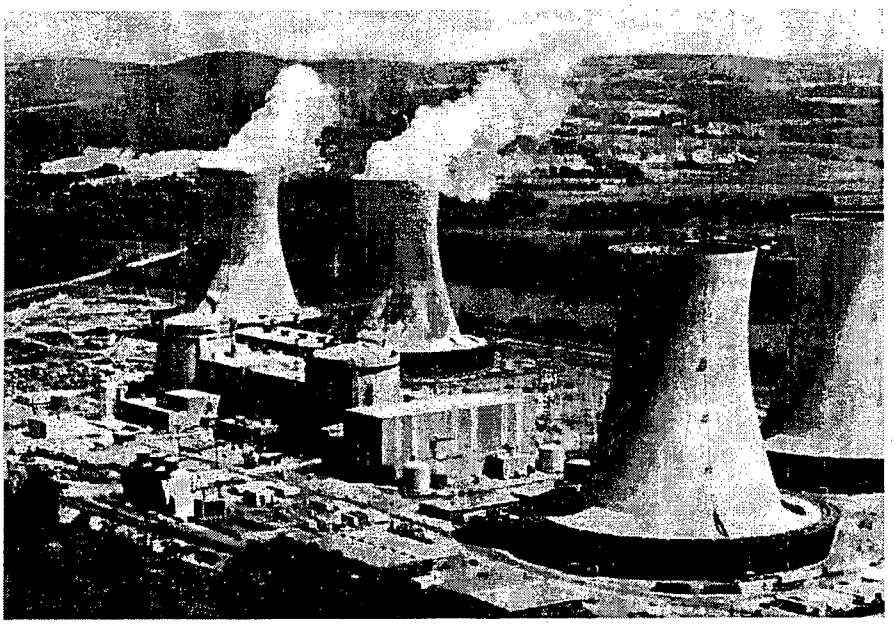
DECOMMISSIONING COST ANALYSIS

for

THREE MILE ISLAND, UNIT 1



prepared for

Exelon Generation Company LLC

prepared by

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No.	CRA No.	Date	Item Revised	Reason for Revision
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EXECUTIVE SUMMARY

This report presents estimates of the cost to decommission Three Mile Island, Unit 1 (TMI-1) for the identified decommissioning scenarios following a scheduled cessation of operations. The analysis relies upon site-specific, technical information, developed in an evaluation in 2003-04,[1] and updated to reflect current assumptions pertaining to the disposition of the nuclear unit and relevant industry experience in undertaking such projects. The updated estimates are designed to provide Exelon Generation Company LLC (Exelon) with sufficient information to assess its financial obligations as they pertain to the eventual decommissioning of the unit.

The primary goal of the decommissioning is the removal and disposal of the contaminated systems and structures so that the nuclear unit's operating license can be terminated. The analysis recognizes that spent fuel will be stored at the site in a wet storage pool and/or in an independent spent fuel storage installation (ISFSI) until such time that it can be transferred to a Department of Energy (DOE) facility. Consequently, the estimates also include those costs to manage and subsequently decommission such storage facilities.

The estimates are based on numerous fundamental assumptions, including regulatory requirements, project contingencies, low-level radioactive waste disposal practices, high-level radioactive waste management options, and site restoration requirements. The estimates incorporate a minimum cooling period of five and one half years for the spent fuel that resides in the fuel handling building's wet storage pool when operations cease. In the DECON and SAFSTOR scenarios, any residual fuel remaining in the pool after the cooling period is relocated to the ISFSI to await transfer to a DOE facility (the fuel is assumed to remain in the storage pool for the Delayed DECON scenario and transferred directly from the pool to an off-site DOE facility). The estimates also include the dismantling of non-essential structures and limited restoration of the site.

TMI-1 shares the site with an adjacent and shutdown unit. This analysis, with the exception of site security services, does not consider any additional costs or savings that might be incurred or achieved in coordinating the decommissioning of the two units, in part, due to the unique decontamination and dismantling requirements for the shutdown unit.

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1 "Decommissioning Cost Analysis for the Three Mile Island, Unit 1," Document No. E16-1455-005, Rev. 0, TLG Services, Inc., January 2004.

Alternatives and Regulations

The Nuclear Regulatory Commission (NRC or Commission) provided initial decommissioning requirements in its rule adopted on June 27, 1988.[2] In this rule, the NRC set forth financial criteria for decommissioning licensed nuclear power facilities. The regulations addressed planning needs, timing, funding methods, and environmental review requirements for decommissioning. The rule also defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB.

> DECON is defined as "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations."[3]
>
> SAFSTOR is defined as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use."[4] Decommissioning is to be completed within 60 years, although longer time periods will be considered when necessary to protect public health and safety.
>
> ENTOMB is defined as "the alternative in which radioactive contaminants are encased in a structurally long-lived material, such as concrete; the entombed structure is appropriately maintained and continued surveillance is carried out until the radioactive material decays to a level permitting unrestricted release of the property."[5] As with the SAFSTOR alternative, decommissioning is currently required to be completed within 60 years.
>
> The 60-year restriction has limited the practicality for the ENTOMB alternative at commercial reactors that generate significant amounts of long-lived radioactive material. In 1997, the Commission directed its staff to re-evaluate this alternative and identify the technical requirements and regulatory actions that would be necessary for entombment to become a viable option. The resulting evaluation provided several recommendations, however, rulemaking has been deferred based upon several factors (e.g., no

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2 U.S. Code of Federal Regulations, Title 10, Parts 30, 40, 50, 51, 70 and 72 "General Requirements for Decommissioning Nuclear Facilities," Nuclear Regulatory Commission, Federal Register Volume 53, Number 123 (p 24018 et seq.), June 27, 1988

3 Ibid. Page FR24022, Column 3

4 Ibid.

5 Ibid. Page FR24023, Column 2

licensee has committed to pursuing the entombment option, the unresolved issues associated with the disposition of greater-than-Class C material (GTCC), and the NRC's current priorities) at least until after the additional research studies are complete. The Commission concurred with the staff's recommendation.

In 1996 the NRC amended its decommissioning regulations to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process.[6] The amendments allow for greater public participation and better define the transition process from operations to decommissioning. Regulatory Guide 1.184, issued in July 2000, further described the methods and procedures acceptable to the NRC staff for implementing the requirements of the 1996 amendments relating to the initial activities and major phases of the decommissioning process. The costs and schedules presented in this analysis follow the general guidance and processes described in these regulations.

Decommissioning Scenarios

TMI-1 is currently scheduled to cease operations in 2014. The owner has, however, applied for a 20-year license extension.[7] As such, this analysis assumes that the unit will operate until 2034. The following scenarios were evaluated and are representative of the alternatives available to the owner:

1. DECON: In this scenario, an ISFSI is constructed on site to permit offloading of the spent fuel in the fuel storage facilities so as to facilitate decontamination and dismantling activities within the fuel handling building. The unit is then promptly decommissioned as an integrated activity. Spent fuel storage operations continue at the site until the transfer of fuel to the DOE is complete, assumed to be in the year 2048.

2. Delayed DECON: In the second scenario the unit is shutdown and prepared for an abbreviated period of storage prior to the actual start of field activities. The spent fuel discharged to the storage pool once operations cease remains in the pool until it can be transferred to a DOE facility. Decommissioning is delayed until the transfer of the fuel to the DOE is completed (i.e., in the year 2048). The unit is then decommissioned.

3. SAFSTOR: The unit is also placed into storage in the third scenario. However, decommissioning is deferred beyond the fuel storage period to the maximum

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6 U.S. Code of Federal Regulations, Title 10, Parts 2, 50, and 51, "Decommissioning of Nuclear Power Reactors," NRC, Federal Register Volume 61, (p 39278 et seq.), July 29, 1996

7 Application for license renewal received by the NRC on January 8, 2008

extent possible; termination of the license would conclude within the maximum required 60-year period. An ISFSI is constructed on site to permit offloading of the spent fuel in the fuel storage facilities; spent fuel remaining in the spent fuel storage pool after a minimum cooling period is transferred to the ISFSI for interim storage. The unit remains in safe-storage after the fuel has been removed from site until decommissioning operations commence (timed to allow the process to be completed and license terminated within the required 60 year period). As with the first two scenarios, decommissioning activities are sequenced and integrated so as to minimize the total duration of the physical dismantling process.

Methodology

The methodology used to develop the estimates described within this document follows the basic approach originally presented in the cost estimating guidelines [8] developed by the Atomic Industrial Forum (now Nuclear Energy Institute). This reference describes a unit factor method for determining decommissioning activity costs. The unit factors used in this analysis incorporate site-specific costs and the latest available information on worker productivity in decommissioning.

The estimates are area-based estimates, i.e., the plant inventory has been correlated with site-specific area working conditions, and the plant work activities organized into discrete areas to better reflect the manner in which the decommissioning will be conducted. The areas were determined on the basis of "common" conditions or attributes. Each area was evaluated for work difficulty, including affects of radiation, external surface contamination, and access. This evaluation was used to adjust the work difficulty factors for removing equipment in a given area. A data base was constructed and identified the installed equipment in each area. This data base contains a list of components that have a unique identifier, such as valves, tanks, electrical equipment, and heat exchangers. It also contains bulk commodities such as piping, ventilation ductwork, cable tray, electrical conduit, and supports.

The inventory was organized according to its proposed disposition. There were three primary waste streams identified for the TMI-1 inventory: (1) clean material (expected to meet the release criteria without any decontamination), (2) contaminated material with recovery potential or requiring additional processing for disposal (expected to be sent to an off-site waste processor), and (3) contaminated material designated for direct disposal at a controlled low-level

[8] T.S. LaGuardia et al., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986

radioactive waste disposal site (i.e., material expected to exceed waste processor acceptance criteria or uneconomical to process).

An activity duration critical path is used to determine the total decommissioning program schedule. The schedule is relied upon in calculating the carrying costs, which include program management, administration, field engineering, equipment rental, and support services such as quality control and security. This systematic approach for assembling decommissioning estimates ensures a high degree of confidence in the reliability of the resulting cost estimate.

Contingency

Consistent with standard cost estimating practice, contingencies are applied to the decontamination and dismantling costs as "specific provision for unforeseeable elements of cost within the defined project scope, particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur."[9] The cost elements in the estimates are based on ideal conditions; therefore, the types of unforeseeable events that are almost certain to occur in decommissioning, based on industry experience, are addressed through a percentage contingency applied on a line-item basis. This contingency factor is a nearly universal element in all large-scale construction and demolition projects. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the station.

The use and role of contingency within decommissioning estimates is not a safety factor issue. Safety factors provide additional security and address situations that may never occur. Contingency funds, by contrast, are expected to be fully expended throughout the program. Inclusion of contingency is necessary to provide assurance that sufficient funding will be available to accomplish the intended tasks.

Low-Level Radioactive Waste Disposal

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is classified as low-level (radioactive) waste, although not all of the material is suitable for "shallow-land" disposal. With the passage of the "Low-Level Radioactive Waste Policy Act" in 1980,[10] and its

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9 Project and Cost Engineers' Handbook, Second Edition, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, p. 239

10 "Low-Level Radioactive Waste Policy Act of 1980," Public Law 96-573, 1980

Amendments of 1985,[11] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

Until recently, there were two facilities available to Exelon for the disposal of low-level radioactive waste generated by TMI-1. As of July 1, 2008, however, the facility in Barnwell, South Carolina was closed to generators outside the Atlantic Compact (comprised of the states of Connecticut, New Jersey and South Carolina). This leaves the facility in Clive, Utah, operated by EnergySolutions, as the only available destination for low-level radioactive waste requiring controlled disposal.

EnergySolutions does not have a license to dispose of the more highly radioactive waste (Class B and C as defined by 10 CFR §61) generated in the decontamination and dismantling of the reactor vessel. In the interim (at least until new waste disposal options become available) and for purposes of this analysis, waste disposal costs for this material are based upon previously negotiated costs of disposal at the Barnwell site.

The dismantling of the components residing closest to the reactor core generates radioactive waste considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance. As such, the GTCC radioactive waste in this study is assumed to be packaged and disposed of as high-level waste, at a cost equivalent to that envisioned for the spent fuel. The GTCC material is either stored with the spent fuel at the ISFSI or shipped directly to a DOE facility as it is generated (depending upon the timing of the decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

A significant portion of the waste material generated during decommissioning may only be potentially contaminated by radioactive materials. This waste can be analyzed on site or shipped off site to licensed facilities for further analysis, for processing and/or for conditioning/recovery. Reduction in the volume of low-level radioactive waste requiring disposal in a licensed low-level radioactive waste disposal facility can be accomplished through a variety of methods, including analyses and surveys or decontamination to eliminate the portion of waste that does not require disposal as

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11 "Low-Level Radioactive Waste Policy Amendments Act of 1985," Public Law 99-240, 1986

radioactive waste, compaction, incineration or metal melt. The estimates for TMI-1 reflect the savings from waste recovery/volume reduction.

High-Level Radioactive Waste Management

Congress passed the "Nuclear Waste Policy Act"[12] (NWPA) in 1982, assigning the responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. Two permanent disposal facilities were envisioned, as well as an interim storage facility. To recover the cost, the legislation created a Nuclear Waste Fund through which money is collected from the sale of electricity generated by the power plants. The NWPA, along with the individual disposal contracts with the utilities, specified that the DOE was to begin accepting spent fuel by January 31, 1998.

Since the original legislation, the DOE has announced several delays in the program schedule. By January 1998, the DOE had failed to initiate the disposal of spent nuclear fuel and high level waste, as required by the NWPA and the utility contracts. As a result, utilities initiated legal action against the DOE. While legal actions continue, the DOE has no plans to receive spent fuel prior to completing the construction of its geologic repository.

Operation of DOE's yet-to-be constructed repository is contingent upon the review and approval of the facility's license application by the NRC and the successful resolution of pending litigation. The DOE submitted its license application to the NRC on June 3, 2008, seeking authorization to construct the repository at Yucca Mountain, Nevada. The NRC formally docketed the DOE's license application on September 8, 2008, triggering a three-year deadline, with a possible one-year extension, set by Congress for the NRC to decide on whether to authorize construction.

Construction, if adequately funded, could take five to six years after the DOE receives authorization to proceed. DOE expects that receipt of fuel could begin as early as 2017,[13] although 2020 may be more likely according to the director of the DOE's waste program.[14]

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12 "Nuclear Waste Policy Act of 1982 and Amendments," U.S. Department of Energy's Office of Civilian Radioactive Management, 1982

13 "DOE Announces Yucca Mountain License Application Schedule", U.S. Department of Energy's Office of Public Affairs, Press Release July 19, 2006

14 Statement of OCRWM Director Ward Sproat Edward F. Sproat, III, before the Subcommittee on Energy and Air Quality, Committee on Energy and Commerce, U.S. House of Representatives, July 15, 2008

Once the repository is operational, fuel acceptance will be prioritized and spent fuel assemblies will need to meet certain acceptance criteria, including heat output. These conditions require that the fuel discharged upon the cessation of operations be actively cooled and stored for a minimum period at the generating site prior to transfer (a minimum of five years as defined in 10CFR§961 for standard fuel). As such, the NRC requires that licensees establish a program to manage and provide funding for the management of all irradiated fuel at the reactor until title of the fuel is transferred to the Secretary of Energy, pursuant to 10CFR§50.54(bb).[15] This funding requirement is fulfilled through inclusion of certain cost elements in the decommissioning estimates, for example, associated with the isolation and continued operation of the nuclear unit's spent fuel spent pool and/or ISFSI.

At shutdown, the wet storage pool is expected to contain freshly discharged assemblies (from the most recent refueling cycles) as well as the final reactor core. In the DECON and SAFSTOR scenarios the assemblies are packaged into multipurpose canisters for transfer to the ISFSI. A five and one-half year cooling period following the cessation of operations is provided for the final core to meet the conditions for dry storage.

Once the wet storage pool is emptied, the fuel handling building can be either decontaminated and dismantled or prepared for long-term storage. The ISFSI, which can be operated under the station's general license, will be designed to accommodate the dry storage casks needed to off-load the wet storage pool. In the Delayed DECON scenario, the storage pool remains operational and used for the interim storage of the fuel. No dry storage capacity is assumed to be constructed for decommissioning. The transfer of spent fuel to DOE is performed from the storage pool.

The DOE's generator allocation/receipt schedules are based upon the oldest fuel receiving the highest priority. For purposes of this analysis, acceptance of commercial spent fuel by the DOE is assumed to begin in 2018. With a large fleet of reactors, Exelon is able to re-assign allocations between its units to minimize on-site storage costs. Assuming spent fuel from the older units is given priority and with a maximum rate of transfer of 3,000 metric tons of uranium (MTU) per year, the assemblies residing in the TMI-1 storage pool at the time of shutdown would be scheduled for pickup in the years 2046 through 2048 (assuming the cessation of operations in 2034). This equates to 62 multi-purpose canisters (at 32 assemblies per canister). An additional eight canisters are shipped from the site during plant operations, for a total of 70 canisters generated by TMI-1 over its lifetime.

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[15] U.S. Code of Federal Regulations, Title 10, Part 50, "Domestic Licensing of Production and Utilization Facilities," Subpart 54 (bb), "Conditions of Licenses"

Exelon's strongly held position is that the DOE has a contractual obligation to accept TMI-1's fuel in a timely manner and consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim. However, at this time, including the cost of storing spent fuel in this study is the most reasonable approach because it insures the availability of sufficient decommissioning funds at the end of the station's life if the DOE has not met its contractual obligation to take the fuel.

Site Restoration

The efficient removal of the contaminated materials at the site will result in damage to many of the site structures. Blasting, coring, drilling, and the other decontamination activities will substantially damage power block structures, potentially weakening the footings and structural supports. Prompt demolition once the license is terminated is clearly the most appropriate and cost-effective option. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures with a work force already mobilized is more efficient and less costly than if the process were deferred. Experience at shutdown generating stations has shown that facilities quickly degrade without maintenance, adding additional expense and creating potential hazards to the public and the demolition work force. Consequently, this analysis assumes that non-essential site structures within the restricted access area are removed to a nominal depth of three feet below the local grade level wherever possible. The site is then graded and stabilized.

Summary

The costs to decommission TMI-1 were evaluated for several decommissioning scenarios, incorporating the attributes of both the DECON and SAFSTOR decommissioning alternatives. Regardless of the timing of the decommissioning activities, the estimates assume the eventual removal of all the contaminated and activated components and structural materials, such that the facility operator may then have unrestricted use of the TMI-1 property with no further requirement for an operating license. Delayed decommissioning is initiated after the spent fuel has been removed from the site and, as with SAFSTOR, is accomplished within the 60-year period required by current NRC regulations. In the interim, the spent fuel remains in storage at the site until such time that the transfer to a DOE facility can be completed.

The scenarios analyzed for the purpose of generating the estimates are described in Section 2. The assumptions are presented in Section 3, along with schedules of annual expenditures. The major cost contributors are identified in Section 6, with

detailed activity costs, waste volumes, and associated manpower requirements delineated in Appendices C, D, and E. Cost summaries for the various scenarios are provided at the end of this section for the major cost components.

SUMMARY OF DECOMMISSIONING COST ELEMENTS
DECON
(thousands of 2008 dollars)

Activity	Total
Decontamination	10,012
Removal	113,182
Packaging	13,132
Transportation	15,424
Waste Disposal	74,845
Off-site Waste Processing	9,150
Program Management [1]	314,235
Spent Fuel Pool Isolation	10,819
Spent Fuel Management	116,016
Insurance and Regulatory Fees	13,997
Energy	10,279
Characterization and Licensing Surveys	13,726
Property Taxes	11,079
Miscellaneous Equipment	6,069
Site O&M	4,369
Total [2]	736,331
NRC License Termination	504,115
Spent Fuel Management	158,771
Site Restoration	73,445

[1] Includes engineering and security
[2] Columns may not add due to rounding

SUMMARY OF DECOMMISSIONING COST ELEMENTS
DELAYED DECON
(thousands of 2008 dollars)

Activity	Total
Decontamination	10,342
Removal	108,206
Packaging	10,250
Transportation	13,888
Waste Disposal	51,527
Off-site Waste Processing	12,650
Program Management [1]	372,473
Spent Fuel Pool Isolation	10,819
Spent Fuel Management	34,249
Insurance and Regulatory Fees	19,002
Energy	14,774
Characterization and Licensing Surveys	15,246
Property Taxes	16,365
Miscellaneous Equipment	10,611
Site O&M	6,107
Total [2]	706,507
NRC License Termination	477,208
Spent Fuel Management	153,263
Site Restoration	76,036

[1] Includes engineering and security
[2] Columns may not add due to rounding

SUMMARY OF DECOMMISSIONING COST ELEMENTS
SAFSTOR
(thousands of 2008 dollars)

Activity	Total
Decontamination	9,983
Removal	113,224
Packaging	9,518
Transportation	12,759
Waste Disposal	50,739
Off-site Waste Processing	12,721
Program Management [1]	439,485
Spent Fuel Pool Isolation	10,819
Spent Fuel Management	113,770
Insurance and Regulatory Fees	47,000
Energy	20,075
Characterization and Licensing Surveys	15,246
Property Taxes	49,300
Miscellaneous Equipment	23,920
Site O&M	17,818
Total [2]	946,378
NRC License Termination	692,814
Spent Fuel Management	177,582
Site Restoration	75,982

[1] Includes engineering and security
[2] Columns may not add due to rounding

1. INTRODUCTION

This report presents estimates of the cost to decommission the Three Mile Island, Unit 1 (TMI-1), for the scenarios described in Section 2, following a scheduled cessation of operations. The analysis relies upon site-specific, technical information, originally developed in an evaluation for the Exelon Generation Company LLC (Exelon) in 2003-04 [1] and updated to reflect current assumptions pertaining to the disposition of the nuclear unit and relevant industry experience in undertaking such projects. The current estimates are designed to provide Exelon with sufficient information to assess their financial obligations, as they pertain to the eventual decommissioning of the nuclear unit. It is not a detailed engineering document, but a financial analysis prepared in advance of the detailed engineering that will be required to carry out the decommissioning

1.1 OBJECTIVES OF STUDY

The objectives of this study are to prepare comprehensive estimates of the cost to decommission TMI-1, to provide a sequence or schedule for the associated activities, and to develop waste stream projections from the decontamination and dismantling activities. The nuclear unit's operating license currently expires on April 19, 2014; however, this study assumes that the license will be renewed for an additional 20 years, with shutdown in 2034.

1.2 SITE DESCRIPTION

TMI-1 is located on the northern-most section of Three Mile Island near the east shore of the Susquehanna River in Dauphin County, Pennsylvania. The station is comprised of two pressurized water reactors. This study specifically addresses the decommissioning requirements for Unit 1 and its associated facilities, i.e., no consideration have been given to the decommissioning requirements for the adjacent unit in the scheduling of dismantling activities.

TMI-1 was designed by Gilbert Associates and built by United Engineers & Constructors, Inc. The nuclear steam supply system (NSSS) consists of a pressurized water reactor rated at a core thermal power level of 2568 MWth with a corresponding turbine-generator gross output of 871 MWe. The NSSS consists of the reactor with two independent primary coolant loops, each containing two reactor coolant pumps and a steam generator. An electrically heated pressurizer and connecting piping complete the system. The system is housed within a steel-lined, post-tensioned concrete structure in the shape of a right, vertical cylinder with a hemispherical dome and a flat, reinforced concrete basemat. A welded

steel liner plate, anchored to the inside face of containment, serves as a leak-tight membrane.

Heat produced in the reactor is converted to electrical energy by the turbine generator system. This system converts the thermal energy of the steam into mechanical shaft power and then into electrical energy. The turbine-generator is a tandem-compound design, consisting of one double-flow, high pressure turbine and three double-flow, low-pressure turbines driving a directly coupled generator at 1800 rpm. The turbine is operated in a closed feedwater cycle that condenses the steam; the heated feedwater is returned to the steam generators. Heat rejected in the main condensers is removed by the condenser circulating and river water systems.

The condenser circulating water is cooled in two hyperbolic natural draft cooling towers located to the east of the station. The towers provide the heat sink required for removal of waste heat in the power plant's thermal cycle. Cooling tower blowdown is discharged to the Susquehanna River.

1.3 REGULATORY GUIDANCE

The Nuclear Regulatory Commission (NRC or Commission) provided initial decommissioning requirements in its rule "General Requirements for Decommissioning Nuclear Facilities," issued in June 1988.[2]* This rule set forth financial criteria for decommissioning licensed nuclear power facilities. The regulation addressed decommissioning planning needs, timing, funding methods, and environmental review requirements. The intent of the rule was to ensure that decommissioning would be accomplished in a safe and timely manner and that adequate funds would be available for this purpose. Subsequent to the rule, the NRC issued Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors,[3]" which provided additional guidance to the licensees of nuclear facilities on the financial methods acceptable to the NRC staff for complying with the requirements of the rule. The regulatory guide addressed the funding requirements and provided guidance on the content and form of the financial assurance mechanisms indicated in the rule.

The rule defined three decommissioning alternatives as being acceptable to the NRC: DECON, SAFSTOR, and ENTOMB. The DECON alternative assumes that any contaminated or activated portion of the systems, structures, and facilities are removed or decontaminated to levels that permit the site to be

* Annotated references for citations in Sections 1-6 are provided in Section 7.

released for unrestricted use shortly after the cessation of operations. The rule also placed limits on the time allowed to complete the decommissioning process. For SAFSTOR, the process is restricted in overall duration to 60 years, unless it can be shown that a longer duration is necessary to protect public health and safety. The guidelines for ENTOMB are similar, providing the NRC with both sufficient leverage and flexibility to ensure that these deferred options are only used in situations where it is reasonable and consistent with the definition of decommissioning. At the conclusion of a 60-year dormancy period (or longer for ENTOMB if the NRC approves such a case), the site would still require significant remediation to meet the unrestricted release limits for license termination.

The ENTOMB alternative has not been viewed as a viable option for power reactors due to the significant time required to isolate the long-lived radionuclides for decay to permissible levels. However, with recent rulemaking permitting the controlled release of a site, the NRC has re-evaluated this alternative.[4] The resulting feasibility study, based upon an assessment by Pacific Northwest National Laboratory, concluded that the method did have conditional merit for some, if not most, reactors. However, the staff also found that additional rulemaking would be needed before this option could be treated as a generic alternative. The NRC had considered rulemaking to alter the 60-year time for completing decommissioning and to clarify the use of engineered barriers for reactor entombments.[5] However, the NRC's staff has recommended that rulemaking be deferred, based upon several factors, e.g., no licensee has committed to pursuing the entombment option, the unresolved issues associated with the disposition of greater-than-Class C material (GTCC), and the NRC's current priorities, at least until after the additional research studies are complete. The Commission concurred with the staff's recommendation.

The NRC published amendments to its decommissioning regulations in 1996.[6] When the regulations were originally adopted in 1988, it was assumed that the majority of licensees would decommission at the end of the facility's operating licensed life. Since that time, several licensees permanently and prematurely ceased operations. Exemptions from certain operating requirements were required once the reactor was defueled to facilitate the decommissioning. Each case was handled individually, without clearly defined generic requirements. The NRC amended the decommissioning regulations in 1996 to clarify ambiguities and codify procedures and terminology as a means of enhancing efficiency and uniformity in the decommissioning process. The new amendments allow for greater public participation and better define the transition process from operations to decommissioning.

Under the revised regulations, licensees will submit written certification to the NRC within 30 days after the decision to cease operations. Certification will also be required once the fuel is permanently removed from the reactor vessel. Submittal of these notices will entitle the licensee to a fee reduction and eliminate the obligation to follow certain requirements needed only during operation of the reactor. Within two years of submitting notice of permanent cessation of operations, the licensee is required to submit a Post-Shutdown Decommissioning Activities Report (PSDAR) to the NRC. The PSDAR describes the planned decommissioning activities, the associated sequence and schedule, and an estimate of expected costs. Prior to completing decommissioning, the licensee is required to submit applications to the NRC to terminate the license, which will include a License Termination Plan (LTP).

1.3.1 Nuclear Waste Policy Act

Congress passed the "Nuclear Waste Policy Act"[7] (NWPA) in 1982, assigning the responsibility for disposal of the spent nuclear fuel created by the commercial nuclear generating plants to the DOE. Two permanent disposal facilities were envisioned, as well as an interim storage facility. To recover the cost, the legislation created a Nuclear Waste Fund through which money is collected from the sale of electricity generated by the power plants. NWPA, along with the individual disposal contracts with the utilities, specified that the DOE was to begin accepting spent fuel by January 31, 1998.

Since the original legislation, the DOE has announced several delays in the program schedule. By January 1998, the DOE had failed to initiate the disposal of spent nuclear fuel and high level waste, as required by the NWPA and utility contracts. Delays continue and, as a result, generators have initiated legal action against the DOE in an attempt to resolve the impasse.[8]

Operation of DOE's yet-to-be constructed repository is contingent upon the review and approval of the facility's license application by the NRC and the successful resolution of pending litigation. The DOE submitted its license application to the NRC on June 3, 2008, seeking authorization to construct the repository at Yucca Mountain, Nevada. The NRC formally docketed the DOE's license application on September 8, 2008, triggering a three-year deadline, with a possible one-year extension, set by Congress for the NRC to decide on whether to authorize construction.

Construction, if adequately funded, could take five to six years after the DOE receives authorization to proceed. DOE expects that receipt of fuel could begin as early as 2017,[9] although 2020 may be more likely according to the director of the DOE's waste program.[10]

Once the repository is operational, fuel acceptance will be prioritized and spent fuel assemblies will need to meet certain acceptance criteria, including heat output. These conditions require that the fuel discharged upon the cessation of operations be actively cooled and stored for a minimum period at the generating site prior to transfer (five years as defined in 10CFR§961 for standard fuel). As such, the NRC requires that licensees establish a program to manage and provide funding for the management of all irradiated fuel at the reactor until title of the fuel is transferred to the Secretary of Energy, pursuant to 10CFR§50.54(bb).[11] This funding requirement is fulfilled through inclusion of certain cost elements in the decommissioning estimate, for example, associated with the isolation and continued operation of the spent fuel pool and ISFSI.

At shutdown, the fuel storage pool is expected to contain freshly discharged assemblies (from the most recent refueling cycles) as well as the final reactor core. Over the next five and one half years the assemblies are packaged into multipurpose canisters for transfer to the ISFSI (DECON and SAFSTOR only). It is assumed that this period provides the necessary cooling for the final core to meet ISFSI cask design requirements for decay heat.

It is anticipated that Exelon will not need to construct an ISFSI at the site to support operations. In two of the scenarios evaluated, it is expected that an ISFSI will be constructed after final shutdown to support decommissioning operations. The ISFSI is built to accommodate the inventory of spent fuel residing in the wet storage pool at the conclusion of the required cooling period. Once emptied, the fuel handling building can be either decontaminated and dismantled or prepared for long-term storage. In the Delayed DECON scenario, the storage pool remains operational and is used for the interim storage of the fuel.

The DOE's generator allocation/receipt schedules are based upon the oldest fuel receiving the highest priority. For purposes of this analysis, the acceptance of commercial spent fuel by the DOE is assumed to begin in 2018. Given this scenario and an anticipated rate of transfer, spent fuel is projected to remain at the TMI-1 site for approximately fourteen years after the cessation of operations. Consequently, costs are included

within the analysis for the continued operation of the storage pool and for the long-term caretaking of the spent fuel at the site until the year 2048.

Exelon's strongly held position is that the DOE has a contractual obligation to accept TMI-1's fuel in a timely manner and consistent with its contract commitments. No assumption made in this study should be interpreted to be inconsistent with this claim. However, at this time, including the cost of storing spent fuel in this study is the most reasonable approach because it insures the availability of sufficient decommissioning funds at the end of the station's life if, contrary to its contractual obligation, the DOE has not performed.

1.3.2 Low-Level Radioactive Waste Acts

The contaminated and activated material generated in the decontamination and dismantling of a commercial nuclear reactor is classified as low-level (radioactive) waste, although not all of the material is suitable for "shallow-land" disposal. With the passage of the "Low-Level Radioactive Waste Policy Act" in 1980,[12] and its Amendments of 1985,[13] the states became ultimately responsible for the disposition of low-level radioactive waste generated within their own borders.

Until recently, there were two facilities available to Exelon for the disposal of low-level radioactive waste generated by TMI-1. As of July 1, 2008, however, the facility in Barnwell, South Carolina was closed to generators outside the Atlantic Compact (comprised of the states of Connecticut, New Jersey and South Carolina). This leaves the facility in Clive, Utah, operated by EnergySolutions, as the only available destination for low-level radioactive waste requiring controlled disposal.

EnergySolutions does not have a license to dispose of the more highly radioactive waste (Class B and C as defined by 10 CFR §61) generated in the dismantling of the reactor vessel. In the interim (at least until new waste disposal options become available) and for purposes of this analysis, waste disposal costs for this material are based upon previously negotiated costs of disposal at the Barnwell site.

The dismantling of the components residing closest to the reactor core generates radioactive waste considered unsuitable for shallow-land disposal (i.e., low-level radioactive waste with concentrations of

radionuclides that exceed the limits established by the NRC for Class C radioactive waste (GTCC)). The Low-Level Radioactive Waste Policy Amendments Act of 1985 assigned the federal government the responsibility for the disposal of this material. The Act also stated that the beneficiaries of the activities resulting in the generation of such radioactive waste bear all reasonable costs of disposing of such waste. However, to date, the federal government has not identified a cost for disposing of GTCC or a schedule for acceptance. As such, the GTCC radioactive waste in this study is assumed to be packaged and disposed of as high-level waste, at a cost equivalent to that envisioned for the spent fuel. The GTCC material is either stored with the spent fuel at the ISFSI or shipped directly to a DOE facility as it is generated (depending upon the timing of the decommissioning and whether the spent fuel has been removed from the site prior to the start of decommissioning).

A significant portion of the waste material generated during decommissioning may only be potentially contaminated by radioactive materials. This waste can be analyzed on site or shipped off site to licensed facilities for further analysis, for processing and/or for conditioning/recovery. Reduction in the volume of low-level radioactive waste requiring disposal in a licensed low-level radioactive waste disposal facility can be accomplished through a variety of methods, including analyses and surveys or decontamination to eliminate the portion of waste that does not require disposal as radioactive waste, compaction, incineration or metal melt. The estimates for TMI-1 reflect the savings from waste recovery/volume reduction.

1.3.3 Radiological Criteria for License Termination

In 1997, the NRC published Subpart E, "Radiological Criteria for License Termination,"[14] amending 10 CFR §20. This subpart provides radiological criteria for releasing a facility for unrestricted use. The regulation states that the site can be released for unrestricted use if radioactivity levels are such that the average member of a critical group would not receive a Total Effective Dose Equivalent (TEDE) in excess of 25 millirem per year, and provided that residual radioactivity has been reduced to levels that are As Low As Reasonably Achievable (ALARA). The decommissioning estimates for TMI-1 assume that the site will be remediated to a residual level consistent with the NRC-prescribed level.

It should be noted that the NRC and the Environmental Protection Agency (EPA) differ on the amount of residual radioactivity considered

acceptable in site remediation. The EPA has two limits that apply to radioactive materials. An EPA limit of 15 millirem per year is derived from criteria established by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund).[15] An additional limit of 4 millirem per year, as defined in 40 CFR §141.16, is applied to drinking water.[16]

On October 9, 2002, the NRC signed an agreement with the EPA on the radiological decommissioning and decontamination of NRC-licensed sites. The Memorandum of Understanding (MOU)[17] provides that EPA will defer exercise of authority under CERCLA for the majority of facilities decommissioned under NRC authority. The MOU also includes provisions for NRC and EPA consultation for certain sites when, at the time of license termination, (1) groundwater contamination exceeds EPA-permitted levels; (2) NRC contemplates restricted release of the site; and/or (3) residual radioactive soil concentrations exceed levels defined in the MOU.

The MOU does not impose any new requirements on NRC licensees and should reduce the involvement of the EPA with NRC licensees who are decommissioning. Most sites are expected to meet the NRC criteria for unrestricted use, and the NRC believes that only a few sites will have groundwater or soil contamination in excess of the levels specified in the MOU that trigger consultation with the EPA. However, if there are other hazardous materials on the site, the EPA may be involved in the cleanup. As such, the possibility of dual regulation remains for certain licensees. The present study does not include any costs for this occurrence.

2. DECOMMISSIONING ALTERNATIVES

Detailed cost estimates were developed to decommission TMI-1 for three variations of the approved decommissioning alternatives: DECON and SAFSTOR. Although the scenarios differ with respect to technique, process, cost, and schedule, they attain the same result: the ultimate release of the site for unrestricted use.

TMI-1 is currently scheduled to cease operations in 2014. The owner has, however, applied for a 20-year extension. As such, this analysis assumes that the unit will operate until 2034. The scenarios selected are representative of alternatives available to the owner and are defined as follows:

1. DECON: In this scenario, an ISFSI is constructed on site to permit offloading of the spent fuel in the fuel storage facilities so as to facilitate decontamination and dismantling activities within the fuel handling building. The unit is then promptly decommissioned as an integrated activity. Spent fuel storage operations continue at the site until the transfer of fuel to the DOE is complete, assumed to be in the year 2048.

2. Delayed DECON: In the second scenario the unit is shutdown and prepared for an abbreviated period of storage prior to the actual start of field activities. The spent fuel discharged to the storage pool once operations cease remains in the pool until it can be transferred to a DOE facility. Decommissioning is delayed until the transfer of the fuel to the DOE is completed (i.e., in the year 2048). The unit is then decommissioned.

3. SAFSTOR: The unit is also placed into storage in the third scenario. However, decommissioning is deferred beyond the fuel storage period to the maximum extent possible; termination of the license would conclude within the maximum required 60-year period. An ISFSI is constructed on site to permit offloading of the spent fuel in the fuel storage facilities; spent fuel remaining in the spent fuel storage pool after a minimum cooling period is transferred to the ISFSI for interim storage. The unit remains in safe-storage after the fuel has been removed from site until decommissioning operations commence (timed to allow the process to be completed and license terminated within the required 60 year period). As with the first two scenarios, decommissioning activities are sequenced and integrated so as to minimize the total duration of the physical dismantling process.

The following sections describe the basic activities associated with each alternative. Although detailed procedures for each activity identified are not provided, and the

actual sequence of work may vary, the activity descriptions provide a basis not only for estimating but also for the expected scope of work (i.e., engineering and planning at the time of decommissioning).

The conceptual approach that the NRC has described in its regulations divides decommissioning into three phases. The initial phase commences with the effective date of permanent cessation of operations and involves the transition of both nuclear unit and licensee from reactor operations (i.e., power production) to facilitate de-activation and closure. During the first phase, notification is to be provided to the NRC certifying the permanent cessation of operations and the removal of fuel from the reactor vessel. The licensee would then be prohibited from reactor operation.

The second phase encompasses activities during the storage period or during major decommissioning activities, or a combination of the two. The third phase pertains to the activities involved in license termination. The decommissioning estimates developed for TMI-1 are also divided into phases or periods; however, demarcation of the phases is based upon major milestones within the project or significant changes in the projected expenditures.

2.1 DECON

The DECON alternative, as defined by the NRC, is "the alternative in which the equipment, structures, and portions of a facility and site containing radioactive contaminants are removed or decontaminated to a level that permits the property to be released for unrestricted use shortly after cessation of operations." This study does not address the cost to dispose of the spent fuel residing at the site; such costs are funded through a surcharge on electrical generation. However, the study does estimate the costs incurred with the interim on-site storage of the fuel pending shipment by the DOE to an off-site disposal facility.

2.1.1 Period 1 - Preparations

In anticipation of the cessation of operations, detailed preparations are undertaken to provide a smooth transition from operations to decommissioning. Through implementation of a staffing transition plan, the organization required to manage the intended decommissioning activities is assembled from available plant staff and outside resources. Preparations include the planning for permanent defueling of the reactor, revision of technical specifications applicable to the operating

conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

Engineering and Planning

The PSDAR, required within two years of the notice to cease operations, provides a description of the licensee's planned decommissioning activities, a timetable, and the associated financial requirements of the intended decommissioning program. Upon receipt of the PSDAR, the NRC will make the document available to the public for comment in a local meeting to be held in the vicinity of the reactor site. Ninety days following submittal and NRC receipt of the PSDAR, the licensee may begin to perform major decommissioning activities under a modified 10 CFR §50.59 procedure, i.e., without specific NRC approval. Major activities are defined as any activity that results in permanent removal of major radioactive components, permanently modifies the structure of the containment, or results in dismantling components (for shipment) containing GTCC, as defined by 10 CFR §61. Major components are further defined as comprising the reactor vessel and internals, large bore reactor recirculation system piping, and other large components that are radioactive. The NRC includes the following additional criteria for use of the §50.59 process in decommissioning. The proposed activity must not:

- foreclose release of the site for possible unrestricted use,
- significantly increase decommissioning costs,
- cause any significant environmental impact, or
- violate the terms of the licensee's existing license.

Existing operational technical specifications are reviewed and modified to reflect plant conditions and the safety concerns associated with permanent cessation of operations. The environmental impact associated with the planned decommissioning activities is also considered. Typically, a licensee will not be allowed to proceed if the consequences of a particular decommissioning activity are greater than that bounded by previously evaluated environmental assessments or impact statements. In this instance, the licensee would have to submit a license amendment for the specific activity and update the environmental report.

The decommissioning program outlined in the PSDAR will be designed to accomplish the required tasks within the ALARA guidelines (as

defined in 10 CFR §20) for protection of personnel from exposure to radiation hazards. It will also address the continued protection of the health and safety of the public and the environment during the dismantling activity. Consequently, with the development of the PSDAR, activity specifications, cost-benefit and safety analyses, and work packages and procedures, would be assembled to support the proposed decontamination and dismantling activities.

Site Preparations

Following final shutdown, and in preparation for actual decommissioning activities, the following activities are initiated:

- Characterization of the site and surrounding environs. This includes radiation surveys of work areas, major components (including the reactor vessel and its internals), internal piping, and primary shield cores.
- Construction of the ISFSI and transfer of the spent fuel from the wet storage pool to the ISFSI pad for interim storage. Spent fuel storage operations continue throughout the active decommissioning period. Fuel transfer to the DOE is expected to begin in 2046 and to be completed by the end of the year 2048.
- Isolation of the spent fuel storage pool and fuel handling systems, such that decommissioning operations can commence on the balance of the plant. Decommissioning operations are scheduled around the fuel handling area to optimize the overall project schedule. The fuel is transferred to the ISFSI as it decays to the point that it meets the heat load criteria of the containers. Consequently, it is assumed that the fuel pool remains operational for five and one-half years following the cessation of operations.
- Specification of transport and disposal requirements for activated materials and/or hazardous materials, including shielding and waste stabilization.
- Development of procedures for occupational exposure control, control and release of liquid and gaseous effluent, processing of radwaste (including dry-active waste, resins, filter media, metallic and non-metallic components generated in decommissioning), site security and emergency programs, and industrial safety.

2.1.2 Period 2 - Decommissioning Operations

This period includes the physical decommissioning activities associated with the removal and disposal of contaminated and activated components and structures, including the successful termination of the 10 CFR §50 operating license. Significant decommissioning activities in this phase include:

- Construction of temporary facilities and/or modification of existing facilities to support dismantling activities. This may include a centralized processing area to facilitate equipment removal and component preparations for off-site disposal.
- Reconfiguration and modification of site structures and facilities as needed to support decommissioning operations. This may include the upgrading of roads (on and off site) to facilitate hauling and transport. Modifications may be required to the containment structure to facilitate access of large/heavy equipment. Modifications may also be required to the refueling canal to support the segmentation of the reactor vessel internals and component extraction.
- Design and fabrication of temporary and permanent shielding to support removal and transportation activities, construction of contamination control envelopes, and the procurement of specialty tooling.
- Procurement (lease or purchase) of shipping canisters, cask liners, and industrial packages.
- Decontamination of components and piping systems as required to control (minimize) worker exposure.
- Removal of piping and components no longer essential to support decommissioning operations.
- Removal of control rod drive housings and the head service structure from reactor vessel head. Segmentation of the vessel closure head.
- Removal and segmentation of the upper internals assemblies. Segmentation will maximize the loading of the shielded transport casks, i.e., by weight and activity. The operations are conducted under water using remotely operated tooling and contamination controls.
- Disassembly and segmentation of the remaining reactor internals, including the core former and lower core support assembly. Some

material is expected to exceed Class C disposal requirements. As such, the segments will be packaged in modified fuel storage canisters for geologic disposal.

- Segmentation of the reactor vessel. A shielded platform is installed for segmentation as cutting operations are performed in-air using remotely operated equipment within a contamination control envelope. The water level is maintained just below the cut to minimize the working area dose rates. Segments are transferred in-air to containers that are stored under water, for example, in an isolated area of the refueling canal.
- Removal of the activated portions of the concrete biological shield and accessible contaminated concrete surfaces. If dictated by the steam generator and pressurizer removal scenarios, those portions of the associated D-rings necessary for access and component extraction are removed.
- Removal of the steam generators and pressurizer for material recovery and controlled disposal. These components can serve as their own burial containers provided that all penetrations are properly sealed and the internal contaminants are stabilized, e.g., with grout. Steel shielding will be added, as necessary, to those external areas of the package to meet transportation limits and regulations.

At least two years prior to the anticipated date of license termination, an LTP is required. Submitted as a supplement to the Final Safety Analysis Report (FSAR) or its equivalent, the plan must include: a site characterization, description of the remaining dismantling activities, plans for site remediation, procedures for the final radiation survey, designation of the end use of the site, an updated cost estimate to complete the decommissioning, and any associated environmental concerns. The NRC will notice the receipt of the plan, make the plan available for public comment, and schedule a local meeting. LTP approval will be subject to any conditions and limitations as deemed appropriate by the Commission. The licensee may then commence with the final remediation of site facilities and services, including:

- Removal of remaining systems and associated components as they become nonessential to the decommissioning program or worker health and safety (e.g., waste collection and treatment systems, electrical power and ventilation systems).

- Removal of the steel liners from the refueling canal, disposing of the activated and contaminated sections as radioactive waste. Removal of any activated/contaminated concrete.
- Surveys of the decontaminated areas of the containment structures.
- Removal of the contaminated equipment and material from the auxiliary and fuel buildings, and any other contaminated facility. Use radiation and contamination control techniques until radiation surveys indicate that the structures can be released for unrestricted access and conventional demolition. This activity may necessitate the dismantling and disposition of most of the systems and components (both clean and contaminated) located within these buildings. This activity will facilitate surface decontamination and subsequent verification surveys required prior to obtaining release for demolition.
- Removal of the remaining components, equipment, and services in support of the area release survey(s).
- Routing of material removed in the decontamination and dismantling to a central processing area. Material certified to be free of contamination is released for unrestricted disposition, e.g., as scrap, recycle, or general disposal. Contaminated material is characterized and segregated for additional off-site processing (disassembly, chemical cleaning, volume reduction, and waste treatment), and/or packaged for controlled disposal at a low-level radioactive waste disposal facility.

Incorporated into the LTP is the Final Survey Plan. This plan identifies the radiological surveys to be performed once the decontamination activities are completed and is developed using the guidance provided in the "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)."[18] This document incorporates the statistical approaches to survey design and data interpretation used by the EPA. It also identifies commercially available instrumentation and procedures for conducting radiological surveys. Use of this guidance ensures that the surveys are conducted in a manner that provides a high degree of confidence that applicable NRC criteria are satisfied. Once the survey is complete, the results are provided to the NRC in a format that can be verified. The NRC then reviews and evaluates the information, performs an independent confirmation of radiological site conditions, and makes a determination on final termination of the license.

The NRC will terminate the operating license when it determines that site remediation has been performed in accordance with the LTP, and that the terminal radiation survey and associated documentation demonstrate that the facility is suitable for release.

2.1.3 Period 3 - Site Restoration

Following completion of decommissioning operations, site restoration activities will begin. Efficient removal of the contaminated materials and verification that residual radionuclide concentrations are below the NRC limits will result in substantial damage to many of the structures. Although performed in a controlled and safe manner, blasting, coring, drilling, scarification (surface removal), and the other decontamination activities will substantially degrade power block structures including the reactor, and auxiliary buildings. Under certain circumstances, verifying that subsurface radionuclide concentrations meet NRC site release requirements will require removal of grade slabs and lower floors, potentially weakening footings and structural supports. This removal activity will be necessary for those facilities and areas where historical records, when available, indicate the potential for radionuclides having been present in the soil, where system failures have been recorded, or where it is required to confirm that subsurface process and drain lines were not breached over the operating life of the station.

Prompt dismantling of site structures is clearly the most appropriate and cost-effective option. It is unreasonable to anticipate that these structures would be repaired and preserved after the radiological contamination is removed. The cost to dismantle site structures with a work force already mobilized on site is more efficient than if the process were deferred. Site facilities quickly degrade without maintenance, adding additional expense and creating potential hazards to the public as well as to future workers. Abandonment creates a breeding ground for vermin infestation as well as other biological hazards.

This cost study presumes that non-essential structures and site facilities are dismantled as a continuation of the decommissioning activity. Foundations and exterior walls are removed to a nominal depth of three feet below grade. The three-foot depth allows for the placement of gravel for drainage, as well as topsoil, so that vegetation can be established for erosion control. Site areas affected by the dismantling activities are

restored and the property graded as required to prevent ponding and inhibit the refloating of subsurface materials.

Concrete rubble produced by demolition activities is processed to remove rebar and miscellaneous embedments. The processed material is then used on site to backfill voids. Excess materials are trucked to an off-site area for disposal as construction debris.

2.1.4 ISFSI Operations and Decommissioning

The ISFSI will continue to operate under a general 10 CFR §72 license in conjunction with the facility's §50 operating license. Assuming the DOE starts accepting fuel in 2018, transfer of spent fuel from TMI-1 is anticipated to begin in 2046 and continue through the year 2048.

At the conclusion of the spent fuel transfer process, the ISFSI will be decommissioned. The Commission will terminate the license when it determines that the remediation of the ISFSI has been performed in accordance with an ISFSI license termination plan and that the final radiation survey and associated documentation demonstrate that the facility is suitable for release. Once the requirements are satisfied, the NRC can terminate the license for the ISFSI.

The assumed design for the ISFSI is based upon the use of a multi-purpose canister and a concrete module for pad storage. For purposes of this cost analysis, it is assumed that once the inner canisters containing the spent fuel assemblies have been removed, any required decontamination performed, and the license for the facility terminated, the modules can be dismantled using conventional techniques for the demolition of reinforced concrete. The concrete storage pad will then be removed, and the area graded and landscaped to conform to the surrounding environment.

2.2 DELAYED DECON AND SAFSTOR

The NRC defines SAFSTOR as "the alternative in which the nuclear facility is placed and maintained in a condition that allows the nuclear facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use." The facility is left intact (during the dormancy period), with structures maintained in a sound condition. Systems not required to operate in support of the spent fuel pool or site surveillance and security are drained, de-energized, and secured. Minimal

cleaning/removal of loose contamination and/or fixation and sealing of remaining contamination are performed. Access to contaminated areas is secured to provide controlled access for inspection and maintenance.

The engineering and planning requirements are similar to those for the DECON alternative, although a shorter time period is expected for these activities due to the more limited work scope. Site preparations are also similar to those for the DECON alternative. However, with the exception of the required radiation surveys and site characterizations, the mobilization and preparation of site facilities is less extensive.

The following discussion is appropriate for both the SAFSTOR and Delayed DECON scenarios, the primary differences being in the storage methods for the spent fuel and the length of the dormancy period. Spent fuel is continued to be stored in the wet storage pool for the Delayed DECON scenario until such time that the transfer to a DOE facility can be completed. Decommissioning operations are assumed to begin once the transfer of the spent fuel is complete. By contrast, all of the fuel remaining in the storage pool after the minimum required cooling period is relocated to the ISFSI in the SAFSTOR scenario and the pool emptied. The nuclear unit remains in storage after fuel transfer operations are completed, with decommissioning operations initiated such that the license is terminated within the required 60-year time period.

2.2.1 Period 1 - Preparations

Preparations for long-term storage include the planning for permanent defueling of the reactor, revision of technical specifications appropriate to the operating conditions and requirements, a characterization of the facility and major components, and the development of the PSDAR.

The process of placing a nuclear unit in safe-storage includes, but is not limited to, the following activities:

- Isolation of the spent fuel storage services and fuel handling systems located in the fuel handling building so that safe-storage operations may commence on the balance of the plant. This activity may be carried out by plant personnel in accordance with existing operating technical specifications. Activities are scheduled around the fuel handling systems to the greatest extent possible.
- Draining and de-energizing of the non-contaminated systems not required to support continued site operations or maintenance.

- Disposing of contaminated filter elements and resin beds not required for processing wastes from layup activities for future operations.
- Draining of the reactor vessel, with the internals left in place and the vessel head secured.
- Draining and de-energizing non-essential, contaminated systems with decontamination as required for future maintenance and inspection.
- Preparing lighting and alarm systems whose continued use is required; de-energizing portions of fire protection, electric power, and HVAC systems whose continued use is not required.
- Cleaning of the loose surface contamination from building access pathways.
- Performing an interim radiation survey, posting warning signs where appropriate.
- Erecting physical barriers and/or securing all access to radioactive or contaminated areas, except as required for inspection and maintenance.
- Installing security and surveillance monitoring equipment and relocating security fence around secured structures, as required.

2.2.2 Period 2 - Dormancy

The second phase identified by the NRC in its rule addresses licensed activities during a storage period and is applicable to the dormancy phases of the deferred decommissioning alternatives. Dormancy activities include a 24-hour security force, preventive and corrective maintenance on security systems, area lighting, general building maintenance, heating and ventilation of buildings, routine radiological inspections of contaminated structures, maintenance of structural integrity, and a site environmental and radiation monitoring program. Resident maintenance personnel perform equipment maintenance, inspection activities, routine services to maintain safe conditions, adequate lighting, heating, and ventilation, and periodic preventive maintenance on essential site services.

An environmental surveillance program is carried out during the dormancy period to ensure that releases of radioactive material to the environment are prevented and/or detected and controlled. Appropriate

emergency procedures are established and initiated for potential releases that exceed prescribed limits. The environmental surveillance program constitutes an abbreviated version of the program in effect during normal operations.

Security during the dormancy period is conducted primarily to prevent unauthorized entry and to protect the public from the consequences of their own actions. The security fence, sensors, alarms, and other surveillance equipment provide security. Fire and radiation alarms are also monitored and maintained. While remote surveillance is an option, it does not offer the immediate response time of a physical presence.

The transfer of the spent fuel to a DOE facility continues during this period until complete. Fuel is shipped exclusively from the ISFSI in the SAFSTOR scenario and from the pool in the Delayed DECON scenario.

After an optional period of storage (such that license terminations are accomplished within 60 years of final shutdown), it is required that the licensee submit applications to terminate the license, along with an LTP (described in Section 2.1.2), thereby initiating the third phase.

2.2.3 Periods 3 and 4 - Delayed Decommissioning

Prior to the commencement of decommissioning operations, preparations are undertaken to reactivate site services and prepare for decommissioning. Preparations include engineering and planning, a detailed site characterization, and the assembly of a decommissioning management organization. Final planning for activities and the writing of activity specifications and detailed procedures are also initiated at this time.

Much of the work in developing a termination plan is relevant to the development of the detailed engineering plans and procedures. The activities associated with this phase and the follow-on decontamination and dismantling processes are detailed in Sections 2.1.1 and 2.1.2. The primary difference between the sequences anticipated for the DECON and deferred scenarios is the absence, in the latter, of any constraint on the availability of the fuel storage facilities located within the fuel handling building for decommissioning.

Variations in the length of the dormancy period are expected to have little effect upon the quantities of radioactive wastes generated from

system and structure removal operations. Given the levels of radioactivity and spectrum of radionuclides expected from fifty to sixty years of operation, no process system identified as being contaminated upon final shutdown will become releasable due to the decay period alone, i.e., there is no significant reduction in the waste generated from the decommissioning activities. However, due to the lower activity levels, a greater percentage of the waste volume can be designated for off-site processing and recovery.

The delay in decommissioning also yields lower working area radiation levels. As such, the estimates for the delayed scenarios incorporate reduced ALARA controls for the lower occupational exposure potential.

Although the initial radiation levels due to ^{60}Co will decrease during the dormancy period, the internal components of the reactor vessel will still exhibit sufficiently high radiation dose rates to require remote sectioning under water due to the presence of long-lived radionuclides such as ^{94}Nb, ^{59}Ni, and ^{63}Ni. Therefore, the dismantling procedures described for the DECON alternative would still be employed during SAFSTOR scenario. Portions of the biological shield will still be radioactive due to the presence of activated trace elements with long half-lives (^{152}Eu and ^{154}Eu). Decontamination will require controlled removal and disposal. It is assumed that radioactive corrosion products on inner surfaces of piping and components will not have decayed to levels that will permit unrestricted use or allow conventional removal. These systems and components will be surveyed as they are removed and disposed of in accordance with the existing radioactive release criteria.

2.2.4 Period 5 - Site Restoration

Following completion of decommissioning operations, site-restoration activities can begin. If the site structures are to be dismantled, dismantling as a continuation of the decommissioning process is clearly the most appropriate and cost-effective option, as described in Section 2.1.3. The basis for the dismantling cost in the SAFSTOR scenario is consistent with that described for DECON, presuming the removal of structures and site facilities to a nominal depth of three feet below grade and the limited restoration of the site.

3. COST ESTIMATE

The cost estimates prepared for decommissioning TMI-1 consider the unique features of the plant, including the NSSS, power generation systems, support services, site buildings, and ancillary facilities. The basis of the estimates, including the sources of information relied upon, the estimating methodology employed, site-specific considerations, and other pertinent assumptions, is described in this section.

3.1 BASIS OF ESTIMATE

The current estimates are area-based estimates, i.e., the plant inventory has been correlated with site-specific area working conditions, and the plant work activities organized into discrete areas to better reflect the manner in which the decommissioning will take place. The areas were determined on the basis of "common" conditions or attributes. Each area was evaluated for work difficulty, including affects of radiation, external surface contamination, and access. This evaluation was used to adjust the work difficulty factors for removing equipment in a given area.

3.2 METHODOLOGY

The methodology used to develop the estimates follows the basic approach originally presented in the AIF/NESP-036 study report, "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates,"[19] and the DOE "Decommissioning Handbook."[20] These documents present a unit factor method for estimating decommissioning activity costs, which simplifies the estimating calculations. Unit factors for concrete removal ($/cubic yard), steel removal ($/ton), and cutting costs ($/inch) were developed using local labor rates. The activity-dependent costs were then estimated with the item quantities (cubic yards and tons), developed from plant drawings and plant design information. A data base was constructed identifying the installed equipment in each designated work area. This data base contains a list of components that have a unique identifier, such as valves, tanks, electrical equipment, and heat exchangers. It also contains bulk commodities such as piping, ventilation ductwork, cable tray, electrical conduit, and supports. Data base categories were consistent with unit cost factors described previously. Assignment of the radiological status of the components into one of four categories (direct burial, off-site processing, off-site survey and release, or clean) was guided by the area postings by health physics for the system involved, and the general area.

Removal rates and material costs for the conventional disposition of components and structures relied upon information available in the industry publication, "Building Construction Cost Data," published by R.S. Means.[21]

This analysis reflects lessons learned from TLG's involvement in the Shippingport Station Decommissioning Project, completed in 1989, as well as the decommissioning of the Cintichem reactor, hot cells, and associated facilities, completed in 1997. In addition, the planning and engineering for the Pathfinder, Shoreham, Rancho Seco, Trojan, Yankee Rowe, Big Rock Point, Maine Yankee, Humboldt Bay-3, Connecticut Yankee, and San Onofre-1 nuclear units have provided additional insight into the process, the regulatory aspects, and the technical challenges of decommissioning commercial nuclear units.

The inventory was also organized according to its proposed disposition. There were three primary waste streams identified for the TMI-1 inventory: (1) clean material (expected to meet the release criteria without any decontamination), (2) contaminated material with recovery potential or requiring additional processing for disposal (expected to be sent to an off-site waste processor), and (3) contaminated material designated for direct disposal at a controlled low-level radioactive waste disposal site (i.e., material expected to exceed waste processor acceptance criteria or uneconomical to process).

The unit factor method provides a demonstrable basis for establishing reliable cost estimates. The detail provided in the unit factors, including activity duration, labor costs (by craft), and equipment and consumable costs, ensures that essential elements have not been omitted. Appendix A presents the detailed development of a typical unit factor. Appendix B provides the values contained within one set of factors developed for this analysis.

Work Difficulty Factors

WDFs were assigned to each area, commensurate with the inefficiencies associated with working in confined, hazardous environments. The ranges used for the WDFs are as follows:

- Access Factor 0% to 30%
- Respiratory Protection Factor 0% to 50%
- Radiation/ALARA Factor 0% to 100%
- Protective Clothing Factor 0% to 30%
- Work Break Factor 8.33%

These factors and their associated range of values were developed in conjunction with the Atomic Industrial Forum's Guideline Study. The factors (and their suggested application) are discussed in more detail in Appendix F.

Scheduling Program Durations

The unit factors, adjusted by the WDFs as described above, are applied against the inventory of materials to be removed in the radiologically controlled areas. The resulting man-hours, or crew-hours, are used in the development of the decommissioning program schedule, using resource loading and event sequencing considerations. The scheduling of conventional removal and dismantling activities are based upon productivity information available from the "Building Construction Cost Data" publication.

An area-by-area activity duration critical path was used to develop the total decommissioning program schedule. The unit cost factors, adjusted for WDF's as described above, were applied against the inventory of materials to be removed in each defined work area. Each work area was assessed for the most efficient number of workers/crews for the decommissioning activities. These adjusted unit cost factors were applied against the available manpower so that an overall duration for removal of components and piping from each work area could be calculated. Work area identification is based upon TLG's determination of work area size and location. An index of the work areas is provided in Appendix G.

The program schedule is used to determine the period-dependent costs for program management, administration, field engineering, equipment rental, contracted services, etc. The study relies upon regional or site-specific salary and wage rates for the personnel associated with the intended program.

3.3 IMPACT OF DECOMMISSIONING MULTIPLE REACTOR UNITS

TMI-1 shares the site with an adjacent and shutdown unit. This analysis, with the exception of site security services, does not consider any additional costs or savings that might be incurred or achieved in coordinating the decommissioning of the two units, in part, due to the unique decontamination and dismantling requirements for the shutdown unit.

- Since the security program for the site is likely to be an integrated approach, the security guard force is assumed to be shared to varying degrees between the units, depending upon the level of activities at each

unit. This reduces the security costs for the decommissioning estimates for both units on site.

- The final radiological survey schedule is also affected by a two-unit decommissioning schedule. It is impractical to try to complete the final status survey of Unit 1 while Unit 2 still has ongoing radiological remediation work and waste handling in progress. As such, it is assumed that the decommissioning operations at Unit 2 will be completed prior to the start of the license termination survey for Unit 1, i.e., the license termination surveys for both units will run concurrently. No cost impact of this coordination is included in this estimate.

3.4 FINANCIAL COMPONENTS OF THE COST MODEL

TLG's proprietary decommissioning cost model, DECCER, produces a number of distinct cost elements. These direct expenditures, however, do not comprise the total cost to accomplish the project goal, i.e., license termination and site restoration.

Inherent in any cost estimate that does not rely on historical data is the inability to specify the precise source of costs imposed by factors such as tool breakage, accidents, illnesses, weather delays, and labor stoppages. In the DECCER cost model, contingency fulfills this role. Contingency is added to each line item to account for costs that are difficult or impossible to develop analytically. Such costs are historically inevitable over the duration of a job of this magnitude; therefore, this cost analysis includes funds to cover these types of expenses.

3.4.1 Contingency

The activity- and period-dependent costs are combined to develop the total decommissioning cost. A contingency is then applied on a line-item basis, using one or more of the contingency types listed in the AIF/NESP-036 study. "Contingencies" are defined in the American Association of Cost Engineers "Project and Cost Engineers' Handbook[22] as "specific provision for unforeseeable elements of cost within the defined project scope; particularly important where previous experience relating estimates and actual costs has shown that unforeseeable events which will increase costs are likely to occur." The cost elements in this analysis are based upon ideal conditions and maximum efficiency; therefore, consistent with industry practice, a contingency factor has been applied. In the AIF/NESP-036 study, the types of unforeseeable events that are likely to occur in decommissioning are discussed and

guidelines are provided for percentage contingency in each category. It should be noted that contingency, as used in this analysis, does not account for price escalation and inflation in the cost of decommissioning over the remaining operating life of the station.

The use and role of contingency within decommissioning estimates is not a "safety factor issue." Safety factors provide additional security and address situations that may never occur. Contingency funds are expected to be fully expended throughout the program. They also provide assurance that sufficient funding is available to accomplish the intended tasks. An estimate without contingency, or from which contingency has been removed, can disrupt the orderly progression of events and jeopardize a successful conclusion to the decommissioning process.

For example, the most technologically challenging task in decommissioning a commercial nuclear station is the disposition of the reactor vessel and internal components, now highly radioactive after a lifetime of exposure to core activity. The disposition of these components forms the basis of the critical path (schedule) for decommissioning operations. Cost and schedule are interdependent, and any deviation in schedule has a significant impact on cost for performing a specific activity.

Disposition of the reactor vessel internals involves the underwater cutting of complex components that are highly radioactive. Costs are based upon optimum segmentation, handling, and packaging scenarios. The schedule is primarily dependent upon the turnaround time for the heavily shielded shipping casks, including preparation, loading, and decontamination of the containers for transport. The number of casks required is a function of the pieces generated in the segmentation activity, a value calculated on optimum performance of the tooling employed in cutting the various subassemblies. The expected optimization, however, may not be achieved, resulting in delays and additional program costs. For this reason, contingency must be included to mitigate the consequences of the expected inefficiencies inherent in this complex activity, along with related concerns associated with the operation of highly specialized tooling, field conditions, and water clarity.

Contingency funds are an integral part of the total cost to complete the decommissioning process. Exclusion of this component puts at risk a

successful completion of the intended tasks and, potentially, subsequent related activities. For this study, TLG examined the major activity-related problems (decontamination, segmentation, equipment handling, packaging, transport, and waste disposal) that necessitate a contingency. Individual activity contingencies ranged from 10% to 75%, depending on the degree of difficulty judged to be appropriate from TLG's actual decommissioning experience. The contingency values used in this study are as follows:

Decontamination	50%
Contaminated Component Removal	25%
Contaminated Component Packaging	10%
Contaminated Component Transport	15%
Low-Level Radioactive Waste Disposal	25%
Reactor Segmentation	75%
NSSS Component Removal	25%
Reactor Waste Packaging	25%
Reactor Waste Transport	25%
Reactor Vessel Component Disposal	50%
GTCC Disposal	15%
Non-Radioactive Component Removal	15%
Heavy Equipment and Tooling	15%
Supplies	25%
Engineering	15%
Energy	15%
Characterization and Termination Surveys	30%
Construction	15%
Taxes and Fees	10%
Insurance	10%
Staffing	15%

The contingency values are applied to the appropriate components of the estimates on a line-item basis. A composite value is then reported at the end of each estimate. For example, the composite contingency value reported for the DECON alternative is 18.33%. Values for the other alternatives are delineated within the detailed cost tables in Appendices D and E.

3.4.2 Financial Risk

In addition to the routine uncertainties addressed by contingency, another cost element that is sometimes necessary to consider when bounding decommissioning costs relates to uncertainty, or risk. Examples can include changes in work scope, pricing, job performance, and other variations that could conceivably, but not necessarily, occur. Consideration is sometimes necessary to generate a level of confidence in the estimate, within a range of probabilities. TLG considers these types of costs under the broad term "financial risk." Included within the category of financial risk are:

- Transition activities and costs: ancillary expenses associated with eliminating 50% to 80% of the site labor force shortly after the cessation of operations, added cost for worker separation packages throughout the decommissioning program, national or company-mandated retraining, and retention incentives for key personnel.
- Delays in approval of the decommissioning plan due to intervention, public participation in local community meetings, legal challenges, and national and local hearings.
- Changes in the project work scope from the baseline estimate, involving the discovery of unexpected levels of contaminants, contamination in places not previously expected, contaminated soil previously undiscovered (either radioactive or hazardous material contamination), variations in inventory or configuration not indicated by the as-built drawings.
- Regulatory changes (e.g., affecting worker health and safety, site release criteria, waste transportation, and disposal).
- Policy decisions altering national commitments (e.g., in the ability to accommodate certain waste forms for disposition or in the timetable for such, for example, in the start and rate of acceptance of spent fuel by the DOE).
- Pricing changes for basic inputs, such as labor, energy, materials, and burial.

It has been TLG's experience that the results of a risk analysis, when compared with the base case estimate for decommissioning, indicate that the chances of the base decommissioning estimate being too high is a low probability, and the chances that the estimate is too low is a higher probability. This cost study, however, does not add any additional

cost to the estimate for financial risk since there is insufficient historical data from which to project future liabilities. Consequently, the areas of uncertainty or risk are revisited periodically and addressed through repeated revisions or updates of the base estimate.

3.5 SITE-SPECIFIC CONSIDERATIONS

There are a number of site-specific considerations that affect the method for dismantling and removal of equipment from the site and the degree of restoration required. The cost impacts of the considerations identified below are included in this cost study.

3.5.1 Spent Fuel Management

The cost to dispose of spent fuel generated from operations is not reflected within the estimates to decommission TMI-1. Ultimate disposition of the spent fuel is within the province of the DOE's Waste Management System, as defined by the NWPA. As such, the disposal cost is financed by a 1 mill/kWhr surcharge paid into the DOE's waste fund during operations. However, the NRC requires licensees to establish a program to manage and provide funding for the management of all irradiated fuel at the reactors until title of the fuel is transferred to the Secretary of Energy. This funding requirement is fulfilled through inclusion of certain high-level waste cost elements within the estimate, as described below.

The total inventory of assemblies that will require handling during decommissioning is based upon several assumptions. The pickup of commercial fuel is assumed to begin in the year 2018. The maximum rate at which the fuel is removed from the commercial sites is based upon an annual capacity at the geologic repository of 3,000 metric tons of uranium (MTU). Any delay in the startup of the repository or decrease in the rate of acceptance will correspondingly prolong the transfer process and result in the fuel remaining at the site longer.

In the DECON and SAFSTOR scenarios, the ISFSI will continue to operate until such time that the transfer of spent fuel to the DOE can be completed. Assuming that the DOE commences repository operation in 2018, all fuel is projected to be removed from the TMI-1 site by the year 2048. In the Delayed DECON scenario, spent fuel off-loaded from the reactor after operations cease, remains in the pool during the transfer period.

Operation and maintenance costs for the storage facilities (the ISFSI and the pool for the Delayed DECON scenario) are included within the estimates and address the cost for staffing the facilities, as well as security, insurance, and licensing fees. For the DECON and SAFSTOR scenarios, the estimates include the cost to design, license and construct an ISFSI, and also include the costs to purchase, load, and transfer the fuel storage canisters. Costs are also provided for the final disposition of the facilities once the transfer is complete.

Repository Startup

Operation of the DOE's yet-to-be constructed geologic repository is contingent upon the review and approval of the facility's license application by the NRC, the successful resolution of pending litigation, and the development of a national transportation system. The DOE submitted its license application to the NRC on June 3, 2008, seeking authorization to construct the repository at Yucca Mountain, Nevada. The NRC formally docketed the DOE's license application on September 8, 2008, triggering a three-year deadline, with a possible one-year extension, set by Congress for the NRC to decide on whether to grant a construction authorization.

Construction, if adequately funded, could take five to six years after the DOE receives authorization to proceed. As such, the spent fuel management plan described in this section is predicated upon the DOE initiating the pickup of commercial fuel in the year 2018.

Spent Fuel Management Model

The Exelon nuclear fleet consists of 21 units at 11 sites in Illinois, Pennsylvania, and New Jersey, including the inactive units at Dresden, Peach Bottom, and Zion. The ability to complete the decommissioning of these units, particularly for the DECON and Delayed DECON alternatives, is highly dependent upon when the DOE is assumed to remove spent fuel from the sites.

The DOE's repository program assumes that spent fuel will be accepted for disposal from the nation's commercial nuclear plants in the order (the "queue") in which it was removed from service ("oldest fuel first").[23] A computer model developed by Exelon Nuclear was used to determine when the DOE would provide allocations in the queue for removal of spent fuel from the individual sites. Repository operations were based

upon annual industry-wide acceptance rates of 400 MTU/year for year 1, 600 MTU/ year for year 2, 1200 MTU/year for year 3, 2000 MTU/year for year 4, and 3000 MTU/year for year 5 and beyond.[24]

ISFSIs are constructed as necessary to maintain full-core discharge capability at the individual sites. Once the DOE begins repository operations, queue allocations are used to ship spent fuel from Exelon's operating sites. Spent fuel shipments are then made from decommissioning sites in the order of retirement.

Canister Design

The design and capacity of future cask acquisitions for the ISFSI is based upon the NUHOMS® system, with a 32-fuel assembly capacity. A unit cost of $500,000 is used for pricing the internal multi-purpose canister (MPC), with an additional cost of $250,000 for the concrete storage module. The DOE is assumed to provide the MPC for fuel transferred directly from the pool to the DOE at no cost to the owner.

Canister Loading and Transfer

An average cost of $250,000 is used for the labor to load/transport the spent fuel from the pool to the ISFSI pad, based upon Exelon experience. For estimating purposes, 50% of this cost is used to estimate the cost to transfer the fuel from the ISFSI to the DOE.

Operations and Maintenance

Annual costs (excluding labor) of approximately $746,000 and $85,000 are used for operation and maintenance of the spent fuel pool and the ISFSI, respectively.

ISFSI Design Considerations

A multi-purpose (storage and transport) dry shielded storage canister with a horizontal, reinforced concrete storage module is used as a basis for the cost analysis. The final core off load, equivalent to six modules, is assumed to have some level of neutron-induced activation as a result of the long-term storage of the fuel (i.e., to levels exceeding free-release limits). The steel support structure is assumed to be removed from these modules for controlled disposal. The cost of the disposition of this

material, as well as the demolition of the ISFSI facility, is included in the estimate.

3.5.2 Reactor Vessel and Internal Components

The reactor pressure vessel and internal components are segmented for disposal in shielded, reusable transportation casks. Segmentation is performed in the refueling canal, where a turntable and remote cutter are installed. The vessel is segmented in place, using a mast-mounted cutter supported off the lower head and directed from a shielded work platform installed overhead in the reactor cavity. Transportation cask specifications and transportation regulations will dictate segmentation and packaging methodology.

The dismantling of the reactor internals will generate radioactive waste considered unsuitable for shallow land disposal (i.e., GTCC). Although the material is not classified as high-level waste, the DOE has indicated it will accept this waste for disposal at the future high-level waste repository.[25] However, the DOE has not been forthcoming with an acceptance criteria or disposition schedule for this material, and numerous questions remain as to the ultimate disposal cost and waste form requirements. As such, for purposes of this study, the GTCC has been packaged and disposed of as high-level waste, at a cost equivalent to that envisioned for the spent fuel. It is not anticipated that the DOE would accept this waste prior to completing the transfer of spent fuel. Therefore, until such time the DOE is ready to accept GTCC waste, it is reasonable to assume that this material would remain in storage at the site.

Intact disposal of the reactor vessel and internal components can provide savings in cost and worker exposure by eliminating the complex segmentation requirements, isolation of the GTCC material, and transport/storage of the resulting waste packages. Portland General Electric (PGE) was able to dispose of the Trojan reactor as an intact package. However, its location on the Columbia River simplified the transportation analysis since:

- the reactor package could be secured to the transport vehicle for the entire journey, i.e., the package was not lifted during transport,

- there were no man-made or natural terrain features between the site and the disposal location that could produce a large drop, and
- transport speeds were very low, limited by the overland transport vehicle and the river barge.

As a member of the Northwest Compact, PGE had a site available for disposal of the package - the US Ecology facility in Washington State. The characteristics of this arid site proved favorable in demonstrating compliance with land disposal regulations.

It is not known whether this option will be available when TMI-1 ceases operation. Future viability of this option will depend upon the ultimate location of the disposal site, as well as the disposal site licensee's ability to accept highly radioactive packages and effectively isolate them from the environment. Consequently, the study assumes the reactor vessel will require segmentation, as a bounding condition.

3.5.3 Primary System Components

In the DECON scenario, the reactor coolant system components are assumed to be decontaminated using chemical agents prior to the start of cutting operations. This type of decontamination can be expected to have a significant ALARA impact, since in this scenario the removal work is done within the first few years of shutdown. A decontamination factor (average reduction) of 10 is assumed for the process. Disposal of the decontamination solution effluent is included within the estimate as a "process liquid waste" charge. In the Delayed DECON and SAFSTOR scenarios, radionuclide decay is expected to provide the same benefit and, therefore, a chemical decontamination is not included.

The following discussion deals with the removal and disposition of the steam generators, but the techniques involved are also applicable to other large components, such as heat exchangers, component coolers, and the pressurizer. The steam generators' size and weight, as well as their location within the reactor building, will ultimately determine the removal strategy.

A trolley crane is set up for the removal of the generators. It can also be used to move portions of the steam generator cubicle walls and floor slabs from the reactor building to a location where they can be

decontaminated and transported to the material handling area. Interferences within the work area, such as grating, piping, and other components are removed to create sufficient laydown space for processing these large components.

The generators are rigged for removal, disconnected from the surrounding piping and supports, and maneuvered into the open area where they are lowered onto a dolly. Each generator is rotated into the horizontal position for extraction from the containment and placed onto a multi-wheeled vehicle for transport to an on-site processing and storage area.

The generators are segmented on-site to facilitate transportation. Each unit is cut in half, across the tube sheet. The exposed ends are capped and sealed. The interior volume is filled with low-density cellular concrete for stabilization of the internal contamination. Each component is then loaded onto a rail car for transport to the disposal facility.

Reactor coolant piping is cut from the reactor vessel once the water level in the vessel (used for personnel shielding during dismantling and cutting operations in and around the vessel) is dropped below the nozzle zone. The piping is boxed and transported by shielded van. The reactor coolant pumps and motors are lifted out intact, packaged, and transported for processing and/or disposal.

3.5.4 Retired Components

The estimate includes the cost to dispose of two retired steam generators expected to be in storage at the site upon the cessation of plant operations. The components are processed for disposal in the same manner as described for the installed units.

3.5.5 Main Turbine and Condenser

The main turbine will be dismantled using conventional maintenance procedures. The turbine rotors and shafts will be removed to a laydown area. The lower turbine casings will be removed from their anchors by controlled demolition. The main condensers will also be disassembled and moved to a laydown area. Material is then prepared for transportation to an off-site recycling facility where it will be surveyed and designated for either decontamination or volume reduction, conventional disposal, or controlled disposal. Components will be

packaged and readied for transport in accordance with the intended disposition.

3.5.6 Transportation Methods

Contaminated piping, components, and structural material other than the highly activated reactor vessel and internal components will qualify as LSA-I, II or III or Surface Contaminated Object, SCO-I or II, as described in Title 49.[26] The contaminated material will be packaged in Industrial Packages (IP-1, 2, or 3, as defined in subpart 173.411) for transport unless demonstrated to qualify as their own shipping containers. The reactor vessel and internal components are expected to be transported as Type B, in accordance with §71. It is conceivable that the reactor, due to its limited specific activity, could qualify as LSA-II or III. However, the high radiation levels on the outer surface would require that additional shielding be incorporated within the packaging so as to attenuate the dose to levels acceptable for transport.

Transport of the highly activated metal, produced in the segmentation of the reactor vessel and internal components, will be by shielded truck cask. Cask shipments may exceed 95,000 pounds, including vessel segment(s), supplementary shielding, cask tie-downs, and tractor-trailer. The maximum level of activity per shipment assumed permissible was based upon the license limits of the available shielded transport casks. The segmentation scheme for the vessel and internal segments is designed to meet these limits.

The transport of large intact components (e.g., large heat exchangers and other oversized components) will be by a combination of truck, rail, and/or multi-wheeled transporter.

Transportation costs for material requiring controlled disposal are based upon the mileage to the EnergySolutions facility in Clive, Utah. Transportation costs for off-site waste processing are based upon the mileage to Memphis, Tennessee. Truck transport costs are estimated using published tariffs from Tri-State Motor Transit.[27]

3.5.7 Low-Level Radioactive Waste Disposal

To the greatest extent practical, metallic material generated in the decontamination and dismantling processes is treated to reduce the total volume requiring controlled disposal. The treated material, meeting the

regulatory and/or site release criterion, is released as scrap, requiring no further cost consideration. Conditioning and recovery of the waste stream is performed off site at a licensed processing center.

The mass of radioactive waste generated during the various decommissioning activities is reported by line item in Appendices C, D and E, and summarized in Section 5. The Section 5 waste summaries are consistent with 10 CFR §61 classifications. Commercially available steel containers are used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations. The waste volumes are calculated on the exterior package dimensions for containerized material or a dimensional calculation for components serving as their own waste containers.

The more highly activated reactor components are transported in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, with surcharges added for the special handling requirements and the radiological characteristics of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

Disposal fees are based upon estimated charges, with surcharges added for the highly activated components, for example, generated in the segmentation of the reactor vessel. The cost to dispose of the majority of the material generated from the decontamination and dismantling activities is based upon the current cost for disposal at EnergySolutions' facility in Clive, Utah. Disposal costs for the higher activity waste (Class B and C) were based upon the last available rate schedule for the Barnwell facility (as a proxy).

Material exceeding Class C limits (limited to material closest to the reactor core and comprising less than 0.3% of the total waste volume) is generally not suitable for shallow-land disposal. This material is packaged in the same multipurpose canisters used for spent fuel storage/transport and designated for geologic disposal.

3.5.8 Site Conditions Following Decommissioning

The NRC will terminate (or amend) the site license when it determines that site remediation has been performed in accordance with the license termination plan, and that the terminal radiation survey and associated documentation demonstrate that the facility is suitable for release. The NRC's involvement in the decommissioning process will end at this point. Building codes and environmental regulations will dictate the next step in the decommissioning process, as well as the owner's own future plans for the site.

Non-essential structures or buildings severely damaged in decontamination process are removed to a nominal depth of three feet below grade. Concrete rubble generated from demolition activities is processed and made available as clean fill. The excavations will be regraded such that the power block area will have a final contour consistent with adjacent surroundings.

The estimates include an allowance for the remediation of radioactively contaminated soil. This assumption may be affected by continued operations and/or future regulatory actions, such as the development of site-specific release criteria.

3.6 ASSUMPTIONS

The following are the major assumptions made in the development of the estimates for decommissioning the site.

3.6.1 Estimating Basis

The study follows the principles of ALARA through the use of work duration adjustment factors. These factors address the impact of activities such as radiological protection instruction, mock-up training, and the use of respiratory protection and protective clothing. The factors lengthen a task's duration, increasing costs and lengthening the overall schedule. ALARA planning is considered in the costs for engineering and planning, and in the development of activity specifications and detailed procedures. Changes to worker exposure limits may impact the decommissioning cost and project schedule.

3.6.2 Labor Costs

The craft labor required to decontaminate and dismantle the nuclear unit will be acquired through standard site contracting practices. The current cost of labor at the site is used as an estimating basis. Costs for site administration, operations, construction, and maintenance personnel are based upon average salary information provided by Exelon or from comparable industry information.

Exelon will hire a Decommissioning Operations Contractor (DOC) to manage the decommissioning. The owner will provide site security, radiological health and safety, quality assurance and overall site administration during the decommissioning and demolition phases. Contract personnel will provide engineering services (e.g., for preparing the activity specifications, work procedures, activation, and structural analyses) under the direction of Exelon.

3.6.3 Design Conditions

Any fuel cladding failure that occurred during the lifetime of the nuclear unit is assumed to have released fission products at sufficiently low levels that the buildup of quantities of long-lived isotopes (e.g., ^{137}Cs, ^{90}Sr, or transuranics) has been prevented from reaching levels exceeding those that permit the major NSSS components to be shipped under current transportation regulations and disposal requirements.

The curie contents of the vessel and internals at final shutdown are derived from those listed in NUREG/CR-3474.[28] Actual estimates are derived from the curie/gram values contained therein and adjusted for the different mass of the TMI-1 components, projected operating life, and different periods of decay. Additional short-lived isotopes were derived from CR-0130[29] and CR-0672,[30] and benchmarked to the long-lived values from CR-3474.

The control elements are disposed of along with the spent fuel, i.e., there is no additional cost provided for their disposal.

Activation of the containment building structure is confined to the biological shield. More extensive activation (at very low levels) of the interior structures within containment has been detected at several reactors and their owners have elected to dispose of the affected material at a controlled facility rather than reuse the material as fill on

site or send it to a landfill. The ultimate disposition of the material removed from the reactor building will depend upon the site release criteria selected, as well as the designated end use for the site.

3.6.4 General

Transition Activities

Existing warehouses will be cleared of non-essential material and remain for use by Exelon and its subcontractors. The operating staff will perform the following activities at no additional cost or credit to the project during the transition period:

- Drain and collect fuel oils, lubricating oils, and transformer oils for recycle and/or sale.
- Drain and collect acids, caustics, and other chemical stores for recycle and/or sale.
- Processes operating waste inventories, i.e., the estimates do not address the disposition of any legacy wastes; the disposal of operating wastes during this initial period is not considered a decommissioning expense.

Scrap and Salvage

The existing equipment is considered obsolete and suitable for scrap as deadweight quantities only. Exelon will make economically reasonable efforts to salvage equipment following final shutdown. However, dismantling techniques assumed by TLG for equipment in this analysis are not consistent with removal techniques required for salvage (resale) of equipment. Experience has indicated that some buyers wanted equipment stripped down to very specific requirements before they would consider purchase. This required expensive rework after the equipment had been removed from its installed location. Since placing a salvage value on this machinery and equipment would be speculative, and the value would be small in comparison to the overall decommissioning expenses, this analysis does not attempt to quantify the possible salvage value that an owner may realize based upon those efforts.

It is assumed, for purposes of this analysis, that any value received from the sale of scrap generated in the dismantling process would be more

than offset by the on-site processing costs. The dismantling techniques assumed in the decommissioning estimates do not include the additional cost for size reduction and preparation to meet "furnace ready" conditions. For example, the recovery of copper from electrical cabling may require the removal and disposition of any contaminated insulation, an added expense. With a volatile market, the potential profit margin in scrap recovery is highly speculative, regardless of the ability to free release this material. This assumption is an implicit recognition of scrap value in the disposal of clean metallic waste at no additional cost to the project.

Furniture, tools, mobile equipment such as forklifts, trucks, bulldozers, and other property will be removed at no cost or credit to the decommissioning project. Disposition may include relocation to other facilities. Spare parts will also be made available for alternative use.

Energy

For estimating purposes, the nuclear unit is assumed to be de-energized, with the exception of those facilities associated with spent fuel storage. Replacement power costs are used for the cost of energy consumption during decommissioning for tooling, lighting, ventilation, and essential services.

Insurance

Costs for continuing coverage (nuclear liability and property insurance) following cessation of operations and during decommissioning are included and based upon current operating premiums. Reductions in premiums, throughout the decommissioning process, are based upon the guidance and the limits for coverage defined in the NRC's proposed rulemaking "Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors."[31] NRC's financial protection requirements are based on various reactor (and spent fuel) configurations.

Taxes

Property taxes are included for all decommissioning periods. Exelon provided a schedule of decreasing tax payments against the current tax assessment. These reductions continue until reaching a minimum

property tax payment of $1 million per year; this level is maintained for the balance of the decommissioning program.

Site Modifications

The perimeter fence and in-plant security barriers will be moved, as appropriate, to conform to the Site Security Plan in force during the various stages of the project.

3.7 COST ESTIMATE SUMMARY

A schedule of expenditures for each scenario is provided in Tables 3.1 through 3.3. Decommissioning costs are reported in the year of projected expenditure; however, the values are provided in thousands of 2008 dollars. Costs are not inflated, escalated, or discounted over the period of expenditure. The annual expenditures are based upon the detailed activity costs reported in Appendices C through E, along with the schedules discussed in Section 4.

TABLE 3.1
SCHEDULE OF ANNUAL EXPENDITURES
DECON
(thousands, 2008 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	36,680	7,793	1,180	30	18,174	63,856
2035	59,996	19,871	2,502	17,398	26,573	126,341
2036	58,355	30,741	1,598	32,927	11,195	134,816
2037	47,731	15,893	1,307	7,984	5,725	78,641
2038	45,953	13,385	1,258	3,763	4,802	69,161
2039	44,014	12,034	1,176	4,010	4,766	66,001
2040	31,512	2,829	559	3,681	4,011	42,592
2041	26,536	8,479	237	14	2,467	37,733
2042	24,010	13,646	168	0	2,147	39,970
2043	11,421	5,271	85	0	2,183	18,960
2044	3,506	0	34	0	2,211	5,751
2045	3,496	0	34	0	2,205	5,735
2046	4,000	1,509	34	0	2,205	7,748
2047	4,359	2,588	34	0	2,205	9,185
2048	4,367	3,003	34	0	16,348	23,753
2049	1,395	2,665	41	54	1,933	6,089
	407,333	139,708	10,279	69,862	109,150	736,331

TABLE 3.2
SCHEDULE OF ANNUAL EXPENDITURES
DELAYED DECON
(thousands, 2008 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	29,979	665	1,180	30	2,662	34,517
2035	36,700	3,840	1,406	1,077	16,104	59,127
2036	8,345	296	336	29	2,976	11,982
2037	8,322	295	335	29	2,967	11,949
2038	8,322	295	335	29	2,967	11,949
2039	8,322	295	335	29	2,967	11,949
2040	8,345	296	336	29	2,976	11,982
2041	8,322	295	335	29	2,967	11,949
2042	8,322	295	335	29	2,967	11,949
2043	8,322	295	335	29	2,967	11,949
2044	8,345	296	336	29	2,976	11,982
2045	8,322	295	335	29	2,967	11,949
2046	9,329	3,314	335	29	2,967	15,974
2047	23,496	5,972	1,007	32	2,984	33,492
2048	42,894	8,174	1,683	114	5,329	58,193
2049	49,556	20,494	1,593	27,466	21,321	120,431
2050	41,948	8,513	1,347	11,243	8,753	71,803
2051	39,194	4,177	1,258	5,371	4,203	54,203
2052	37,317	3,602	1,087	4,377	3,831	50,214
2053	25,314	6,579	261	18	1,699	33,871
2054	21,023	13,553	168	0	1,099	35,843
2055	11,289	7,278	90	0	590	19,247
	451,330	89,116	14,774	50,044	101,243	706,507

TABLE 3.3
SCHEDULE OF ANNUAL EXPENDITURES
SAFSTOR
(thousands, 2008 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2034	32,284	7,516	1,181	30	18,186	59,197
2035	40,359	13,532	1,405	1,077	22,665	79,038
2036	13,779	9,884	336	29	3,067	27,096
2037	13,741	9,857	335	29	3,059	27,022
2038	13,741	9,857	335	29	3,059	27,022
2039	12,521	8,519	312	29	2,935	24,315
2040	5,024	280	168	27	2,177	7,676
2041	5,010	279	168	27	2,171	7,655
2042	5,010	279	168	27	2,171	7,655
2043	5,010	279	168	27	2,171	7,655
2044	5,024	280	168	27	2,177	7,676
2045	5,010	279	168	27	2,171	7,655
2046	5,514	1,788	168	27	2,171	9,667
2047	5,873	2,867	168	27	2,171	11,105
2048	5,879	2,867	168	27	2,176	11,117
2049	2,191	274	168	26	1,823	4,481
2050	2,191	274	168	26	1,823	4,481
2051	2,191	274	168	26	1,823	4,481
2052	2,197	275	168	26	1,828	4,494
2053	2,191	274	168	26	1,823	4,481
2054	2,191	274	168	26	1,823	4,481
2055	2,191	274	168	26	1,823	4,481
2056	2,197	275	168	26	1,828	4,494
2057	2,191	274	168	26	1,823	4,481
2058	2,191	274	168	26	1,823	4,481
2059	2,191	274	168	26	1,823	4,481
2060	2,197	275	168	26	1,828	4,494
2061	2,191	274	168	26	1,823	4,481
2062	2,191	274	168	26	1,823	4,481
2063	2,191	274	168	26	1,823	4,481
2064	2,197	275	168	26	1,828	4,494
2065	2,191	274	168	26	1,823	4,481
2066	2,191	274	168	26	1,823	4,481
2067	2,191	274	168	26	1,823	4,481
2068	2,197	275	168	26	1,828	4,494

TABLE 3.3 (continued)
SCHEDULE OF ANNUAL EXPENDITURES
SAFSTOR
(thousands, 2008 dollars)

Year	Labor	Equipment & Materials	Energy	Burial	Other	Total
2069	2,191	274	168	26	1,823	4,481
2070	2,191	274	168	26	1,823	4,481
2071	2,191	274	168	26	1,823	4,481
2072	2,197	275	168	26	1,828	4,494
2073	2,191	274	168	26	1,823	4,481
2074	2,191	274	168	26	1,823	4,481
2075	2,191	274	168	26	1,823	4,481
2076	2,197	275	168	26	1,828	4,494
2077	2,191	274	168	26	1,823	4,481
2078	2,191	274	168	26	1,823	4,481
2079	2,191	274	168	26	1,823	4,481
2080	2,197	275	168	26	1,828	4,494
2081	2,191	274	168	26	1,823	4,481
2082	2,191	274	168	26	1,823	4,481
2083	2,191	274	168	26	1,823	4,481
2084	2,197	275	168	26	1,828	4,494
2085	2,191	274	168	26	1,823	4,481
2086	2,191	274	168	26	1,823	4,481
2087	2,191	274	168	26	1,823	4,481
2088	21,633	874	1,057	32	1,858	25,454
2089	42,375	4,874	1,670	2,732	6,062	57,712
2090	50,759	23,281	1,593	30,758	23,561	129,952
2091	39,359	4,175	1,258	5,213	4,612	54,616
2092	39,467	4,186	1,261	5,227	4,624	54,766
2093	34,520	2,772	841	2,871	3,485	44,489
2094	23,390	10,618	218	10	1,423	35,659
2095	21,149	14,683	168	0	1,127	37,126
2096	5,794	4,023	46	0	309	10,172
	537,718	148,540	20,075	49,327	190,718	946,378

4. SCHEDULE ESTIMATE

The schedules for the decommissioning scenarios considered in this study follow the sequence presented in the AIF/NESP-036 study, with minor changes to reflect recent experience and site-specific constraints. In addition, the scheduling has been revised to reflect the spent fuel management plans described in Section 3.4.1.

A schedule or sequence of activities is presented in Figure 4.1 for the DECON decommissioning alternative. The schedule is also representative of the work activities identified in the delayed dismantling scenarios, absent any spent fuel constraints. The scheduling sequence assumes that fuel is removed from the spent fuel pool within the first 5½ years after operations cease. The key activities listed in the schedule do not reflect a one-to-one correspondence with those activities in the cost tables, but reflect dividing some activities for clarity and combining others for convenience. The schedule was prepared using the "Microsoft Project 2003" computer software.[32]

4.1 SCHEDULE ESTIMATE ASSUMPTIONS

The schedule reflects the results of a precedence network developed for the site decommissioning activities, i.e., a PERT (Program Evaluation and Review Technique) Software Package. The work activity durations used in the precedence network reflect the actual man-hour estimates from the cost tables, adjusted by stretching certain activities over their slack range and shifting the start and end dates of others. The following assumptions were made in the development of the DECON decommissioning schedule:

- The fuel handling building is isolated until such time that all spent fuel has been discharged from the storage pool to the DOE or to the ISFSI. Decontamination and dismantling of the storage pool is initiated once the transfer of spent fuel to the DOE or ISFSI is complete.
- All work (except vessel and internals removal) is performed during an 8-hour workday, 5 days per week, with no overtime. There are eleven paid holidays per year.
- Reactor and internals removal activities are performed by using separate crews for different activities working on different shifts, with a corresponding backshift charge for the second shift.
- Multiple crews work parallel activities to the maximum extent possible, consistent with optimum efficiency, adequate access for cutting, removal

and laydown space, and with the stringent safety measures necessary during demolition of heavy components and structures.

- For systems removal, the systems with the longest removal durations in areas on the critical path are considered to determine the duration of the activity.

4.2 PROJECT SCHEDULE

The period-dependent costs presented in the detailed cost tables are based upon the durations developed in the schedule for decommissioning TMI-1. Durations are established between several milestones in each project period; these durations are used to establish a critical path for the entire project. In turn, the critical path duration for each period is used as the basis for determining the period-dependent costs. A second critical path is also shown for the spent fuel cooling period, which determines the release of the fuel handling building for final decontamination.

Project timelines are provided in Figures 4.2 through 4.4; the milestone dates are based on this same shutdown date. The start of decommissioning activities in the Delayed Decommissioning scenario is concurrent with the end of the fuel transfer activity (i.e., to an off-site DOE facility).

FIGURE 4.1
DECON ACTIVITY SCHEDULE

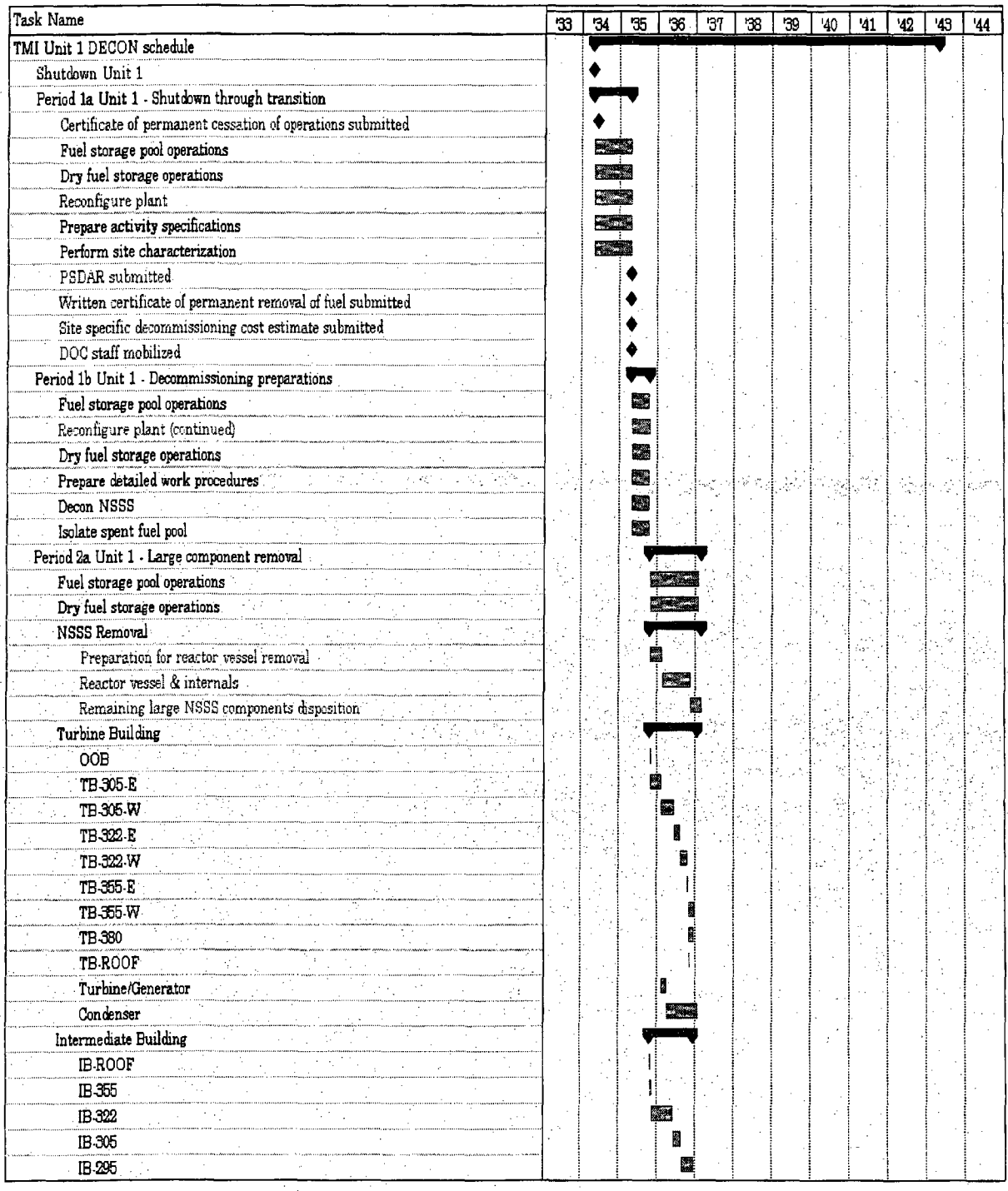


FIGURE 4.1
DECON ACTIVITY SCHEDULE
(continued)

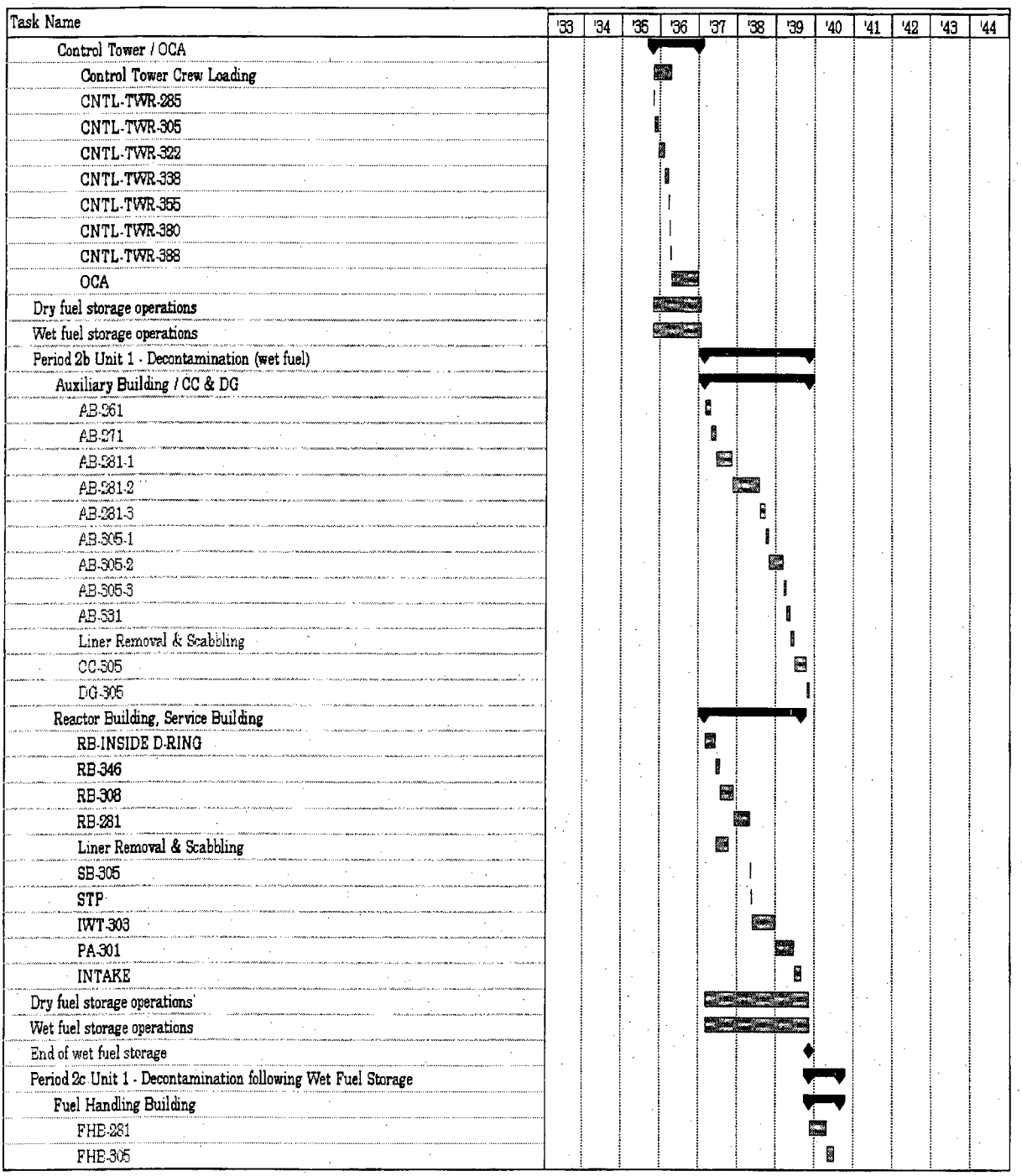


FIGURE 4.1
DECON ACTIVITY SCHEDULE
(continued)

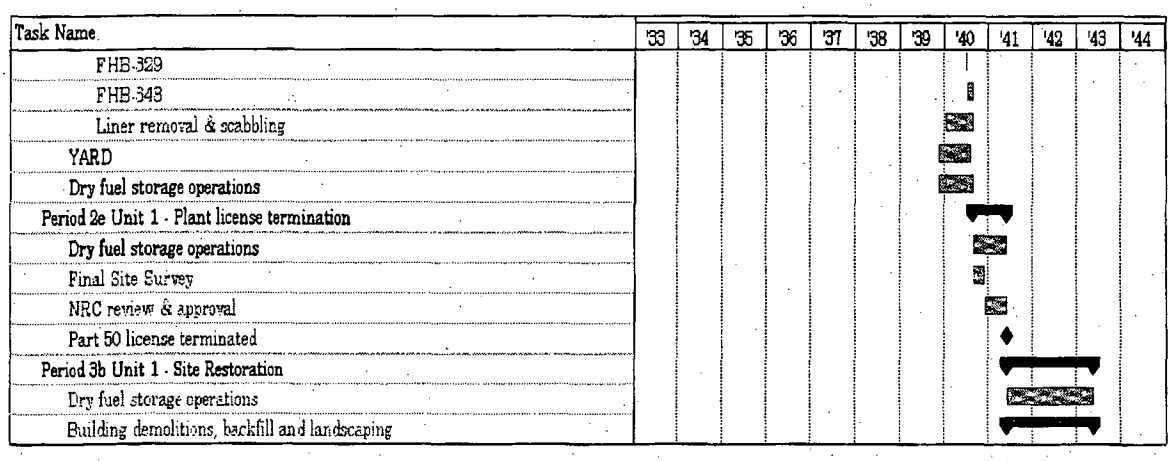


FIGURE 4.2
DECOMMISSIONING TIMELINE
DECON
(not to scale)

DECON
(Shutdown April 19, 2034)

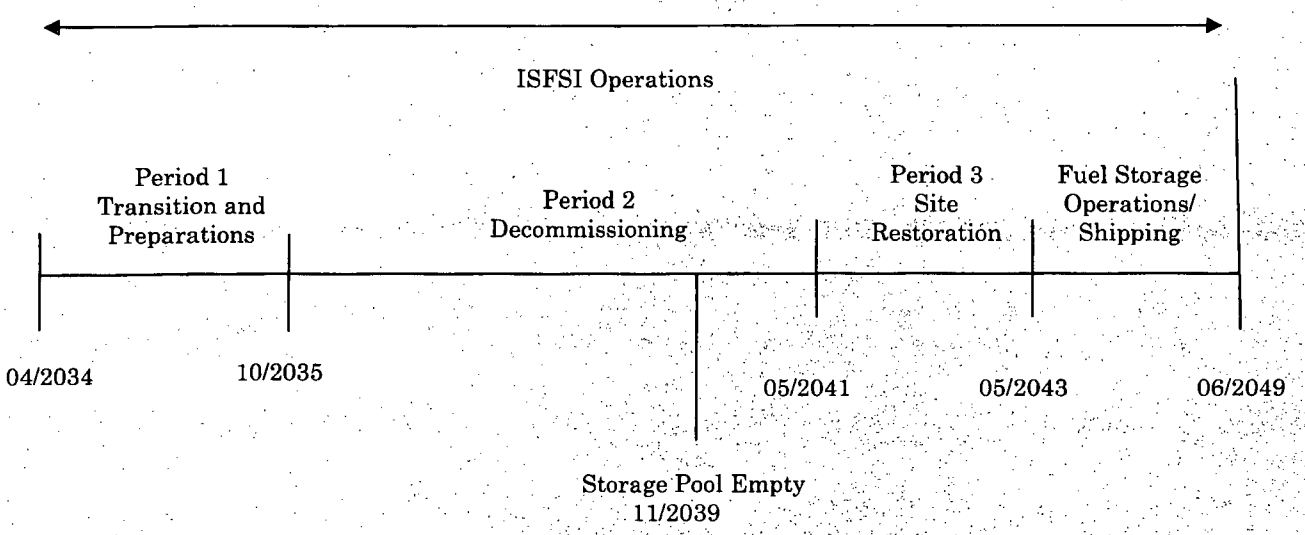


FIGURE 4.3
DECOMMISSIONING TIMELINE
DELAYED DECON
(not to scale)

Delayed DECON
(Shutdown April 19, 2034)

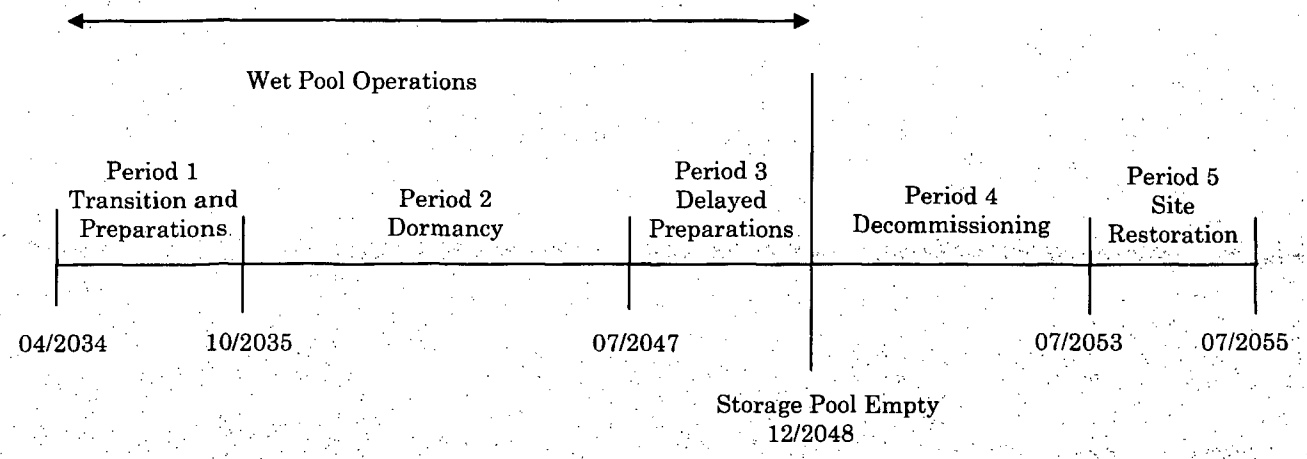
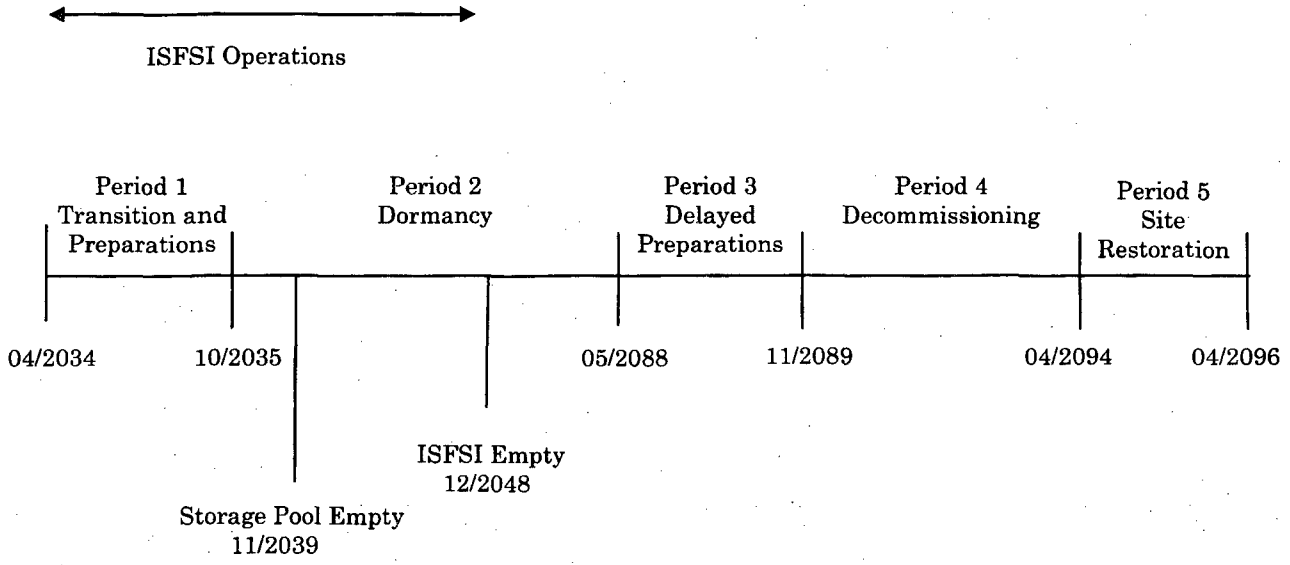


FIGURE 4.4
DECOMMISSIONING TIMELINE
SAFSTOR
(not to scale)

SAFSTOR
(Shutdown April 19, 2034)



5. RADIOACTIVE WASTES

The objectives of the decommissioning process are the removal of all radioactive material from the site that would restrict its future use and the termination of the NRC license(s). This currently requires the remediation of all radioactive material at the site in excess of applicable legal limits. Under the Atomic Energy Act,[33] the NRC is responsible for protecting the public from sources of ionizing radiation. Title 10 of the Code of Federal Regulations delineates the production, utilization, and disposal of radioactive materials and processes. In particular, §71 defines radioactive material as it pertains to packaging and transportation and §61 specifies its disposition.

Most of the materials being transported for controlled burial are categorized as Low Specific Activity (LSA) or Surface Contaminated Object (SCO) materials containing Type A quantities, as defined in 49 CFR §173-178. Shipping containers are required to be Industrial Packages (IP-1, IP-2 or IP-3, as defined in subpart 173.411). For this study, commercially available steel containers are presumed to be used for the disposal of piping, small components, and concrete. Larger components can serve as their own containers, with proper closure of all openings, access ways, and penetrations.

The volumes of radioactive waste generated during the various decommissioning activities at the site is shown on a line-item basis in Appendices C, D, and E and summarized in Tables 5.1 through 5.3. The quantified waste volume summaries shown in these tables are consistent with §61 classifications. The volumes are calculated based on the exterior dimensions for containerized material and on the displaced volume of components serving as their own waste containers.

The reactor vessel and internals are categorized as large quantity shipments and, accordingly, will be shipped in reusable, shielded truck casks with disposable liners. In calculating disposal costs, the burial fees are applied against the liner volume, as well as the special handling requirements of the payload. Packaging efficiencies are lower for the highly activated materials (greater than Type A quantity waste), where high concentrations of gamma-emitting radionuclides limit the capacity of the shipping canisters.

No process system containing/handling radioactive substances at shutdown is presumed to meet material release criteria by decay alone, i.e., systems radioactive at shutdown will still be radioactive over the time period during which the decommissioning is accomplished, due to the presence of long-lived radionuclides.

While the dose rates decrease with time, radionuclides such as ^{137}Cs will still control the disposition requirements.

The waste material generated in the decontamination and dismantling of TMI-1 is primarily generated during Period 2 of the DECON alternative and Period 4 of the deferred alternatives. Material that is considered potentially contaminated when removed from the radiologically controlled area is sent to processing facilities in Tennessee for conditioning and disposal. Heavily contaminated components and activated materials are routed for controlled disposal. The disposal volumes reported in the tables reflect the savings resulting from reprocessing and recycling.

Disposal fees are calculated using current disposal agreements, with surcharges added for the highly activated components, for example, generated in the segmentation of the reactor vessel. The cost to dispose of the majority of the material generated from the decontamination and dismantling activities is based upon the current disposal agreement with EnergySolutions for its facility in Clive, Utah.

Since EnergySolutions is not currently able to receive the more highly radioactive components generated in the decontamination and dismantling of the reactor, disposal costs for the Class B and C material were based upon the last published rate schedule for non-compact waste for the Barnwell facility (as a proxy). Additional surcharges were included for activity, dose rate, and/or handling added as appropriate for the particular package.

TABLE 5.1
DECOMMISSIONING WASTE SUMMARY
DECON

	Waste Class[1]	Volume (cubic feet)	Weight (pounds)
Low-Level Radioactive Waste			
EnergySolutions (Clive, Utah)			
Containerized	A	159,619	16,279,712
Bulk	A	57,110	3,891,428
Future Disposal Facility			
	B	4,893	592,229
	C	517	61,605
Geologic Repository (Greater-than Class C)			
	>C	580	105,646
Total [2]		222,718	20,930,620
Processed Waste (off-site)		179,851	7,477,298
Scrap Metal			142,360,000

1 Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

2 Columns may not add due to rounding.

TABLE 5.2
DECOMMISSIONING WASTE SUMMARY
DELAYED DECON

	Waste Class[1]	Volume (cubic feet)	Weight (pounds)
Low-Level Radioactive Waste			
EnergySolutions (Clive, Utah)			
Containerized	A	107,707	12,639,275
Bulk	A	59,929	3,838,940
Future Disposal Facility			
	B	2,629	337,226
	C	517	61,605
Geologic Repository (Greater-than Class C)			
	>C	580	105,646
Total [2]		171,361	16,982,692
Processed Waste (off-site)		247,821	10,243,890
Scrap Metal			142,452,000

1 Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55

2 Columns may not add due to rounding.

TABLE 5.3
DECOMMISSIONING WASTE SUMMARY
SAFSTOR

	Waste Class[1]	Volume (cubic feet)	Weight (pounds)
Low-Level Radioactive Waste			
EnergySolutions (Clive, Utah)			
Containerized	A	105,376	12,479,270
Bulk	A	76,527	4,303,350
Future Disposal Facility			
	B	2,824	294,791
	C	517	61,605
Geologic Repository (Greater-than Class C)			
	>C	580	105,646
Total [2]		185,823	17,244,662
Processed Waste (off-site)		248,328	10,300,150
Scrap Metal			142,452,000

1 Waste is classified according to the requirements as delineated in Title 10 CFR, Part 61.55
2 Columns may not add due to rounding.

6. RESULTS

The analysis to estimate the costs to decommission TMI-1 relied upon the site-specific, technical information developed for a previous analysis prepared in 2003-04. While not an engineering study, the estimates provide Exelon with sufficient information to assess their financial obligations, as they pertain to the eventual decommissioning of the nuclear station.

The estimates described in this report are based on numerous fundamental assumptions, including regulatory requirements, project contingencies, low-level radioactive waste disposal practices, high-level radioactive waste management options, and site restoration requirements. The decommissioning scenarios assume continued operation of the spent fuel pool for a minimum of approximately five years following the cessation of operations for continued cooling of the assemblies. For the DECON and SAFSTOR scenarios, an ISFSI is constructed and used to safeguard the spent fuel, once sufficiently cooled, until such time that the DOE can complete the transfer of the assemblies to its repository. The spent fuel remains in the storage pool in the Delayed-DECON alternative.

The cost projected to promptly decommission (DECON) TMI-1 is estimated to be $736.3 million. The majority of this cost (approximately 68.5%) is associated with the physical decontamination and dismantling of the nuclear unit so that the license can be terminated. Another 21.6% is associated with the management, interim storage, and eventual transfer of the spent fuel. The remaining 10.0% is for the demolition of the designated structures and limited restoration of the site.

The primary cost contributors, identified in Tables 6.1 through 6.3, are either labor-related or associated with the management and disposition of the radioactive waste. Program management is the largest single contributor to the overall cost. The magnitude of the expense is a function of both the size of the organization required to manage the decommissioning, as well as the duration of the program. It is assumed, for purposes of this analysis, that Exelon will oversee the decommissioning program, using a DOC to manage the decommissioning labor force and the associated subcontractors. The size and composition of the management organization varies with the decommissioning phase and associated site activities. However, once the operating license is terminated, the staff is substantially reduced for the conventional demolition and restoration of the site, and the long-term care of the spent fuel (for the DECON alternative).

As described in this report, the spent fuel pool will remain operational for approximately five and one-half years following the cessation of operations. The

pool will be isolated and an independent spent fuel island created. This will allow decommissioning operations to proceed in and around the pool area. Within the five and one-half year period, the spent fuel will be packaged into transportable steel canisters for loading into a DOE-provided transport cask (DECON and SAFSTOR alternatives). The canisters will be stored in concrete overpacks at the ISFSI until the DOE is able to receive them. Dry storage of the fuel provides additional flexibility in the event the DOE is not able to meet the current timetable for completing the transfer of assemblies to an off-site facility and minimizes the associated caretaking expenses.

The cost for waste disposal includes only those costs associated with the controlled disposition of the low-level radioactive waste generated from decontamination and dismantling activities, including equipment and components, structural material, filters, resins and dry-active waste. As described in Section 5, disposal of the majority of the radioactive material is at EnergySolutions facility in Clive, Utah or some alternative facility. Highly activated components, requiring additional isolation from the environment, are packaged for geologic disposal. Disposal of these components is based upon a cost equivalent for spent fuel.

A significant portion of the metallic waste is designated for additional processing and treatment at an off-site facility. Processing reduces the volume of material requiring controlled disposal through such techniques and processes as survey and sorting, decontamination, and volume reduction. The material that cannot be unconditionally released is packaged for controlled disposal at one of the currently operating facilities. The cost identified in the summary table for processing is all-inclusive, incorporating the ultimate disposition of the material.

Removal costs reflect the labor-intensive nature of the decommissioning process, as well as the management controls required to ensure a safe and successful program. Decontamination and packaging costs also have a large labor component that is based upon prevailing union wages. Non-radiological demolition is a natural extension of the decommissioning process. The methods employed in decontamination and dismantling are generally destructive and indiscriminate in inflicting collateral damage. With a work force mobilized to support decommissioning operations, non-radiological demolition can be an integrated activity and a logical expansion of the work being performed in the process of terminating the operating license. Prompt demolition reduces future liabilities and can be more cost effective than deferral, due to the deterioration of the facilities (and therefore the working conditions) with time.

The reported cost for transport includes the tariffs and surcharges associated with moving large components and/or overweight shielded casks overland, as well as the

general expense, e.g., labor and fuel, of transporting material to the destinations identified in this report. For purposes of this analysis, material is primarily moved overland by truck.

Decontamination is used to reduce the radiation fields and minimize worker exposure. Slightly contaminated material or material located within a contaminated area is sent to an off-site processing center, i.e., this analysis does not assume that contaminated components and equipment can be decontaminated for uncontrolled release in-situ. Centralized processing centers have proven to be a more economical means of handling the large volumes of material produced in the dismantling of a nuclear unit.

License termination survey costs are associated with the labor intensive and complex activity of verifying that contamination has been removed from the site to the levels specified by the regulating agency. This process involves a systematic survey of all remaining surface areas and surrounding environs, sampling, isotopic analysis, and documentation of the findings. The status of any components and materials not removed in the decommissioning process will also require confirmation and will add to the expense of surveying the facilities alone.

The remaining costs include allocations for heavy equipment and temporary services, as well as for other expenses such as regulatory fees and the premiums for nuclear insurance. While site operating costs are greatly reduced following the final cessation of operations, certain administrative functions do need to be maintained either at a basic functional or regulatory level.

TABLE 6.1
SUMMARY OF DECOMMISSIONING COST ELEMENTS
DECON
(thousands of 2008 dollars)

Work Category	Cost	%
Decontamination	10,012	1.4%
Removal	113,182	15.4%
Packaging	13,132	1.8%
Transportation	15,424	2.1%
Waste Disposal	74,845	10.2%
Off-site Waste Processing	9,150	1.2%
Program Management [1]	314,235	42.7%
Spent Fuel Pool Isolation	10,819	1.5%
Spent Fuel Management	116,016	15.8%
Insurance and Regulatory Fees	13,997	1.9%
Energy	10,279	1.4%
Characterization and Licensing Surveys	13,726	1.9%
Property Taxes	11,079	1.5%
Miscellaneous Equipment	6,069	0.8%
Site O&M	4,369	0.6%
Total [2]	736,331	100.0%
NRC License Termination	504,115	68.5%
Spent Fuel Management	158,771	21.6%
Site Restoration	73,445	10.0%

[1] Includes engineering and security
[2] Columns may not add due to rounding

TABLE 6.2
SUMMARY OF DECOMMISSIONING COST ELEMENTS
DELAYED DECON
(thousands of 2008 dollars)

Work Category	Cost	%
Decontamination	10,342	1.5%
Removal	108,206	15.3%
Packaging	10,250	1.5%
Transportation	13,888	2.0%
Waste Disposal	51,527	7.3%
Off-site Waste Processing	12,650	1.8%
Program Management [1]	372,473	52.7%
Spent Fuel Pool Isolation	10,819	1.5%
Spent Fuel Management	34,249	4.8%
Insurance and Regulatory Fees	19,002	2.7%
Energy	14,774	2.1%
Characterization and Licensing Surveys	15,246	2.2%
Property Taxes	16,365	2.3%
Miscellaneous Equipment	10,611	1.5%
Site O&M	6,107	0.9%
Total [2]	706,507	100.0%
NRC License Termination	477,208	67.5%
Spent Fuel Management	153,263	21.7%
Site Restoration	76,036	10.8%

[1] Includes engineering and security
[2] Columns may not add due to rounding

TABLE 6.3
SUMMARY OF DECOMMISSIONING COST ELEMENTS
SAFSTOR
(thousands of 2008 dollars)

Work Category	Cost	%
Decontamination	9,983	1.1%
Removal	113,224	12.0%
Packaging	9,518	1.0%
Transportation	12,759	1.3%
Waste Disposal	50,739	5.4%
Off-site Waste Processing	12,721	1.3%
Program Management [1]	439,485	46.4%
Spent Fuel Pool Isolation	10,819	1.1%
Spent Fuel Management	113,770	12.0%
Insurance and Regulatory Fees	47,000	5.0%
Energy	20,075	2.1%
Characterization and Licensing Surveys	15,246	1.6%
Property Taxes	49,300	5.2%
Miscellaneous Equipment	23,920	2.5%
Site O&M	17,818	1.9%
Total [2]	946,378	100.0%
NRC License Termination	692,814	73.2%
Spent Fuel Management	177,582	18.8%
Site Restoration	75,982	8.0%

[1] Includes engineering and security
[2] Columns may not add due to rounding

7. REFERENCES

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3. U.S. Nuclear Regulatory Commission, Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors," October 2003

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7. "Nuclear Waste Policy Act of 1982 and Amendments," U.S. Department of Energy's Office of Civilian Radioactive Management, 1982

8. U.S. Court of Federal Claims awarded Yankee Atomic, Connecticut Yankee and Maine Yankee damages over the federal government's failure to remove spent fuel from the sites in a September 2006 ruling

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7. REFERENCES
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13. "Low-Level Radioactive Waste Policy Amendments Act of 1985," Public Law 99-240, January 15, 1986

14. U.S. Code of Federal Regulations, Title 10, Part 20, Subpart E, "Radiological Criteria for License Termination," Federal Register, Volume 62, Number 139 (p 39058 et seq.), July 21, 1997

15. "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination," EPA Memorandum OSWER No. 9200.4-18, August 22, 1997

16. U.S. Code of Federal Regulations, Title 40, Part 141.16, "Maximum contaminant levels for beta particle and photon radioactivity from man-made radionuclides in community water systems"

17. "Memorandum of Understanding Between the Environmental Protection Agency and the Nuclear Regulatory Commission: Consultation and Finality on Decommissioning and Decontamination of Contaminated Sites," OSWER 9295.8-06a, October 9, 2002

18. "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)," NUREG-1575, Rev. 1, EPA 402-R-97-016, Rev. 1, DOE/EH-0624, Rev. 1, August 2000

19. T.S. LaGuardia et al., "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986

20. W.J. Manion and T.S. LaGuardia, "Decommissioning Handbook," U.S. Department of Energy, DOE/EV/10128-1, November 1980

21 "Building Construction Cost Data 2008," Robert Snow Means Company, Inc., Kingston, Massachusetts

22. Project and Cost Engineers' Handbook, Second Edition, p. 239, American Association of Cost Engineers, Marcel Dekker, Inc., New York, New York, 1984

7. REFERENCES
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23. "Acceptance Priority Ranking & Annual Capacity Report," DOE/RW-0567, July 2004

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25. "Strategy for Management and Disposal of Greater-Than-Class C Low-Level Radioactive Waste," Federal Register Volume 60, Number 48 (p 13424 et seq.), March 1995

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27. Tri-State Motor Transit Company, published tariffs, Interstate Commerce Commission (ICC), Docket No. MC-427719 Rules Tariff, March 2004, Radioactive Materials Tariff, January 2004

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31. "Financial Protection Requirements for Permanently Shutdown Nuclear Power Reactors," 10 CFR Parts 50 and 140, Federal Register Notice, Vol. 62, No. 210, October 30, 1997

32. "Microsoft Project 2003," Microsoft Corporation, Redmond, WA, 2003

33. "Atomic Energy Act of 1954," (68 Stat. 919)

APPENDIX A

UNIT COST FACTOR DEVELOPMENT

APPENDIX A
UNIT COST FACTOR DEVELOPMENT

Example: Unit Factor for Removal of Contaminated Heat Exchanger < 3,000 lbs.

1. SCOPE

Heat exchangers weighing < 3,000 lbs. will be removed in one piece using a crane or small hoist. They will be disconnected from the inlet and outlet piping. The heat exchanger will be sent to the waste processing area.

2. CALCULATIONS

Act ID	Activity Description	Activity Duration (minutes)	Critical Duration (minutes)*
a	Remove insulation	60	(b)
b	Mount pipe cutters	60	60
c	Install contamination controls	20	(b)
d	Disconnect inlet and outlet lines	60	60
e	Cap openings	20	(d)
f	Rig for removal	30	30
g	Unbolt from mounts	30	30
h	Remove contamination controls	15	15
i	Remove, wrap, send to waste processing area	60	60
	Totals (Activity/Critical)	355	255

Duration adjustment(s):	
+ Respiratory protection adjustment (25% of critical duration)	64
+ Radiation/ALARA adjustment (20% of critical duration)	51
Adjusted work duration	370
+ Protective clothing adjustment (30% of adjusted duration)	111
Productive work duration	481
+ Work break adjustment (8.33 % of productive duration)	44
Total work duration (minutes)	521

***** Total duration = 8.683 hr *****

* Alpha designators indicate activities that can be performed in parallel

APPENDIX A
(Continued)

3. LABOR REQUIRED

Crew	Number	Duration (Hours)	Rate ($/hr)	Cost
Laborers	3.00	8.683	30.00	781.47
Craftsmen	2.00	8.683	51.30	890.88
Foreman	1.00	8.683	51.86	450.30
General Foreman	0.25	8.683	53.58	116.31
Fire Watch	0.05	8.683	30.00	13.02
Health Physics Technician	1.00	8.683	56.94	494.41
Total labor cost				$2,746.39

4. EQUIPMENT & CONSUMABLES COSTS

Equipment Costs	none
Consumables/Materials Costs	
• Blotting paper 50 @ $0.42/sq ft {2}	$21.00
• Plastic sheets/bags 50 @ $0.13/sq ft {3}	$6.50
• Gas torch consumables 1 @ $7.51 x 1 /hr {1}	$7.51
Subtotal cost of equipment and materials	$35.01
Overhead & profit on equipment and materials @ 16.00 %	$5.60
Total costs, equipment & material	$40.61

TOTAL COST:

Removal of contaminated heat exchanger <3000 pounds:	$2,787.00
Total labor cost:	$2,746.39
Total equipment/material costs:	$40.61
Total craft labor man-hours required per unit:	63.39

5. NOTES AND REFERENCES

- Work difficulty factors were developed in conjunction with the Atomic Industrial Forum's (now NEI) program to standardize nuclear decommissioning cost estimates and are delineated in Volume 1, Chapter 5 of the "Guidelines for Producing Commercial Nuclear Power Plant Decommissioning Cost Estimates," AIF/NESP-036, May 1986.

- References for equipment & consumables costs:

    1. www.mcmaster.com online catalog - Spill Control (7193T88)
    2. R.S. Means (2008) 01 56 13.60-0200, page 20
    3. R.S. Means (2008) 01 54 33.40-6360, page 626

- Material and consumable costs were adjusted using the regional indices for Middletown, Pennsylvania.

APPENDIX B

UNIT COST FACTOR LISTING
(DECON: Power Block Structures Only)

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit
Removal of clean instrument and sampling tubing, $/linear foot	0.36
Removal of clean pipe 0.25 to 2 inches diameter, $/linear foot	3.66
Removal of clean pipe >2 to 4 inches diameter, $/linear foot	5.38
Removal of clean pipe >4 to 8 inches diameter, $/linear foot	11.21
Removal of clean pipe >8 to 14 inches diameter, $/linear foot	21.12
Removal of clean pipe >14 to 20 inches diameter, $/linear foot	27.41
Removal of clean pipe >20 to 36 inches diameter, $/linear foot	40.34
Removal of clean pipe >36 inches diameter, $/linear foot	47.95
Removal of clean valve >2 to 4 inches	72.30
Removal of clean valve >4 to 8 inches	112.13
Removal of clean valve >8 to 14 inches	211.24
Removal of clean valve >14 to 20 inches	274.08
Removal of clean valve >20 to 36 inches	403.40
Removal of clean valve >36 inches	479.54
Removal of clean pipe hanger for small bore piping	22.88
Removal of clean pipe hanger for large bore piping	80.84
Removal of clean pump, <300 pound	187.89
Removal of clean pump, 300-1000 pound	540.32
Removal of clean pump, 1000-10,000 pound	2,114.97
Removal of clean pump, >10,000 pound	4,085.73
Removal of clean pump motor, 300-1000 pound	227.83
Removal of clean pump motor, 1000-10,000 pound	881.81
Removal of clean pump motor, >10,000 pound	1,984.05
Removal of clean heat exchanger <3000 pound	1,132.50
Removal of clean heat exchanger >3000 pound	2,844.45
Removal of clean feedwater heater/deaerator	8,041.01
Removal of clean moisture separator/reheater	16,560.79
Removal of clean tank, <300 gallons	241.84
Removal of clean tank, 300-3000 gallon	764.94
Removal of clean tank, >3000 gallons, $/square foot surface area	6.61

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit
Removal of clean electrical equipment, <300 pound	103.19
Removal of clean electrical equipment, 300-1000 pound	370.94
Removal of clean electrical equipment, 1000-10,000 pound	741.86
Removal of clean electrical equipment, >10,000 pound	1,777.27
Removal of clean electrical transformer < 30 tons	1,234.29
Removal of clean electrical transformer > 30 tons	3,554.54
Removal of clean standby diesel generator, <100 kW	1,260.72
Removal of clean standby diesel generator, 100 kW to 1 MW	2,814.01
Removal of clean standby diesel generator, >1 MW	5,825.56
Removal of clean electrical cable tray, $/linear foot	9.60
Removal of clean electrical conduit, $/linear foot	4.19
Removal of clean mechanical equipment, <300 pound	103.19
Removal of clean mechanical equipment, 300-1000 pound	370.94
Removal of clean mechanical equipment, 1000-10,000 pound	741.86
Removal of clean mechanical equipment, >10,000 pound	1,777.27
Removal of clean HVAC equipment, <300 pound	103.19
Removal of clean HVAC equipment, 300-1000 pound	370.94
Removal of clean HVAC equipment, 1000-10,000 pound	741.86
Removal of clean HVAC equipment, >10,000 pound	1,777.27
Removal of clean HVAC ductwork, $/pound	0.38
Removal of contaminated instrument and sampling tubing, $/linear foot	1.01
Removal of contaminated pipe 0.25 to 2 inches diameter, $/linear foot	13.32
Removal of contaminated pipe >2 to 4 inches diameter, $/linear foot	22.64
Removal of contaminated pipe >4 to 8 inches diameter, $/linear foot	38.70
Removal of contaminated pipe >8 to 14 inches diameter, $/linear foot	73.84
Removal of contaminated pipe >14 to 20 inches diameter, $/linear foot	88.69
Removal of contaminated pipe >20 to 36 inches diameter, $/linear foot	123.25
Removal of contaminated pipe >36 inches diameter, $/linear foot	146.49
Removal of contaminated valve >2 to 4 inches	297.99
Removal of contaminated valve >4 to 8 inches	360.56

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit
Removal of contaminated valve >8 to 14 inches	706.49
Removal of contaminated valve >14 to 20 inches	901.51
Removal of contaminated valve >20 to 36 inches	1,200.59
Removal of contaminated valve >36 inches	1,432.96
Removal of contaminated pipe hanger for small bore piping	80.88
Removal of contaminated pipe hanger for large bore piping	246.14
Removal of contaminated pump, <300 pound	618.96
Removal of contaminated pump, 300-1000 pound	1,452.09
Removal of contaminated pump, 1000-10,000 pound	4,697.73
Removal of contaminated pump, >10,000 pound	11,401.74
Removal of contaminated pump motor, 300-1000 pound	618.57
Removal of contaminated pump motor, 1000-10,000 pound	1,898.91
Removal of contaminated pump motor, >10,000 pound	4,289.48
Removal of contaminated heat exchanger <3000 pound	2,787.00
Removal of contaminated heat exchanger >3000 pound	8,080.81
Removal of contaminated tank, <300 gallons	1,032.85
Removal of contaminated tank, >300 gallons, $/square foot	20.97
Removal of contaminated electrical equipment, <300 pound	485.85
Removal of contaminated electrical equipment, 300-1000 pound	1,175.05
Removal of contaminated electrical equipment, 1000-10,000 pound	2,261.84
Removal of contaminated electrical equipment, >10,000 pound	4,537.28
Removal of contaminated electrical cable tray, $/linear foot	23.84
Removal of contaminated electrical conduit, $/linear foot	11.29
Removal of contaminated mechanical equipment, <300 pound	552.74
Removal of contaminated mechanical equipment, 300-1000 pound	1,334.68
Removal of contaminated mechanical equipment, 1000-10,000 pound	2,572.77
Removal of contaminated mechanical equipment, >10,000 pound	4,537.28
Removal of contaminated HVAC equipment, <300 pound	552.74
Removal of contaminated HVAC equipment, 300-1000 pound	1,334.68
Removal of contaminated HVAC equipment, 1000-10,000 pound	2,572.77

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit
Removal of contaminated HVAC equipment, >10,000 pound	4,537.28
Removal of contaminated HVAC ductwork, $/pound	1.44
Removal/plasma arc cut of contaminated thin metal components, $/linear in.	2.58
Additional decontamination of surface by washing, $/square foot	5.17
Additional decontamination of surfaces by hydrolasing, $/square foot	25.67
Decontamination rig hook up and flush, $/ 250 foot length	4,666.75
Chemical flush of components/systems, $/gallon	11.83
Removal of clean standard reinforced concrete, $/cubic yard	108.70
Removal of grade slab concrete, $/cubic yard	143.01
Removal of clean concrete floors, $/cubic yard	279.92
Removal of sections of clean concrete floors, $/cubic yard	842.15
Removal of clean heavily rein concrete w/#9 rebar, $/cubic yard	186.40
Removal of contaminated heavily rein concrete w/#9 rebar, $/cubic yard	1,381.95
Removal of clean heavily rein concrete w/#18 rebar, $/cubic yard	235.75
Removal of contaminated heavily rein concrete w/#18 rebar, $/cubic yard	1,825.44
Removal heavily rein concrete w/#18 rebar & steel embedments, $/cubic yard	362.49
Removal of below-grade suspended floors, $/cubic yard	279.92
Removal of clean monolithic concrete structures, $/cubic yard	712.10
Removal of contaminated monolithic concrete structures, $/cubic yard	1,379.35
Removal of clean foundation concrete, $/cubic yard	558.52
Removal of contaminated foundation concrete, $/cubic yard	1,284.44
Explosive demolition of bulk concrete, $/cubic yard	25.00
Removal of clean hollow masonry block wall, $/cubic yard	70.15
Removal of contaminated hollow masonry block wall, $/cubic yard	209.50
Removal of clean solid masonry block wall, $/cubic yard	70.15
Removal of contaminated solid masonry block wall, $/cubic yard	209.50
Backfill of below-grade voids, $/cubic yard	20.53
Removal of subterranean tunnels/voids, $/linear foot	86.38
Placement of concrete for below-grade voids, $/cubic yard	108.93
Excavation of clean material, $/cubic yard	2.33

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit
Excavation of contaminated material, $/cubic yard	27.30
Removal of clean concrete rubble (tipping fee included), $/cubic yard	165.03
Removal of contaminated concrete rubble, $/cubic yard	18.59
Removal of building by volume, $/cubic foot	0.24
Removal of clean building metal siding, $/square foot	0.80
Removal of contaminated building metal siding, $/square foot	2.59
Removal of standard asphalt roofing, $/square foot	1.67
Removal of transite panels, $/square foot	1.69
Scarifying contaminated concrete surfaces (drill & spall), $/square foot	9.26
Scabbling contaminated concrete floors, $/square foot	5.05
Scabbling contaminated concrete walls, $/square foot	13.32
Scabbling contaminated ceilings, $/square foot	45.30
Scabbling structural steel, $/square foot	4.52
Removal of clean overhead crane/monorail < 10 ton capacity	536.99
Removal of contaminated overhead crane/monorail < 10 ton capacity	1,292.34
Removal of clean overhead crane/monorail >10-50 ton capacity	1,288.77
Removal of contaminated overhead crane/monorail >10-50 ton capacity	3,095.46
Removal of polar crane > 50 ton capacity	5,401.44
Removal of gantry crane > 50 ton capacity	22,215.86
Removal of structural steel, $/pound	0.17
Removal of clean steel floor grating, $/square foot	3.96
Removal of contaminated steel floor grating, $/square foot	9.34
Removal of clean free standing steel liner, $/square foot	9.91
Removal of contaminated free standing steel liner, $/square foot	24.49
Removal of clean concrete-anchored steel liner, $/square foot	4.95
Removal of contaminated concrete-anchored steel liner, $/square foot	28.25
Placement of scaffolding in clean areas, $/square foot	12.28
Placement of scaffolding in contaminated areas, $/square foot	18.71
Landscaping with topsoil, $/acre	18,642.32
Cost of CPC B-88 LSA box & preparation for use	1,357.08

APPENDIX B

UNIT COST FACTOR LISTING
(Power Block Structures Only)

Unit Cost Factor	Cost/Unit
Cost of CPC B-25 LSA box & preparation for use	1,195.51
Cost of CPC B-12V 12 gauge LSA box & preparation for use	1,170.56
Cost of CPC B-144 LSA box & preparation for use	7,164.79
Cost of LSA drum & preparation for use	111.45
Cost of cask liner for CNSI 8 120A cask (resins)	5,621.69
Decontamination of surfaces with vacuuming, $/square foot	0.51

APPENDIX C

DETAILED COST ANALYSIS

DECON

Table C
Three Mile Island, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	149	22	171	171	-	-	-	-	-	-	-	-	-	1,300
1a.1.2	Notification of Cessation of Operations									a											
1a.1.3	Remove fuel & source material									n/a											
1a.1.4	Notification of Permanent Defueling									a											
1a.1.5	Deactivate plant systems & process waste									a											
1a.1.6	Prepare and submit PSDAR	-	-	-	-	-	-	229	34	263	263	-	-	-	-	-	-	-	-	-	2,000
1a.1.7	Review plant dwgs & specs.	-	-	-	-	-	-	526	79	604	604	-	-	-	-	-	-	-	-	-	4,600
1a.1.8	Perform detailed rad survey									a											
1a.1.9	Estimate by-product inventory	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
1a.1.10	End product description	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	Detailed by-product inventory	-	-	-	-	-	-	149	22	171	171	-	-	-	-	-	-	-	-	-	1,300
1a.1.12	Define major work sequence	-	-	-	-	-	-	857	129	985	985	-	-	-	-	-	-	-	-	-	7,500
1a.1.13	Perform SER and EA	-	-	-	-	-	-	354	53	407	407	-	-	-	-	-	-	-	-	-	3,100
1a.1.14	Perform Site-Specific Cost Study	-	-	-	-	-	-	571	86	657	657	-	-	-	-	-	-	-	-	-	5,000
1a.1.15	Prepare/submit License Termination Plan	-	-	-	-	-	-	468	70	538	538	-	-	-	-	-	-	-	-	-	4,096
1a.1.16	Receive NRC approval of termination plan									a											
Activity Specifications																					
1a.1.17.1	Plant & temporary facilities	-	-	-	-	-	-	562	84	646	582	-	65	-	-	-	-	-	-	-	4,920
1a.1.17.2	Plant systems	-	-	-	-	-	-	476	71	547	493	-	55	-	-	-	-	-	-	-	4,167
1a.1.17.3	NSSS Decontamination Flush	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	500
1a.1.17.4	Reactor internals	-	-	-	-	-	-	811	122	933	933	-	-	-	-	-	-	-	-	-	7,100
1a.1.17.5	Reactor vessel	-	-	-	-	-	-	743	111	854	854	-	-	-	-	-	-	-	-	-	6,500
1a.1.17.6	Biological shield	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	500
1a.1.17.7	Steam generators	-	-	-	-	-	-	356	53	410	410	-	-	-	-	-	-	-	-	-	3,120
1a.1.17.8	Reinforced concrete	-	-	-	-	-	-	183	27	210	105	-	105	-	-	-	-	-	-	-	1,600
1a.1.17.9	Main Turbine	-	-	-	-	-	-	46	7	53	-	-	53	-	-	-	-	-	-	-	400
1a.1.17.10	Main Condensers	-	-	-	-	-	-	46	7	53	-	-	53	-	-	-	-	-	-	-	400
1a.1.17.11	Plant structures & buildings	-	-	-	-	-	-	356	53	410	205	-	205	-	-	-	-	-	-	-	3,120
1a.1.17.12	Waste management	-	-	-	-	-	-	526	79	604	604	-	-	-	-	-	-	-	-	-	4,600
1a.1.17.13	Facility & site closeout	-	-	-	-	-	-	103	15	118	59	-	59	-	-	-	-	-	-	-	900
1a.1.17	Total	-	-	-	-	-	-	4,322	648	4,970	4,376	-	594	-	-	-	-	-	-	-	37,827
Planning & Site Preparations																					
1a.1.18	Prepare dismantling sequence	-	-	-	-	-	-	274	41	315	315	-	-	-	-	-	-	-	-	-	2,400
1a.1.19	Plant prep. & temp. svces	-	-	-	-	-	-	2,419	363	2,782	2,782	-	-	-	-	-	-	-	-	-	-
1a.1.20	Design water clean-up system	-	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-	-	-	-	1,400
1a.1.21	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,048	307	2,355	2,355	-	-	-	-	-	-	-	-	-	-
1a.1.22	Procure casks/liners & containers	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,230
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	12,893	1,934	14,827	14,233	-	594	-	-	-	-	-	-	-	73,753
Period 1a Additional Costs																					
1a.2.1	ISFSI Construction	-	-	-	-	-	-	16,000	6,000	22,000	-	22,000	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	16,000	6,000	22,000	-	22,000	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	11,280	1,692	12,973	-	12,973	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	11,280	1,692	12,973	-	12,973	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,074	107	1,181	1,181	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	347	-	-	-	-	-	87	433	433	-	-	-	-	-	-	-	-	-	-

Table C
Three Mile Island, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes: Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 1a Period-Dependent Costs (continued)																					
1a.4.4	Heavy equipment rental	-	346	-	-	-	-	-	52	397	397	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	1	1	-	34	-	9	45	45	-	-	-	610	-	-	-	12,190	3	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,459	219	1,677	1,677	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	727	73	800	800	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	550	55	605	-	605	-	-	-	-	-	-	-	-	-
1a.4.9	Site O&M Costs	-	-	-	-	-	-	250	37	287	287	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	745	112	857	-	857	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	85	13	98	-	98	-	-	-	-	-	-	-	-	-
1a.4.12	Security Staff Cost	-	-	-	-	-	-	2,887	433	3,320	3,320	-	-	-	-	-	-	-	-	-	84,868
1a.4.13	Utility Staff Cost	-	-	-	-	-	-	27,176	4,076	31,253	31,253	-	-	-	-	-	-	-	-	-	423,400
1a.4	Subtotal Period 1a Period-Dependent Costs	-	692	1	1	-	34	34,952	5,273	40,953	39,394	1,559	-	-	610	-	-	-	12,190	3	508,268
1a.0	TOTAL PERIOD 1a COST	-	692	1	1	-	34	75,126	14,899	90,753	53,627	36,532	594	-	610	-	-	-	12,190	3	582,020
PERIOD 1b - Decommissioning Preparations																					
Period 1b Direct Decommissioning Activities																					
Detailed Work Procedures																					
1b.1.1.1	Plant systems	-	-	-	-	-	-	541	81	622	560	-	62	-	-	-	-	-	-	-	4,733
1b.1.1.2	NSSS Decontamination Flush	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.3	Reactor internals	-	-	-	-	-	-	286	43	328	328	-	-	-	-	-	-	-	-	-	2,500
1b.1.1.4	Remaining buildings	-	-	-	-	-	-	154	23	177	44	-	133	-	-	-	-	-	-	-	1,350
1b.1.1.5	CRD cooling assembly	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.6	CRD housings & ICI tubes	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.7	Incore instrumentation	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
1b.1.1.8	Reactor vessel	-	-	-	-	-	-	415	62	477	477	-	-	-	-	-	-	-	-	-	3,630
1b.1.1.9	Facility closeout	-	-	-	-	-	-	137	21	158	79	-	79	-	-	-	-	-	-	-	1,200
1b.1.1.10	Missile shields	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	450
1b.1.1.11	Biological shield	-	-	-	-	-	-	137	21	158	158	-	-	-	-	-	-	-	-	-	1,200
1b.1.1.12	Steam generators	-	-	-	-	-	-	526	79	604	604	-	-	-	-	-	-	-	-	-	4,600
1b.1.1.13	Reinforced concrete	-	-	-	-	-	-	114	17	131	66	-	66	-	-	-	-	-	-	-	1,000
1b.1.1.14	Main Turbine	-	-	-	-	-	-	178	27	205	-	-	205	-	-	-	-	-	-	-	1,560
1b.1.1.15	Main Condensers	-	-	-	-	-	-	178	27	205	-	-	205	-	-	-	-	-	-	-	1,560
1b.1.1.16	Auxiliary building	-	-	-	-	-	-	312	47	359	323	-	36	-	-	-	-	-	-	-	2,730
1b.1.1.17	Reactor building	-	-	-	-	-	-	312	47	359	323	-	36	-	-	-	-	-	-	-	2,730
1b.1.1	Total	-	-	-	-	-	-	3,798	570	4,368	3,546	-	821	-	-	-	-	-	-	-	33,243
1b.1.2	Decon primary loop	1,122	-	-	-	-	-	-	561	1,683	1,683	-	-	-	-	-	-	-	-	1,067	-
1b.1	Subtotal Period 1b Activity Costs	1,122	-	-	-	-	-	3,798	1,131	6,051	5,230	-	821	-	-	-	-	-	-	1,067	33,243
Period 1b Additional Costs																					
1b.2.1	Site Characterization	-	-	-	-	-	-	3,373	1,012	4,385	4,385	-	-	-	-	-	-	-	-	19,100	7,852
1b.2.2	Spent Fuel Pool Isolation	-	-	-	-	-	-	9,407	1,411	10,819	10,819	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	12,780	2,423	15,203	15,203	-	-	-	-	-	-	-	-	19,100	7,852
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	667	-	-	-	-	-	-	100	767	767	-	-	-	-	-	-	-	-	-	-
1b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,113	167	1,280	1,280	-	-	-	-	-	-	-	-	-	-
1b.3.3	Process liquid waste	62	-	125	1,083	-	8,563	-	2,347	12,180	12,180	-	-	-	391	2,285	-	-	277,072	522	-
1b.3.4	Small tool allowance	-	2	-	-	-	-	-	0	2	2	-	-	-	-	-	-	-	-	-	-
1b.3.5	Pipe cutting equipment	-	957	-	-	-	-	-	143	1,100	1,100	-	-	-	-	-	-	-	-	-	-
1b.3.6	Decon rig	1,243	-	-	-	-	-	-	186	1,430	1,430	-	-	-	-	-	-	-	-	-	-
1b.3.7	Spent Fuel Capital and Transfer	-	-	-	-	-	-	5,644	847	6,491	-	6,491	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	1,973	958	125	1,083	-	8,563	6,757	3,791	23,250	16,760	6,491	-	-	391	2,285	-	-	277,072	522	-

Table C
Three Mile Island, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	20	-	-	-	-	-	-	5	26	26	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	538	54	592	592	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	368	37	405	405	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	196	-	-	-	-	-	49	245	245	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	173	-	-	-	-	-	26	199	199	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	1	1	-	20	-	5	26	26	-	-	-	358	-	-	-	7,159	2	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	1,463	219	1,682	1,682	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	364	38	401	401	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	276	28	303	-	303	-	-	-	-	-	-	-	-	-
1b.4.10	Site O&M Costs	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	374	56	430	-	430	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	43	6	49	-	49	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	1,447	217	1,665	1,665	-	-	-	-	-	-	-	-	-	42,550
1b.4.14	DOC Staff Cost	-	-	-	-	-	-	5,024	754	5,778	5,778	-	-	-	-	-	-	-	-	-	63,789
1b.4.15	Utility Staff Cost	-	-	-	-	-	-	13,684	2,053	15,737	15,737	-	-	-	-	-	-	-	-	-	213,326
1b.4	Subtotal Period 1b Period-Dependent Costs	20	369	1	1	-	20	23,706	3,564	27,682	26,900	782	-	-	358	-	-	-	7,159	2	319,664
1b.0	TOTAL PERIOD 1b COST	3,115	1,328	126	1,084	-	8,583	47,042	10,908	72,186	64,092	7,273	821	-	749	2,285	-	-	284,232	20,690	360,759
PERIOD 1 TOTALS		3,115	2,020	127	1,085	-	8,617	122,188	25,807	162,939	117,720	43,805	1,415	-	1,358	2,285	-	-	296,422	20,693	942,780
PERIOD 2a - Large Component Removal																					
Period 2a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
2a.1.1.1	Reactor Coolant Piping	113	91	11	33	-	163	-	126	535	535	-	-	-	826	-	-	-	99,877	4,230	-
2a.1.1.2	Pressurizer Relief Tank	15	13	2	7	-	34	-	21	93	93	-	-	-	188	-	-	-	20,849	581	-
2a.1.1.3	Reactor Coolant Pumps & Motors	123	74	35	162	73	1,398	-	468	2,333	2,333	-	-	509	8,974	-	-	-	925,540	4,828	-
2a.1.1.4	Pressurizer	34	51	679	596	-	551	-	325	2,237	2,237	-	-	-	2,588	-	-	-	338,500	2,358	1,875
2a.1.1.5	Steam Generators	175	5,424	1,507	1,944	-	4,800	-	3,086	16,936	16,936	-	-	-	24,813	-	-	-	2,949,429	11,616	3,500
2a.1.1.6	Retired Steam Generator Units	-	-	725	1,940	-	4,640	-	1,523	8,828	8,828	-	-	-	11,714	-	-	-	2,850,879	5,400	2,250
2a.1.1.7	CRDMs/ICIs/Service Structure Removal	88	75	171	89	-	98	-	118	639	639	-	-	-	3,002	-	-	-	59,894	3,176	-
2a.1.1.8	Reactor Vessel Internals	70	2,326	4,217	904	-	6,150	191	6,164	20,023	20,023	-	-	-	626	605	517	-	219,755	23,517	1,073
2a.1.1.9	Reactor Vessel	71	4,935	1,264	1,021	-	8,123	191	7,399	21,004	21,004	-	-	-	7,083	2,003	-	-	980,935	23,517	1,073
2a.1.1	Totals	691	12,990	8,610	6,695	73	23,956	382	19,229	72,628	72,628	-	-	509	59,813	2,608	517	-	8,445,658	79,222	9,770
Removal of Major Equipment																					
2a.1.2	Main Turbine/Generator	-	278	111	104	316	205	-	195	1,209	1,209	-	-	6,394	1,885	-	-	-	456,843	6,072	-
2a.1.3	Main Condensers	-	1,084	88	82	250	161	-	370	2,035	2,035	-	-	5,044	1,487	-	-	-	360,419	24,422	-
Cascading Costs from Clean Building Demolition																					
2a.1.4.1	Reactor	-	690	-	-	-	-	-	104	794	794	-	-	-	-	-	-	-	-	9,845	-
2a.1.4.2	Auxiliary	-	243	-	-	-	-	-	36	280	280	-	-	-	-	-	-	-	-	3,371	-
2a.1.4.3	Fuel Handling	-	317	-	-	-	-	-	48	365	365	-	-	-	-	-	-	-	-	4,242	-
2a.1.4	Totals	-	1,251	-	-	-	-	-	188	1,439	1,439	-	-	-	-	-	-	-	-	17,458	-
Disposal of Plant Systems																					
2a.1.5.1	CNTL-TWR-285_PROCESS	-	58	5	16	43	33	-	32	187	187	-	-	956	308	-	-	-	66,452	1,286	-
2a.1.5.2	CNTL-TWR-305_BURY	-	69	6	13	-	46	-	31	164	164	-	-	-	420	-	-	-	37,709	1,444	-
2a.1.5.3	CNTL-TWR-305_PROCESS	-	47	1	5	23	4	-	17	96	96	-	-	516	36	-	-	-	24,201	1,051	-
2a.1.5.4	CNTL-TWR-322_CLEAN	-	177	-	-	-	-	-	27	203	-	-	203	-	-	-	-	-	-	4,257	-
2a.1.5.5	CNTL-TWR-338_CLEAN	-	128	-	-	-	-	-	19	147	-	-	147	-	-	-	-	-	-	3,122	-
2a.1.5.6	CNTL-TWR-355_CLEAN	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	545	-
2a.1.5.7	CNTL-TWR-380_CLEAN	-	38	-	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	1,001	-
2a.1.5.8	CNTL-TWR-388_CLEAN	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	245	-

Table C
Three Mile Island, Unit 1
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(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Disposal of Plant Systems (continued)																					
2a.1.5.9	IB-295_BURY	-	58	5	9	-	31	-	24	127	127	-	-	-	285	-	-	-	25,568	1,292	-
2a.1.5.10	IB-295_CLEAN	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	1,100	-
2a.1.5.11	IB-295_PROCESS	-	238	14	45	182	63	-	111	652	652	-	-	4,082	584	-	-	-	218,183	5,312	-
2a.1.5.12	IB-305_BURY	-	31	2	5	-	18	-	13	71	71	-	-	-	169	-	-	-	15,164	690	-
2a.1.5.13	IB-305_PROCESS	-	200	8	25	87	43	-	78	442	442	-	-	1,950	397	-	-	-	114,777	4,387	-
2a.1.5.14	IB-322_BURY	-	12	1	2	-	8	-	5	29	29	-	-	-	74	-	-	-	6,642	262	-
2a.1.5.15	IB-322_CLEAN	-	38	-	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	896	-
2a.1.5.16	IB-322_PROCESS	-	513	28	101	401	149	-	244	1,435	1,435	-	-	8,968	1,375	-	-	-	487,541	11,489	-
2a.1.5.17	IB-355_PROCESS	-	57	3	10	45	11	-	26	152	152	-	-	1,012	100	-	-	-	50,026	1,271	-
2a.1.5.18	IB-ROOF_PROCESS	-	15	3	8	15	19	-	12	72	72	-	-	345	174	-	-	-	29,629	344	-
2a.1.5.19	OCA_CLEAN	-	814	-	-	-	-	-	122	936	-	-	936	-	-	-	-	-	-	19,978	-
2a.1.5.20	OCA_PROCESS	-	87	1	6	34	4	-	29	161	161	-	-	753	38	-	-	-	33,998	1,914	-
2a.1.5.21	OOB_CLEAN	-	9	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	252	-
2a.1.5.22	TB-305-E_BURY	-	136	6	16	37	37	-	52	284	284	-	-	830	342	-	-	-	64,399	2,938	-
2a.1.5.23	TB-305-E_CLEAN	-	187	-	-	-	-	-	28	215	-	-	215	-	-	-	-	-	-	4,738	-
2a.1.5.24	TB-305-E_PROCESS	-	425	37	134	549	187	-	259	1,591	1,591	-	-	12,295	1,726	-	-	-	654,168	9,565	-
2a.1.5.25	TB-305-W_BURY	-	96	9	18	-	65	-	44	232	232	-	-	-	599	-	-	-	53,703	2,113	-
2a.1.5.26	TB-305-W_CLEAN	-	222	-	-	-	-	-	33	256	-	-	256	-	-	-	-	-	-	5,764	-
2a.1.5.27	TB-305-W_GIC	-	87	-	-	-	-	-	13	100	-	-	100	-	-	-	-	-	-	2,150	-
2a.1.5.28	TB-305-W_PROCESS	-	790	73	262	1,013	398	-	495	3,031	3,031	-	-	22,670	3,670	-	-	-	1,249,832	17,780	-
2a.1.5.29	TB-322-E_CLEAN	-	79	-	-	-	-	-	12	91	-	-	91	-	-	-	-	-	-	1,960	-
2a.1.5.30	TB-322-E_GIC	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	121	-
2a.1.5.31	TB-322-E_PROCESS	-	483	68	209	534	462	-	354	2,109	2,109	-	-	11,946	4,255	-	-	-	866,708	11,046	-
2a.1.5.32	TB-322-W_CLEAN	-	142	-	-	-	-	-	21	163	-	-	163	-	-	-	-	-	-	3,474	-
2a.1.5.33	TB-322-W_GIC	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	386	-
2a.1.5.34	TB-322-W_PROCESS	-	464	121	402	1,225	786	-	569	3,567	3,567	-	-	27,417	7,242	-	-	-	1,763,044	10,811	-
2a.1.5.35	TB-355-E_CLEAN	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	147	-
2a.1.5.36	TB-355-W_CLEAN	-	23	-	-	-	-	-	3	27	-	-	27	-	-	-	-	-	-	572	-
2a.1.5.37	TB-355-W_GIC	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	46	-
2a.1.5.38	TB-355-W_PROCESS	-	460	39	134	445	244	-	267	1,590	1,590	-	-	9,969	2,248	-	-	-	606,316	10,504	-
2a.1.5.39	TB-380_CLEAN	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	364	-
2a.1.5.40	TB-380_PROCESS	-	407	35	115	344	229	-	232	1,362	1,362	-	-	7,702	2,112	-	-	-	502,137	9,275	-
2a.1.5.41	TB-ROOF_CLEAN	-	21	-	-	-	-	-	3	24	-	-	24	-	-	-	-	-	-	497	-
2a.1.5	Totals	-	6,728	467	1,533	4,977	2,838	-	3,206	19,749	17,353	-	2,395	111,411	26,155	-	-	-	6,870,198	156,385	-
2a.1.6	Scaffolding in support of decommissioning	-	735	8	6	30	4	-	191	973	973	-	-	599	37	-	-	-	30,276	20,187	-
2a.1	Subtotal Period 2a Activity Costs	691	23,065	9,285	8,420	5,646	27,165	382	23,379	98,033	95,637	-	2,395	123,957	89,377	2,608	517	-	16,163,390	303,748	9,770
Period 2a Additional Costs																					
2a.2.1	Turbine Bldg GIC Waste Disposition	-	-	-	85	232	-	-	43	360	360	-	-	10,108	-	-	-	-	454,855	-	-
2a.2	Subtotal Period 2a Additional Costs	-	-	-	85	232	-	-	43	360	360	-	-	10,108	-	-	-	-	454,855	-	-
Period 2a Collateral Costs																					
2a.3.1	Process liquid waste	106	-	34	280	-	207	-	150	776	776	-	-	-	721	-	-	-	43,286	141	-
2a.3.2	Small tool allowance	-	187	-	-	-	-	-	28	216	194	-	22	-	-	-	-	-	-	-	-
2a.3.3	Spent Fuel Capital and Transfer	-	-	-	-	-	-	15,195	2,279	17,474	-	17,474	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	106	187	34	280	-	207	15,195	2,457	18,466	970	17,474	22	-	721	-	-	-	43,286	141	-
Period 2a Period-Dependent Costs																					
2a.4.1	Decon supplies	55	-	-	-	-	-	-	14	69	69	-	-	-	-	-	-	-	-	-	-
2a.4.2	Insurance	-	-	-	-	-	-	640	64	704	704	-	-	-	-	-	-	-	-	-	-
2a.4.3	Property taxes	-	-	-	-	-	-	992	99	1,091	982	-	109	-	-	-	-	-	-	-	-
2a.4.4	Health physics supplies	-	1,456	-	-	-	-	-	364	1,820	1,820	-	-	-	-	-	-	-	-	-	-
2a.4.5	Heavy equipment rental	-	2,245	-	-	-	-	-	337	2,581	2,581	-	-	-	-	-	-	-	-	-	-
2a.4.6	Disposal of DAW generated	-	-	7	9	-	248	-	64	328	328	-	-	-	4,437	-	-	-	88,730	20	-

Table C
Three Mile Island, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 2a Period-Dependent Costs (continued)																					
2a.4.7	*Plant energy budget*	-	-	-	-	-	-	1,872	281	2,152	2,152	-	-	-	-	-	-	-	-	-	-
2a.4.8	NRC Fees	-	-	-	-	-	-	918	92	1,009	1,009	-	-	-	-	-	-	-	-	-	-
2a.4.9	Emergency Planning Fees	-	-	-	-	-	-	270	27	297	-	297	-	-	-	-	-	-	-	-	-
2a.4.10	Site O&M Costs	-	-	-	-	-	-	337	51	388	388	-	-	-	-	-	-	-	-	-	-
2a.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	1,007	151	1,158	-	1,158	-	-	-	-	-	-	-	-	-
2a.4.12	ISFSI Operating Costs	-	-	-	-	-	-	115	17	132	-	132	-	-	-	-	-	-	-	-	-
2a.4.13	Security Staff Cost	-	-	-	-	-	-	3,325	499	3,824	3,824	-	-	-	-	-	-	-	-	-	96,853
2a.4.14	*DOC Staff Cost*	-	-	-	-	-	-	16,688	2,503	19,191	19,191	-	-	-	-	-	-	-	-	-	214,103
2a.4.15	Utility Staff Cost	-	-	-	-	-	-	26,082	3,912	29,994	29,994	-	-	-	-	-	-	-	-	-	398,626
2a.4	Subtotal Period 2a Period-Dependent Costs	55	3,700	7	9	-	248	52,245	8,474	64,738	63,042	1,587	109	-	4,437	-	-	-	88,730	20	709,582
2a.0	TOTAL PERIOD 2a COST	852	26,953	9,326	8,793	5,878	27,619	67,822	34,353	181,596	160,009	19,061	2,526	134,065	94,535	2,608	517	-	16,750,270	303,909	719,352
PERIOD 2b - Site Decontamination																					
Period 2b Direct Decommissioning Activities																					
Disposal of Plant Systems																					
2b.1.1.1	AB-261_BURY	-	149	24	56	-	200	-	98	527	527	-	-	-	1,844	-	-	-	165,398	3,451	-
2b.1.1.2	AB-261_PROCESS	-	71	7	16	31	40	-	36	202	202	-	-	704	373	-	-	-	62,046	1,639	-
2b.1.1.3	AB-271_BURY	-	78	12	27	-	98	-	49	264	264	-	-	-	898	-	-	-	80,591	1,765	-
2b.1.1.4	AB-271_PROCESS	-	110	14	47	164	81	-	81	496	496	-	-	3,669	742	-	-	-	215,571	2,606	-
2b.1.1.5	AB-281-1_BURY	-	599	67	123	-	438	-	284	1,511	1,511	-	-	-	4,978	-	-	-	362,114	13,634	-
2b.1.1.6	AB-281-1_PROCESS	-	6	0	0	1	1	-	2	11	11	-	-	20	11	-	-	-	1,830	151	-
2b.1.1.7	AB-281-2_BURY	-	596	87	165	-	587	-	329	1,763	1,763	-	-	-	6,052	-	-	-	484,727	13,135	-
2b.1.1.8	AB-281-2_PROCESS	-	403	23	57	101	150	-	164	899	899	-	-	2,253	1,387	-	-	-	215,864	8,971	-
2b.1.1.9	AB-281-3_BURY	-	169	9	17	-	59	-	60	313	313	-	-	-	544	-	-	-	48,749	3,882	-
2b.1.1.10	AB-281-3_PROCESS	-	73	2	5	12	13	-	24	130	130	-	-	258	122	-	-	-	21,461	1,674	-
2b.1.1.11	AB-305-1_BURY	-	91	33	81	-	288	-	110	603	603	-	-	-	2,650	-	-	-	237,727	1,997	-
2b.1.1.12	AB-305-1_PROCESS	-	28	0	2	12	2	-	10	55	55	-	-	274	15	-	-	-	12,437	814	-
2b.1.1.13	AB-305-2_BURY	-	192	23	44	-	155	-	96	510	510	-	-	-	1,555	-	-	-	128,368	4,202	-
2b.1.1.14	AB-305-2_PROCESS	-	345	11	45	233	36	-	138	808	808	-	-	5,224	333	-	-	-	242,019	7,715	-
2b.1.1.15	AB-305-3_BURY	-	107	7	11	-	40	-	39	204	204	-	-	-	368	-	-	-	32,987	2,461	-
2b.1.1.16	AB-331_BURY	-	31	4	7	-	25	-	15	82	82	-	-	-	251	-	-	-	20,865	678	-
2b.1.1.17	AB-331_PROCESS	-	129	4	16	73	18	-	51	292	292	-	-	1,636	177	-	-	-	81,515	2,823	-
2b.1.1.18	CC-305_BURY	-	467	63	114	-	405	-	241	1,290	1,290	-	-	-	4,613	-	-	-	334,678	10,438	-
2b.1.1.19	DG-305_BURY	-	44	8	14	-	48	-	26	140	140	-	-	-	565	-	-	-	39,762	987	-
2b.1.1.20	DG-305_CLEAN	-	100	-	-	-	-	-	15	115	-	-	115	-	-	-	-	-	-	2,441	-
2b.1.1.21	INTAKE_CLEAN	-	221	-	-	-	-	-	33	254	-	-	254	-	-	-	-	-	-	5,603	-
2b.1.1.22	IWT-303_PROCESS	-	906	67	177	485	373	-	426	2,434	2,434	-	-	10,867	3,847	-	-	-	749,882	19,981	-
2b.1.1.23	OCA_BURY	-	430	99	165	-	587	-	289	1,569	1,569	-	-	-	7,233	-	-	-	485,016	9,645	-
2b.1.1.24	PA-301_BURY	-	163	37	62	-	220	-	109	590	590	-	-	-	2,743	-	-	-	181,570	3,657	-
2b.1.1.25	PA-301_CLEAN	-	247	-	-	-	-	-	37	284	-	-	284	-	-	-	-	-	-	5,969	-
2b.1.1.26	PA-301_PROCESS	-	257	9	46	272	20	-	118	722	722	-	-	6,089	238	-	-	-	263,465	5,678	-
2b.1.1.27	RB-281_BURY	-	450	51	108	-	384	-	229	1,221	1,221	-	-	-	3,555	-	-	-	316,988	10,142	-
2b.1.1.28	RB-281_PROCESS	-	142	10	22	18	69	-	60	320	320	-	-	410	633	-	-	-	73,452	3,172	-
2b.1.1.29	RB-308_BURY	-	311	35	67	-	238	-	151	801	801	-	-	-	2,328	-	-	-	196,583	6,935	-
2b.1.1.30	RB-308_PROCESS	-	218	18	53	109	133	-	114	646	646	-	-	2,430	1,225	-	-	-	208,552	4,978	-
2b.1.1.31	RB-346_BURY	-	59	6	13	-	45	-	29	152	152	-	-	-	419	-	-	-	37,577	1,213	-
2b.1.1.32	RB-346_PROCESS	-	126	10	24	10	82	-	58	310	310	-	-	227	753	-	-	-	76,734	2,696	-
2b.1.1.33	RB-INSIDE O-RING_BURY	-	393	26	54	-	194	-	158	825	825	-	-	-	1,783	-	-	-	159,948	9,170	-
2b.1.1.34	SB-305_CLEAN	-	9	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	242	-
2b.1.1.35	STP_CLEAN	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	884	-
2b.1.1.36	TB-305-E_GIC	-	88	-	-	-	-	-	13	101	-	-	101	-	-	-	-	-	-	2,342	-
2b.1.1.37	TB-355-E_PROCESS	-	54	4	13	53	19	-	28	171	171	-	-	1,193	175	-	-	-	63,860	1,188	-
2b.1.1	Totals	-	7,901	768	1,650	1,575	5,046	-	3,727	20,667	19,859	-	808	35,256	52,408	-	-	-	5,602,141	178,759	-

Table C
Three Mile Island, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
2b.1.2	Scaffolding in support of decommissioning	-	918	11	7	37	5	-	238	1,216	1,216	-	-	748	47	-	-	-	37,845	25,234	-
Decontamination of Site Buildings																					
2b.1.3.1	Reactor	816	699	142	346	41	844	-	866	3,752	3,752	-	-	913	10,494	-	-	-	992,342	32,185	-
2b.1.3.2	Auxiliary	258	144	23	65	34	90	-	205	819	819	-	-	752	1,651	-	-	-	194,204	8,637	-
2b.1.3.3	Classified Waste Storage Facility	13	5	1	3	-	5	-	9	36	36	-	-	-	87	-	-	-	8,697	386	-
2b.1.3.4	Heat Exchanger Vault	43	25	4	11	4	15	-	34	135	135	-	-	99	270	-	-	-	30,691	1,464	-
2b.1.3.5	Interim Solid Waste Staging Facility	54	21	5	14	1	20	-	40	154	154	-	-	21	362	-	-	-	37,064	1,625	-
2b.1.3.6	Intermediate	22	33	8	22	-	32	-	31	148	148	-	-	-	590	-	-	-	59,046	1,068	-
2b.1.3.7	Miscellaneous Buildings - Contaminated	134	51	12	34	-	49	-	98	377	377	-	-	-	903	-	-	-	90,294	4,008	-
2b.1.3.8	Respirator Cleaning Facility	25	9	2	6	-	9	-	18	71	71	-	-	-	169	-	-	-	16,926	751	-
2b.1.3	Totals	1,364	987	196	500	80	1,062	-	1,301	5,491	5,491	-	-	1,785	14,527	-	-	-	1,429,264	50,125	-
2b.1	Subtotal Period 2b Activity Costs	1,364	9,807	975	2,157	1,692	6,113	-	5,267	27,375	26,567	-	808	37,789	66,981	-	-	-	7,069,250	254,117	-
Period 2b Collateral Costs																					
2b.3.1	Process liquid waste	115	-	37	306	-	227	-	164	849	849	-	-	-	790	-	-	-	47,393	154	-
2b.3.2	Small tool allowance	-	151	-	-	-	-	-	23	174	174	-	-	-	-	-	-	-	-	-	-
2b.3.3	Spent Fuel Capital and Transfer	-	-	-	-	-	-	29,885	4,483	34,368	-	34,368	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	115	151	37	306	-	227	29,885	4,669	35,391	1,023	34,368	-	-	790	-	-	-	47,393	154	-
Period 2b Period-Dependent Costs																					
2b.4.1	Decon supplies	705	-	-	-	-	-	-	176	882	882	-	-	-	-	-	-	-	-	-	-
2b.4.2	Insurance	-	-	-	-	-	-	1,286	129	1,415	1,415	-	-	-	-	-	-	-	-	-	-
2b.4.3	Property taxes	-	-	-	-	-	-	1,994	199	2,194	2,194	-	-	-	-	-	-	-	-	-	-
2b.4.4	Health physics supplies	-	1,767	-	-	-	-	-	442	2,208	2,208	-	-	-	-	-	-	-	-	-	-
2b.4.5	Heavy equipment rental	-	4,480	-	-	-	-	-	672	5,152	5,152	-	-	-	-	-	-	-	-	-	-
2b.4.6	Disposal of DAW generated	-	-	8	10	-	277	-	72	366	366	-	-	-	4,963	-	-	-	99,251	23	-
2b.4.7	Plant energy budget	-	-	-	-	-	-	2,970	446	3,416	3,416	-	-	-	-	-	-	-	-	-	-
2b.4.8	NRC Fees	-	-	-	-	-	-	1,844	184	2,029	2,029	-	-	-	-	-	-	-	-	-	-
2b.4.9	Emergency Planning Fees	-	-	-	-	-	-	543	54	597	-	597	-	-	-	-	-	-	-	-	-
2b.4.10	Site O&M Costs	-	-	-	-	-	-	678	102	780	780	-	-	-	-	-	-	-	-	-	-
2b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	2,024	304	2,328	-	2,328	-	-	-	-	-	-	-	-	-
2b.4.12	Radwaste Processing Equipment/Services	-	-	-	-	-	-	509	76	586	586	-	-	-	-	-	-	-	-	-	-
2b.4.13	ISFSI Operating Costs	-	-	-	-	-	-	230	35	265	-	265	-	-	-	-	-	-	-	-	-
2b.4.14	Security Staff Cost	-	-	-	-	-	-	6,685	1,003	7,687	7,687	-	-	-	-	-	-	-	-	-	194,689
2b.4.15	DOC Staff Cost	-	-	-	-	-	-	32,269	4,840	37,109	37,109	-	-	-	-	-	-	-	-	-	413,389
2b.4.16	Utility Staff Cost	-	-	-	-	-	-	50,433	7,565	57,998	57,998	-	-	-	-	-	-	-	-	-	767,317
2b.4	Subtotal Period 2b Period-Dependent Costs	705	6,247	8	10	-	277	101,466	16,298	125,011	121,821	3,190	-	-	4,963	-	-	-	99,251	23	1,375,395
2b.0	TOTAL PERIOD 2b COST	2,185	16,205	1,020	2,473	1,692	6,617	131,351	26,234	187,776	149,411	37,557	808	37,789	72,734	-	-	-	7,215,894	254,294	1,375,395
PERIOD 2c - Decontamination Following Wet Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Remove spent fuel racks	315	41	105	83	-	294	-	264	1,102	1,102	-	-	-	2,707	-	-	-	242,924	1,056	-
Disposal of Plant Systems																					
2c.1.2.1	FHB-281_BURY	-	170	24	44	-	157	-	91	485	485	-	-	-	1,611	-	-	-	129,564	3,740	-
2c.1.2.2	FHB-281_PROCESS	-	151	7	19	35	48	-	59	319	319	-	-	790	445	-	-	-	71,968	3,368	-
2c.1.2.3	FHB-305_BURY	-	53	6	12	-	43	-	26	140	140	-	-	-	405	-	-	-	35,492	1,189	-
2c.1.2.4	FHB-305_PROCESS	-	74	5	12	11	36	-	31	169	169	-	-	254	332	-	-	-	40,106	1,666	-
2c.1.2.5	FHB-329_BURY	-	14	1	2	-	6	-	5	29	29	-	-	-	57	-	-	-	5,081	319	-
2c.1.2.6	FHB-329_PROCESS	-	12	1	2	1	6	-	5	27	27	-	-	22	56	-	-	-	5,907	265	-
2c.1.2.7	FHB-348_BURY	-	68	13	29	-	102	-	48	260	260	-	-	-	943	-	-	-	83,967	1,497	-
2c.1.2.8	FHB-348_PROCESS	-	32	2	5	6	15	-	14	73	73	-	-	131	148	-	-	-	17,553	699	-
2c.1.2.9	YARD_CLEAN	-	492	-	-	-	-	-	74	566	-	-	566	-	-	-	-	-	-	12,996	-

Table C
Three Mile Island, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
2c.1.2	Totals	-	1,067	59	124	53	413	-	353	2,068	1,502	-	566	1,197	3,996	-	-	-	389,637	25,739	-
Decontamination of Site Buildings																					
2c.1.3.1	Fuel Handling	525	552	33	59	29	141	-	452	1,791	1,791	-	-	650	1,745	-	-	-	181,173	22,480	-
2c.1.3	Totals	525	552	33	59	29	141	-	452	1,791	1,791	-	-	650	1,745	-	-	-	181,173	22,480	-
2c.1.4	Scaffolding in support of decommissioning	-	184	2	1	7	1	-	48	243	243	-	-	150	9	-	-	-	7,569	5,047	-
2c.1	Subtotal Period 2c Activity Costs	840	1,843	198	266	90	849	-	1,117	5,203	4,637	-	566	1,997	8,457	-	-	-	821,303	54,322	-
Period 2c Additional Costs																					
2c.2.1	License Termination Survey Planning	-	-	-	-	-	-	848	254	1,102	1,102	-	-	-	-	-	-	-	-	-	6,240
2c.2.2	Contaminated Soil Remediation	-	39	2	110	-	1,930	-	509	2,589	2,589	-	-	-	35,745	-	-	-	2,716,592	462	-
2c.2	Subtotal Period 2c Additional Costs	-	39	2	110	-	1,930	848	763	3,691	3,691	-	-	-	35,745	-	-	-	2,716,592	462	6,240
Period 2c Collateral Costs																					
2c.3.1	Process liquid waste	156	-	50	415	-	307	-	222	1,150	1,150	-	-	-	1,070	-	-	-	64,196	209	-
2c.3.2	Small tool allowance	-	38	-	-	-	-	-	6	43	43	-	-	-	-	-	-	-	-	-	-
2c.3.3	Decommissioning Equipment Disposition	-	-	85	65	297	41	-	73	560	560	-	-	6,000	373	-	-	-	303,507	88	-
2c.3	Subtotal Period 2c Collateral Costs	156	38	135	480	297	347	-	300	1,753	1,753	-	-	6,000	1,443	-	-	-	367,703	297	-
Period 2c Period-Dependent Costs																					
2c.4.1	Decon supplies	123	-	-	-	-	-	-	31	154	154	-	-	-	-	-	-	-	-	-	-
2c.4.2	Insurance	-	-	-	-	-	-	380	38	418	418	-	-	-	-	-	-	-	-	-	-
2c.4.3	Property taxes	-	-	-	-	-	-	590	59	649	649	-	-	-	-	-	-	-	-	-	-
2c.4.4	Health physics supplies	-	430	-	-	-	-	-	107	537	537	-	-	-	-	-	-	-	-	-	-
2c.4.5	Heavy equipment rental	-	1,325	-	-	-	-	-	199	1,523	1,523	-	-	-	-	-	-	-	-	-	-
2c.4.6	Disposal of DAW generated	-	-	2	3	-	73	-	19	96	96	-	-	-	1,301	-	-	-	26,014	6	-
2c.4.7	Plant energy budget	-	-	-	-	-	-	468	70	539	539	-	-	-	-	-	-	-	-	-	-
2c.4.8	NRC Fees	-	-	-	-	-	-	545	55	600	600	-	-	-	-	-	-	-	-	-	-
2c.4.9	Emergency Planning Fees	-	-	-	-	-	-	160	16	176	-	176	-	-	-	-	-	-	-	-	-
2c.4.10	Site O&M Costs	-	-	-	-	-	-	201	30	231	231	-	-	-	-	-	-	-	-	-	-
2c.4.11	Radwaste Processing Equipment/Services	-	-	-	-	-	-	301	45	346	346	-	-	-	-	-	-	-	-	-	-
2c.4.12	ISFSI Operating Costs	-	-	-	-	-	-	68	10	78	-	78	-	-	-	-	-	-	-	-	-
2c.4.13	Security Staff Cost	-	-	-	-	-	-	1,098	165	1,263	1,263	-	-	-	-	-	-	-	-	-	30,355
2c.4.14	DOC Staff Cost	-	-	-	-	-	-	6,583	987	7,570	7,570	-	-	-	-	-	-	-	-	-	83,714
2c.4.15	Utility Staff Cost	-	-	-	-	-	-	10,903	1,635	12,539	12,539	-	-	-	-	-	-	-	-	-	159,894
2c.4	Subtotal Period 2c Period-Dependent Costs	123	1,754	2	3	-	73	21,298	3,467	26,719	26,464	255	-	-	1,301	-	-	-	26,014	6	273,963
2c.0	TOTAL PERIOD 2c COST	1,119	3,674	338	858	387	3,199	22,145	5,647	37,367	36,546	255	566	7,997	48,946	-	-	-	3,931,612	55,086	280,203
PERIOD 2e - License Termination																					
Period 2e Direct Decommissioning Activities																					
2e.1.1	ORISE confirmatory survey	-	-	-	-	-	-	155	46	201	201	-	-	-	-	-	-	-	-	-	-
2e.1.2	Terminate license									8											
2e.1	Subtotal Period 2e Activity Costs	-	-	-	-	-	-	155	46	201	201	-	-	-	-	-	-	-	-	-	-
Period 2e Additional Costs																					
2e.2.1	License Termination Survey	-	-	-	-	-	-	6,183	1,855	8,038	8,038	-	-	-	-	-	-	-	-	124,444	3,120
2e.2	Subtotal Period 2e Additional Costs	-	-	-	-	-	-	6,183	1,855	8,038	8,038	-	-	-	-	-	-	-	-	124,444	3,120
Period 2e Collateral Costs																					
2e.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,113	167	1,280	1,280	-	-	-	-	-	-	-	-	-	-
2e.3	Subtotal Period 2e Collateral Costs	-	-	-	-	-	-	1,113	167	1,280	1,280	-	-	-	-	-	-	-	-	-	-

Table C
Three Mile Island, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 2e Period-Dependent Costs																					
2e.4.1	Insurance	-	-	-	-	-	-	334	33	368	368	-	-	-	-	-	-	-	-	-	-
2e.4.2	Property taxes	-	-	-	-	-	-	551	55	607	607	-	-	-	-	-	-	-	-	-	-
2e.4.3	Health physics supplies	-	612	-	-	-	-	-	153	766	766	-	-	-	-	-	-	-	-	-	-
2e.4.4	Disposal of DAW generated	-	-	1	1	-	20	-	5	26	26	-	-	-	354	-	-	-	7,071	2	-
2e.4.5	Plant energy budget	-	-	-	-	-	-	219	33	252	252	-	-	-	-	-	-	-	-	-	-
2e.4.6	NRC Fees	-	-	-	-	-	-	546	55	600	600	-	-	-	-	-	-	-	-	-	-
2e.4.7	Emergency Planning Fees	-	-	-	-	-	-	150	15	165	-	165	-	-	-	-	-	-	-	-	-
2e.4.8	Site O&M Costs	-	-	-	-	-	-	188	28	216	216	-	-	-	-	-	-	-	-	-	-
2e.4.9	ISFSI Operating Costs	-	-	-	-	-	-	64	10	73	-	73	-	-	-	-	-	-	-	-	-
2e.4.10	Security Staff Cost	-	-	-	-	-	-	1,008	151	1,159	1,159	-	-	-	-	-	-	-	-	-	27,791
2e.4.11	DOC Staff Cost	-	-	-	-	-	-	4,650	697	5,347	5,347	-	-	-	-	-	-	-	-	-	57,149
2e.4.12	Utility Staff Cost	-	-	-	-	-	-	5,930	889	6,819	6,819	-	-	-	-	-	-	-	-	-	80,634
2e.4	Subtotal Period 2e Period-Dependent Costs	-	612	1	1	-	20	13,639	2,125	16,398	16,160	238	-	-	354	-	-	-	7,071	2	165,574
2e.0	TOTAL PERIOD 2e COST	-	612	1	1	-	20	21,091	4,193	25,918	25,679	238	-	-	354	-	-	-	7,071	124,446	168,694
PERIOD 2 TOTALS		4,155	47,444	10,684	12,125	7,957	37,454	242,409	70,428	432,657	371,645	57,111	3,901	179,851	214,569	2,608	517	-	27,904,840	737,735	2,543,645
PERIOD 3b - Site Restoration																					
Period 3b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
3b.1.1.1	Reactor	-	3,707	-	-	-	-	-	556	4,263	-	-	4,263	-	-	-	-	-	-	52,366	-
3b.1.1.2	Air Intake Tunnel	-	50	-	-	-	-	-	8	58	-	-	58	-	-	-	-	-	-	844	-
3b.1.1.3	Auxiliary	-	2,086	-	-	-	-	-	313	2,399	-	-	2,399	-	-	-	-	-	-	28,722	-
3b.1.1.4	Carpenters Shop #117	-	14	-	-	-	-	-	2	16	-	-	16	-	-	-	-	-	-	219	-
3b.1.1.5	Circulating Water Chlorinator	-	50	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	875	-
3b.1.1.6	Circulating Water Chlorinator House	-	54	-	-	-	-	-	8	62	-	-	62	-	-	-	-	-	-	1,087	-
3b.1.1.7	Circulating Water Intake Flume	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	709	-
3b.1.1.8	Circulating Water Pumphouse	-	121	-	-	-	-	-	18	140	-	-	140	-	-	-	-	-	-	2,422	-
3b.1.1.9	Circulating Water Tunnels	-	532	-	-	-	-	-	80	612	-	-	612	-	-	-	-	-	-	9,010	-
3b.1.1.10	Classified Waste Storage Facility	-	22	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	452	-
3b.1.1.11	Coagulator	-	36	-	-	-	-	-	5	42	-	-	42	-	-	-	-	-	-	726	-
3b.1.1.12	Control Room Tower	-	2,622	-	-	-	-	-	393	3,015	-	-	3,015	-	-	-	-	-	-	35,625	-
3b.1.1.13	Cooling Towers	-	838	-	-	-	-	-	126	964	-	-	964	-	-	-	-	-	-	13,913	-
3b.1.1.14	Corridor	-	67	-	-	-	-	-	10	77	-	-	77	-	-	-	-	-	-	1,381	-
3b.1.1.15	Desilting Basin	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	32	-
3b.1.1.16	Diesel Generator	-	600	-	-	-	-	-	90	690	-	-	690	-	-	-	-	-	-	9,233	-
3b.1.1.17	Emergency Diesel Generator	-	502	-	-	-	-	-	75	577	-	-	577	-	-	-	-	-	-	6,842	-
3b.1.1.18	Fire Brigade Training Facility	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	231	-
3b.1.1.19	Fuel Oil Unloading & Pump Station	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	109	-
3b.1.1.20	Heat Exchanger Vault	-	319	-	-	-	-	-	48	367	-	-	367	-	-	-	-	-	-	4,093	-
3b.1.1.21	High Range Sample Station	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	67	-
3b.1.1.22	Indust Waste Trtmnt & Sludge Fltr	-	76	-	-	-	-	-	11	87	-	-	87	-	-	-	-	-	-	1,406	-
3b.1.1.23	Intake Screen & Pumphouse	-	1,679	-	-	-	-	-	252	1,930	-	-	1,930	-	-	-	-	-	-	18,870	-
3b.1.1.24	Interim Solid Waste Staging Facility	-	89	-	-	-	-	-	13	103	-	-	103	-	-	-	-	-	-	1,752	-
3b.1.1.25	Intermediate	-	1,287	-	-	-	-	-	193	1,480	-	-	1,480	-	-	-	-	-	-	17,189	-
3b.1.1.26	Lube Oil Storage	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	139	-
3b.1.1.27	Mechanical Draft Cooling Tower	-	121	-	-	-	-	-	18	139	-	-	139	-	-	-	-	-	-	1,802	-
3b.1.1.28	Miscellaneous Buildings - Clean	-	874	-	-	-	-	-	131	1,005	-	-	1,005	-	-	-	-	-	-	19,054	-
3b.1.1.29	Miscellaneous Buildings - Contaminated	-	166	-	-	-	-	-	25	190	-	-	190	-	-	-	-	-	-	3,414	-
3b.1.1.30	Miscellaneous Yard Structures	-	1,258	-	-	-	-	-	188	1,444	-	-	1,444	-	-	-	-	-	-	20,519	-
3b.1.1.31	North Office	-	255	-	-	-	-	-	38	293	-	-	293	-	-	-	-	-	-	4,920	-
3b.1.1.32	Operations Office	-	54	-	-	-	-	-	8	62	-	-	62	-	-	-	-	-	-	1,102	-
3b.1.1.33	Operations Support Facility	-	244	-	-	-	-	-	37	280	-	-	280	-	-	-	-	-	-	4,425	-

Table C
Three Mile Island, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Demolition of Remaining Site Buildings (continued)																					
3b.1.1.34	Respirator Cleaning Facility	-	51	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	-	1,072	-
3b.1.1.35	Security Improvements	-	664	-	-	-	-	-	100	763	-	-	763	-	-	-	-	-	-	6,957	-
3b.1.1.36	Service	-	252	-	-	-	-	-	38	290	-	-	290	-	-	-	-	-	-	5,003	-
3b.1.1.37	Sewage Pumping Station	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	97	-
3b.1.1.38	Steam Generator Mausoleum	-	305	-	-	-	-	-	46	351	-	-	351	-	-	-	-	-	-	3,900	-
3b.1.1.39	Substation Relay Control House	-	24	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	489	-
3b.1.1.40	Training Facility #43	-	58	-	-	-	-	-	9	67	-	-	67	-	-	-	-	-	-	1,199	-
3b.1.1.41	Turbine	-	1,431	-	-	-	-	-	215	1,646	-	-	1,646	-	-	-	-	-	-	26,877	-
3b.1.1.42	Turbine Pedestal	-	1,128	-	-	-	-	-	169	1,297	-	-	1,297	-	-	-	-	-	-	14,441	-
3b.1.1.43	Warehouse #1	-	377	-	-	-	-	-	57	434	-	-	434	-	-	-	-	-	-	8,170	-
3b.1.1.44	Water Pretreatment House	-	115	-	-	-	-	-	17	132	-	-	132	-	-	-	-	-	-	2,006	-
3b.1.1.45	Fuel Handling	-	2,937	-	-	-	-	-	441	3,378	-	-	3,378	-	-	-	-	-	-	40,440	-
3b.1.1	Totals	-	25,145	-	-	-	-	-	3,772	28,916	-	-	28,916	-	-	-	-	-	-	374,203	-
Site Closeout Activities																					
3b.1.2	Remove Rubble	-	8,707	-	-	-	-	-	1,306	10,013	-	-	10,013	-	-	-	-	-	-	7,228	-
3b.1.3	Grade & landscape site	-	121	-	-	-	-	-	18	140	-	-	140	-	-	-	-	-	-	531	-
3b.1.4	Final report to NRC	-	-	-	-	-	-	178	27	205	205	-	-	-	-	-	-	-	-	-	1,560
3b.1	Subtotal Period 3b Activity Costs	-	33,973	-	-	-	-	178	5,123	39,274	205	-	39,089	-	-	-	-	-	-	381,962	1,560
Period 3b Additional Costs																					
3b.2.1	Concrete Processing	-	1,030	-	8	-	-	-	155	1,193	-	-	1,193	-	-	-	-	-	-	6,293	-
3b.2.2	Intake cofferdam	-	245	-	-	-	-	-	37	282	-	-	282	-	-	-	-	-	-	2,794	-
3b.2	Subtotal Period 3b Additional Costs	-	1,276	-	8	-	-	-	192	1,475	-	-	1,475	-	-	-	-	-	-	9,087	-
Period 3b Collateral Costs																					
3b.3.1	Small tool allowance	-	238	-	-	-	-	-	36	274	-	-	274	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	-	238	-	-	-	-	-	36	274	-	-	274	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Insurance	-	-	-	-	-	-	880	88	968	-	968	-	-	-	-	-	-	-	-	-
3b.4.2	Property taxes	-	-	-	-	-	-	1,451	145	1,596	-	1,596	-	-	-	-	-	-	-	-	-
3b.4.3	Heavy equipment rental	-	4,367	-	-	-	-	-	655	5,023	-	-	5,023	-	-	-	-	-	-	-	-
3b.4.4	Plant energy budget	-	-	-	-	-	-	288	43	331	(0)	66	265	-	-	-	-	-	-	-	-
3b.4.5	NRC ISFSI Fees	-	-	-	-	-	-	430	43	474	-	474	-	-	-	-	-	-	-	-	-
3b.4.6	Emergency Planning Fees	-	-	-	-	-	-	395	39	434	-	434	-	-	-	-	-	-	-	-	-
3b.4.7	ISFSI Operating Costs	-	-	-	-	-	-	168	25	193	-	193	-	-	-	-	-	-	-	-	-
3b.4.8	Site O&M Cost	-	-	-	-	-	-	493	74	568	-	-	568	-	-	-	-	-	-	-	-
3b.4.9	Security Staff Cost	-	-	-	-	-	-	4,907	736	5,643	(0)	4,796	846	-	-	-	-	-	-	-	133,900
3b.4.10	DOC Staff Cost	-	-	-	-	-	-	11,826	1,774	13,600	-	-	13,600	-	-	-	-	-	-	-	140,080
3b.4.11	Utility Staff Cost	-	-	-	-	-	-	7,917	1,187	9,104	-	2,094	7,010	-	-	-	-	-	-	-	112,270
3b.4	Subtotal Period 3b Period-Dependent Costs	-	4,367	-	-	-	-	28,754	4,810	37,932	(0)	10,621	27,311	-	-	-	-	-	-	-	386,250
3b.0	TOTAL PERIOD 3b COST	-	39,854	-	8	-	-	28,932	10,161	78,955	205	10,621	68,129	-	-	-	-	-	-	391,049	387,810
PERIOD 3c - Fuel Storage Operations/Shipping																					
Period 3c Direct Decommissioning Activities																					
Period 3c Collateral Costs																					
3c.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	7,750	1,163	8,913	-	8,913	-	-	-	-	-	-	-	-	-
3c.3	Subtotal Period 3c Collateral Costs	-	-	-	-	-	-	7,750	1,163	8,913	-	8,913	-	-	-	-	-	-	-	-	-
Period 3c Period-Dependent Costs																					
3c.4.1	Insurance	-	-	-	-	-	-	2,465	246	2,711	-	2,711	-	-	-	-	-	-	-	-	-
3c.4.2	Property taxes	-	-	-	-	-	-	4,065	406	4,471	-	4,471	-	-	-	-	-	-	-	-	-

Table C
Three Mile Island, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
Period 3c Period-Dependent Costs (continued)																					
3c.4.3	Plant energy budget	-	-	-	-	-	-	161	24	186	-	186	-	-	-	-	-	-	-	-	-
3c.4.4	NRC ISFSI Fees	-	-	-	-	-	-	1,522	152	1,674	-	1,674	-	-	-	-	-	-	-	-	-
3c.4.5	Emergency Planning Fees	-	-	-	-	-	-	1,106	111	1,217	-	1,217	-	-	-	-	-	-	-	-	-
3c.4.6	Site O&M Costs	-	-	-	-	-	-	1,383	207	1,590	-	1,590	-	-	-	-	-	-	-	-	-
3c.4.7	ISFSI Operating Costs	-	-	-	-	-	-	470	70	540	-	540	-	-	-	-	-	-	-	-	-
3c.4.8	Security Staff Cost	-	-	-	-	-	-	11,698	1,755	13,452	-	13,452	-	-	-	-	-	-	-	-	311,657
3c.4.9	Utility Staff Cost	-	-	-	-	-	-	5,129	769	5,898	-	5,898	-	-	-	-	-	-	-	-	77,914
3c.4	Subtotal Period 3c Period-Dependent Costs	-	-	-	-	-	-	27,998	3,742	31,740	-	31,740	-	-	-	-	-	-	-	-	389,571
3c.0	TOTAL PERIOD 3c COST	-	-	-	-	-	-	35,748	4,904	40,652	-	40,652	-	-	-	-	-	-	-	-	389,571
PERIOD 3d - GTCC shipping																					
Period 3d Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
3d.1.1.1	Vessel & Internals GTCC Disposal	-	-	375	-	-	12,289	-	1,881	14,545	14,545	-	-	-	-	-	-	580	105,646	-	-
3d.1.1	Totals	-	-	375	-	-	12,289	-	1,881	14,545	14,545	-	-	-	-	-	-	580	105,646	-	-
3d.1	Subtotal Period 3d Activity Costs	-	-	375	-	-	12,289	-	1,881	14,545	14,545	-	-	-	-	-	-	580	105,646	-	-
Period 3d Period-Dependent Costs																					
3d.4.1	Insurance	-	-	-	-	-	-	37	4	40	-	40	-	-	-	-	-	-	-	-	-
3d.4.2	Property taxes	-	-	-	-	-	-	60	6	66	-	66	-	-	-	-	-	-	-	-	-
3d.4.3	Plant energy budget	-	-	-	-	-	-	2	0	3	-	3	-	-	-	-	-	-	-	-	-
3d.4.4	NRC ISFSI Fees	-	-	-	-	-	-	18	2	20	-	20	-	-	-	-	-	-	-	-	-
3d.4.5	Emergency Planning Fees	-	-	-	-	-	-	16	2	18	-	18	-	-	-	-	-	-	-	-	-
3d.4.6	Site O&M Costs	-	-	-	-	-	-	21	3	24	-	24	-	-	-	-	-	-	-	-	-
3d.4.7	ISFSI Operating Costs	-	-	-	-	-	-	7	1	8	-	8	-	-	-	-	-	-	-	-	-
3d.4.8	Security Staff Cost	-	-	-	-	-	-	174	26	200	-	200	-	-	-	-	-	-	-	-	4,629
3d.4.9	Utility Staff Cost	-	-	-	-	-	-	76	11	88	-	88	-	-	-	-	-	-	-	-	1,157
3d.4	Subtotal Period 3d Period-Dependent Costs	-	-	-	-	-	-	411	55	466	-	466	-	-	-	-	-	-	-	-	5,786
3d.0	TOTAL PERIOD 3d COST	-	-	375	-	-	12,289	411	1,936	15,012	14,545	466	-	-	-	-	-	580	105,646	-	5,786
PERIOD 3e - ISFSI Decontamination																					
Period 3e Direct Decommissioning Activities																					
Period 3e Additional Costs																					
3e.2.1	ISFSI License Termination	-	457	4	31	-	44	1,285	323	2,144	-	2,144	-	-	802	-	-	-	101,008	21,237	2,560
3e.2	Subtotal Period 3e Additional Costs	-	457	4	31	-	44	1,285	323	2,144	-	2,144	-	-	802	-	-	-	101,008	21,237	2,560
Period 3e Collateral Costs																					
3e.3.1	Small tool allowance	-	5	-	-	-	-	-	1	6	-	6	-	-	-	-	-	-	-	-	-
3e.3	Subtotal Period 3e Collateral Costs	-	5	-	-	-	-	-	1	6	-	6	-	-	-	-	-	-	-	-	-
Period 3e Period-Dependent Costs																					
3e.4.1	Insurance	-	-	-	-	-	-	146	15	161	-	161	-	-	-	-	-	-	-	-	-
3e.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3e.4.3	Heavy equipment rental	-	217	-	-	-	-	-	32	249	-	249	-	-	-	-	-	-	-	-	-
3e.4.4	Plant energy budget	-	-	-	-	-	-	24	4	28	-	28	-	-	-	-	-	-	-	-	-
3e.4.5	NRC ISFSI Fees	-	-	-	-	-	-	72	7	79	-	79	-	-	-	-	-	-	-	-	-
3e.4.6	Site O&M Costs	-	-	-	-	-	-	82	12	94	-	94	-	-	-	-	-	-	-	-	-
3e.4.7	Security Staff Cost	-	-	-	-	-	-	187	28	215	-	215	-	-	-	-	-	-	-	-	4,971
3e.4.8	Utility Staff Cost	-	-	-	-	-	-	254	38	293	-	293	-	-	-	-	-	-	-	-	3,771
3e.4	Subtotal Period 3e Period-Dependent Costs	-	217	-	-	-	-	766	136	1,119	-	1,119	-	-	-	-	-	-	-	-	8,743

Table C
Three Mile Island, Unit 1
DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
3e.0	TOTAL PERIOD 3e COST	-	679	4	31	-	44	2,051	460	3,269	-	3,269	-	-	802	-	-	-	101,008	21,237	11,303
PERIOD 3f - ISFSI Site Restoration																					
Period 3f Direct Decommissioning Activities																					
Period 3f Additional Costs																					
3f.2.1	ISFSI Site Restoration	-	2,105	-	-	-	-	47	323	2,474	-	2,474	-	-	-	-	-	-	-	5,372	160
3f.2	Subtotal Period 3f Additional Costs	-	2,105	-	-	-	-	47	323	2,474	-	2,474	-	-	-	-	-	-	-	5,372	160
Period 3f Collateral Costs																					
3f.3.1	Small tool allowance	-	3	-	-	-	-	-	0	3	-	3	-	-	-	-	-	-	-	-	-
3f.3	Subtotal Period 3f Collateral Costs	-	3	-	-	-	-	-	0	3	-	3	-	-	-	-	-	-	-	-	-
Period 3f Period-Dependent Costs																					
3f.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3f.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3f.4.3	Heavy equipment rental	-	72	-	-	-	-	-	11	82	-	82	-	-	-	-	-	-	-	-	-
3f.4.4	Plant energy budget	-	-	-	-	-	-	12	2	14	-	14	-	-	-	-	-	-	-	-	-
3f.4.5	Site O&M Costs	-	-	-	-	-	-	41	6	47	-	47	-	-	-	-	-	-	-	-	-
3f.4.6	Security Staff Cost	-	-	-	-	-	-	94	14	108	-	108	-	-	-	-	-	-	-	-	2,486
3f.4.7	Utility Staff Cost	-	-	-	-	-	-	104	16	119	-	119	-	-	-	-	-	-	-	-	1,543
3f.4	Subtotal Period 3f Period-Dependent Costs	-	72	-	-	-	-	250	48	370	-	370	-	-	-	-	-	-	-	-	4,029
3f.0	TOTAL PERIOD 3f COST	-	2,179	-	-	-	-	297	371	2,847	-	2,847	-	-	-	-	-	-	-	5,372	4,189
PERIOD 3 TOTALS		-	42,712	379	38	-	12,333	67,439	17,833	140,735	14,750	57,855	68,129	-	802	-	-	580	206,654	417,658	798,659
TOTAL COST TO DECOMMISSION		7,271	92,176	11,191	13,249	7,957	58,404	432,016	114,068	736,331	504,115	158,771	73,445	179,851	216,729	4,893	517	580	28,407,920	1,176,085	4,285,083

TOTAL COST TO DECOMMISSION WITH 18.33% CONTINGENCY:	**$736,331**	**thousands of 2008 dollars**
TOTAL NRC LICENSE TERMINATION COST IS 68.46% OR:	**$504,115**	**thousands of 2008 dollars**
SPENT FUEL MANAGEMENT COST IS 21.56% OR:	**$158,771**	**thousands of 2008 dollars**
NON-NUCLEAR DEMOLITION COST IS 9.97% OR:	**$73,445**	**thousands of 2008 dollars**
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	**222,138**	**cubic feet**
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	**580**	**cubic feet**
TOTAL SCRAP METAL REMOVED:	**71,180**	**tons**
TOTAL CRAFT LABOR REQUIREMENTS:	**1,176,085**	**man-hours**

End Notes:
n/a - indicates that this activity not charged as decommissioning expense.
a - indicates that this activity performed by decommissioning staff.
0 - indicates that this value is less than 0.5 but is non-zero.
a cell containing " - " indicates a zero value

APPENDIX D

DETAILED COST ANALYSIS

DELAYED DECON

Table D
Three Mile Island, Unit 1
Delayed DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	436	131	567	567	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	149	22	171	171	-	-	-	-	-	-	-	-	-	1,300
1a.1.3	Notification of Cessation of Operations									a											
1a.1.4	Remove fuel & source material									n/a											
1a.1.5	Notification of Permanent Defueling									a											
1a.1.6	Deactivate plant systems & process waste									a											
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	229	34	263	263	-	-	-	-	-	-	-	-	-	2,000
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	149	22	171	171	-	-	-	-	-	-	-	-	-	1,300
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	End product description	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	171	26	197	197	-	-	-	-	-	-	-	-	-	1,500
1a.1.13	Define major work sequence	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
1a.1.14	Perform SER and EA	-	-	-	-	-	-	354	53	407	407	-	-	-	-	-	-	-	-	-	3,100
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	571	86	657	657	-	-	-	-	-	-	-	-	-	5,000
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	562	84	646	646	-	-	-	-	-	-	-	-	-	4,920
1a.1.16.2	Plant systems	-	-	-	-	-	-	476	71	547	547	-	-	-	-	-	-	-	-	-	4,167
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	356	53	410	410	-	-	-	-	-	-	-	-	-	3,120
1a.1.16.4	Waste management	-	-	-	-	-	-	229	34	263	263	-	-	-	-	-	-	-	-	-	2,000
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	229	34	263	263	-	-	-	-	-	-	-	-	-	2,000
1a.1.16	Total	-	-	-	-	-	-	1,852	278	2,129	2,129	-	-	-	-	-	-	-	-	-	16,207
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	135	20	155	155	-	-	-	-	-	-	-	-	-	1,183
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	137	21	158	158	-	-	-	-	-	-	-	-	-	1,200
1a.1.17	Total	-	-	-	-	-	-	272	41	313	313	-	-	-	-	-	-	-	-	-	2,383
1a.1.18	Procure vacuum drying system	-	-	-	-	-	-	11	2	13	13	-	-	-	-	-	-	-	-	-	100
1a.1.19	Drain/de-energize non-cont. systems									a											
1a.1.20	Drain & dry NSSS									a											
1a.1.21	Drain/de-energize contaminated systems									a											
1a.1.22	Decon/secure contaminated systems									a											
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	4,536	746	5,282	5,282	-	-	-	-	-	-	-	-	-	35,890
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,074	107	1,181	1,181	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	347	-	-	-	-	-	87	433	433	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	346	-	-	-	-	-	52	397	397	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	1	1	-	34	-	9	45	45	-	-	-	610	-	-	-	12,190	3	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,459	219	1,677	1,677	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	775	77	852	852	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	550	55	605	-	605	-	-	-	-	-	-	-	-	-
1a.4.9	Site O&M Costs	-	-	-	-	-	-	250	37	287	287	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	745	112	857	-	857	-	-	-	-	-	-	-	-	-
1a.4.11	Security Staff Cost	-	-	-	-	-	-	5,378	807	6,185	6,185	-	-	-	-	-	-	-	-	-	157,471
1a.4.12	Utility Staff Cost	-	-	-	-	-	-	27,176	4,076	31,253	31,253	-	-	-	-	-	-	-	-	-	423,400
1a.4	Subtotal Period 1a Period-Dependent Costs	-	692	1	1	-	34	37,407	5,838	43,774	42,312	1,462	-	-	610	-	-	-	12,190	3	580,871

Table D
Three Mile Island, Unit 1
Delayed DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
1a.0	TOTAL PERIOD 1a COST	-	692	1	1	-	34	41,943	6,384	49,056	47,594	1,462	-	-	610	-	-	-	12,190	3	616,761
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor	759	-	-	-	-	-	-	380	1,139	1,139	-	-	-	-	-	-	-	-	16,970	-
1b.1.1.2	Auxiliary	232	-	-	-	-	-	-	116	348	348	-	-	-	-	-	-	-	-	5,397	-
1b.1.1.3	Classified Waste Storage Facility	12	-	-	-	-	-	-	6	17	17	-	-	-	-	-	-	-	-	272	-
1b.1.1.4	Heat Exchanger Vault	39	-	-	-	-	-	-	19	58	58	-	-	-	-	-	-	-	-	902	-
1b.1.1.5	Interim Solid Waste Staging Facility	48	-	-	-	-	-	-	24	72	72	-	-	-	-	-	-	-	-	1,135	-
1b.1.1.6	Miscellaneous Buildings - Contaminated	120	-	-	-	-	-	-	60	180	180	-	-	-	-	-	-	-	-	2,825	-
1b.1.1.7	Respirator Cleaning Facility	22	-	-	-	-	-	-	11	34	34	-	-	-	-	-	-	-	-	529	-
1b.1.1.8	Fuel Handling	491	-	-	-	-	-	-	245	736	736	-	-	-	-	-	-	-	-	9,742	-
1b.1.1	Totals	1,723	-	-	-	-	-	-	861	2,584	2,584	-	-	-	-	-	-	-	-	37,772	-
1b.1	Subtotal Period 1b Activity Costs	1,723	-	-	-	-	-	-	861	2,584	2,584	-	-	-	-	-	-	-	-	37,772	-
Period 1b Additional Costs																					
1b.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	9,407	1,411	10,819	10,819	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	9,407	1,411	10,819	10,819	-	-	-	-	-	-	-	-	-	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	667	-	-	-	-	-	-	100	767	767	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process liquid waste	167	-	53	442	-	327	-	237	1,227	1,227	-	-	-	1,140	-	-	-	68,413	222	-
1b.3.3	Small tool allowance	-	24	-	-	-	-	-	4	27	27	-	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	835	24	53	442	-	327	-	341	2,022	2,022	-	-	-	1,140	-	-	-	68,413	222	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	632	-	-	-	-	-	-	158	790	790	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	271	27	298	298	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	185	19	204	204	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	209	-	-	-	-	-	52	262	262	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	87	-	-	-	-	-	13	100	100	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	1	1	-	29	-	7	38	38	-	-	-	512	-	-	-	10,239	2	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	195	20	215	215	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	139	14	152	-	152	-	-	-	-	-	-	-	-	-
1b.4.10	Site O&M Costs	-	-	-	-	-	-	63	9	72	72	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	188	28	216	-	216	-	-	-	-	-	-	-	-	-
1b.4.12	Security Staff Cost	-	-	-	-	-	-	1,356	203	1,559	1,559	-	-	-	-	-	-	-	-	-	39,691
1b.4.13	Utility Staff Cost	-	-	-	-	-	-	6,850	1,027	7,877	7,877	-	-	-	-	-	-	-	-	-	106,720
1b.4	Subtotal Period 1b Period-Dependent Costs	632	297	1	1	-	29	9,614	1,633	12,206	11,837	368	-	-	512	-	-	-	10,239	2	146,411
1b.0	TOTAL PERIOD 1b COST	3,189	320	54	443	-	356	19,021	4,248	27,630	27,261	368	-	-	1,652	-	-	-	78,652	37,997	146,411
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	407	-	-	-	-	-	61	468	468	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	36	-	-	-	-	-	5	41	41	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	12,115	-
1c.1.4	Secure building accesses									a											

Table D
Three Mile Island, Unit 1
Delayed DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	67	10	77	77	-	-	-	-	-	-	-	-	-	583
1c.1	Subtotal Period 1c Activity Costs	-	442	-	-	-	-	800	296	1,538	1,538	-	-	-	-	-	-	-	-	15,815	583
Period 1c Collateral Costs																					
1c.3.1	Process liquid waste	247	-	79	652	-	483	-	350	1,811	1,811	-	-	-	1,683	-	-	-	100,960	328	-
1c.3.2	Small tool allowance	-	3	-	-	-	-	-	0	3	3	-	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	247	3	79	652	-	483	-	350	1,814	1,814	-	-	-	1,683	-	-	-	100,960	328	-
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	268	27	294	294	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	183	18	201	201	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	138	-	-	-	-	-	35	173	173	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	86	-	-	-	-	-	13	99	99	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	0	0	-	8	-	2	11	11	-	-	-	152	-	-	-	3,039	1	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	193	19	213	213	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	137	14	151	-	151	-	-	-	-	-	-	-	-	-
1c.4.9	Site O&M Costs	-	-	-	-	-	-	62	9	72	72	-	-	-	-	-	-	-	-	-	-
1c.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	186	28	214	-	214	-	-	-	-	-	-	-	-	-
1c.4.11	Security Staff Cost	-	-	-	-	-	-	1,341	201	1,542	1,542	-	-	-	-	-	-	-	-	-	39,260
1c.4.12	Utility Staff Cost	-	-	-	-	-	-	6,775	1,016	7,792	7,792	-	-	-	-	-	-	-	-	-	105,560
1c.4	Subtotal Period 1c Period-Dependent Costs	-	224	0	0	-	8	9,509	1,437	11,180	10,815	364	-	-	152	-	-	-	3,039	1	144,820
1c.0	TOTAL PERIOD 1c COST	247	670	79	653	-	491	10,309	2,084	14,532	14,167	364	-	-	1,835	-	-	-	103,999	16,144	145,403
PERIOD 1 TOTALS		3,436	1,682	134	1,097	-	881	71,273	12,714	91,217	89,023	2,195	-	-	4,096	-	-	-	194,841	54,143	808,576
PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage																					
Period 2a Direct Decommissioning Activities																					
2a.1.1	Quarterly Inspection									a											
2a.1.2	Semi-annual environmental survey									a											
2a.1.3	Prepare reports									a											
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	1,729	259	1,988	1,988	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	1,472	368	1,840	1,840	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	3,201	627	3,828	3,828	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	6,500	975	7,475	-	7,475	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	6,500	975	7,475	-	7,475	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	5,547	555	6,102	-	6,102	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	8,601	860	9,461	-	9,461	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	942	-	-	-	-	-	236	1,178	1,178	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	8	10	-	270	-	70	357	357	-	-	-	4,831	-	-	-	96,622	22	-
2a.4.5	Plant energy budget	-	-	-	-	-	-	3,416	512	3,928	-	3,928	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	2,673	267	2,940	2,940	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	2,340	234	2,574	-	2,574	-	-	-	-	-	-	-	-	-
2a.4.8	Site O&M Costs	-	-	-	-	-	-	2,925	439	3,364	-	3,364	-	-	-	-	-	-	-	-	-
2a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	8,729	1,309	10,038	-	10,038	-	-	-	-	-	-	-	-	-
2a.4.10	Security Staff Cost	-	-	-	-	-	-	22,721	3,408	26,129	-	26,129	-	-	-	-	-	-	-	-	650,381
2a.4.11	Utility Staff Cost	-	-	-	-	-	-	60,896	9,134	70,030	-	70,030	-	-	-	-	-	-	-	-	964,703
2a.4	Subtotal Period 2a Period-Dependent Costs	-	942	8	10	-	270	117,848	17,024	136,101	4,475	131,626	-	-	4,831	-	-	-	96,622	22	1,615,084

Table D
Three Mile Island, Unit 1
Delayed DECON Decommissioning Cost Estimate
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Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
2a.0	TOTAL PERIOD 2a COST	-	942	8	10	-	270	127,548	18,627	147,405	8,303	139,101	-	-	4,831	-	-	-	96,622	22	1,615,084
PERIOD 2 TOTALS		-	942	8	10	-	270	127,548	18,627	147,405	8,303	139,101	-	-	4,831	-	-	-	96,622	22	1,615,084
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	149	22	171	171	-	-	-	-	-	-	-	-	-	1,300
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	528	79	604	604	-	-	-	-	-	-	-	-	-	4,600
3a.1.3	Perform detailed rad survey									a											
3a.1.4	End product description	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	149	22	171	171	-	-	-	-	-	-	-	-	-	1,300
3a.1.6	Define major work sequence	-	-	-	-	-	-	857	129	985	985	-	-	-	-	-	-	-	-	-	7,500
3a.1.7	Perform SER and EA	-	-	-	-	-	-	354	53	407	407	-	-	-	-	-	-	-	-	-	3,100
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	571	86	657	657	-	-	-	-	-	-	-	-	-	5,000
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	468	70	538	538	-	-	-	-	-	-	-	-	-	4,096
3a.1.10	Receive NRC approval of termination plan									a											
Activity Specifications																					
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	842	126	968	871	-	97	-	-	-	-	-	-	-	7,370
3a.1.11.2	Plant systems	-	-	-	-	-	-	476	71	547	493	-	55	-	-	-	-	-	-	-	4,167
3a.1.11.3	Reactor internals	-	-	-	-	-	-	811	122	933	933	-	-	-	-	-	-	-	-	-	7,100
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	743	111	854	854	-	-	-	-	-	-	-	-	-	6,500
3a.1.11.5	Biological shield	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	500
3a.1.11.6	Steam generators	-	-	-	-	-	-	356	53	410	410	-	-	-	-	-	-	-	-	-	3,120
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	183	27	210	105	-	105	-	-	-	-	-	-	-	1,600
3a.1.11.8	Main Turbine	-	-	-	-	-	-	46	7	53	-	-	53	-	-	-	-	-	-	-	400
3a.1.11.9	Main Condensers	-	-	-	-	-	-	46	7	53	-	-	53	-	-	-	-	-	-	-	400
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	356	53	410	205	-	205	-	-	-	-	-	-	-	3,120
3a.1.11.11	Waste management	-	-	-	-	-	-	526	79	604	604	-	-	-	-	-	-	-	-	-	4,600
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	103	15	118	59	-	59	-	-	-	-	-	-	-	900
3a.1.11	Total	-	-	-	-	-	-	4,544	682	5,226	4,600	-	626	-	-	-	-	-	-	-	39,777
Planning & Site Preparations																					
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	274	41	315	315	-	-	-	-	-	-	-	-	-	2,400
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	2,419	363	2,782	2,782	-	-	-	-	-	-	-	-	-	-
3a.1.14	Design water clean-up system	-	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-	-	-	-	1,400
3a.1.15	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,048	307	2,355	2,355	-	-	-	-	-	-	-	-	-	-
3a.1.16	Procure casks/liners & containers	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,230
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	12,773	1,916	14,689	14,063	-	626	-	-	-	-	-	-	-	72,703
Period 3a Collateral Costs																					
3a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	6,000	900	6,900	-	6,900	-	-	-	-	-	-	-	-	-
3a.3	Subtotal Period 3a Collateral Costs	-	-	-	-	-	-	6,000	900	6,900	-	6,900	-	-	-	-	-	-	-	-	-
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	474	47	521	521	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	734	73	808	808	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	303	-	-	-	-	-	76	379	379	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	346	-	-	-	-	-	52	397	397	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	1	1	-	29	-	7	38	38	-	-	-	514	-	-	-	10,287	2	-
3a.4.6	Plant energy budget	-	-	-	-	-	-	1,459	219	1,677	1,677	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	280	28	308	308	-	-	-	-	-	-	-	-	-	-
3a.4.8	Emergency Planning Fees	-	-	-	-	-	-	200	20	220	-	220	-	-	-	-	-	-	-	-	-

Table D
Three Mile Island, Unit 1
Delayed DECON Decommissioning Cost Estimate
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Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 3a Period-Dependent Costs (continued)																					
3a.4.9	Site O&M Costs	-	-	-	-	-	-	250	37	287	287	-	-	-	-	-	-	-	-	-	-
3a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	745	112	857	-	857	-	-	-	-	-	-	-	-	-
3a.4.11	Security Staff Cost	-	-	-	-	-	-	1,301	195	1,496	1,496	-	-	-	-	-	-	-	-	-	55,543
3a.4.12	Utility Staff Cost	-	-	-	-	-	-	16,970	2,545	19,515	19,515	-	-	-	-	-	-	-	-	-	258,629
3a.4	Subtotal Period 3a Period-Dependent Costs	-	649	1	1	-	29	22,412	3,412	26,504	25,427	1,077	-	-	514	-	-	-	10,287	2	314,171
3a.0	TOTAL PERIOD 3a COST	-	649	1	1	-	29	41,185	6,228	48,093	39,490	7,977	626	-	514	-	-	-	10,287	2	386,874
PERIOD 3b - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	541	81	622	560	-	62	-	-	-	-	-	-	-	4,733
3b.1.1.2	Reactor internals	-	-	-	-	-	-	286	43	328	328	-	-	-	-	-	-	-	-	-	2,500
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	154	23	177	44	-	133	-	-	-	-	-	-	-	1,350
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	415	62	477	477	-	-	-	-	-	-	-	-	-	3,630
3b.1.1.8	Facility closeout	-	-	-	-	-	-	137	21	158	79	-	79	-	-	-	-	-	-	-	1,200
3b.1.1.9	Missile shields	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	450
3b.1.1.10	Biological shield	-	-	-	-	-	-	137	21	158	158	-	-	-	-	-	-	-	-	-	1,200
3b.1.1.11	Steam generators	-	-	-	-	-	-	526	79	604	604	-	-	-	-	-	-	-	-	-	4,600
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	114	17	131	66	-	66	-	-	-	-	-	-	-	1,000
3b.1.1.13	Main Turbine	-	-	-	-	-	-	178	27	205	-	-	205	-	-	-	-	-	-	-	1,560
3b.1.1.14	Main Condensers	-	-	-	-	-	-	178	27	205	-	-	205	-	-	-	-	-	-	-	1,560
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	312	47	359	323	-	36	-	-	-	-	-	-	-	2,730
3b.1.1.16	Reactor building	-	-	-	-	-	-	312	47	359	323	-	36	-	-	-	-	-	-	-	2,730
3b.1.1	Total	-	-	-	-	-	-	3,684	553	4,236	3,415	-	821	-	-	-	-	-	-	-	32,243
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	3,684	553	4,236	3,415	-	821	-	-	-	-	-	-	-	32,243
Period 3b Additional Costs																					
3b.2.1	Site Characterization	-	-	-	-	-	-	3,373	1,012	4,385	4,385	-	-	-	-	-	-	-	-	19,100	7,852
3b.2	Subtotal Period 3b Additional Costs	-	-	-	-	-	-	3,373	1,012	4,385	4,385	-	-	-	-	-	-	-	-	19,100	7,852
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	667	-	-	-	-	-	-	100	767	767	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,113	167	1,280	1,280	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	957	-	-	-	-	-	143	1,100	1,100	-	-	-	-	-	-	-	-	-	-
3b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	3,000	450	3,450	-	3,450	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	667	957	-	-	-	-	4,113	861	6,598	3,148	3,450	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	20	-	-	-	-	-	-	5	26	26	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	238	24	261	261	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	368	37	405	405	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	167	-	-	-	-	-	42	209	209	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	173	-	-	-	-	-	26	199	199	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	0	1	-	16	-	4	22	22	-	-	-	292	-	-	-	5,834	1	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	731	110	841	841	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	140	14	154	154	-	-	-	-	-	-	-	-	-	-
3b.4.9	Emergency Planning Fees	-	-	-	-	-	-	100	10	110	-	110	-	-	-	-	-	-	-	-	-

Table D
Three Mile Island, Unit 1
Delayed DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 3b Period-Dependent Costs (continued)																					
3b.4.10	Site O&M Costs	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	-
3b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	374	56	430	-	430	-	-	-	-	-	-	-	-	-
3b.4.12	Security Staff Cost	-	-	-	-	-	-	652	98	750	750	-	-	-	-	-	-	-	-	-	27,847
3b.4.13	DOC Staff Cost	-	-	-	-	-	-	4,604	691	5,295	5,295	-	-	-	-	-	-	-	-	-	58,560
3b.4.14	Utility Staff Cost	-	-	-	-	-	-	8,508	1,276	9,784	9,784	-	-	-	-	-	-	-	-	-	129,669
3b.4	Subtotal Period 3b Period-Dependent Costs	20	341	0	1	-	16	15,841	2,411	18,631	18,091	540	-	-	292	-	-	-	5,834	1	216,076
3b.0	TOTAL PERIOD 3b COST	688	1,297	0	1	-	16	27,011	4,836	33,849	29,038	3,990	821	-	292	-	-	-	5,834	19,101	256,171
PERIOD 3 TOTALS		688	1,946	1	2	-	45	68,196	11,064	81,942	68,528	11,967	1,447	-	806	-	-	-	16,121	19,104	643,045
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	19	78	11	25	-	163	-	75	371	371	-	-	-	826	-	-	-	99,877	2,227	-
4a.1.1.2	Pressurizer Relief Tank	3	11	2	6	-	34	-	14	69	69	-	-	-	188	-	-	-	20,849	307	-
4a.1.1.3	Reactor Coolant Pumps & Motors	25	74	35	162	73	1,398	-	419	2,186	2,186	-	-	509	8,974	-	-	-	925,540	4,386	-
4a.1.1.4	Pressurizer	6	51	483	596	-	551	-	291	1,979	1,979	-	-	-	2,588	-	-	-	338,550	1,794	1,500
4a.1.1.5	Steam Generators	30	5,424	1,107	1,940	-	4,640	-	2,933	16,073	16,073	-	-	-	11,714	-	-	-	2,850,879	10,254	2,250
4a.1.1.6	Retired Steam Generator Units	-	-	668	1,940	-	4,640	-	1,518	8,765	8,765	-	-	-	11,714	-	-	-	2,850,879	5,400	2,250
4a.1.1.7	CRDMs/ICIs/Service Structure Removal	15	75	171	68	-	98	-	78	505	505	-	-	-	3,002	-	-	-	59,894	1,847	-
4a.1.1.8	Reactor Vessel Internals	43	2,251	3,339	679	-	4,268	180	4,875	15,635	15,635	-	-	-	888	626	517	-	220,735	21,917	1,009
4a.1.1.9	Vessel & Internals GTCC Disposal	-	-	-	-	-	12,289	-	1,843	14,133	14,133	-	-	-	-	-	-	580	105,646	-	-
4a.1.1.10	Reactor Vessel	61	4,860	1,179	1,021	-	2,886	180	5,596	15,583	15,583	-	-	-	7,083	2,003	-	-	980,935	21,917	1,009
4a.1.1	Totals	201	12,825	6,994	6,436	73	30,767	360	17,641	75,298	75,298	-	-	509	46,976	2,629	517	580	8,453,784	70,049	8,017
Removal of Major Equipment																					
4a.1.2	Main Turbine/Generator	-	259	89	49	333	-	-	131	861	861	-	-	6,730	-	-	-	-	302,857	5,654	-
4a.1.3	Main Condensers	-	1,020	70	39	263	-	-	307	1,699	1,699	-	-	5,310	-	-	-	-	238,934	22,942	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor	-	690	-	-	-	-	-	104	794	794	-	-	-	-	-	-	-	-	9,845	-
4a.1.4.2	Auxiliary	-	243	-	-	-	-	-	36	280	280	-	-	-	-	-	-	-	-	3,371	-
4a.1.4.3	Fuel Handling	-	317	-	-	-	-	-	48	365	365	-	-	-	-	-	-	-	-	4,242	-
4a.1.4	Totals	-	1,251	-	-	-	-	-	188	1,439	1,439	-	-	-	-	-	-	-	-	17,458	-
Disposal of Plant Systems																					
4a.1.5.1	CNTL-TWR-285_PROCESS	-	58	2	10	70	-	-	27	166	166	-	-	1,564	-	-	-	-	63,529	1,278	-
4a.1.5.2	CNTL-TWR-305_BURY	-	69	6	13	-	46	-	31	164	164	-	-	-	420	-	-	-	37,709	1,444	-
4a.1.5.3	CNTL-TWR-305_PROCESS	-	47	1	4	26	-	-	16	93	93	-	-	587	-	-	-	-	23,851	1,050	-
4a.1.5.4	CNTL-TWR-322_CLEAN	-	177	-	-	-	-	-	27	203	-	-	203	-	-	-	-	-	-	4,257	-
4a.1.5.5	CNTL-TWR-338_CLEAN	-	128	-	-	-	-	-	19	147	-	-	147	-	-	-	-	-	-	3,122	-
4a.1.5.6	CNTL-TWR-355_CLEAN	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	545	-
4a.1.5.7	CNTL-TWR-380_CLEAN	-	38	-	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	1,001	-
4a.1.5.8	CNTL-TWR-388_CLEAN	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	245	-
4a.1.5.9	IB-295_BURY	-	55	5	9	-	31	-	23	123	123	-	-	-	285	-	-	-	25,568	1,217	-
4a.1.5.10	IB-295_CLEAN	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	1,100	-
4a.1.5.11	IB-295_PROCESS	-	222	5	35	234	-	-	96	592	592	-	-	5,231	-	-	-	-	212,426	4,930	-
4a.1.5.12	IB-305_BURY	-	30	2	5	-	18	-	13	69	69	-	-	-	169	-	-	-	15,184	647	-
4a.1.5.13	IB-305_PROCESS	-	187	3	18	122	-	-	68	398	398	-	-	2,731	-	-	-	-	110,888	4,073	-
4a.1.5.14	IB-322_BURY	-	11	1	2	-	8	-	5	28	28	-	-	-	74	-	-	-	6,642	247	-
4a.1.5.15	IB-322_CLEAN	-	38	-	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	896	-

Table D
Three Mile Island, Unit 1
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(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Disposal of Plant Systems (continued)																					
4a.1.5.16	IB-322_PROCESS	-	481	12	77	522	-	-	211	1,303	1,303	-	-	11,682	-	-	-	-	474,418	10,690	-
4a.1.5.17	IB-355_PROCESS	-	54	1	8	54	-	-	23	140	140	-	-	1,207	-	-	-	-	49,022	1,185	-
4a.1.5.18	IB-ROOF_PROCESS	-	15	1	5	31	-	-	9	60	60	-	-	689	-	-	-	-	27,993	340	-
4a.1.5.19	OCA_CLEAN	-	814	-	-	-	-	-	122	936	-	-	936	-	-	-	-	-	-	19,978	-
4a.1.5.20	OCA_PROCESS	-	87	1	5	37	-	-	28	158	158	-	-	828	-	-	-	-	33,630	1,913	-
4a.1.5.21	OOB_CLEAN	-	9	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	252	-
4a.1.5.22	TB-305-E_BURY	-	136	13	23	-	83	-	59	314	314	-	-	-	765	-	-	-	68,600	2,953	-
4a.1.5.23	TB-305-E_CLEAN	-	187	-	-	-	-	-	28	215	-	-	215	-	-	-	-	-	-	4,738	-
4a.1.5.24	TB-305-E_PROCESS	-	425	16	104	701	-	-	228	1,474	1,474	-	-	15,700	-	-	-	-	637,566	9,513	-
4a.1.5.25	TB-305-W_BURY	-	96	9	18	-	65	-	44	232	232	-	-	-	599	-	-	-	53,703	2,113	-
4a.1.5.26	TB-305-W_CLEAN	-	222	-	-	-	-	-	33	256	-	-	256	-	-	-	-	-	-	5,764	-
4a.1.5.27	TB-305-W_GIC	-	87	-	-	-	-	-	13	100	-	-	100	-	-	-	-	-	-	2,150	-
4a.1.5.28	TB-305-W_PROCESS	-	790	30	197	1,336	-	-	430	2,784	2,784	-	-	29,913	-	-	-	-	1,214,787	17,675	-
4a.1.5.29	TB-322-E_CLEAN	-	79	-	-	-	-	-	12	91	-	-	91	-	-	-	-	-	-	1,960	-
4a.1.5.30	TB-322-E_GIC	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	121	-
4a.1.5.31	TB-322-E_PROCESS	-	483	21	134	909	-	-	279	1,827	1,827	-	-	20,352	-	-	-	-	826,490	10,932	-
4a.1.5.32	TB-322-W_CLEAN	-	142	-	-	-	-	-	21	163	-	-	163	-	-	-	-	-	-	3,474	-
4a.1.5.33	TB-322-W_GIC	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	386	-
4a.1.5.34	TB-322-W_PROCESS	-	464	42	276	1,864	-	-	441	3,087	3,087	-	-	41,730	-	-	-	-	1,694,677	10,620	-
4a.1.5.35	TB-355-E_CLEAN	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	147	-
4a.1.5.36	TB-355-W_CLEAN	-	23	-	-	-	-	-	3	27	-	-	27	-	-	-	-	-	-	572	-
4a.1.5.37	TB-355-W_GIC	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	46	-
4a.1.5.38	TB-355-W_PROCESS	-	460	15	95	644	-	-	227	1,441	1,441	-	-	14,408	-	-	-	-	585,109	10,445	-
4a.1.5.39	TB-380_CLEAN	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	364	-
4a.1.5.40	TB-380_PROCESS	-	407	12	78	530	-	-	194	1,222	1,222	-	-	11,873	-	-	-	-	482,176	9,218	-
4a.1.5.41	TB-ROOF_CLEAN	-	21	-	-	-	-	-	3	24	-	-	24	-	-	-	-	-	-	497	-
4a.1.5	Totals	-	6,660	196	1,117	7,080	251	-	2,769	18,072	15,677	-	2,395	158,495	2,313	-	-	-	6,643,948	154,095	-
4a.1.6	Scaffolding in support of decommissioning	-	702	9	5	33	-	-	182	931	931	-	-	665	-	-	-	-	29,926	19,349	-
4a.1	Subtotal Period 4a Activity Costs	201	22,717	7,359	7,646	7,782	31,018	360	21,218	98,301	95,906	-	2,395	171,709	49,289	2,629	517	580	15,669,450	289,547	8,017
Period 4a Additional Costs																					
4a.2.1	Turbine Bldg GIC Waste Disposition	-	-	-	85	232	-	-	43	360	360	-	-	10,108	-	-	-	-	454,855	-	-
4a.2	Subtotal Period 4a Additional Costs	-	-	-	85	232	-	-	43	360	360	-	-	10,108	-	-	-	-	454,855	-	-
Period 4a Collateral Costs																					
4a.3.1	Process liquid waste	77	-	25	210	-	155	-	112	580	580	-	-	-	542	-	-	-	32,503	106	-
4a.3.2	Small tool allowance	-	176	-	-	-	-	-	26	202	182	-	20	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	77	176	25	210	-	155	-	138	782	762	-	20	-	542	-	-	-	32,503	106	-
Period 4a Period-Dependent Costs																					
4a.4.1	Decon supplies	52	-	-	-	-	-	-	13	65	65	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	601	60	661	661	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	932	93	1,025	922	-	102	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,364	-	-	-	-	-	341	1,705	1,705	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	2,108	-	-	-	-	-	316	2,424	2,424	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	7	8	-	224	-	58	297	297	-	-	-	4,018	-	-	-	80,356	18	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	1,758	264	2,021	2,021	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	918	92	1,009	1,009	-	-	-	-	-	-	-	-	-	-
4a.4.9	Site O&M Costs	-	-	-	-	-	-	317	48	364	364	-	-	-	-	-	-	-	-	-	-
4a.4.10	Radwaste Processing Equipment/Services	-	-	-	-	-	-	476	71	547	547	-	-	-	-	-	-	-	-	-	48,628
4a.4.11	Security Staff Cost	-	-	-	-	-	-	1,757	264	2,020	2,020	-	-	-	-	-	-	-	-	-	182,554
4a.4.12	DOC Staff Cost	-	-	-	-	-	-	14,096	2,114	16,210	16,210	-	-	-	-	-	-	-	-	-	

Table D
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Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 4a Period-Dependent Costs (continued)																					
4a.4.13	Utility Staff Cost	-	-	-	-	-	-	21,716	3,257	24,974	24,974	-	-	-	-	-	-	-	-	-	330,714
4a.4	Subtotal Period 4a Period-Dependent Costs	52	3,472	7	8	-	224	42,569	6,991	53,323	53,220	-	102	-	4,018	-	-	-	80,356	18	561,897
4a.0	TOTAL PERIOD 4a COST	330	26,365	7,391	7,948	8,014	31,398	42,929	28,390	152,766	150,247	-	2,518	181,817	53,848	2,629	517	580	16,237,160	289,671	569,914
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	297	41	105	83	-	294	-	255	1,074	1,074	-	-	-	2,707	-	-	-	242,924	1,056	-
Disposal of Plant Systems																					
4b.1.2.1	AB-261_BURY	-	126	24	56	-	200	-	92	499	499	-	-	-	1,844	-	-	-	165,398	2,914	-
4b.1.2.2	AB-261_PROCESS	-	60	1	9	64	-	-	26	162	162	-	-	1,436	-	-	-	-	58,327	1,367	-
4b.1.2.3	AB-271_BURY	-	74	12	27	-	98	-	48	259	259	-	-	-	898	-	-	-	80,591	1,663	-
4b.1.2.4	AB-271_PROCESS	-	103	5	34	229	-	-	66	437	437	-	-	5,133	-	-	-	-	208,455	2,424	-
4b.1.2.5	AB-281-1_BURY	-	413	67	123	-	438	-	238	1,278	1,278	-	-	-	4,978	-	-	-	362,114	9,277	-
4b.1.2.6	AB-281-1_PROCESS	-	4	0	0	2	-	-	1	8	8	-	-	42	-	-	-	-	1,725	100	-
4b.1.2.7	AB-281-2_BURY	-	567	87	165	-	587	-	322	1,727	1,727	-	-	-	6,052	-	-	-	484,727	12,421	-
4b.1.2.8	AB-281-2_PROCESS	-	375	5	33	223	-	-	133	768	768	-	-	4,984	-	-	-	-	202,399	8,273	-
4b.1.2.9	AB-281-3_BURY	-	117	9	17	-	59	-	47	248	248	-	-	-	544	-	-	-	48,749	2,582	-
4b.1.2.10	AB-281-3_PROCESS	-	50	1	3	22	-	-	16	93	93	-	-	500	-	-	-	-	20,292	1,114	-
4b.1.2.11	AB-305-1_BURY	-	86	33	81	-	288	-	109	596	596	-	-	-	2,650	-	-	-	237,727	1,877	-
4b.1.2.12	AB-305-1_PROCESS	-	26	0	2	14	-	-	9	51	51	-	-	303	-	-	-	-	12,298	558	-
4b.1.2.13	AB-305-2_BURY	-	183	23	44	-	155	-	93	498	498	-	-	-	1,555	-	-	-	128,368	3,977	-
4b.1.2.14	AB-305-2_PROCESS	-	319	6	39	263	-	-	125	751	751	-	-	5,878	-	-	-	-	238,721	7,092	-
4b.1.2.15	AB-305-3_BURY	-	74	7	11	-	40	-	31	162	162	-	-	-	368	-	-	-	32,987	1,629	-
4b.1.2.16	AB-331_BURY	-	31	4	7	-	25	-	15	82	82	-	-	-	251	-	-	-	20,665	678	-
4b.1.2.17	AB-331_PROCESS	-	129	2	13	88	-	-	48	280	280	-	-	1,967	-	-	-	-	79,879	2,818	-
4b.1.2.18	CC-305_BURY	-	441	63	114	-	405	-	235	1,257	1,257	-	-	-	4,613	-	-	-	334,678	9,825	-
4b.1.2.19	DG-305_BURY	-	44	8	14	-	48	-	26	140	140	-	-	-	565	-	-	-	39,762	987	-
4b.1.2.20	DG-305_CLEAN	-	100	-	-	-	-	-	15	115	-	-	115	-	-	-	-	-	-	2,441	-
4b.1.2.21	FHB-281_BURY	-	161	24	44	-	157	-	88	474	474	-	-	-	1,611	-	-	-	129,564	3,528	-
4b.1.2.22	FHB-281_PROCESS	-	140	2	11	74	-	-	48	275	275	-	-	1,687	-	-	-	-	67,683	3,100	-
4b.1.2.23	FHB-305_BURY	-	51	6	12	-	43	-	26	137	137	-	-	-	405	-	-	-	35,492	1,125	-
4b.1.2.24	FHB-305_PROCESS	-	68	2	7	34	8	-	25	145	145	-	-	766	73	-	-	-	37,657	1,529	-
4b.1.2.25	FHB-329_BURY	-	14	1	2	-	6	-	5	28	28	-	-	-	57	-	-	-	5,081	303	-
4b.1.2.26	FHB-329_PROCESS	-	11	0	1	4	2	-	4	23	23	-	-	91	21	-	-	-	5,574	249	-
4b.1.2.27	FHB-348_BURY	-	64	13	29	-	102	-	47	255	255	-	-	-	943	-	-	-	83,967	1,400	-
4b.1.2.28	FHB-348_PROCESS	-	30	1	3	15	3	-	11	63	63	-	-	344	30	-	-	-	16,521	643	-
4b.1.2.29	INTAKE_CLEAN	-	221	-	-	-	-	-	33	254	-	-	254	-	-	-	-	-	-	5,603	-
4b.1.2.30	IWT-303_PROCESS	-	906	18	117	789	-	-	364	2,193	2,193	-	-	17,653	-	-	-	-	716,882	19,868	-
4b.1.2.31	OCA_BURY	-	430	99	165	-	587	-	289	1,569	1,569	-	-	-	7,233	-	-	-	485,016	9,645	-
4b.1.2.32	PA-301_BURY	-	163	37	62	-	220	-	109	590	590	-	-	-	2,743	-	-	-	181,570	3,657	-
4b.1.2.33	PA-301_CLEAN	-	247	-	-	-	-	-	37	284	-	-	284	-	-	-	-	-	-	5,969	-
4b.1.2.34	PA-301_PROCESS	-	257	6	43	288	-	-	115	709	709	-	-	6,446	-	-	-	-	261,756	5,672	-
4b.1.2.35	RB-281_BURY	-	428	51	108	-	384	-	224	1,194	1,194	-	-	-	3,555	-	-	-	316,988	9,602	-
4b.1.2.36	RB-281_PROCESS	-	131	4	13	62	15	-	48	274	274	-	-	1,379	143	-	-	-	68,778	2,922	-
4b.1.2.37	RB-308_BURY	-	295	35	67	-	238	-	147	781	781	-	-	-	2,328	-	-	-	196,583	6,561	-
4b.1.2.38	RB-308_PROCESS	-	205	5	32	217	-	-	89	547	547	-	-	4,650	-	-	-	-	196,969	4,613	-
4b.1.2.39	RB-346_BURY	-	56	8	13	-	45	-	28	148	148	-	-	-	419	-	-	-	37,577	1,135	-
4b.1.2.40	RB-346_PROCESS	-	120	6	18	42	43	-	50	279	279	-	-	934	395	-	-	-	73,371	2,548	-
4b.1.2.41	*RB-INSIDE O-RING_BURY*	-	271	26	54	-	194	-	127	672	672	-	-	-	1,783	-	-	-	159,948	6,114	-
4b.1.2.42	SB-305_CLEAN	-	9	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	242	-
4b.1.2.43	STP_CLEAN	-	37	-	-	-	-	-	8	43	-	-	43	-	-	-	-	-	-	884	-

Table D
Three Mile Island, Unit 1
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(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Disposal of Plant Systems (continued)																					
4b.1.2.44	TB-305-E_GIC	-	88	-	-	-	-	-	13	101	-	-	101	-	-	-	-	-	-	2,342	-
4b.1.2.45	TB-355-E_PROCESS	-	54	2	10	68	-	-	25	159	159	-	-	1,532	-	-	-	-	62,212	1,183	-
4b.1.2.46	YARD_CLEAN	-	492	-	-	-	-	-	74	566	-	-	566	-	-	-	-	-	-	12,998	-
4b.1.2	Totals	-	8,272	698	1,601	2,497	4,388	-	3,730	21,187	19,812	-	1,374	55,905	46,055	-	-	-	5,897,056	187,449	-
4b.1.3	Scaffolding in support of decommissioning	-	1,054	13	7	49	-	-	273	1,397	1,397	-	-	998	-	-	-	-	44,889	29,024	-
Decontamination of Site Buildings																					
4b.1.4.1	Reactor	767	606	129	319	41	673	-	770	3,305	3,305	-	-	913	9,415	-	-	-	905,593	29,350	-
4b.1.4.2	Auxiliary	239	93	12	35	34	46	-	166	624	624	-	-	752	842	-	-	-	113,287	7,302	-
4b.1.4.3	Classified Waste Storage Facility	12	2	1	2	-	2	-	7	26	26	-	-	-	43	-	-	-	4,349	319	-
4b.1.4.4	Heat Exchanger Vault	40	16	2	6	4	7	-	28	103	103	-	-	99	138	-	-	-	17,468	1,243	-
4b.1.4.5	Interim Solid Waste Staging Facility	50	10	2	7	1	10	-	31	111	111	-	-	21	182	-	-	-	18,988	1,345	-
4b.1.4.6	Intermediate	18	16	4	11	-	16	-	19	83	83	-	-	-	295	-	-	-	29,523	685	-
4b.1.4.7	Miscellaneous Buildings - Contaminated	123	24	6	17	-	24	-	77	271	271	-	-	-	451	-	-	-	45,147	3,312	-
4b.1.4.8	Respirator Cleaning Facility	23	4	1	3	-	5	-	14	51	51	-	-	-	85	-	-	-	8,463	621	-
4b.1.4.9	Fuel Handling	494	500	28	46	29	122	-	416	1,635	1,635	-	-	650	1,399	-	-	-	146,622	20,809	-
4b.1.4	Totals	1,765	1,271	185	445	109	906	-	1,529	6,210	6,210	-	-	2,435	12,850	-	-	-	1,289,439	64,987	-
4b.1	Subtotal Period 4b Activity Costs	2,062	10,637	1,001	2,137	2,656	5,588	-	5,787	29,867	28,493	-	1,374	59,338	61,612	-	-	-	7,474,307	282,516	-
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	848	254	1,102	1,102	-	-	-	-	-	-	-	-	-	6,240
4b.2.2	Contaminated Soil Remediation	-	39	2	110	-	1,930	-	509	2,589	2,589	-	-	-	35,745	-	-	-	2,716,592	482	-
4b.2	Subtotal Period 4b Additional Costs	-	39	2	110	-	1,930	848	763	3,691	3,691	-	-	-	35,745	-	-	-	2,716,592	482	6,240
Period 4b Collateral Costs																					
4b.3.1	Process liquid waste	203	-	67	552	-	409	-	293	1,524	1,524	-	-	-	1,425	-	-	-	85,497	278	-
4b.3.2	Small tool allowance	-	173	-	-	-	-	-	26	199	199	-	-	-	-	-	-	-	-	-	-
4b.3.3	Decommissioning Equipment Disposition	-	-	88	60	330	-	-	67	545	545	-	-	6,667	-	-	-	-	300,000	88	-
4b.3	Subtotal Period 4b Collateral Costs	203	173	155	612	330	409	-	386	2,268	2,268	-	-	6,667	1,425	-	-	-	385,497	366	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	725	-	-	-	-	-	-	181	907	907	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	1,207	121	1,328	1,328	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	1,871	187	2,059	2,059	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	1,769	-	-	-	-	-	442	2,211	2,211	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	4,204	-	-	-	-	-	631	4,835	4,835	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	8	10	-	275	-	71	364	364	-	-	-	4,923	-	-	-	98,469	23	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	2,787	418	3,205	3,205	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	1,843	184	2,027	2,027	-	-	-	-	-	-	-	-	-	-
4b.4.9	Site O&M Costs	-	-	-	-	-	-	637	95	732	732	-	-	-	-	-	-	-	-	-	-
4b.4.10	Radwaste Processing Equipment/Services	-	-	-	-	-	-	966	143	1,099	1,099	-	-	-	-	-	-	-	-	-	-
4b.4.11	Security Staff Cost	-	-	-	-	-	-	3,529	529	4,058	4,058	-	-	-	-	-	-	-	-	-	97,677
4b.4.12	DOC Staff Cost	-	-	-	-	-	-	27,598	4,140	31,737	31,737	-	-	-	-	-	-	-	-	-	356,057
4b.4.13	Utility Staff Cost	-	-	-	-	-	-	41,494	6,224	47,718	47,718	-	-	-	-	-	-	-	-	-	627,086
4b.4	Subtotal Period 4b Period-Dependent Costs	725	5,973	8	10	-	275	81,921	13,367	102,279	102,279	-	-	-	4,923	-	-	-	98,469	23	1,080,819
4b.0	TOTAL PERIOD 4b COST	2,990	16,822	1,167	2,868	2,986	8,201	82,769	20,303	138,106	136,732	-	1,374	66,004	103,706	-	-	-	10,674,860	283,367	1,087,059
PERIOD 4e - License Termination																					
Period 4e Direct Decommissioning Activities																					
4e.1.1	ORISE confirmatory survey	-	-	-	-	-	-	155	46	201	201	-	-	-	-	-	-	-	-	-	-

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4e.1.2	Terminate license									[a]											
4e.1	Subtotal Period 4e Activity Costs	-	-	-	-	-	-	155	46	201	201	-	-	-	-	-	-	-	-	-	-
Period 4e Additional Costs																					
4e.2.1	License Termination Survey	-	-	-	-	-	-	6,183	1,855	8,038	8,038	-	-	-	-	-	-	-	-	124,444	3,120
4e.2	Subtotal Period 4e Additional Costs	-	-	-	-	-	-	6,183	1,855	8,038	8,038	-	-	-	-	-	-	-	-	124,444	3,120
Period 4e Collateral Costs																					
4e.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,113	167	1,280	1,280	-	-	-	-	-	-	-	-	-	-
4e.3	Subtotal Period 4e Collateral Costs	-	-	-	-	-	-	1,113	167	1,280	1,280	-	-	-	-	-	-	-	-	-	-
Period 4e Period-Dependent Costs																					
4e.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4e.4.2	Property taxes	-	-	-	-	-	-	549	55	604	604	-	-	-	-	-	-	-	-	-	-
4e.4.3	Health physics supplies	-	610	-	-	-	-	-	153	763	763	-	-	-	-	-	-	-	-	-	-
4e.4.4	Disposal of DAW generated	-	-	1	1	-	19	-	5	26	26	-	-	-	349	-	-	-	6,974	2	-
4e.4.5	Plant energy budget	-	-	-	-	-	-	218	33	251	251	-	-	-	-	-	-	-	-	-	-
4e.4.6	NRC Fees	-	-	-	-	-	-	580	58	638	638	-	-	-	-	-	-	-	-	-	-
4e.4.7	Site O&M Costs	-	-	-	-	-	-	187	28	215	215	-	-	-	-	-	-	-	-	-	-
4e.4.8	Security Staff Cost	-	-	-	-	-	-	443	66	509	509	-	-	-	-	-	-	-	-	-	11,700
4e.4.9	DOC Staff Cost	-	-	-	-	-	-	4,833	695	5,328	5,328	-	-	-	-	-	-	-	-	-	56,940
4e.4.10	Utility Staff Cost	-	-	-	-	-	-	5,493	824	6,317	6,317	-	-	-	-	-	-	-	-	-	74,100
4e.4	Subtotal Period 4e Period-Dependent Costs	-	610	1	1	-	19	12,103	1,917	14,650	14,650	-	-	-	349	-	-	-	6,974	2	142,740
4e.0	TOTAL PERIOD 4e COST	-	610	1	1	-	19	19,554	3,985	24,170	24,170	-	-	-	349	-	-	-	6,974	124,446	145,860
PERIOD 4 TOTALS		3,321	43,797	8,558	10,817	11,000	39,618	145,252	52,679	315,041	311,149	-	3,893	247,821	157,903	2,629	517	580	26,919,000	697,483	1,802,834
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor	-	3,707	-	-	-	-	-	556	4,263	-	-	4,263	-	-	-	-	-	-	52,366	-
5b.1.1.2	Air Intake Tunnel	-	50	-	-	-	-	-	8	58	-	-	58	-	-	-	-	-	-	844	-
5b.1.1.3	Auxiliary	-	2,086	-	-	-	-	-	313	2,399	-	-	2,399	-	-	-	-	-	-	28,722	-
5b.1.1.4	Carpenters Shop #117	-	14	-	-	-	-	-	2	16	-	-	16	-	-	-	-	-	-	219	-
5b.1.1.5	Circulating Water Chlorinator	-	50	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	875	-
5b.1.1.6	Circulating Water Chlorinator House	-	54	-	-	-	-	-	8	62	-	-	62	-	-	-	-	-	-	1,087	-
5b.1.1.7	Circulating Water Intake Flume	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	709	-
5b.1.1.8	Circulating Water Pumphouse	-	121	-	-	-	-	-	18	140	-	-	140	-	-	-	-	-	-	2,422	-
5b.1.1.9	Circulating Water Tunnels	-	532	-	-	-	-	-	80	612	-	-	612	-	-	-	-	-	-	9,010	-
5b.1.1.10	Classified Waste Storage Facility	-	22	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	452	-
5b.1.1.11	Coagulator	-	36	-	-	-	-	-	5	42	-	-	42	-	-	-	-	-	-	726	-
5b.1.1.12	Control Room Tower	-	2,622	-	-	-	-	-	393	3,015	-	-	3,015	-	-	-	-	-	-	35,625	-
5b.1.1.13	Cooling Towers	-	838	-	-	-	-	-	126	964	-	-	964	-	-	-	-	-	-	13,913	-
5b.1.1.14	Corridor	-	67	-	-	-	-	-	10	77	-	-	77	-	-	-	-	-	-	1,381	-
5b.1.1.15	Desilting Basin	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	32	-
5b.1.1.16	Diesel Generator	-	600	-	-	-	-	-	90	690	-	-	690	-	-	-	-	-	-	9,233	-
5b.1.1.17	Emergency Diesel Generator	-	502	-	-	-	-	-	75	577	-	-	577	-	-	-	-	-	-	6,842	-
5b.1.1.18	Fire Brigade Training Facility	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	231	-
5b.1.1.19	Fuel Oil Unloading & Pump Station	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	109	-
5b.1.1.20	Heat Exchanger Vault	-	319	-	-	-	-	-	48	367	-	-	367	-	-	-	-	-	-	4,093	-
5b.1.1.21	High Range Sample Station	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	67	-
5b.1.1.22	Indust Waste Trtmnt & Sludge Fltr	-	76	-	-	-	-	-	11	87	-	-	87	-	-	-	-	-	-	1,406	-

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Demolition of Remaining Site Buildings (continued)																					
5b.1.1.23	Intake Screen & Pumphouse	-	1,679	-	-	-	-	-	252	1,930	-	-	1,930	-	-	-	-	-	-	18,870	-
5b.1.1.24	Interim Solid Waste Staging Facility	-	89	-	-	-	-	-	13	103	-	-	103	-	-	-	-	-	-	1,752	-
5b.1.1.25	Intermediate	-	1,287	-	-	-	-	-	193	1,480	-	-	1,480	-	-	-	-	-	-	17,189	-
5b.1.1.26	Lube Oil Storage	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	139	-
5b.1.1.27	Mechanical Draft Cooling Tower	-	121	-	-	-	-	-	18	139	-	-	139	-	-	-	-	-	-	1,802	-
5b.1.1.28	Miscellaneous Buildings - Clean	-	874	-	-	-	-	-	131	1,005	-	-	1,005	-	-	-	-	-	-	19,054	-
5b.1.1.29	Miscellaneous Buildings - Contaminated	-	166	-	-	-	-	-	25	190	-	-	190	-	-	-	-	-	-	3,414	-
5b.1.1.30	Miscellaneous Yard Structures	-	1,256	-	-	-	-	-	188	1,444	-	-	1,444	-	-	-	-	-	-	20,519	-
5b.1.1.31	North Office	-	255	-	-	-	-	-	38	293	-	-	293	-	-	-	-	-	-	4,920	-
5b.1.1.32	Operations Office	-	54	-	-	-	-	-	8	62	-	-	62	-	-	-	-	-	-	1,102	-
5b.1.1.33	Operations Support Facility	-	244	-	-	-	-	-	37	280	-	-	280	-	-	-	-	-	-	4,425	-
5b.1.1.34	Respirator Cleaning Facility	-	51	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	-	1,072	-
5b.1.1.35	Security Improvements	-	664	-	-	-	-	-	100	763	-	-	763	-	-	-	-	-	-	6,957	-
5b.1.1.36	Service	-	252	-	-	-	-	-	38	290	-	-	290	-	-	-	-	-	-	5,003	-
5b.1.1.37	Sewage Pumping Station	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	97	-
5b.1.1.38	Steam Generator Mausoleum	-	305	-	-	-	-	-	46	351	-	-	351	-	-	-	-	-	-	3,900	-
5b.1.1.39	Substation Relay Control House	-	24	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	489	-
5b.1.1.40	Training Facility #43	-	58	-	-	-	-	-	9	67	-	-	67	-	-	-	-	-	-	1,199	-
5b.1.1.41	Turbine	-	1,431	-	-	-	-	-	215	1,646	-	-	1,646	-	-	-	-	-	-	26,877	-
5b.1.1.42	Turbine Pedestal	-	1,128	-	-	-	-	-	169	1,297	-	-	1,297	-	-	-	-	-	-	14,441	-
5b.1.1.43	Warehouse #1	-	377	-	-	-	-	-	57	434	-	-	434	-	-	-	-	-	-	8,170	-
5b.1.1.44	Water Pretreatment House	-	115	-	-	-	-	-	17	132	-	-	132	-	-	-	-	-	-	2,006	-
5b.1.1.45	Fuel Handling	-	2,937	-	-	-	-	-	441	3,378	-	-	3,378	-	-	-	-	-	-	40,440	-
5b.1.1	Totals	-	25,145	-	-	-	-	-	3,772	28,916	-	-	28,916	-	-	-	-	-	-	374,203	-
Site Closeout Activities																					
5b.1.2	Remove Rubble	-	8,707	-	-	-	-	-	1,306	10,013	-	-	10,013	-	-	-	-	-	-	7,228	-
5b.1.3	Grade & landscape site	-	121	-	-	-	-	-	18	140	-	-	140	-	-	-	-	-	-	531	-
5b.1.4	Final report to NRC	-	-	-	-	-	-	178	27	205	205	-	-	-	-	-	-	-	-	-	1,560
5b.1	Subtotal Period 5b Activity Costs	-	33,973	-	-	-	-	178	5,123	39,274	205	-	39,069	-	-	-	-	-	-	381,962	1,560
Period 5b Additional Costs																					
5b.2.1	Concrete Processing	-	1,030	-	8	-	-	-	155	1,193	-	-	1,193	-	-	-	-	-	-	6,293	-
5b.2	Subtotal Period 5b Additional Costs	-	1,030	-	8	-	-	-	155	1,193	-	-	1,193	-	-	-	-	-	-	6,293	-
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	237	-	-	-	-	-	35	272	-	-	272	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	237	-	-	-	-	-	35	272	-	-	272	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5b.4.2	Property taxes	-	-	-	-	-	-	1,453	145	1,598	-	-	1,598	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	4,374	-	-	-	-	-	656	5,030	-	-	5,030	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	289	43	332	-	-	332	-	-	-	-	-	-	-	-
5b.4.5	Site O&M Cost	-	-	-	-	-	-	494	74	568	-	-	568	-	-	-	-	-	-	-	-
5b.4.6	Security Staff Cost	-	-	-	-	-	-	1,943	291	2,234	-	-	2,234	-	-	-	-	-	-	-	49,509
5b.4.7	DOC Staff Cost	-	-	-	-	-	-	11,842	1,776	13,619	-	-	13,619	-	-	-	-	-	-	-	140,274
5b.4.8	Utility Staff Cost	-	-	-	-	-	-	5,897	885	6,782	-	-	6,782	-	-	-	-	-	-	-	80,451
5b.4	Subtotal Period 5b Period-Dependent Costs	-	4,374	-	-	-	-	21,918	3,871	30,162	-	-	30,162	-	-	-	-	-	-	-	270,234
5b.0	TOTAL PERIOD 5b COST	-	39,613	-	8	-	-	22,096	9,185	70,901	205	-	70,696	-	-	-	-	-	-	388,255	271,794
PERIOD 5 TOTALS		-	39,613	-	8	-	-	22,096	9,185	70,901	205	-	70,696	-	-	-	-	-	-	388,255	271,794

Table D
Three Mile Island, Unit 1
Delayed DECON Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			
TOTAL COST TO DECOMMISSION		7,444	87,981	8,702	11,932	11,000	40,814	434,365	104,268	706,507	477,208	153,263	76,036	247,821	167,636	2,629	517	580	27,226,590	1,159,007	5,241,332

TOTAL COST TO DECOMMISSION WITH 17.31% CONTINGENCY:	$706,507	thousands of 2008 dollars
TOTAL NRC LICENSE TERMINATION COST IS 67.54% OR:	$477,208	thousands of 2008 dollars
SPENT FUEL MANAGEMENT COST IS 21.69% OR:	$153,263	thousands of 2008 dollars
NON-NUCLEAR DEMOLITION COST IS 10.76% OR:	$76,036	thousands of 2008 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	170,782	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	580	cubic feet
TOTAL SCRAP METAL REMOVED:	71,226	tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,159,007	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense.
a - indicates that this activity performed by decommissioning staff.
0 - indicates that this value is less than 0.5 but is non-zero.
a cell containing " - " indicates a zero value

APPENDIX E

DETAILED COST ANALYSIS

SAFSTOR

Table E
Three Mile Island, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes: Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 1a - Shutdown through Transition																					
Period 1a Direct Decommissioning Activities																					
1a.1.1	SAFSTOR site characterization survey	-	-	-	-	-	-	436	131	567	567	-	-	-	-	-	-	-	-	-	-
1a.1.2	Prepare preliminary decommissioning cost	-	-	-	-	-	-	149	22	171	171	-	-	-	-	-	-	-	-	-	1,300
1a.1.3	Notification of Cessation of Operations									a											
1a.1.4	Remove fuel & source material									n/a											
1a.1.5	Notification of Permanent Defueling									a											
1a.1.6	Deactivate plant systems & process waste									a											
1a.1.7	Prepare and submit PSDAR	-	-	-	-	-	-	229	34	263	263	-	-	-	-	-	-	-	-	-	2,000
1a.1.8	Review plant dwgs & specs.	-	-	-	-	-	-	149	22	171	171	-	-	-	-	-	-	-	-	-	1,300
1a.1.9	Perform detailed rad survey									a											
1a.1.10	Estimate by-product inventory	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
1a.1.11	End product description	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
1a.1.12	Detailed by-product inventory	-	-	-	-	-	-	171	26	197	197	-	-	-	-	-	-	-	-	-	1,500
1a.1.13	Define major work sequence	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
1a.1.14	Perform SER and EA	-	-	-	-	-	-	354	53	407	407	-	-	-	-	-	-	-	-	-	3,100
1a.1.15	Perform Site-Specific Cost Study	-	-	-	-	-	-	571	86	657	657	-	-	-	-	-	-	-	-	-	5,000
Activity Specifications																					
1a.1.16.1	Prepare plant and facilities for SAFSTOR	-	-	-	-	-	-	562	84	646	646	-	-	-	-	-	-	-	-	-	4,920
1a.1.16.2	Plant systems	-	-	-	-	-	-	476	71	547	547	-	-	-	-	-	-	-	-	-	4,167
1a.1.16.3	Plant structures and buildings	-	-	-	-	-	-	356	53	410	410	-	-	-	-	-	-	-	-	-	3,120
1a.1.16.4	Waste management	-	-	-	-	-	-	229	34	263	263	-	-	-	-	-	-	-	-	-	2,000
1a.1.16.5	Facility and site dormancy	-	-	-	-	-	-	229	34	263	263	-	-	-	-	-	-	-	-	-	2,000
1a.1.16	Total	-	-	-	-	-	-	1,852	278	2,129	2,129	-	-	-	-	-	-	-	-	-	16,207
Detailed Work Procedures																					
1a.1.17.1	Plant systems	-	-	-	-	-	-	135	20	155	155	-	-	-	-	-	-	-	-	-	1,183
1a.1.17.2	Facility closeout & dormancy	-	-	-	-	-	-	137	21	158	158	-	-	-	-	-	-	-	-	-	1,200
1a.1.17	Total	-	-	-	-	-	-	272	41	313	313	-	-	-	-	-	-	-	-	-	2,383
1a.1.18	Procure vacuum drying system	-	-	-	-	-	-	11	2	13	13	-	-	-	-	-	-	-	-	-	100
1a.1.19	Drain/de-energize non-cont. systems									a											
1a.1.20	Drain & dry NSSS									a											
1a.1.21	Drain/de-energize contaminated systems									a											
1a.1.22	Decon/secure contaminated systems									a											
1a.1	Subtotal Period 1a Activity Costs	-	-	-	-	-	-	4,536	746	5,282	5,282	-	-	-	-	-	-	-	-	-	35,890
Period 1a Additional Costs																					
1a.2.1	ISFSI Construction	-	-	-	-	-	-	16,000	6,000	22,000	-	22,000	-	-	-	-	-	-	-	-	-
1a.2	Subtotal Period 1a Additional Costs	-	-	-	-	-	-	16,000	6,000	22,000	-	22,000	-	-	-	-	-	-	-	-	-
Period 1a Collateral Costs																					
1a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	11,280	1,692	12,973	-	12,973	-	-	-	-	-	-	-	-	-
1a.3	Subtotal Period 1a Collateral Costs	-	-	-	-	-	-	11,280	1,692	12,973	-	12,973	-	-	-	-	-	-	-	-	-
Period 1a Period-Dependent Costs																					
1a.4.1	Insurance	-	-	-	-	-	-	1,074	107	1,181	1,181	-	-	-	-	-	-	-	-	-	-
1a.4.2	Property taxes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1a.4.3	Health physics supplies	-	347	-	-	-	-	-	87	433	433	-	-	-	-	-	-	-	-	-	-
1a.4.4	Heavy equipment rental	-	346	-	-	-	-	-	52	397	397	-	-	-	-	-	-	-	-	-	-
1a.4.5	Disposal of DAW generated	-	-	-	1	1	-	34	9	45	45	-	-	-	610	-	-	-	12,190	3	-
1a.4.6	Plant energy budget	-	-	-	-	-	-	1,459	219	1,677	1,677	-	-	-	-	-	-	-	-	-	-
1a.4.7	NRC Fees	-	-	-	-	-	-	727	73	800	800	-	-	-	-	-	-	-	-	-	-
1a.4.8	Emergency Planning Fees	-	-	-	-	-	-	550	55	605	-	605	-	-	-	-	-	-	-	-	-

Table E
Three Mile Island, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 1a Period-Dependent Costs (continued)																					
1a.4.9	Site O&M Costs	-	-	-	-	-	-	250	37	287	287	-	-	-	-	-	-	-	-	-	-
1a.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	745	112	857	-	857	-	-	-	-	-	-	-	-	-
1a.4.11	ISFSI Operating Costs	-	-	-	-	-	-	85	13	98	-	98	-	-	-	-	-	-	-	-	-
1a.4.12	Security Staff Cost	-	-	-	-	-	-	5,378	807	6,185	6,185	-	-	-	-	-	-	-	-	-	157,471
1a.4.13	Utility Staff Cost	-	-	-	-	-	-	27,176	4,076	31,253	31,253	-	-	-	-	-	-	-	-	-	423,400
1a.4	Subtotal Period 1a Period-Dependent Costs	-	692	1	1	-	34	37,444	5,646	43,819	42,259	1,559	-	-	610	-	-	-	12,190	3	580,871
1a.0	TOTAL PERIOD 1a COST	-	692	1	1	-	34	69,260	14,084	84,073	47,541	36,532	-	-	610	-	-	-	12,190	3	616,761
PERIOD 1b - SAFSTOR Limited DECON Activities																					
Period 1b Direct Decommissioning Activities																					
Decontamination of Site Buildings																					
1b.1.1.1	Reactor	759	-	-	-	-	-	-	380	1,139	1,139	-	-	-	-	-	-	-	-	16,970	-
1b.1.1.2	Auxiliary	232	-	-	-	-	-	-	116	348	348	-	-	-	-	-	-	-	-	5,397	-
1b.1.1.3	Classified Waste Storage Facility	12	-	-	-	-	-	-	6	17	17	-	-	-	-	-	-	-	-	272	-
1b.1.1.4	Heat Exchanger Vault	39	-	-	-	-	-	-	19	58	58	-	-	-	-	-	-	-	-	902	-
1b.1.1.5	Interim Solid Waste Staging Facility	48	-	-	-	-	-	-	24	72	72	-	-	-	-	-	-	-	-	1,135	-
1b.1.1.6	Miscellaneous Buildings - Contaminated	120	-	-	-	-	-	-	60	180	180	-	-	-	-	-	-	-	-	2,825	-
1b.1.1.7	Respirator Cleaning Facility	22	-	-	-	-	-	-	11	34	34	-	-	-	-	-	-	-	-	529	-
1b.1.1.8	Fuel Handling	491	-	-	-	-	-	-	245	736	736	-	-	-	-	-	-	-	-	9,742	-
1b.1.1	Totals	1,723	-	-	-	-	-	-	861	2,584	2,584	-	-	-	-	-	-	-	-	37,772	-
1b.1	Subtotal Period 1b Activity Costs	1,723	-	-	-	-	-	-	861	2,584	2,584	-	-	-	-	-	-	-	-	37,772	-
Period 1b Additional Costs																					
1b.2.1	Spent Fuel Pool Isolation	-	-	-	-	-	-	9,407	1,411	10,819	10,819	-	-	-	-	-	-	-	-	-	-
1b.2	Subtotal Period 1b Additional Costs	-	-	-	-	-	-	9,407	1,411	10,819	10,819	-	-	-	-	-	-	-	-	-	-
Period 1b Collateral Costs																					
1b.3.1	Decon equipment	667	-	-	-	-	-	-	100	767	767	-	-	-	-	-	-	-	-	-	-
1b.3.2	Process liquid waste	167	-	53	442	-	327	-	237	1,227	1,227	-	-	-	1,140	-	-	-	68,417	222	-
1b.3.3	Small tool allowance	-	24	-	-	-	-	-	4	27	27	-	-	-	-	-	-	-	-	-	-
1b.3.4	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,810	422	3,232	-	3,232	-	-	-	-	-	-	-	-	-
1b.3	Subtotal Period 1b Collateral Costs	835	24	53	442	-	327	2,810	762	5,254	2,022	3,232	-	-	1,140	-	-	-	68,417	222	-
Period 1b Period-Dependent Costs																					
1b.4.1	Decon supplies	632	-	-	-	-	-	-	158	789	789	-	-	-	-	-	-	-	-	-	-
1b.4.2	Insurance	-	-	-	-	-	-	268	27	294	294	-	-	-	-	-	-	-	-	-	-
1b.4.3	Property taxes	-	-	-	-	-	-	183	18	201	201	-	-	-	-	-	-	-	-	-	-
1b.4.4	Health physics supplies	-	209	-	-	-	-	-	52	261	261	-	-	-	-	-	-	-	-	-	-
1b.4.5	Heavy equipment rental	-	86	-	-	-	-	-	13	99	99	-	-	-	-	-	-	-	-	-	-
1b.4.6	Disposal of DAW generated	-	-	1	1	-	28	-	7	38	38	-	-	-	510	-	-	-	10,206	2	-
1b.4.7	Plant energy budget	-	-	-	-	-	-	364	55	418	418	-	-	-	-	-	-	-	-	-	-
1b.4.8	NRC Fees	-	-	-	-	-	-	181	18	199	199	-	-	-	-	-	-	-	-	-	-
1b.4.9	Emergency Planning Fees	-	-	-	-	-	-	137	14	151	-	151	-	-	-	-	-	-	-	-	-
1b.4.10	Site O&M Costs	-	-	-	-	-	-	62	9	72	72	-	-	-	-	-	-	-	-	-	-
1b.4.11	Spent Fuel Pool O&M	-	-	-	-	-	-	186	28	214	-	214	-	-	-	-	-	-	-	-	-
1b.4.12	ISFSI Operating Costs	-	-	-	-	-	-	21	3	24	-	24	-	-	-	-	-	-	-	-	-
1b.4.13	Security Staff Cost	-	-	-	-	-	-	1,341	201	1,542	1,542	-	-	-	-	-	-	-	-	-	39,260
1b.4.14	Utility Staff Cost	-	-	-	-	-	-	6,775	1,018	7,792	7,792	-	-	-	-	-	-	-	-	-	105,560
1b.4	Subtotal Period 1b Period-Dependent Costs	632	295	1	1	-	28	9,518	1,620	12,095	11,706	389	-	-	510	-	-	-	10,206	2	144,820
1b.0	TOTAL PERIOD 1b COST	3,189	318	54	443	-	356	21,736	4,654	30,751	27,130	3,621	-	-	1,651	-	-	-	78,622	37,997	144,820

Table E
Three Mile Island, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 1c - Preparations for SAFSTOR Dormancy																					
Period 1c Direct Decommissioning Activities																					
1c.1.1	Prepare support equipment for storage	-	407	-	-	-	-	-	61	468	468	-	-	-	-	-	-	-	-	3,000	-
1c.1.2	Install containment pressure equal. lines	-	36	-	-	-	-	-	5	41	41	-	-	-	-	-	-	-	-	700	-
1c.1.3	Interim survey prior to dormancy	-	-	-	-	-	-	733	220	953	953	-	-	-	-	-	-	-	-	12,115	-
1c.1.4	Secure building accesses									a											
1c.1.5	Prepare & submit interim report	-	-	-	-	-	-	67	10	77	77	-	-	-	-	-	-	-	-	-	583
1c.1	Subtotal Period 1c Activity Costs	-	442	-	-	-	-	800	296	1,538	1,538	-	-	-	-	-	-	-	-	15,815	583
Period 1c Collateral Costs																					
1c.3.1	Process liquid waste	247	-	79	652	-	483	-	350	1,811	1,811	-	-	-	1,683	-	-	-	100,960	328	-
1c.3.2	Small tool allowance	-	3	-	-	-	-	-	0	3	3	-	-	-	-	-	-	-	-	-	-
1c.3.3	Spent Fuel Capital and Transfer	-	-	-	-	-	-	2,841	426	3,268	-	3,268	-	-	-	-	-	-	-	-	-
1c.3	Subtotal Period 1c Collateral Costs	247	3	79	652	-	483	2,841	777	5,081	1,814	3,268	-	-	1,683	-	-	-	100,960	328	-
Period 1c Period-Dependent Costs																					
1c.4.1	Insurance	-	-	-	-	-	-	271	27	298	298	-	-	-	-	-	-	-	-	-	-
1c.4.2	Property taxes	-	-	-	-	-	-	185	19	204	204	-	-	-	-	-	-	-	-	-	-
1c.4.3	Health physics supplies	-	139	-	-	-	-	-	35	174	174	-	-	-	-	-	-	-	-	-	-
1c.4.4	Heavy equipment rental	-	87	-	-	-	-	-	13	100	100	-	-	-	-	-	-	-	-	-	-
1c.4.5	Disposal of DAW generated	-	-	0	0	-	9	-	2	11	11	-	-	-	154	-	-	-	3,073	1	-
1c.4.6	Plant energy budget	-	-	-	-	-	-	368	55	423	423	-	-	-	-	-	-	-	-	-	-
1c.4.7	NRC Fees	-	-	-	-	-	-	183	18	202	202	-	-	-	-	-	-	-	-	-	-
1c.4.8	Emergency Planning Fees	-	-	-	-	-	-	139	14	152	-	152	-	-	-	-	-	-	-	-	-
1c.4.9	Site O&M Costs	-	-	-	-	-	-	63	9	72	72	-	-	-	-	-	-	-	-	-	-
1c.4.10	Spent Fuel Pool O&M	-	-	-	-	-	-	188	28	216	-	216	-	-	-	-	-	-	-	-	-
1c.4.11	ISFSI Operating Costs	-	-	-	-	-	-	21	3	25	-	25	-	-	-	-	-	-	-	-	-
1c.4.12	Security Staff Cost	-	-	-	-	-	-	1,356	203	1,559	1,559	-	-	-	-	-	-	-	-	-	39,691
1c.4.13	Utility Staff Cost	-	-	-	-	-	-	6,850	1,027	7,877	7,877	-	-	-	-	-	-	-	-	-	106,720
1c.4	Subtotal Period 1c Period-Dependent Costs	-	226	0	0	-	9	9,623	1,455	11,313	10,920	393	-	-	154	-	-	-	3,073	1	146,411
1c.0	TOTAL PERIOD 1c COST	247	672	79	653	-	491	13,264	2,527	17,933	14,272	3,661	-	-	1,838	-	-	-	104,033	16,144	146,995
PERIOD 1 TOTALS		3,436	1,682	134	1,097	-	881	104,261	21,266	132,757	88,943	43,813	-	-	4,096	-	-	-	194,845	54,143	908,576
PERIOD 2a - SAFSTOR Dormancy with Wet Spent Fuel Storage																					
Period 2a Direct Decommissioning Activities																					
2a.1.1	Quarterly Inspection									a											
2a.1.2	Semi-annual environmental survey									a											
2a.1.3	Prepare reports									a											
2a.1.4	Bituminous roof replacement	-	-	-	-	-	-	600	90	690	690	-	-	-	-	-	-	-	-	-	-
2a.1.5	Maintenance supplies	-	-	-	-	-	-	511	128	639	639	-	-	-	-	-	-	-	-	-	-
2a.1	Subtotal Period 2a Activity Costs	-	-	-	-	-	-	1,111	218	1,329	1,329	-	-	-	-	-	-	-	-	-	-
Period 2a Collateral Costs																					
2a.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	45,072	6,761	51,833	-	51,833	-	-	-	-	-	-	-	-	-
2a.3	Subtotal Period 2a Collateral Costs	-	-	-	-	-	-	45,072	6,761	51,833	-	51,833	-	-	-	-	-	-	-	-	-
Period 2a Period-Dependent Costs																					
2a.4.1	Insurance	-	-	-	-	-	-	1,926	193	2,119	1,954	165	-	-	-	-	-	-	-	-	-
2a.4.2	Property taxes	-	-	-	-	-	-	2,986	299	3,285	3,285	-	-	-	-	-	-	-	-	-	-
2a.4.3	Health physics supplies	-	327	-	-	-	-	-	82	409	409	-	-	-	-	-	-	-	-	-	-
2a.4.4	Disposal of DAW generated	-	-	3	3	-	94	-	24	124	124	-	-	-	1,677	-	-	-	33,549	8	-

Table E
Three Mile Island, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes: Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 2a Period-Dependent Costs (continued)																					
2a.4.5	Plant energy budget	-	-	-	-	-	-	1,186	178	1,364	682	682	-	-	-	-	-	-	-	-	-
2a.4.6	NRC Fees	-	-	-	-	-	-	905	91	996	996	-	-	-	-	-	-	-	-	-	-
2a.4.7	Emergency Planning Fees	-	-	-	-	-	-	813	81	894	-	894	-	-	-	-	-	-	-	-	-
2a.4.8	Site O&M Costs	-	-	-	-	-	-	1,016	152	1,168	1,168	-	-	-	-	-	-	-	-	-	-
2a.4.9	Spent Fuel Pool O&M	-	-	-	-	-	-	3,031	455	3,485	-	3,485	-	-	-	-	-	-	-	-	-
2a.4.10	ISFSI Operating Costs	-	-	-	-	-	-	345	52	397	-	397	-	-	-	-	-	-	-	-	-
2a.4.11	Security Staff Cost	-	-	-	-	-	-	15,778	2,367	18,145	3,053	15,092	-	-	-	-	-	-	-	-	451,560
2a.4.12	Utility Staff Cost	-	-	-	-	-	-	21,144	3,172	24,316	5,403	18,913	-	-	-	-	-	-	-	-	334,960
2a.4	Subtotal Period 2a Period-Dependent Costs	-	327	3	3	-	94	49,130	7,144	56,701	17,074	39,627	-	-	1,677	-	-	-	33,549	8	786,520
2a.0	TOTAL PERIOD 2a COST	-	327	3	3	-	94	95,314	14,123	109,863	18,403	91,460	-	-	1,677	-	-	-	33,549	8	786,520
PERIOD 2b - SAFSTOR Dormancy with Dry Spent Fuel Storage																					
Period 2b Direct Decommissioning Activities																					
2b.1.1	Quarterly Inspection									a											
2b.1.2	Semi-annual environmental survey									a											
2b.1.3	Prepare reports									a											
2b.1.4	Bituminous roof replacement	-	-	-	-	-	-	1,350	203	1,553	1,553	-	-	-	-	-	-	-	-	-	-
2b.1.5	Maintenance supplies	-	-	-	-	-	-	1,150	287	1,437	1,437	-	-	-	-	-	-	-	-	-	-
2b.1	Subtotal Period 2b Activity Costs	-	-	-	-	-	-	2,500	490	2,990	2,990	-	-	-	-	-	-	-	-	-	-
Period 2b Collateral Costs																					
2b.3.1	Spent Fuel Capital and Transfer	-	-	-	-	-	-	7,750	1,163	8,913	-	8,913	-	-	-	-	-	-	-	-	-
2b.3	Subtotal Period 2b Collateral Costs	-	-	-	-	-	-	7,750	1,163	8,913	-	8,913	-	-	-	-	-	-	-	-	-
Period 2b Period-Dependent Costs																					
2b.4.1	Insurance	-	-	-	-	-	-	4,073	407	4,480	4,395	86	-	-	-	-	-	-	-	-	-
2b.4.2	Property taxes	-	-	-	-	-	-	6,717	672	7,389	7,389	-	-	-	-	-	-	-	-	-	-
2b.4.3	Health physics supplies	-	617	-	-	-	-	-	154	771	771	-	-	-	-	-	-	-	-	-	-
2b.4.4	Disposal of DAW generated	-	-	6	7	-	196	-	51	260	260	-	-	-	3,514	-	-	-	70,285	16	-
2b.4.5	Plant energy budget	-	-	-	-	-	-	1,334	200	1,534	1,534	-	-	-	-	-	-	-	-	-	-
2b.4.6	NRC Fees	-	-	-	-	-	-	2,037	204	2,240	2,240	-	-	-	-	-	-	-	-	-	-
2b.4.7	Emergency Planning Fees	-	-	-	-	-	-	1,828	183	2,011	-	2,011	-	-	-	-	-	-	-	-	-
2b.4.8	Site O&M Costs	-	-	-	-	-	-	2,285	343	2,627	2,627	-	-	-	-	-	-	-	-	-	-
2b.4.9	ISFSI Operating Costs	-	-	-	-	-	-	776	116	893	-	893	-	-	-	-	-	-	-	-	-
2b.4.10	Security Staff Cost	-	-	-	-	-	-	19,330	2,899	22,229	6,867	15,362	-	-	-	-	-	-	-	-	515,006
2b.4.11	Utility Staff Cost	-	-	-	-	-	-	19,634	2,945	22,579	12,153	10,426	-	-	-	-	-	-	-	-	305,189
2b.4	Subtotal Period 2b Period-Dependent Costs	-	617	6	7	-	196	58,013	8,174	67,014	38,236	28,777	-	-	3,514	-	-	-	70,285	16	820,194
2b.0	TOTAL PERIOD 2b COST	-	617	6	7	-	196	68,263	9,827	78,916	41,226	37,690	-	-	3,514	-	-	-	70,285	16	820,194
PERIOD 2c - SAFSTOR Dormancy without Spent Fuel Storage																					
Period 2c Direct Decommissioning Activities																					
2c.1.1	Quarterly Inspection									a											
2c.1.2	Semi-annual environmental survey									a											
2c.1.3	Prepare reports									a											
2c.1.4	Bituminous roof replacement	-	-	-	-	-	-	5,824	874	6,697	6,697	-	-	-	-	-	-	-	-	-	-
2c.1.5	Maintenance supplies	-	-	-	-	-	-	4,958	1,239	6,197	6,197	-	-	-	-	-	-	-	-	-	-
2c.1	Subtotal Period 2c Activity Costs	-	-	-	-	-	-	10,782	2,113	12,895	12,895	-	-	-	-	-	-	-	-	-	-
Period 2c Period-Dependent Costs																					
2c.4.1	Insurance	-	-	-	-	-	-	17,230	1,723	18,953	18,953	-	-	-	-	-	-	-	-	-	-
2c.4.2	Property taxes	-	-	-	-	-	-	28,969	2,897	31,866	31,866	-	-	-	-	-	-	-	-	-	-
2c.4.3	Health physics supplies	-	2,504	-	-	-	-	-	626	3,129	3,129	-	-	-	-	-	-	-	-	-	-

Table E
Three Mile Island, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 2c Period-Dependent Costs (continued)																					
2c.4.4	Disposal of DAW generated	-	-	25	29	-	826	-	213	1,094	1,094	-	-	-	14,812	-	-	-	296,234	68	-
2c.4.5	Plant energy budget	-	-	-	-	-	-	5,753	863	6,616	6,616	-	-	-	-	-	-	-	-	-	-
2c.4.6	NRC Fees	-	-	-	-	-	-	8,033	803	8,836	8,836	-	-	-	-	-	-	-	-	-	-
2c.4.7	Site O&M Costs	-	-	-	-	-	-	9,853	1,478	11,332	11,332	-	-	-	-	-	-	-	-	-	-
2c.4.8	Security Staff Cost	-	-	-	-	-	-	25,753	3,863	29,616	29,616	-	-	-	-	-	-	-	-	-	616,971
2c.4.9	Utility Staff Cost	-	-	-	-	-	-	45,578	6,837	52,414	52,414	-	-	-	-	-	-	-	-	-	719,800
2c.4	Subtotal Period 2c Period-Dependent Costs	-	2,504	25	29	-	826	141,169	19,303	163,856	163,856	-	-	-	14,812	-	-	-	296,234	68	1,336,771
2c.0	TOTAL PERIOD 2c COST	-	2,504	25	29	-	826	151,951	21,416	176,750	176,750	-	-	-	14,812	-	-	-	296,234	68	1,336,771
PERIOD 2 TOTALS		-	3,448	33	39	-	1,116	315,527	45,365	365,529	236,379	129,150	-	-	20,003	-	-	-	400,067	92	2,943,486
PERIOD 3a - Reactivate Site Following SAFSTOR Dormancy																					
Period 3a Direct Decommissioning Activities																					
3a.1.1	Prepare preliminary decommissioning cost	-	-	-	-	-	-	149	22	171	171	-	-	-	-	-	-	-	-	-	1,300
3a.1.2	Review plant dwgs & specs.	-	-	-	-	-	-	526	79	604	604	-	-	-	-	-	-	-	-	-	4,600
3a.1.3	Perform detailed rad survey									a											
3a.1.4	End product description	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
3a.1.5	Detailed by-product inventory	-	-	-	-	-	-	149	22	171	171	-	-	-	-	-	-	-	-	-	1,300
3a.1.6	Define major work sequence	-	-	-	-	-	-	857	129	985	985	-	-	-	-	-	-	-	-	-	7,500
3a.1.7	Perform SER and EA	-	-	-	-	-	-	354	53	407	407	-	-	-	-	-	-	-	-	-	3,100
3a.1.8	Perform Site-Specific Cost Study	-	-	-	-	-	-	571	86	657	657	-	-	-	-	-	-	-	-	-	5,000
3a.1.9	Prepare/submit License Termination Plan	-	-	-	-	-	-	468	70	538	538	-	-	-	-	-	-	-	-	-	4,096
3a.1.10	Receive NRC approval of termination plan									a											
Activity Specifications																					
3a.1.11.1	Re-activate plant & temporary facilities	-	-	-	-	-	-	842	126	968	871	-	97	-	-	-	-	-	-	-	7,370
3a.1.11.2	Plant systems	-	-	-	-	-	-	476	71	547	493	-	55	-	-	-	-	-	-	-	4,167
3a.1.11.3	Reactor internals	-	-	-	-	-	-	811	122	933	933	-	-	-	-	-	-	-	-	-	7,100
3a.1.11.4	Reactor vessel	-	-	-	-	-	-	743	111	854	854	-	-	-	-	-	-	-	-	-	6,500
3a.1.11.5	Biological shield	-	-	-	-	-	-	57	9	66	66	-	-	-	-	-	-	-	-	-	500
3a.1.11.6	Steam generators	-	-	-	-	-	-	356	53	410	410	-	-	-	-	-	-	-	-	-	3,120
3a.1.11.7	Reinforced concrete	-	-	-	-	-	-	183	27	210	105	-	105	-	-	-	-	-	-	-	1,600
3a.1.11.8	Main Turbine	-	-	-	-	-	-	46	7	53	-	-	53	-	-	-	-	-	-	-	400
3a.1.11.9	Main Condensers	-	-	-	-	-	-	46	7	53	-	-	53	-	-	-	-	-	-	-	400
3a.1.11.10	Plant structures & buildings	-	-	-	-	-	-	356	53	410	205	-	205	-	-	-	-	-	-	-	3,120
3a.1.11.11	Waste management	-	-	-	-	-	-	526	79	604	604	-	-	-	-	-	-	-	-	-	4,600
3a.1.11.12	Facility & site closeout	-	-	-	-	-	-	103	15	118	59	-	59	-	-	-	-	-	-	-	900
3a.1.11	Total	-	-	-	-	-	-	4,544	682	5,226	4,600	-	626	-	-	-	-	-	-	-	39,777
Planning & Site Preparations																					
3a.1.12	Prepare dismantling sequence	-	-	-	-	-	-	274	41	315	315	-	-	-	-	-	-	-	-	-	2,400
3a.1.13	Plant prep. & temp. svces	-	-	-	-	-	-	2,419	363	2,782	2,782	-	-	-	-	-	-	-	-	-	-
3a.1.14	Design water clean-up system	-	-	-	-	-	-	160	24	184	184	-	-	-	-	-	-	-	-	-	1,400
3a.1.15	Rigging/Cont. Cntrl Envlps/tooling/etc.	-	-	-	-	-	-	2,048	307	2,355	2,355	-	-	-	-	-	-	-	-	-	-
3a.1.16	Procure casks/liners & containers	-	-	-	-	-	-	141	21	162	162	-	-	-	-	-	-	-	-	-	1,230
3a.1	Subtotal Period 3a Activity Costs	-	-	-	-	-	-	12,773	1,916	14,689	14,063	-	626	-	-	-	-	-	-	-	72,703
Period 3a Period-Dependent Costs																					
3a.4.1	Insurance	-	-	-	-	-	-	437	44	481	481	-	-	-	-	-	-	-	-	-	-
3a.4.2	Property taxes	-	-	-	-	-	-	734	73	808	808	-	-	-	-	-	-	-	-	-	-
3a.4.3	Health physics supplies	-	303	-	-	-	-	-	76	379	379	-	-	-	-	-	-	-	-	-	-
3a.4.4	Heavy equipment rental	-	346	-	-	-	-	-	52	397	397	-	-	-	-	-	-	-	-	-	-
3a.4.5	Disposal of DAW generated	-	-	1	1	-	29	-	7	38	38	-	-	-	514	-	-	-	10,287	2	-

Table E
Three Mile Island, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes: Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 3a Period-Dependent Costs (continued)																					
3a.4.6	Plant energy budget	-	-	-	-	-	-	1,459	219	1,677	1,677	-	-	-	-	-	-	-	-	-	-
3a.4.7	NRC Fees	-	-	-	-	-	-	270	27	297	297	-	-	-	-	-	-	-	-	-	-
3a.4.8	Site O&M Costs	-	-	-	-	-	-	250	37	287	287	-	-	-	-	-	-	-	-	-	-
3a.4.9	Security Staff Cost	-	-	-	-	-	-	1,301	195	1,496	1,496	-	-	-	-	-	-	-	-	-	35,728
3a.4.10	Utility Staff Cost	-	-	-	-	-	-	16,970	2,545	19,515	19,515	-	-	-	-	-	-	-	-	-	258,629
3a.4	Subtotal Period 3a Period-Dependent Costs	-	649	1	1	-	29	21,420	3,276	25,376	25,376	-	-	-	514	-	-	-	10,287	2	294,357
3a.0	TOTAL PERIOD 3a COST	-	649	1	1	-	29	34,194	5,192	40,065	39,439	-	626	-	514	-	-	-	10,287	2	367,060
PERIOD 3b - Decommissioning Preparations																					
Period 3b Direct Decommissioning Activities																					
Detailed Work Procedures																					
3b.1.1.1	Plant systems	-	-	-	-	-	-	541	81	622	560	-	62	-	-	-	-	-	-	-	4,733
3b.1.1.2	Reactor internals	-	-	-	-	-	-	286	43	328	328	-	-	-	-	-	-	-	-	-	2,500
3b.1.1.3	Remaining buildings	-	-	-	-	-	-	154	23	177	44	-	133	-	-	-	-	-	-	-	1,350
3b.1.1.4	CRD cooling assembly	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.5	CRD housings & ICI tubes	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.6	Incore instrumentation	-	-	-	-	-	-	114	17	131	131	-	-	-	-	-	-	-	-	-	1,000
3b.1.1.7	Reactor vessel	-	-	-	-	-	-	415	62	477	477	-	-	-	-	-	-	-	-	-	3,630
3b.1.1.8	Facility closeout	-	-	-	-	-	-	137	21	158	79	-	79	-	-	-	-	-	-	-	1,200
3b.1.1.9	Missile shields	-	-	-	-	-	-	51	8	59	59	-	-	-	-	-	-	-	-	-	450
3b.1.1.10	Biological shield	-	-	-	-	-	-	137	21	158	158	-	-	-	-	-	-	-	-	-	1,200
3b.1.1.11	Steam generators	-	-	-	-	-	-	526	79	604	604	-	-	-	-	-	-	-	-	-	4,600
3b.1.1.12	Reinforced concrete	-	-	-	-	-	-	114	17	131	66	-	66	-	-	-	-	-	-	-	1,000
3b.1.1.13	Main Turbine	-	-	-	-	-	-	178	27	205	-	-	205	-	-	-	-	-	-	-	1,560
3b.1.1.14	Main Condensers	-	-	-	-	-	-	178	27	205	-	-	205	-	-	-	-	-	-	-	1,560
3b.1.1.15	Auxiliary building	-	-	-	-	-	-	312	47	359	323	-	36	-	-	-	-	-	-	-	2,730
3b.1.1.16	Reactor building	-	-	-	-	-	-	312	47	359	323	-	36	-	-	-	-	-	-	-	2,730
3b.1.1	Total	-	-	-	-	-	-	3,684	553	4,236	3,415	-	821	-	-	-	-	-	-	-	32,243
3b.1	Subtotal Period 3b Activity Costs	-	-	-	-	-	-	3,684	553	4,236	3,415	-	821	-	-	-	-	-	-	-	32,243
Period 3b Additional Costs																					
3b.2.1	Site Characterization	-	-	-	-	-	-	3,373	1,012	4,385	4,385	-	-	-	-	-	-	-	-	19,100	7,852
3b.2	Subtotal Period 3b Additional Costs	-	-	-	-	-	-	3,373	1,012	4,385	4,385	-	-	-	-	-	-	-	-	19,100	7,852
Period 3b Collateral Costs																					
3b.3.1	Decon equipment	667	-	-	-	-	-	-	100	767	767	-	-	-	-	-	-	-	-	-	-
3b.3.2	DOC staff relocation expenses	-	-	-	-	-	-	1,113	167	1,280	1,280	-	-	-	-	-	-	-	-	-	-
3b.3.3	Pipe cutting equipment	-	957	-	-	-	-	-	143	1,100	1,100	-	-	-	-	-	-	-	-	-	-
3b.3	Subtotal Period 3b Collateral Costs	667	957	-	-	-	-	1,113	411	3,148	3,148	-	-	-	-	-	-	-	-	-	-
Period 3b Period-Dependent Costs																					
3b.4.1	Decon supplies	20	-	-	-	-	-	-	5	26	26	-	-	-	-	-	-	-	-	-	-
3b.4.2	Insurance	-	-	-	-	-	-	238	24	261	261	-	-	-	-	-	-	-	-	-	-
3b.4.3	Property taxes	-	-	-	-	-	-	368	37	405	405	-	-	-	-	-	-	-	-	-	-
3b.4.4	Health physics supplies	-	167	-	-	-	-	-	42	209	209	-	-	-	-	-	-	-	-	-	-
3b.4.5	Heavy equipment rental	-	173	-	-	-	-	-	26	199	199	-	-	-	-	-	-	-	-	-	-
3b.4.6	Disposal of DAW generated	-	-	0	1	-	16	-	4	22	22	-	-	-	292	-	-	-	5,834	1	-
3b.4.7	Plant energy budget	-	-	-	-	-	-	731	110	841	841	-	-	-	-	-	-	-	-	-	-
3b.4.8	NRC Fees	-	-	-	-	-	-	135	14	149	149	-	-	-	-	-	-	-	-	-	-
3b.4.9	Site O&M Costs	-	-	-	-	-	-	125	19	144	144	-	-	-	-	-	-	-	-	-	-
3b.4.10	Security Staff Cost	-	-	-	-	-	-	652	98	750	750	-	-	-	-	-	-	-	-	-	17,913
3b.4.11	DOC Staff Cost	-	-	-	-	-	-	4,604	691	5,295	5,295	-	-	-	-	-	-	-	-	-	58,560

Table E
Three Mile Island, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 3b Period-Dependent Costs (continued)																					
3b.4.12	Utility Staff Cost	-	-	-	-	-	-	8,508	1,276	9,784	9,784	-	-	-	-	-	-	-	-	-	129,669
3b.4	Subtotal Period 3b Period-Dependent Costs	20	341	0	1	-	16	15,362	2,344	18,085	18,085	-	-	-	292	-	-	-	5,834	1	206,142
3b.0	TOTAL PERIOD 3b COST	688	1,297	0	1	-	16	23,532	4,319	29,854	29,033	-	821	-	292	-	-	-	5,834	19,101	246,237
PERIOD 3 TOTALS		688	1,946	1	2	-	45	57,726	9,511	69,919	68,472	-	1,447	-	806	-	-	-	16,121	19,104	613,296
PERIOD 4a - Large Component Removal																					
Period 4a Direct Decommissioning Activities																					
Nuclear Steam Supply System Removal																					
4a.1.1.1	Reactor Coolant Piping	19	78	11	18	50	81	-	61	319	319	-	-	413	413	-	-	-	95,775	2,227	-
4a.1.1.2	Pressurizer Relief Tank	3	11	2	4	11	17	-	11	60	60	-	-	94	94	-	-	-	20,849	307	-
4a.1.1.3	Reactor Coolant Pumps & Motors	25	74	35	162	73	1,398	-	419	2,186	2,186	-	-	509	8,974	-	-	-	925,540	4,386	-
4a.1.1.4	Pressurizer	6	51	483	596	-	551	-	291	1,979	1,979	-	-	-	2,588	-	-	-	338,550	1,794	1,500
4a.1.1.5	Steam Generators	30	5,424	1,107	1,940	-	4,640	-	2,933	16,073	16,073	-	-	-	11,714	-	-	-	2,850,879	10,254	2,250
4a.1.1.6	Retired Steam Generator Units	-	-	668	1,940	-	4,640	-	1,518	8,765	8,765	-	-	-	11,714	-	-	-	2,850,879	5,400	2,250
4a.1.1.7	CRDMs/ICIs/Service Structure Removal	15	75	171	68	-	98	-	78	505	505	-	-	-	3,002	-	-	-	59,894	1,847	-
4a.1.1.8	Reactor Vessel Internals	39	2,042	3,098	649	-	3,558	148	4,289	13,824	13,824	-	-	-	1,329	250	517	-	221,325	17,467	831
4a.1.1.9	Vessel & Internals GTCC Disposal	-	-	-	-	-	12,289	-	1,843	14,133	14,133	-	-	-	-	-	-	580	105,646	-	-
4a.1.1.10	Reactor Vessel	-	4,651	857	483	-	2,590	148	5,140	13,868	13,868	-	-	-	7,148	2,573	-	-	986,490	17,467	831
4a.1.1	Totals	137	12,407	6,431	5,861	135	29,862	296	16,583	71,712	71,712	-	-	1,016	46,976	2,824	517	580	8,455,827	61,149	7,661
Removal of Major Equipment																					
4a.1.2	*Main Turbine/Generator*	-	259	89	49	333	-	-	131	861	861	-	-	6,730	-	-	-	-	302,857	5,654	-
4a.1.3	Main Condensers	-	1,020	70	39	263	-	-	307	1,699	1,699	-	-	5,310	-	-	-	-	238,934	22,942	-
Cascading Costs from Clean Building Demolition																					
4a.1.4.1	Reactor	-	690	-	-	-	-	-	104	794	794	-	-	-	-	-	-	-	-	9,845	-
4a.1.4.2	Auxiliary	-	243	-	-	-	-	-	36	280	280	-	-	-	-	-	-	-	-	3,371	-
4a.1.4.3	Fuel Handling	-	317	-	-	-	-	-	48	365	365	-	-	-	-	-	-	-	-	4,242	-
4a.1.4	Totals	-	1,251	-	-	-	-	-	188	1,439	1,439	-	-	-	-	-	-	-	-	17,458	-
Disposal of Plant Systems																					
4a.1.5.1	CNTL-TWR-285_PROCESS	-	58	2	10	70	-	-	27	166	166	-	-	1,564	-	-	-	-	63,529	1,278	-
4a.1.5.2	CNTL-TWR-305_BURY	-	69	6	13	-	46	-	31	164	164	-	-	-	420	-	-	-	37,709	1,444	-
4a.1.5.3	CNTL-TWR-305_PROCESS	-	47	1	4	26	-	-	16	93	93	-	-	587	-	-	-	-	23,851	1,050	-
4a.1.5.4	CNTL-TWR-322_CLEAN	-	177	-	-	-	-	-	27	203	-	-	203	-	-	-	-	-	-	4,257	-
4a.1.5.5	CNTL-TWR-338_CLEAN	-	128	-	-	-	-	-	19	147	-	-	147	-	-	-	-	-	-	3,122	-
4a.1.5.6	CNTL-TWR-355_CLEAN	-	20	-	-	-	-	-	3	23	-	-	23	-	-	-	-	-	-	545	-
4a.1.5.7	CNTL-TWR-380_CLEAN	-	38	-	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	1,001	-
4a.1.5.8	CNTL-TWR-388_CLEAN	-	10	-	-	-	-	-	2	12	-	-	12	-	-	-	-	-	-	245	-
4a.1.5.9	IB-295_BURY	-	55	5	9	-	31	-	23	123	123	-	-	-	285	-	-	-	25,568	1,217	-
4a.1.5.10	IB-295_CLEAN	-	46	-	-	-	-	-	7	53	-	-	53	-	-	-	-	-	-	1,100	-
4a.1.5.11	IB-295_PROCESS	-	222	5	35	234	-	-	96	592	592	-	-	5,231	-	-	-	-	212,426	4,930	-
4a.1.5.12	IB-305_BURY	-	30	2	5	-	18	-	13	69	69	-	-	-	169	-	-	-	15,164	647	-
4a.1.5.13	IB-305_PROCESS	-	187	3	18	122	-	-	68	398	398	-	-	2,731	-	-	-	-	110,888	4,073	-
4a.1.5.14	IB-322_BURY	-	11	1	2	-	8	-	5	28	28	-	-	-	74	-	-	-	6,642	247	-
4a.1.5.15	IB-322_CLEAN	-	38	-	-	-	-	-	6	44	-	-	44	-	-	-	-	-	-	896	-
4a.1.5.16	IB-322_PROCESS	-	481	12	77	522	-	-	211	1,303	1,303	-	-	11,682	-	-	-	-	474,418	10,690	-
4a.1.5.17	IB-355_PROCESS	-	54	1	8	54	-	-	23	140	140	-	-	1,207	-	-	-	-	49,022	1,185	-
4a.1.5.18	IB-ROOF_PROCESS	-	15	1	5	31	-	-	9	60	60	-	-	689	-	-	-	-	27,993	340	-
4a.1.5.19	OCA_CLEAN	-	814	-	-	-	-	-	122	936	-	-	936	-	-	-	-	-	-	19,978	-
4a.1.5.20	OCA_PROCESS	-	87	1	5	37	-	-	28	158	158	-	-	828	-	-	-	-	33,630	1,913	-
4a.1.5.21	OOB_CLEAN	-	9	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	252	-

Table E
Three Mile Island, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Disposal of Plant Systems (continued)																					
4a.1.5.22	TB-305-E_BURY	-	136	13	23	-	83	-	59	314	314	-	-	-	765	-	-	-	88,600	2,953	-
4a.1.5.23	TB-305-E_CLEAN	-	187	-	-	-	-	-	28	215	-	-	215	-	-	-	-	-	-	4,738	-
4a.1.5.24	TB-305-E_PROCESS	-	425	16	104	701	-	-	228	1,474	1,474	-	-	15,700	-	-	-	-	637,566	9,513	-
4a.1.5.25	TB-305-W_BURY	-	96	9	18	-	65	-	44	232	232	-	-	-	599	-	-	-	53,703	2,113	-
4a.1.5.26	TB-305-W_CLEAN	-	222	-	-	-	-	-	33	256	-	-	256	-	-	-	-	-	-	5,764	-
4a.1.5.27	TB-305-W_GIC	-	87	-	-	-	-	-	13	100	-	-	100	-	-	-	-	-	-	2,150	-
4a.1.5.28	TB-305-W_PROCESS	-	790	30	197	1,336	-	-	430	2,784	2,784	-	-	29,913	-	-	-	-	1,214,787	17,675	-
4a.1.5.29	TB-322-E_CLEAN	-	79	-	-	-	-	-	12	91	-	-	91	-	-	-	-	-	-	1,960	-
4a.1.5.30	TB-322-E_GIC	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	121	-
4a.1.5.31	TB-322-E_PROCESS	-	483	21	134	909	-	-	279	1,827	1,827	-	-	20,352	-	-	-	-	826,490	10,932	-
4a.1.5.32	TB-322-W_CLEAN	-	142	-	-	-	-	-	21	163	-	-	163	-	-	-	-	-	-	3,474	-
4a.1.5.33	TB-322-W_GIC	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	386	-
4a.1.5.34	TB-322-W_PROCESS	-	464	42	276	1,864	-	-	441	3,087	3,087	-	-	41,730	-	-	-	-	1,694,677	10,620	-
4a.1.5.35	TB-355-E_CLEAN	-	6	-	-	-	-	-	1	7	-	-	7	-	-	-	-	-	-	147	-
4a.1.5.36	TB-355-W_CLEAN	-	23	-	-	-	-	-	3	27	-	-	27	-	-	-	-	-	-	572	-
4a.1.5.37	TB-355-W_GIC	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	46	-
4a.1.5.38	TB-355-W_PROCESS	-	460	15	95	644	-	-	227	1,441	1,441	-	-	14,408	-	-	-	-	585,109	10,445	-
4a.1.5.39	TB-380_CLEAN	-	15	-	-	-	-	-	2	17	-	-	17	-	-	-	-	-	-	364	-
4a.1.5.40	TB-380_PROCESS	-	407	12	78	530	-	-	194	1,222	1,222	-	-	11,873	-	-	-	-	482,176	9,218	-
4a.1.5.41	TB-ROOF_CLEAN	-	21	-	-	-	-	-	3	24	-	-	24	-	-	-	-	-	-	497	-
4a.1.5	Totals	-	6,660	196	1,117	7,080	251	-	2,769	18,072	15,677	-	2,395	158,495	2,313	-	-	-	6,643,948	154,095	-
4a.1.6	Scaffolding in support of decommissioning	-	702	9	5	33	-	-	182	931	931	-	-	665	-	-	-	-	29,926	19,349	-
4a.1	Subtotal Period 4a Activity Costs	137	22,299	6,795	7,070	7,844	30,113	296	20,160	94,715	92,320	-	2,395	172,216	49,288	2,824	517	580	15,671,490	280,647	7,661
Period 4a Additional Costs																					
4a.2.1	Turbine Bldg GIC Waste Disposition	-	-	-	85	232	-	-	43	360	360	-	-	10,108	-	-	-	-	454,855	-	-
4a.2	Subtotal Period 4a Additional Costs	-	-	-	85	232	-	-	43	360	360	-	-	10,108	-	-	-	-	454,855	-	-
Period 4a Collateral Costs																					
4a.3.1	Process liquid waste	30	-	11	94	-	69	-	48	252	252	-	-	-	241	-	-	-	14,482	47	-
4a.3.2	Small tool allowance	-	169	-	-	-	-	-	25	194	175	-	19	-	-	-	-	-	-	-	-
4a.3	Subtotal Period 4a Collateral Costs	30	169	11	94	-	69	-	73	446	427	-	19	-	241	-	-	-	14,482	47	-
Period 4a Period-Dependant Costs																					
4a.4.1	Decon supplies	44	-	-	-	-	-	-	11	55	55	-	-	-	-	-	-	-	-	-	-
4a.4.2	Insurance	-	-	-	-	-	-	515	52	567	567	-	-	-	-	-	-	-	-	-	-
4a.4.3	Property taxes	-	-	-	-	-	-	799	80	879	791	-	88	-	-	-	-	-	-	-	-
4a.4.4	Health physics supplies	-	1,274	-	-	-	-	-	318	1,592	1,592	-	-	-	-	-	-	-	-	-	-
4a.4.5	Heavy equipment rental	-	1,808	-	-	-	-	-	271	2,079	2,079	-	-	-	-	-	-	-	-	-	-
4a.4.6	Disposal of DAW generated	-	-	6	7	-	211	-	55	280	280	-	-	-	3,785	-	-	-	75,699	17	-
4a.4.7	Plant energy budget	-	-	-	-	-	-	1,507	226	1,733	1,733	-	-	-	-	-	-	-	-	-	-
4a.4.8	NRC Fees	-	-	-	-	-	-	739	74	813	813	-	-	-	-	-	-	-	-	-	-
4a.4.9	Site O&M Costs	-	-	-	-	-	-	272	41	312	312	-	-	-	-	-	-	-	-	-	-
4a.4.10	Radwaste Processing Equipment/Services	-	-	-	-	-	-	408	61	469	469	-	-	-	-	-	-	-	-	-	-
4a.4.11	Security Staff Cost	-	-	-	-	-	-	1,506	226	1,732	1,732	-	-	-	-	-	-	-	-	-	41,696
4a.4.12	DOC Staff Cost	-	-	-	-	-	-	12,086	1,813	13,899	13,899	-	-	-	-	-	-	-	-	-	156,531
4a.4.13	Utility Staff Cost	-	-	-	-	-	-	18,620	2,793	21,414	21,414	-	-	-	-	-	-	-	-	-	283,571
4a.4	Subtotal Period 4a Period-Dependent Costs	44	3,081	6	7	-	211	36,453	6,020	45,824	45,736	-	88	-	3,785	-	-	-	75,699	17	481,799
4a.0	TOTAL PERIOD 4a COST	212	25,548	6,813	7,258	8,078	30,393	36,749	26,297	141,345	138,842	-	2,503	182,324	53,315	2,824	517	580	16,216,530	280,712	489,461

Table E
Three Mile Island, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
PERIOD 4b - Site Decontamination																					
Period 4b Direct Decommissioning Activities																					
4b.1.1	Remove spent fuel racks	297	41	105	83	-	294	-	255	1,074	1,074	-	-	-	2,707	-	-	-	242,924	1,056	-
Disposal of Plant Systems																					
4b.1.2.1	AB-261_BURY	-	126	24	56	-	200	-	92	499	499	-	-	-	1,844	-	-	-	165,398	2,914	-
4b.1.2.2	AB-261_PROCESS	-	60	1	9	64	-	-	26	162	162	-	-	1,436	-	-	-	-	58,327	1,367	-
4b.1.2.3	AB-271_BURY	-	74	12	27	-	98	-	48	259	259	-	-	-	898	-	-	-	80,591	1,683	-
4b.1.2.4	AB-271_PROCESS	-	103	5	34	229	-	-	86	437	437	-	-	5,133	-	-	-	-	208,455	2,424	-
4b.1.2.5	AB-281-1_BURY	-	413	67	123	-	438	-	238	1,278	1,278	-	-	-	4,978	-	-	-	362,114	9,277	-
4b.1.2.6	AB-281-1_PROCESS	-	4	0	0	2	-	-	1	8	8	-	-	42	-	-	-	-	1,725	100	-
4b.1.2.7	AB-281-2_BURY	-	567	87	165	-	587	-	322	1,727	1,727	-	-	-	6,052	-	-	-	484,727	12,421	-
4b.1.2.8	AB-281-2_PROCESS	-	375	5	33	223	-	-	133	768	768	-	-	4,984	-	-	-	-	202,399	8,273	-
4b.1.2.9	AB-281-3_BURY	-	117	9	17	-	59	-	47	248	248	-	-	-	544	-	-	-	48,749	2,582	-
4b.1.2.10	AB-281-3_PROCESS	-	50	1	3	22	-	-	16	93	93	-	-	500	-	-	-	-	20,292	1,114	-
4b.1.2.11	AB-305-1_BURY	-	86	33	81	-	288	-	109	596	596	-	-	-	2,650	-	-	-	237,727	1,877	-
4b.1.2.12	AB-305-1_PROCESS	-	26	0	2	14	-	-	9	51	51	-	-	303	-	-	-	-	12,298	558	-
4b.1.2.13	AB-305-2_BURY	-	183	23	44	-	155	-	93	498	498	-	-	-	1,555	-	-	-	128,368	3,977	-
4b.1.2.14	AB-305-2_PROCESS	-	319	6	39	263	-	-	125	751	751	-	-	5,878	-	-	-	-	238,721	7,092	-
4b.1.2.15	AB-305-3_BURY	-	74	7	11	-	40	-	31	162	162	-	-	-	368	-	-	-	32,987	1,629	-
4b.1.2.16	AB-331_BURY	-	31	4	7	-	25	-	15	82	82	-	-	-	251	-	-	-	20,665	678	-
4b.1.2.17	AB-331_PROCESS	-	129	2	13	88	-	-	48	280	280	-	-	1,967	-	-	-	-	79,879	2,818	-
4b.1.2.18	CC-305_BURY	-	441	63	114	-	405	-	235	1,257	1,257	-	-	-	4,613	-	-	-	334,678	9,825	-
4b.1.2.19	DG-305_BURY	-	44	8	14	-	48	-	26	140	140	-	-	-	565	-	-	-	39,762	987	-
4b.1.2.20	DG-305_CLEAN	-	100	-	-	-	-	-	15	115	-	-	115	-	-	-	-	-	-	2,441	-
4b.1.2.21	FHB-281_BURY	-	161	24	44	-	157	-	88	474	474	-	-	-	1,611	-	-	-	129,564	3,528	-
4b.1.2.22	FHB-281_PROCESS	-	140	2	11	74	-	-	48	275	275	-	-	1,667	-	-	-	-	67,683	3,100	-
4b.1.2.23	FHB-305_BURY	-	51	6	12	-	43	-	26	137	137	-	-	-	405	-	-	-	35,492	1,125	-
4b.1.2.24	FHB-305_PROCESS	-	68	2	7	34	8	-	25	145	145	-	-	766	73	-	-	-	37,657	1,529	-
4b.1.2.25	FHB-329_BURY	-	14	1	2	-	6	-	5	28	28	-	-	-	57	-	-	-	5,081	303	-
4b.1.2.26	FHB-329_PROCESS	-	11	0	1	4	2	-	4	23	23	-	-	91	21	-	-	-	5,574	249	-
4b.1.2.27	FHB-348_BURY	-	64	13	29	-	102	-	47	255	255	-	-	-	943	-	-	-	83,967	1,400	-
4b.1.2.28	FHB-348_PROCESS	-	30	1	3	15	3	-	11	63	63	-	-	344	30	-	-	-	16,521	643	-
4b.1.2.29	INTAKE_CLEAN	-	221	-	-	-	-	-	33	254	-	-	254	-	-	-	-	-	-	5,603	-
4b.1.2.30	IWT-303_PROCESS	-	906	18	117	789	-	-	364	2,193	2,193	-	-	17,653	-	-	-	-	716,882	19,868	-
4b.1.2.31	OCA_BURY	-	430	99	165	-	587	-	289	1,569	1,569	-	-	-	7,233	-	-	-	485,016	9,645	-
4b.1.2.32	PA-301_BURY	-	183	37	62	-	220	-	109	590	590	-	-	-	2,743	-	-	-	181,570	3,657	-
4b.1.2.33	PA-301_CLEAN	-	247	-	-	-	-	-	37	284	-	-	284	-	-	-	-	-	-	5,969	-
4b.1.2.34	PA-301_PROCESS	-	257	6	43	288	-	-	115	709	709	-	-	6,446	-	-	-	-	261,756	5,672	-
4b.1.2.35	RB-281_BURY	-	428	51	108	-	384	-	224	1,194	1,194	-	-	-	3,555	-	-	-	316,988	9,602	-
4b.1.2.36	RB-281_PROCESS	-	131	4	13	62	15	-	48	274	274	-	-	1,379	143	-	-	-	68,778	2,922	-
4b.1.2.37	RB-308_BURY	-	295	35	67	-	238	-	147	781	781	-	-	-	2,328	-	-	-	196,583	6,561	-
4b.1.2.38	RB-308_PROCESS	-	205	5	32	217	-	-	89	547	547	-	-	4,850	-	-	-	-	196,969	4,613	-
4b.1.2.39	RB-346_BURY	-	56	6	13	-	45	-	28	148	148	-	-	-	419	-	-	-	37,577	1,135	-
4b.1.2.40	RB-346_PROCESS	-	120	6	18	42	43	-	50	279	279	-	-	934	395	-	-	-	73,371	2,548	-
4b.1.2.41	RB-INSIDE D-RING_BURY	-	271	26	54	-	194	-	127	672	672	-	-	-	1,783	-	-	-	159,948	6,114	-
4b.1.2.42	SB-305_CLEAN	-	9	-	-	-	-	-	1	11	-	-	11	-	-	-	-	-	-	242	-
4b.1.2.43	STP_CLEAN	-	37	-	-	-	-	-	6	43	-	-	43	-	-	-	-	-	-	884	-
4b.1.2.44	TB-305-E_GIC	-	88	-	-	-	-	-	13	101	-	-	101	-	-	-	-	-	-	2,342	-
4b.1.2.45	TB-355-E_PROCESS	-	54	2	10	68	-	-	25	159	159	-	-	1,532	-	-	-	-	62,212	1,183	-
4b.1.2.46	YARD_CLEAN	-	492	-	-	-	-	-	74	566	-	-	566	-	-	-	-	-	-	12,996	-
4b.1.2	Totals	-	8,272	698	1,601	2,497	4,388	-	3,730	21,187	19,812	-	1,374	55,905	46,055	-	-	-	5,697,056	187,449	-
4b.1.3	Scaffolding in support of decommissioning	-	1,054	13	7	49	-	-	273	1,397	1,397	-	-	998	-	-	-	-	44,889	29,024	-

Table E
Three Mile Island, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Decontamination of Site Buildings																					
4b.1.4.1	Reactor	767	606	125	318	41	539	-	736	3,131	3,131	-	-	913	9,010	-	-	-	886,240	29,340	-
4b.1.4.2	Auxiliary	239	93	12	35	34	46	-	166	624	624	-	-	752	842	-	-	-	113,287	7,302	-
4b.1.4.3	Classified Waste Storage Facility	12	2	1	2	-	2	-	7	26	26	-	-	-	43	-	-	-	4,349	319	-
4b.1.4.4	Heat Exchanger Vault	40	16	2	6	4	7	-	28	103	103	-	-	99	138	-	-	-	17,468	1,243	-
4b.1.4.5	Interim Solid Waste Staging Facility	50	10	2	7	1	10	-	31	111	111	-	-	21	182	-	-	-	18,988	1,345	-
4b.1.4.6	Intermediate	18	16	4	11	-	16	-	19	83	83	-	-	-	295	-	-	-	29,523	585	-
4b.1.4.7	Miscellaneous Buildings - Contaminated	123	24	6	17	-	24	-	77	271	271	-	-	-	451	-	-	-	45,147	3,312	-
4b.1.4.8	Respirator Cleaning Facility	23	4	1	3	-	5	-	14	51	51	-	-	-	85	-	-	-	8,483	621	-
4b.1.4.9	Fuel Handling	494	500	28	46	29	122	-	416	1,635	1,635	-	-	650	1,399	-	-	-	146,822	20,809	-
4b.1.4	Totals	1,765	1,271	181	444	109	771	-	1,494	6,037	6,037	-	-	2,435	12,445	-	-	-	1,270,086	64,977	-
4b.1	Subtotal Period 4b Activity Costs	2,062	10,637	997	2,136	2,656	5,454	-	5,753	29,694	28,320	-	1,374	59,338	61,207	-	-	-	7,454,954	282,506	-
Period 4b Additional Costs																					
4b.2.1	License Termination Survey Planning	-	-	-	-	-	-	848	254	1,102	1,102	-	-	-	-	-	-	-	-	-	6,240
4b.2.2	ISFSI License Termination	-	457	4	31	-	44	1,285	323	2,144	-	2,144	-	-	802	-	-	-	101,008	21,237	2,560
4b.2.3	Contaminated Soil Remediation	-	39	2	110	-	1,930	-	509	2,589	2,589	-	-	-	35,745	-	-	-	2,716,592	462	-
4b.2	Subtotal Period 4b Additional Costs	-	496	7	140	-	1,974	2,133	1,086	5,835	3,691	2,144	-	-	36,547	-	-	-	2,817,600	21,699	8,800
Period 4b Collateral Costs																					
4b.3.1	Process liquid waste	81	-	31	253	-	187	-	129	681	681	-	-	-	653	-	-	-	39,202	127	-
4b.3.2	Small tool allowance	-	179	-	-	-	-	-	27	205	205	-	-	-	-	-	-	-	-	-	-
4b.3.3	Decommissioning Equipment Disposition	-	-	88	60	330	-	-	67	545	545	-	-	6,667	-	-	-	-	300,000	88	-
4b.3	Subtotal Period 4b Collateral Costs	81	179	119	313	330	187	-	223	1,432	1,432	-	-	6,667	653	-	-	-	339,202	216	-
Period 4b Period-Dependent Costs																					
4b.4.1	Decon supplies	725	-	-	-	-	-	-	181	907	907	-	-	-	-	-	-	-	-	-	-
4b.4.2	Insurance	-	-	-	-	-	-	1,208	121	1,329	1,329	-	-	-	-	-	-	-	-	-	-
4b.4.3	Property taxes	-	-	-	-	-	-	1,873	187	2,061	2,061	-	-	-	-	-	-	-	-	-	-
4b.4.4	Health physics supplies	-	1,837	-	-	-	-	-	459	2,297	2,297	-	-	-	-	-	-	-	-	-	-
4b.4.5	Heavy equipment rental	-	4,209	-	-	-	-	-	631	4,840	4,840	-	-	-	-	-	-	-	-	-	-
4b.4.6	Disposal of DAW generated	-	-	8	10	-	275	-	71	364	364	-	-	-	4,925	-	-	-	98,501	23	-
4b.4.7	Plant energy budget	-	-	-	-	-	-	2,790	419	3,209	3,209	-	-	-	-	-	-	-	-	-	-
4b.4.8	NRC Fees	-	-	-	-	-	-	1,733	173	1,906	1,906	-	-	-	-	-	-	-	-	-	-
4b.4.9	Site O&M Costs	-	-	-	-	-	-	637	96	733	733	-	-	-	-	-	-	-	-	-	-
4b.4.10	Radwaste Processing Equipment/Services	-	-	-	-	-	-	957	144	1,100	1,100	-	-	-	-	-	-	-	-	-	-
4b.4.11	Security Staff Cost	-	-	-	-	-	-	3,533	530	4,063	4,063	-	-	-	-	-	-	-	-	-	97,782
4b.4.12	DOC Staff Cost	-	-	-	-	-	-	27,627	4,144	31,772	31,772	-	-	-	-	-	-	-	-	-	356,440
4b.4.13	Utility Staff Cost	-	-	-	-	-	-	41,538	6,231	47,769	47,769	-	-	-	-	-	-	-	-	-	627,760
4b.4	Subtotal Period 4b Period-Dependent Costs	725	6,046	8	10	-	275	81,897	13,387	102,348	102,348	-	-	-	4,925	-	-	-	98,501	23	1,081,982
4b.0	TOTAL PERIOD 4b COST	2,869	17,358	1,131	2,599	2,986	7,890	84,030	20,448	139,309	135,791	2,144	1,374	66,004	103,333	-	-	-	10,710,260	304,444	1,090,782
PERIOD 4e - License Termination																					
Period 4e Direct Decommissioning Activities																					
4e.1.1	ORISE confirmatory survey	-	-	-	-	-	-	155	46	201	201	-	-	-	-	-	-	-	-	-	-
4e.1.2	Terminate license									8											
4e.1	Subtotal Period 4e Activity Costs	-	-	-	-	-	-	155	46	201	201	-	-	-	-	-	-	-	-	-	-
Period 4e Additional Costs																					
4e.2.1	License Termination Survey	-	-	-	-	-	-	6,183	1,855	8,038	8,038	-	-	-	-	-	-	-	-	124,444	3,120
4e.2	Subtotal Period 4e Additional Costs	-	-	-	-	-	-	6,183	1,855	8,038	8,038	-	-	-	-	-	-	-	-	124,444	3,120

Table E
Three Mile Island, Unit 1
SAFSTOR Decommissioning Cost Estimate
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Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes Class A Cu. Feet	Burial Volumes Class B Cu. Feet	Burial Volumes Class C Cu. Feet	Burial Volumes GTCC Cu. Feet	Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
Period 4e Collateral Costs																					
4e.3.1	DOC staff relocation expenses	-	-	-	-	-	-	1,113	167	1,280	1,280	-	-	-	-	-	-	-	-	-	-
4e.3	Subtotal Period 4e Collateral Costs	-	-	-	-	-	-	1,113	167	1,280	1,280	-	-	-	-	-	-	-	-	-	-
Period 4e Period-Dependent Costs																					
4e.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4e.4.2	Property taxes	-	-	-	-	-	-	551	55	607	607	-	-	-	-	-	-	-	-	-	-
4e.4.3	Health physics supplies	-	611	-	-	-	-	-	153	763	763	-	-	-	-	-	-	-	-	-	-
4e.4.4	Disposal of DAW generated	-	-	1	1	-	20	-	5	26	26	-	-	-	350	-	-	-	6,999	2	-
4e.4.5	Plant energy budget	-	-	-	-	-	-	219	33	252	252	-	-	-	-	-	-	-	-	-	-
4e.4.6	NRC Fees	-	-	-	-	-	-	546	55	600	600	-	-	-	-	-	-	-	-	-	-
4e.4.7	Site O&M Costs	-	-	-	-	-	-	188	28	216	216	-	-	-	-	-	-	-	-	-	-
4e.4.8	Security Staff Cost	-	-	-	-	-	-	444	67	511	511	-	-	-	-	-	-	-	-	-	11,743
4e.4.9	DOC Staff Cost	-	-	-	-	-	-	4,650	697	5,347	5,347	-	-	-	-	-	-	-	-	-	57,149
4e.4.10	Utility Staff Cost	-	-	-	-	-	-	5,513	827	6,340	6,340	-	-	-	-	-	-	-	-	-	74,371
4e.4	Subtotal Period 4e Period-Dependent Costs	-	611	1	1	-	20	12,111	1,920	14,662	14,662	-	-	-	350	-	-	-	6,999	2	143,263
4e.0	TOTAL PERIOD 4e COST	-	611	1	1	-	20	19,562	3,988	24,182	24,182	-	-	-	350	-	-	-	6,999	124,446	146,383
PERIOD 4 TOTALS		3,080	43,517	7,945	9,855	11,062	38,303	140,342	50,733	304,836	298,815	2,144	3,877	248,328	156,997	2,824	517	580	26,933,780	709,601	1,726,625
PERIOD 5b - Site Restoration																					
Period 5b Direct Decommissioning Activities																					
Demolition of Remaining Site Buildings																					
5b.1.1.1	Reactor	-	3,707	-	-	-	-	-	556	4,263	-	-	4,263	-	-	-	-	-	-	52,366	-
5b.1.1.2	Air Intake Tunnel	-	50	-	-	-	-	-	8	58	-	-	58	-	-	-	-	-	-	844	-
5b.1.1.3	Auxiliary	-	2,086	-	-	-	-	-	313	2,399	-	-	2,399	-	-	-	-	-	-	28,722	-
5b.1.1.4	Carpenters Shop #117	-	14	-	-	-	-	-	2	16	-	-	16	-	-	-	-	-	-	219	-
5b.1.1.5	Circulating Water Chlorinator	-	50	-	-	-	-	-	7	57	-	-	57	-	-	-	-	-	-	875	-
5b.1.1.6	Circulating Water Chlorinator House	-	54	-	-	-	-	-	8	62	-	-	62	-	-	-	-	-	-	1,087	-
5b.1.1.7	Circulating Water Intake Flume	-	44	-	-	-	-	-	7	50	-	-	50	-	-	-	-	-	-	709	-
5b.1.1.8	Circulating Water Pumphouse	-	121	-	-	-	-	-	18	140	-	-	140	-	-	-	-	-	-	2,422	-
5b.1.1.9	Circulating Water Tunnels	-	532	-	-	-	-	-	80	612	-	-	612	-	-	-	-	-	-	9,010	-
5b.1.1.10	Classified Waste Storage Facility	-	22	-	-	-	-	-	3	26	-	-	26	-	-	-	-	-	-	452	-
5b.1.1.11	Coagulator	-	36	-	-	-	-	-	5	42	-	-	42	-	-	-	-	-	-	726	-
5b.1.1.12	Control Room Tower	-	2,622	-	-	-	-	-	393	3,015	-	-	3,015	-	-	-	-	-	-	35,625	-
5b.1.1.13	Cooling Towers	-	838	-	-	-	-	-	126	964	-	-	964	-	-	-	-	-	-	13,913	-
5b.1.1.14	Corridor	-	67	-	-	-	-	-	10	77	-	-	77	-	-	-	-	-	-	1,381	-
5b.1.1.15	Desilting Basin	-	2	-	-	-	-	-	0	2	-	-	2	-	-	-	-	-	-	32	-
5b.1.1.16	Diesel Generator	-	600	-	-	-	-	-	90	690	-	-	690	-	-	-	-	-	-	9,233	-
5b.1.1.17	Emergency Diesel Generator	-	502	-	-	-	-	-	75	577	-	-	577	-	-	-	-	-	-	6,842	-
5b.1.1.18	Fire Brigade Training Facility	-	12	-	-	-	-	-	2	14	-	-	14	-	-	-	-	-	-	231	-
5b.1.1.19	Fuel Oil Unloading & Pump Station	-	7	-	-	-	-	-	1	8	-	-	8	-	-	-	-	-	-	109	-
5b.1.1.20	Heat Exchanger Vault	-	319	-	-	-	-	-	48	367	-	-	367	-	-	-	-	-	-	4,093	-
5b.1.1.21	High Range Sample Station	-	4	-	-	-	-	-	1	5	-	-	5	-	-	-	-	-	-	67	-
5b.1.1.22	Indust Waste Trtmnt & Sludge Fltr	-	76	-	-	-	-	-	11	87	-	-	87	-	-	-	-	-	-	1,406	-
5b.1.1.23	Intake Screen & Pumphouse	-	1,679	-	-	-	-	-	252	1,930	-	-	1,930	-	-	-	-	-	-	18,870	-
5b.1.1.24	Interim Solid Waste Staging Facility	-	89	-	-	-	-	-	13	103	-	-	103	-	-	-	-	-	-	1,752	-
5b.1.1.25	Intermediate	-	1,287	-	-	-	-	-	193	1,480	-	-	1,480	-	-	-	-	-	-	17,189	-
5b.1.1.26	Lube Oil Storage	-	8	-	-	-	-	-	1	9	-	-	9	-	-	-	-	-	-	139	-
5b.1.1.27	Mechanical Draft Cooling Tower	-	121	-	-	-	-	-	18	139	-	-	139	-	-	-	-	-	-	1,802	-
5b.1.1.28	Miscellaneous Buildings - Clean	-	874	-	-	-	-	-	131	1,005	-	-	1,005	-	-	-	-	-	-	19,054	-
5b.1.1.29	Miscellaneous Buildings - Contaminated	-	166	-	-	-	-	-	25	190	-	-	190	-	-	-	-	-	-	3,414	-
5b.1.1.30	Miscellaneous Yard Structures	-	1,256	-	-	-	-	-	188	1,444	-	-	1,444	-	-	-	-	-	-	20,519	-
5b.1.1.31	North Office	-	255	-	-	-	-	-	38	293	-	-	293	-	-	-	-	-	-	4,920	-

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Demolition of Remaining Site Buildings (continued)																					
5b.1.1.32	Operations Office	-	54	-	-	-	-	-	8	62	-	-	62	-	-	-	-	-	-	1,102	-
5b.1.1.33	Operations Support Facility	-	244	-	-	-	-	-	37	280	-	-	280	-	-	-	-	-	-	4,425	-
5b.1.1.34	Respirator Cleaning Facility	-	51	-	-	-	-	-	8	59	-	-	59	-	-	-	-	-	-	1,072	-
5b.1.1.35	Security Improvements	-	664	-	-	-	-	-	100	763	-	-	763	-	-	-	-	-	-	6,957	-
5b.1.1.36	Service	-	252	-	-	-	-	-	38	290	-	-	290	-	-	-	-	-	-	5,003	-
5b.1.1.37	Sewage Pumping Station	-	5	-	-	-	-	-	1	6	-	-	6	-	-	-	-	-	-	97	-
5b.1.1.38	Steam Generator Mausoleum	-	305	-	-	-	-	-	46	351	-	-	351	-	-	-	-	-	-	3,900	-
5b.1.1.39	Substation Relay Control House	-	24	-	-	-	-	-	4	28	-	-	28	-	-	-	-	-	-	489	-
5b.1.1.40	Training Facility #43	-	58	-	-	-	-	-	9	67	-	-	67	-	-	-	-	-	-	1,199	-
5b.1.1.41	Turbine	-	1,431	-	-	-	-	-	215	1,646	-	-	1,646	-	-	-	-	-	-	26,877	-
5b.1.1.42	Turbine Pedestal	-	1,128	-	-	-	-	-	169	1,297	-	-	1,297	-	-	-	-	-	-	14,441	-
5b.1.1.43	Warehouse #1	-	377	-	-	-	-	-	57	434	-	-	434	-	-	-	-	-	-	8,170	-
5b.1.1.44	Water Pretreatment House	-	115	-	-	-	-	-	17	132	-	-	132	-	-	-	-	-	-	2,006	-
5b.1.1.45	Fuel Handling	-	2,937	-	-	-	-	-	441	3,378	-	-	3,378	-	-	-	-	-	-	40,440	-
5b.1.1	Totals	-	25,145	-	-	-	-	-	3,772	28,916	-	-	28,916	-	-	-	-	-	-	374,203	-
Site Closeout Activities																					
5b.1.2	Remove Rubble	-	8,707	-	-	-	-	-	1,306	10,013	-	-	10,013	-	-	-	-	-	-	7,228	-
5b.1.3	Grade & landscape site	-	121	-	-	-	-	-	18	140	-	-	140	-	-	-	-	-	-	531	-
5b.1.4	Final report to NRC	-	-	-	-	-	-	178	27	205	205	-	-	-	-	-	-	-	-	-	1,560
5b.1	Subtotal Period 5b Activity Costs	-	33,973	-	-	-	-	178	5,123	39,274	205	-	39,069	-	-	-	-	-	-	381,962	1,560
Period 5b Additional Costs																					
5b.2.1	Concrete Processing	-	1,030	-	8	-	-	-	155	1,193	-	-	1,193	-	-	-	-	-	-	6,293	-
5b.2.2	ISFSI Site Restoration	-	2,105	-	-	-	-	47	323	2,474	-	2,474	-	-	-	-	-	-	-	5,372	160
5b.2	Subtotal Period 5b Additional Costs	-	3,135	-	8	-	-	47	478	3,667	-	2,474	1,193	-	-	-	-	-	-	11,665	160
Period 5b Collateral Costs																					
5b.3.1	Small tool allowance	-	239	-	-	-	-	-	36	275	-	-	275	-	-	-	-	-	-	-	-
5b.3	Subtotal Period 5b Collateral Costs	-	239	-	-	-	-	-	36	275	-	-	275	-	-	-	-	-	-	-	-
Period 5b Period-Dependent Costs																					
5b.4.1	Insurance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5b.4.2	Property taxes	-	-	-	-	-	-	1,451	145	1,596	-	-	1,596	-	-	-	-	-	-	-	-
5b.4.3	Heavy equipment rental	-	4,367	-	-	-	-	-	655	5,023	-	-	5,023	-	-	-	-	-	-	-	-
5b.4.4	Plant energy budget	-	-	-	-	-	-	288	43	331	-	-	331	-	-	-	-	-	-	-	-
5b.4.5	Site O&M Cost	-	-	-	-	-	-	493	74	568	-	-	568	-	-	-	-	-	-	-	-
5b.4.6	Security Staff Cost	-	-	-	-	-	-	1,940	291	2,231	-	-	2,231	-	-	-	-	-	-	-	49,440
5b.4.7	DOC Staff Cost	-	-	-	-	-	-	11,826	1,774	13,600	-	-	13,600	-	-	-	-	-	-	-	140,080
5b.4.8	Utility Staff Cost	-	-	-	-	-	-	5,889	883	6,772	-	-	6,772	-	-	-	-	-	-	-	80,340
5b.4	Subtotal Period 5b Period-Dependent Costs	-	4,367	-	-	-	-	21,887	3,866	30,121	-	-	30,121	-	-	-	-	-	-	-	269,860
5b.0	TOTAL PERIOD 5b COST	-	41,715	-	8	-	-	22,112	9,502	73,337	205	2,474	70,658	-	-	-	-	-	-	393,627	271,580
PERIOD 5 TOTALS		-	41,715	-	8	-	-	22,112	9,502	73,337	205	2,474	70,658	-	-	-	-	-	-	393,627	271,580
TOTAL COST TO DECOMMISSION		7,204	92,308	8,114	11,001	11,062	40,344	639,967	136,378	946,378	692,814	177,582	75,982	248,328	181,903	2,824	517	580	27,544,820	1,176,566	6,463,563

Table E
Three Mile Island, Unit 1
SAFSTOR Decommissioning Cost Estimate
(thousands of 2008 dollars)

Activity Index	Activity Description	Decon Cost	Removal Cost	Packaging Costs	Transport Costs	Off-Site Processing Costs	LLRW Disposal Costs	Other Costs	Total Contingency	Total Costs	NRC Lic. Term. Costs	Spent Fuel Management Costs	Site Restoration Costs	Processed Volume Cu. Feet	Burial Volumes				Burial / Processed Wt., Lbs.	Craft Manhours	Utility and Contractor Manhours
															Class A Cu. Feet	Class B Cu. Feet	Class C Cu. Feet	GTCC Cu. Feet			

TOTAL COST TO DECOMMISSION WITH 16.84% CONTINGENCY:	$946,378	thousands of 2008 dollars
TOTAL NRC LICENSE TERMINATION COST IS 73.21% OR:	$692,814	thousands of 2008 dollars
SPENT FUEL MANAGEMENT COST IS 18.76% OR:	$177,582	thousands of 2008 dollars
NON-NUCLEAR DEMOLITION COST IS 8.03% OR:	$75,982	thousands of 2008 dollars
TOTAL LOW-LEVEL RADIOACTIVE WASTE VOLUME BURIED (EXCLUDING GTCC):	185,244	cubic feet
TOTAL GREATER THAN CLASS C RADWASTE VOLUME GENERATED:	580	cubic feet
TOTAL SCRAP METAL REMOVED:	71,226	tons
TOTAL CRAFT LABOR REQUIREMENTS:	1,176,566	man-hours

End Notes:
n/a - indicates that this activity not charged as decommissioning expense.
a - indicates that this activity performed by decommissioning staff.
0 - indicates that this value is less than 0.5 but is non-zero.
a cell containing " - " indicates a zero value

APPENDIX F

WORK DIFFICULTY FACTOR ADJUSTMENTS

GUIDELINES FOR APPLYING WORK DURATION ADJUSTMENT FACTORS

TLG has historically applied work duration adjustment factors in determining unit cost factors to account for working in a radiologically controlled environment. In performing an area-by-area decommissioning estimate, the work duration factors are applied on an "area" basis based on the nominal area conditions. Where practical, areas are established based on similar working conditions.

The WDFs fall into five categories: access, respiratory protection, ALARA, protective clothing (PC), and work breaks. The guidelines of how these factors are assessed for each area is described below. Table F-1 details the WDFs used for each of the seven unit cost factor sets contained in the estimates. Table F-2 outlines the unit cost factors used for each area of the TMI-1 nuclear unit.

1) Access Factor:

Controlling Variables:
- Height of the component above the working floor
- Difficulty in working around the component (restricted access)

Source of Variable Information:
- Estimators observation or judgment
- Plant drawings

Range of Access Factor Adjustments:

0% - Components are accessible and located near a working level floor or platform

10% - Scaffolding (component less than <12 feet above floor) is required to access the majority of the components *or* the area around the components is congested.

20% - Scaffolding (component less than <12 feet above floor) is required to access the majority of the components *and* the area around the components is congested.

30% - Scaffolding (component between 12 - 20 feet above floor) is required to access the majority of the components *or* the area around the components is extremely congested.

40% - Scaffolding (component between 20 - 45 feet above floor) is required to access the majority of the components).

50% - Scaffolding (component greater than 45 feet above floor) is required to access the majority of the components).

2) Respiratory Protection Factor:

Controlling Variables:
- Component surface contamination levels (internal or external)
- Type of work (potential to create an airborne problem)
- General area surface contamination levels
- Site specific requirements for maintaining respirator qualifications (initial qualification, requalification, etc.)
- Personal air sampler requirements

Sources of Variable Information:
- Radiation Work Permit Requirements
- Area Survey Maps
- Site Radiation Protection Program Manual

Range of Respiratory Protection Factor Adjustments:
0% - Respiratory protection is not required (clean system or loose surface contamination has been removed).
25% - Respiratory protection is only required during limited segments of the work (i.e., physical cutting)
50% - Respiratory protection is continuously required while working on the component.

3) Radiation/ALARA Factor:

Controlling Variables:
- Component contact dose rate
- General area dose rate
- Site specific requirements for maintaining radiation worker qualification (initial qualification, requalification, etc.)
- Dosimetry requirements

Sources of Variable Information:
- Area Survey Maps
- Site Radiation Protection Program Manual
- Radiation Work Permit Requirements

Range of Radiation/ALARA Factor Adjustments:
(Note that surface contamination levels are principally accounted for in protective clothing requirements and respiratory protection requirements)

0% - The component is clean and is not located in a radiologically controlled area

10% - The component is located in a radiologically controlled area (General Area Radiation field < 2 .5 mrem/hr).

20% - The component is located in a radiologically controlled area (General Area Radiation field between 2. 5 to 15 mrem/hr).

40% - The component is located in a radiologically controlled area (General Area Radiation field between 16 and 99 mrem/hr).

100% - The component is located in a radiologically controlled area (General Area Radiation field > 100 mrem/hr).

4) Protective Clothing Factor:

Controlling Variables:
- Component surface contamination levels (internal or external)
- General area surface contamination levels
- Type of activity (wet/dry work, potential to create a surface contamination problem)
- Site specific work schedule arrangements

Sources of Variable Information:
- Radiation Work Permit Requirements
- Area Survey Maps
- Site Radiation Protection Program Manual

Range of Protective Clothing Factor Adjustments (alternate site-specific schedules may dictate alternate adjustments):

0% - The component is clean and is not located in a radiologically controlled area.

30% - The component is clean or contaminated and is located in a surface contamination controlled area . Work is to be completed in accordance with the requirements of an RWP, which specifies a single or double set of "PCs", or "PCs" with plastics.

50% - The components is located in a surface contamination controlled area. Work is to be completed in accordance with the requirements of an RWP, which specifies "plastics" in addition to double PCs for protective clothing.

100% - The component is located in a surface contamination controlled area. Work is to be completed in accordance with the requirements of an RWP, which specifies double "PCs" and double "plastics" (extremely wet or humid working environment).

5) Work Break Factor:

Controlling Variables:

- Site specific work schedule arrangements

Sources of Variable Information:

- Typical site work schedule

Range of Work Break Factor Adjustments:

8.33% - Workday schedule outlined in AIF/NESP-036 (alternate site-specific schedules may dictate alternate adjustments).

TABLE F-1

UNIT COST FACTOR SETS AND THEIR WORK DIFFICULTY ADJUSTMENT FACTORS

UCF Set ID	DECON / Clean Percentage				DECON / Contaminated Percentage			
	Access	Resp.	PCs	ALARA	Access	Resp.	PCs	ALARA
1	10	0	0	0	10	0	0	0
2	20	0	0	0	20	0	0	0
3	30	0	0	0	30	0	0	0
4	20	0	0	0	20	0	30	10
5	20	0	0	0	20	25	30	10
6	20	0	0	0	20	25	30	20
7	30	0	0	0	30	25	30	20
8	30	0	0	0	30	25	30	40
9	30	0	0	0	30	50	30	100
10	20	0	0	0	20	25	30	20

UCF Set ID	SAFSTOR / Clean Percentage				SAFSTOR / Contaminated Percentage			
	Access	Resp.	PCs	ALARA	Access	Resp.	PCs	ALARA
1	10	0	0	0	10	0	0	0
2	20	0	0	0	20	0	0	0
3	30	0	0	0	30	0	0	0
4	20	0	0	0	20	0	30	10
5	20	0	0	0	20	25	30	10
6	20	0	0	0	20	25	30	10
7	30	0	0	0	30	25	30	10
8	30	0	0	0	30	25	30	10
9	30	0	0	0	30	50	30	10
10	20	0	0	0	20	25	30	10

TABLE F-2

TMI-1 AREA DESIGNATIONS AND ASSOCIATED UNIT COST FACTORS

AREA	AREA DESCRIPTION	UCF SET
AB-261_BURY	AUX BLDG EL 261 DECAY HEAT & BLDG SPRAY VAULT	8
AB-261_PROCESS	AUX BLDG EL 261 DECAY HEAT & BLDG SPRAY VAULT	8
AB-271_BURY	AUX BLDG EL 271 HEAT EXCHANGER VAULT	6
AB-271_PROCESS	AUX BLDG EL 271 HEAT EXCHANGER VAULT	6
AB-281-1_BURY	AUX BLDG EL 281 RX COOLANT BLEED TANK ROOM	9
AB-281-1_PROCESS	AUX BLDG EL 281 RX COOLANT BLEED TANK ROOM	9
AB-281-2_BURY	AUX BLDG EL 281 MAIN HALL	7
AB-281-2_PROCESS	AUX BLDG EL 281 MAIN HALL	7
AB-281-3_BURY	AUX BLDG EL 281 MAKEUP PUMP CUB. & TANK ROOMS	9
AB-281-3_PROCESS	AUX BLDG EL 281 MAKEUP PUMP CUB. & TANK ROOMS	9
AB-305-1_BURY	AUX BLDG EL 305 AUX & FH EXHAUST AIR FILTERS	6
AB-305-1_PROCESS	AUX BLDG EL 305 AUX & FH EXHAUST AIR FILTERS	6
AB-305-2_BURY	AUX BLDG EL 305 MAIN HALL	7
AB-305-2_PROCESS	AUX BLDG EL 305 MAIN HALL	7
AB-305-3_BURY	AUX BLDG EL 305 MAKEUP PURIFICATION DEMINS	9
AB-331_BURY	AUX BLDG EL 305 MAKEUP PURIFICATION DEMINS	5
AB-331_PROCESS	AUX BLDG EL 331 CHEMICAL ADDITION	5
CC-305_BURY	CHEMICAL CLEANING	7
CNTL-TWR-285_PROCESS	CONTROL ROOM TOWER EL 285	5
CNTL-TWR-305_BURY	CONTROL ROOM TOWER EL 305	5
CNTL-TWR-305_PROCESS	CONTROL ROOM TOWER EL 305	5
CNTL-TWR-322_CLEAN	CONTROL ROOM TOWER EL 322	3
CNTL-TWR-338_CLEAN	CONTROL ROOM TOWER EL 338	3
CNTL-TWR-355_CLEAN	CONTROL ROOM TOWER EL 355	3
CNTL-TWR-380_CLEAN	CONTROL ROOM TOWER EL 380	2
DG-305_CLEAN	DIESEL GENERATOR EL 305	2
DG-305_BURY	DIESEL GENERATOR EL 305	5
FHB-281_BURY	FUEL HDLNG BLDG EL 281	7
FHB-281_PROCESS	FUEL HDLNG BLDG EL 281	7
FHB-305_BURY	FUEL HDLNG BLDG EL 305	7
FHB-305_PROCESS	FUEL HDLNG BLDG EL 305	7
FHB-329_BURY	FUEL HDLNG BLDG EL 329	7
FHB-329_PROCESS	FUEL HDLNG BLDG EL 329	7
FHB-348_BURY	FUEL HDLNG BLDG EL 348	6
FHB-348_PROCESS	FUEL HDLNG BLDG EL 348	6
IB-295_BURY	INTERMEDIATE BLDG EL 295	6
IB-295_PROCESS	INTERMEDIATE BLDG EL 295	6
IB-305_BURY	INTERMEDIATE BLDG EL 305	6
IB-305_PROCESS	INTERMEDIATE BLDG EL 305	6
IB-322_BURY	INTERMEDIATE BLDG EL 322	6
IB-322_PROCESS	INTERMEDIATE BLDG EL 322	6

TABLE F-2

TMI-1 AREA DESIGNATIONS AND ASSOCIATED UNIT COST FACTORS

AREA	AREA DESCRIPTION	UCF SET
IB-355_PROCESS	INTERMEDIATE BLDG EL 355	6
IB-360_PROCESS	INTERMEDIATE BLDG EL 360	6
IB-ROOF_PROCESS	INTERMEDIATE BLDG ROOF	5
INTAKE_CLEAN	INTAKE & SCREENHOUSE & PUMPHOUSE	2
IWT-303_PROCESS	INDUSTRIAL WASTE TREATMENT	5
OCA_CLEAN	OWNER CONTROLLED AREA	2
OCA_BURY	OWNER CONTROLLED AREA	5
OOB_CLEAN	OPERATIONS OFFICE BUILDING	2
OCA_PROCESS	OWNER CONTROLLED AREA	5
PA-301_CLEAN	PROTECTED AREA	2
PA-301_BURY	PROTECTED AREA	5
PA-301_PROCESS	PROTECTED AREA	5
RB-281_BURY	REACTOR BLDG EL 281 BASEMENT	7
RB-281_PROCESS	REACTOR BLDG EL 281 BASEMENT	7
RB-308_BURY	REACTOR BLDG EL 308 MEZZANINE	6
RB-308_PROCESS	REACTOR BLDG EL 308 MEZZANINE	6
RB-346_BURY	REACTOR BLDG EL 346 OPERATING FLOOR	6
RB-346_PROCESS	REACTOR BLDG EL 346 OPERATING FLOOR	6
RB-INSIDE D-RING_BURY	INSIDE D-RING ALL ELEVATIONS	9
SB-305_CLEAN	SERVICE BUILDING	2
STP_CLEAN	SEWAGE TREATMENT	2
TB-295_CLEAN	TURBINE BLDG EL 295 BASEMENT	2
TB-295_BURY	TURBINE BLDG EL 295 BASEMENT	5
TB-295_PROCESS	TURBINE BLDG EL 295 BASEMENT	5
TB-305-E_CLEAN	TURBINE BLDG EL 305 GROUND FLOOR EAST	2
TB-305-E_GIC	TURBINE BLDG EL 305 GROUND FLOOR EAST	4
TB-305-E_BURY	TURBINE BLDG EL 305 GROUND FLOOR EAST	5
TB-305-E_PROCESS	TURBINE BLDG EL 305 GROUND FLOOR EAST	5
TB-305-W_CLEAN	TURBINE BLDG EL 305 GROUND FLOOR WEST	2
TB-305-W_GIC	TURBINE BLDG EL 305 GROUND FLOOR WEST	4
TB-305-W_BURY	TURBINE BLDG EL 305 GROUND FLOOR WEST	5
TB-305-W_PROCESS	TURBINE BLDG EL 305 GROUND FLOOR WEST	5
TB-322-E_CLEAN	TURBINE BLDG EL 322 MEZZANINE EAST	2
TB-322-E_GIC	TURBINE BLDG EL 322 MEZZANINE EAST	4
TB-322-E_BURY	TURBINE BLDG EL 322 MEZZANINE EAST	5
TB-322-E_PROCESS	TURBINE BLDG EL 322 MEZZANINE EAST	5
TB-322-W_CLEAN	TURBINE BLDG EL 322 MEZZANINE WEST	2
TB-322-W_GIC	TURBINE BLDG EL 322 MEZZANINE WEST	4
TB-322-W_BURY	TURBINE BLDG EL 322 MEZZANINE WEST	5
TB-322-W_PROCESS	TURBINE BLDG EL 322 MEZZANINE WEST	5
TB-355-E_CLEAN	TURBINE BLDG EL 355 OPERATING FLOOR EAST	2
TB-355-E_GIC	TURBINE BLDG EL 355 OPERATING FLOOR EAST	4
TB-355-E_BURY	TURBINE BLDG EL 355 OPERATING FLOOR EAST	5

TABLE F-2

TMI-1 AREA DESIGNATIONS AND ASSOCIATED UNIT COST FACTORS

AREA	AREA DESCRIPTION	UCF SET
TB-355-E_PROCESS	TURBINE BLDG EL 355 OPERATING FLOOR EAST	5
TB-355-W_CLEAN	TURBINE BLDG EL 355 OPERATING FLOOR WEST	2
TB-355-W_GIC	TURBINE BLDG EL 355 OPERATING FLOOR WEST	4
TB-355-W_PROCESS	TURBINE BLDG EL 355 OPERATING FLOOR WEST	5
TB-380_CLEAN	TURBINE BLDG EL 380 HEATER BAY	2
TB-380_GIC	TURBINE BLDG EL 380 HEATER BAY	4
TB-380_BURY	TURBINE BLDG EL 380 HEATER BAY	5
TB-380_PROCESS	TURBINE BLDG EL 380 HEATER BAY	5
TB-ROOF_CLEAN	TURBINE BUILDING ROOF	2
WPB_CLEAN	WATER PRETREATMENT BUILDING	2
YARD_CLEAN	OWNER CONTROLLED AREA	1

APPENDIX G

AREA MAPS

Figure **Page**

FIGURE G-1
AUX-261 DECAY HEAT & BUILDING SPRAY VAULT

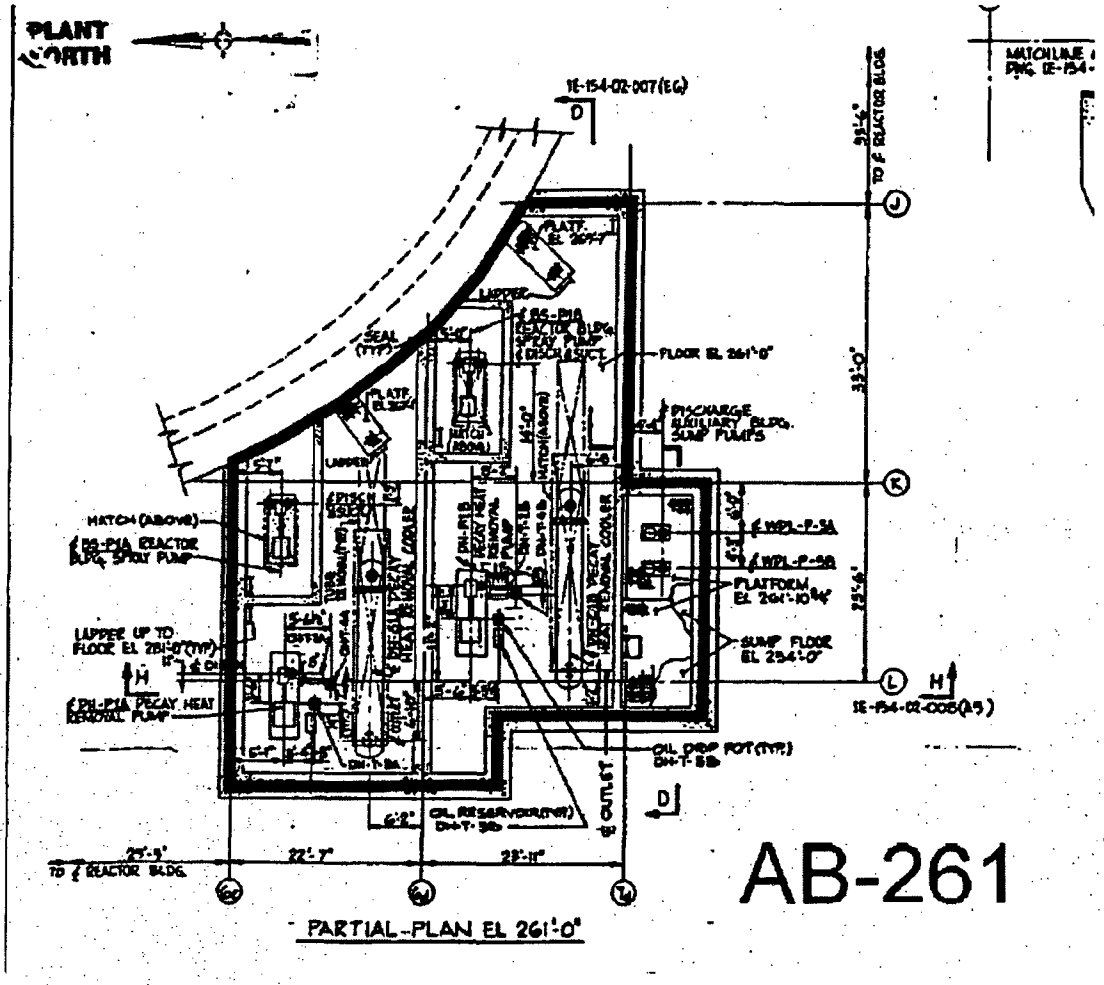


FIGURE G-2
AUX-271 HEAT EXCHANGER VAULT

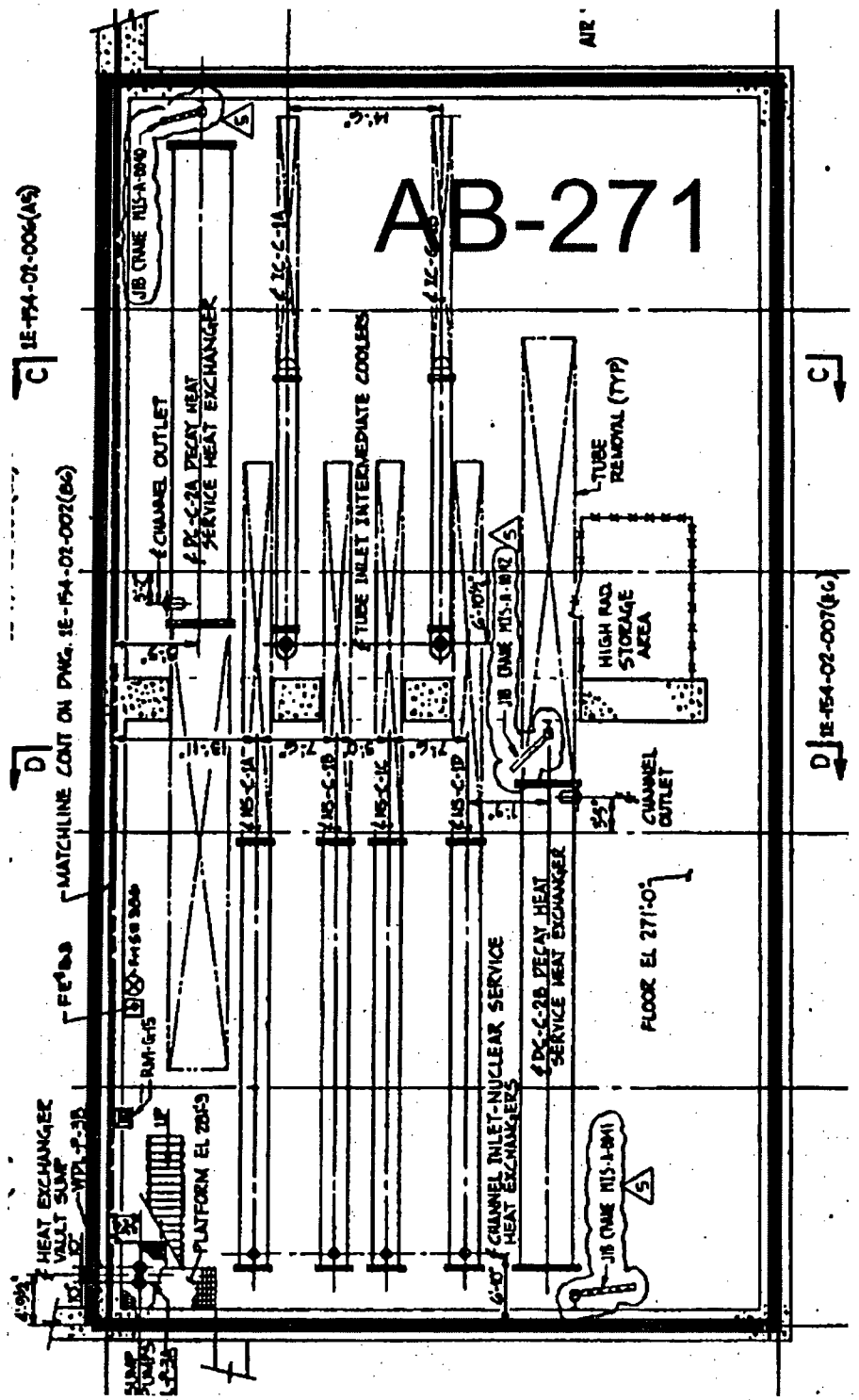


FIGURE G-3
AUXILIARY & FUEL HANDLING BUILDING
281' ELEVATION

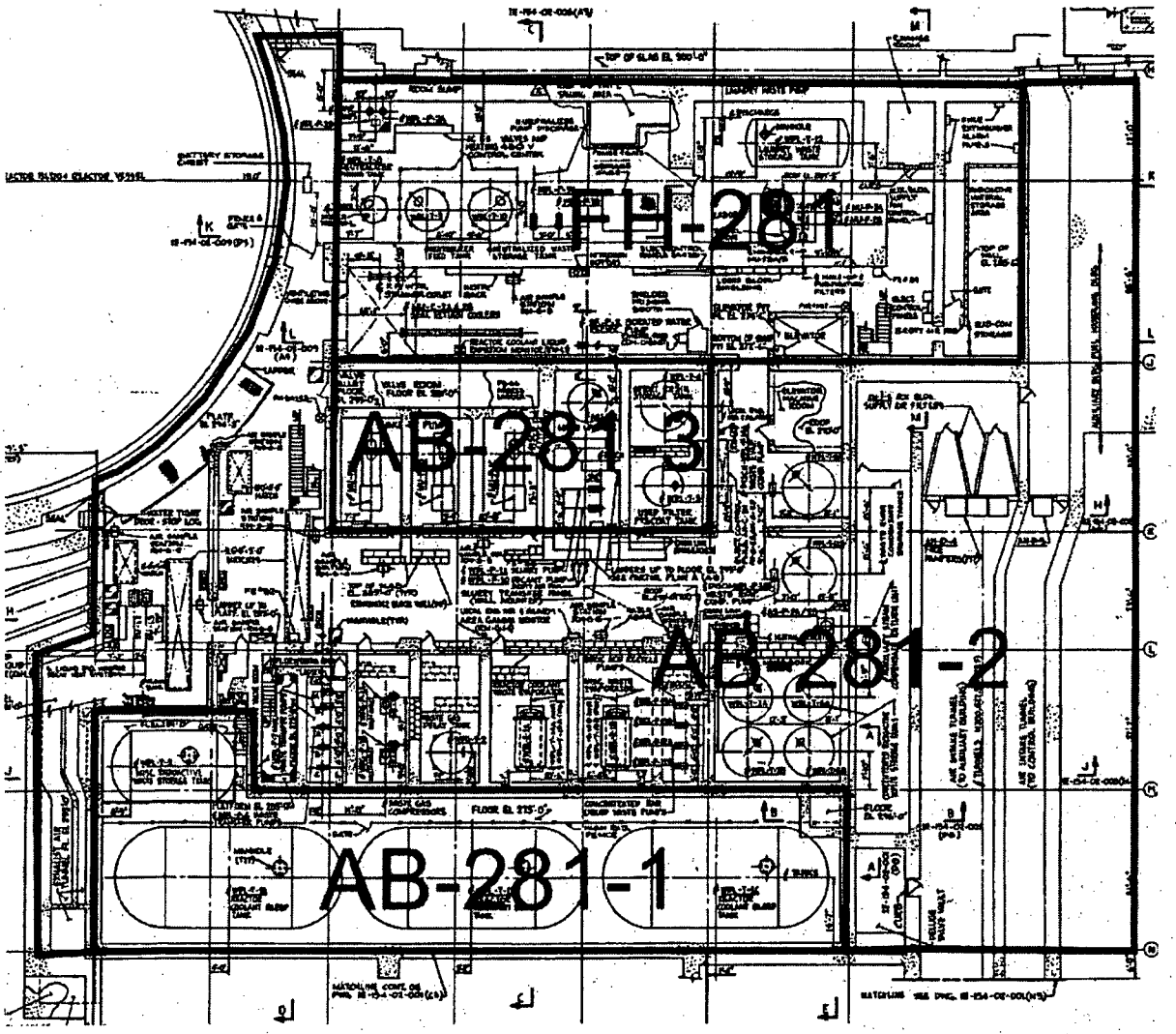


FIGURE G-4
AUXILIARY & FUEL HANDLING BUILDING
305' ELEVATION

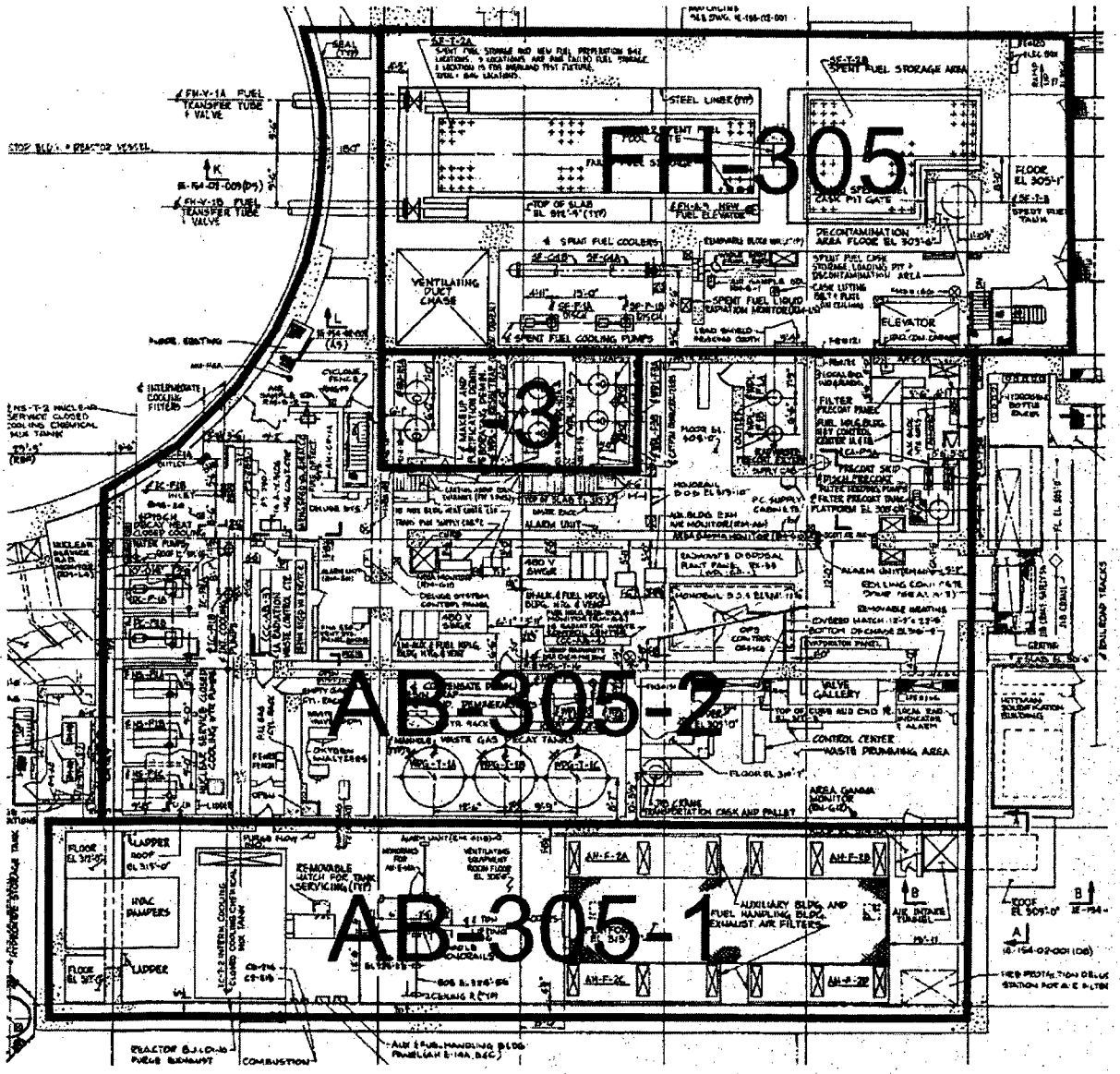


FIGURE G-5
AUXILIARY BUILDING 331' ELEVATION & FUEL HANDLING 329' ELEVATION

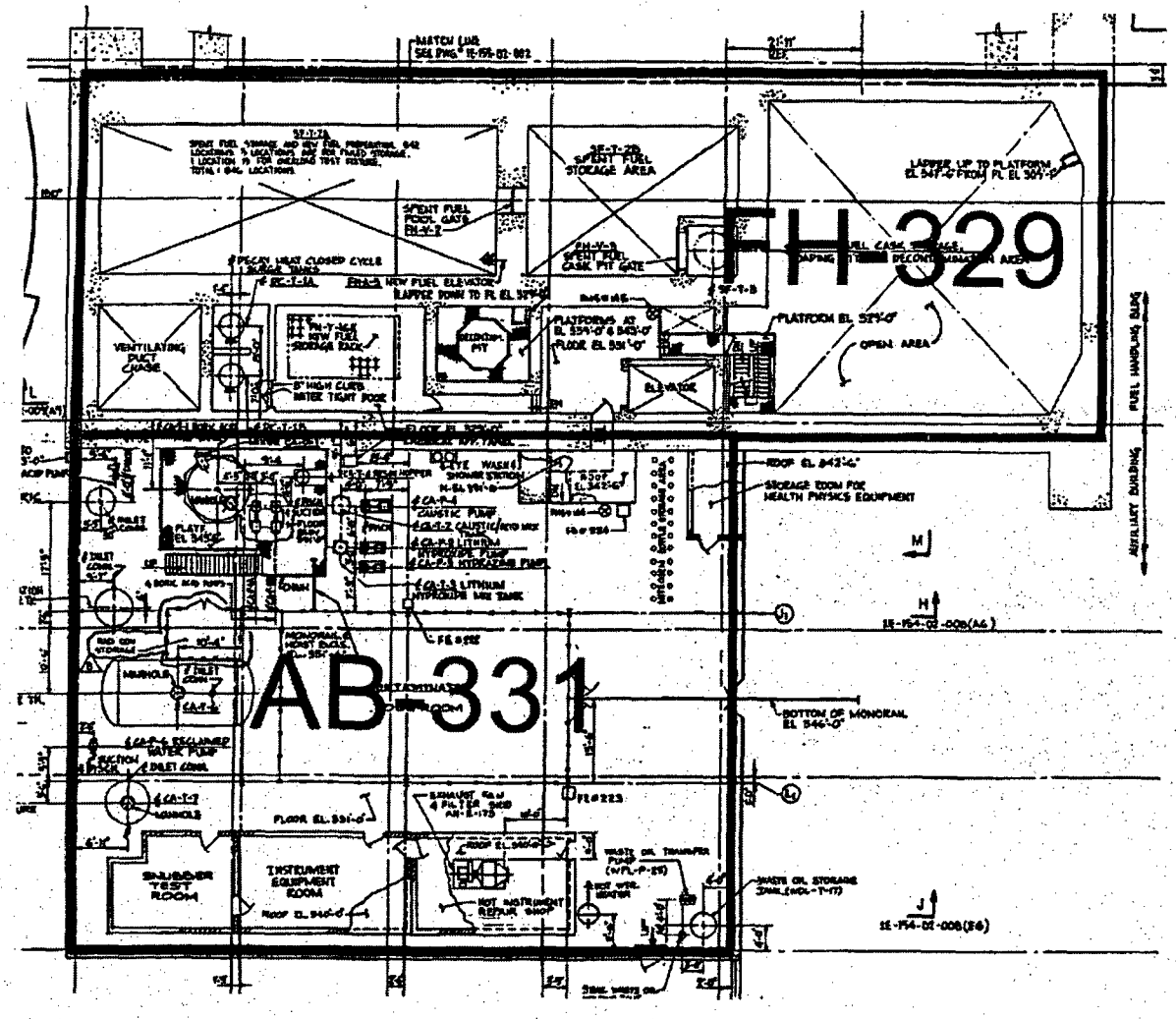


FIGURE G-6
CHEMICAL CLEANING

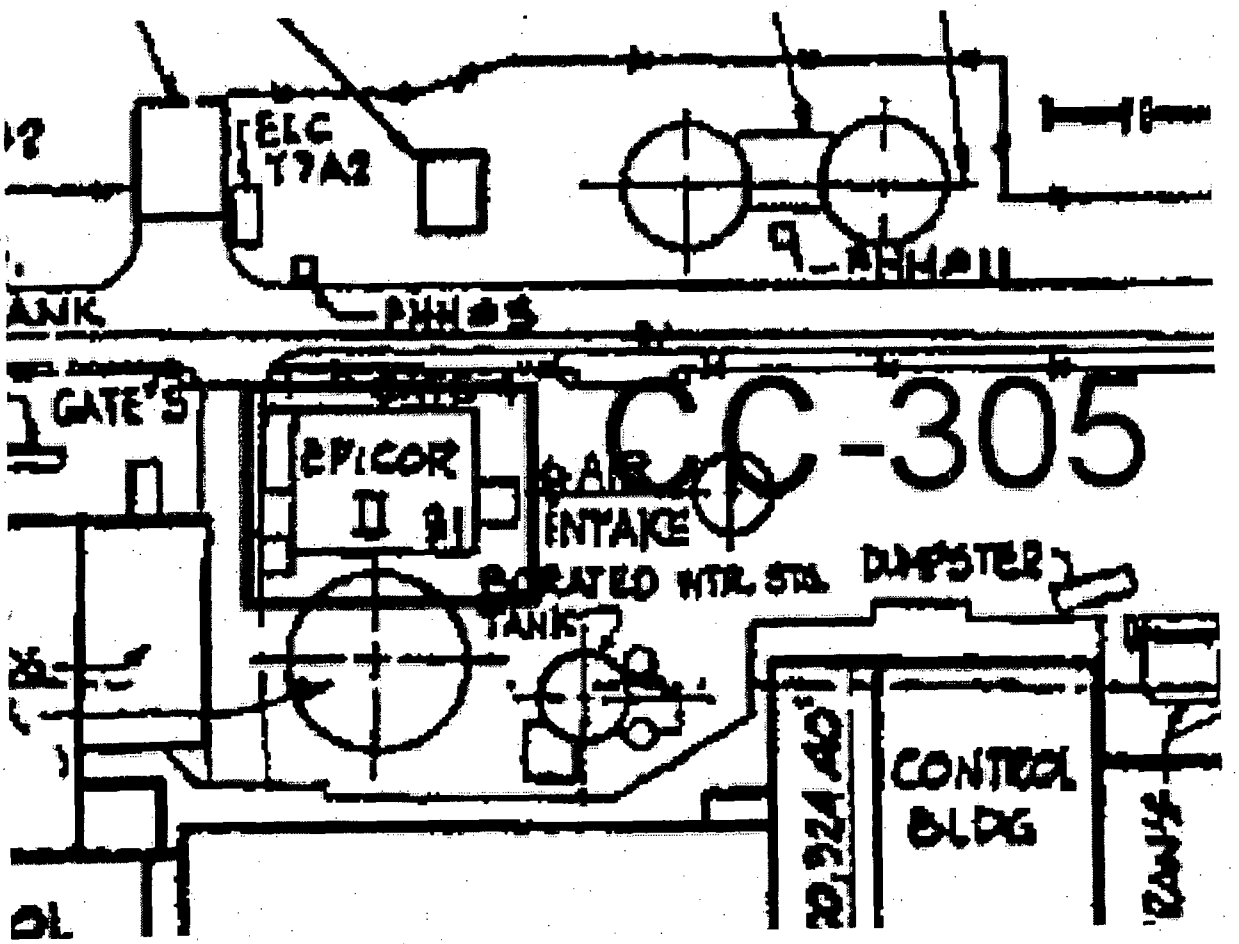


FIGURE G-7
CONTROL ROOM TOWER
306' ELEVATION

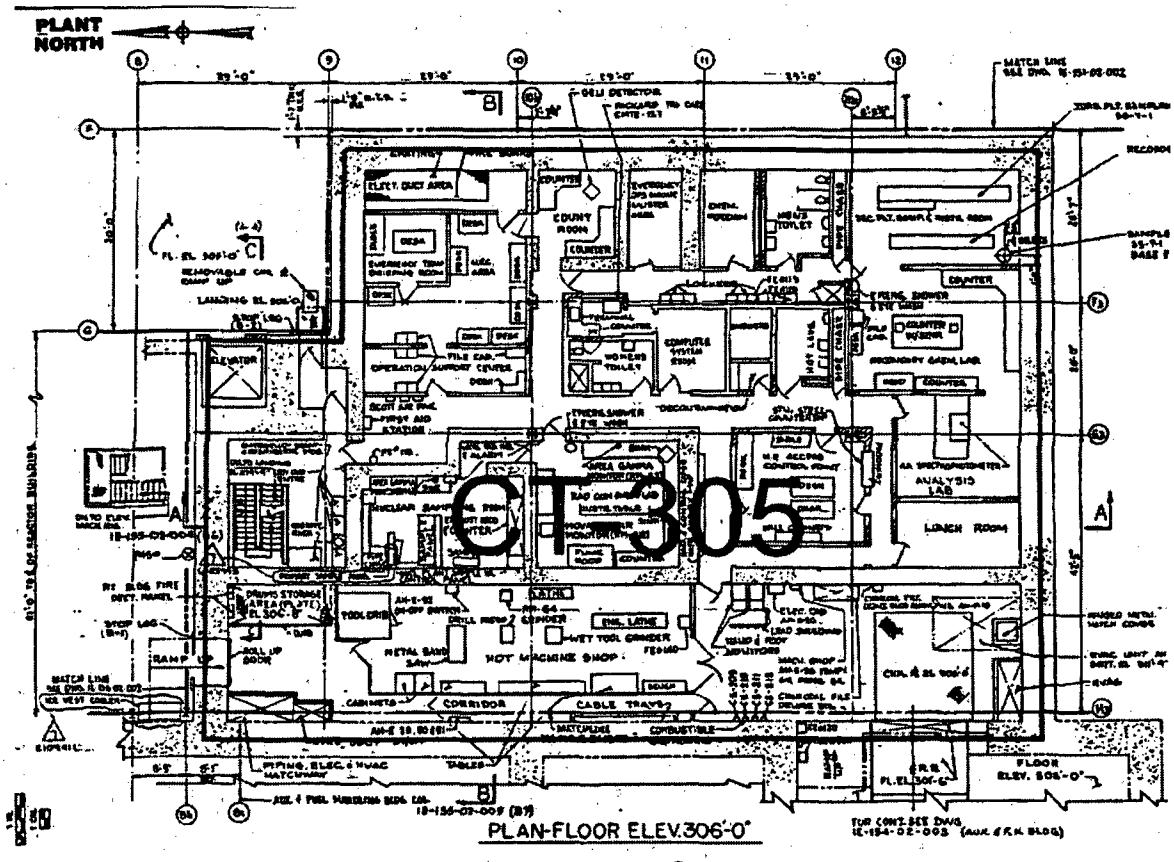


FIGURE G-8
CONTROL ROOM TOWER
322' ELEVATION

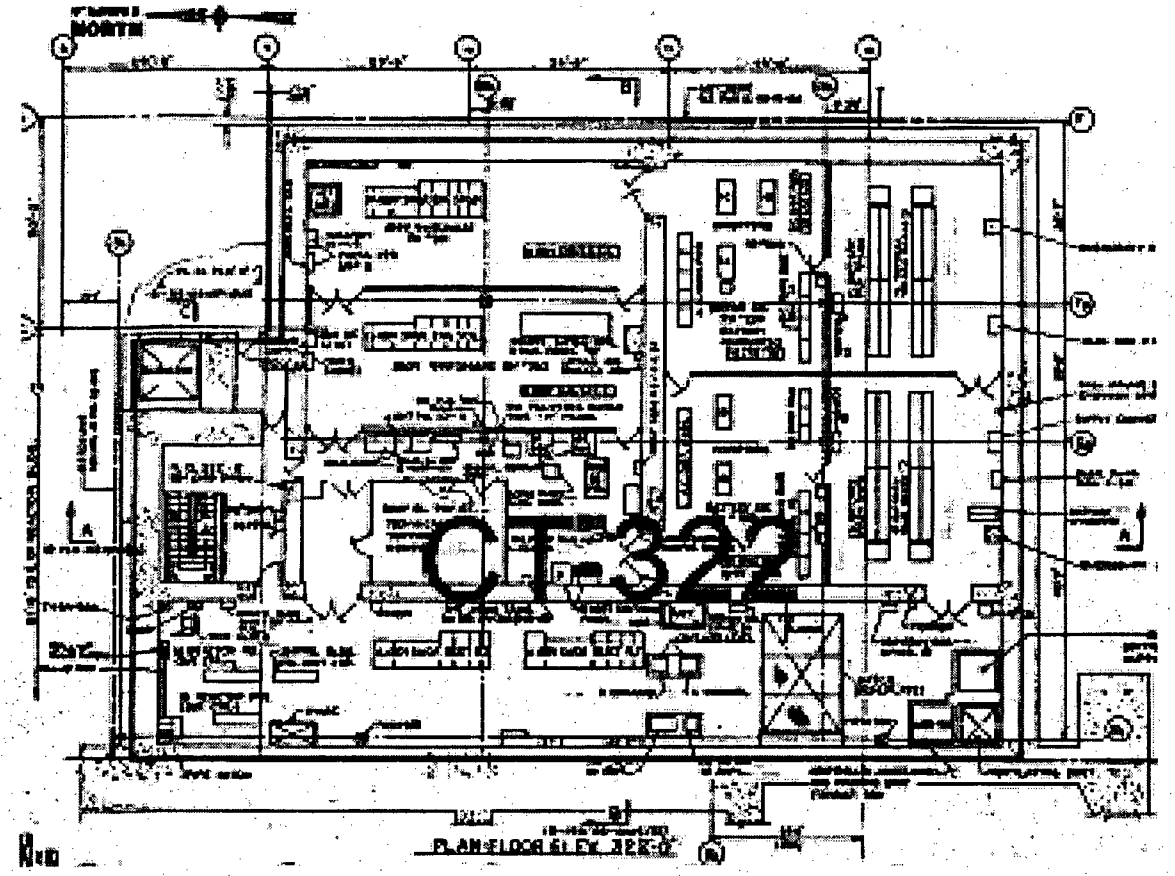


FIGURE G-9
CONTROL ROOM TOWER
338' ELEVATION

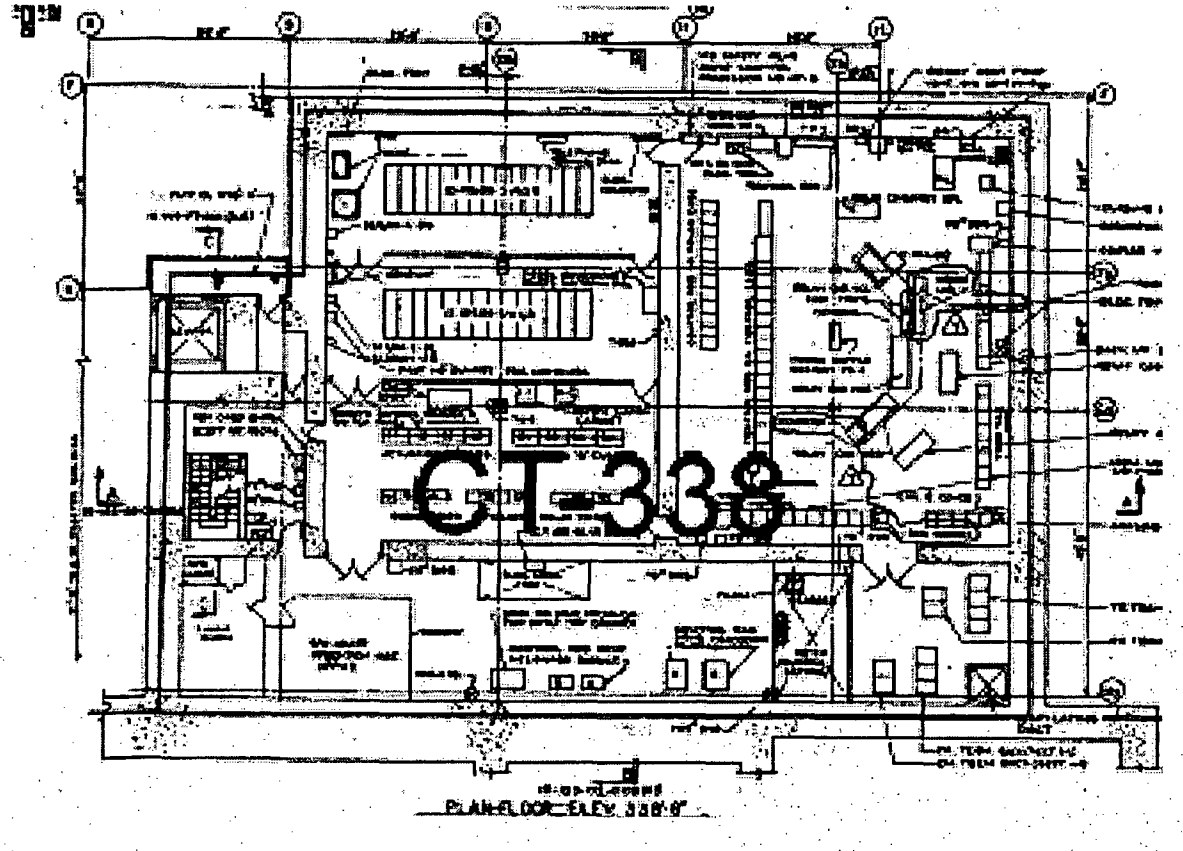


FIGURE G-10
CONTROL ROOM TOWER
355' ELEVATION

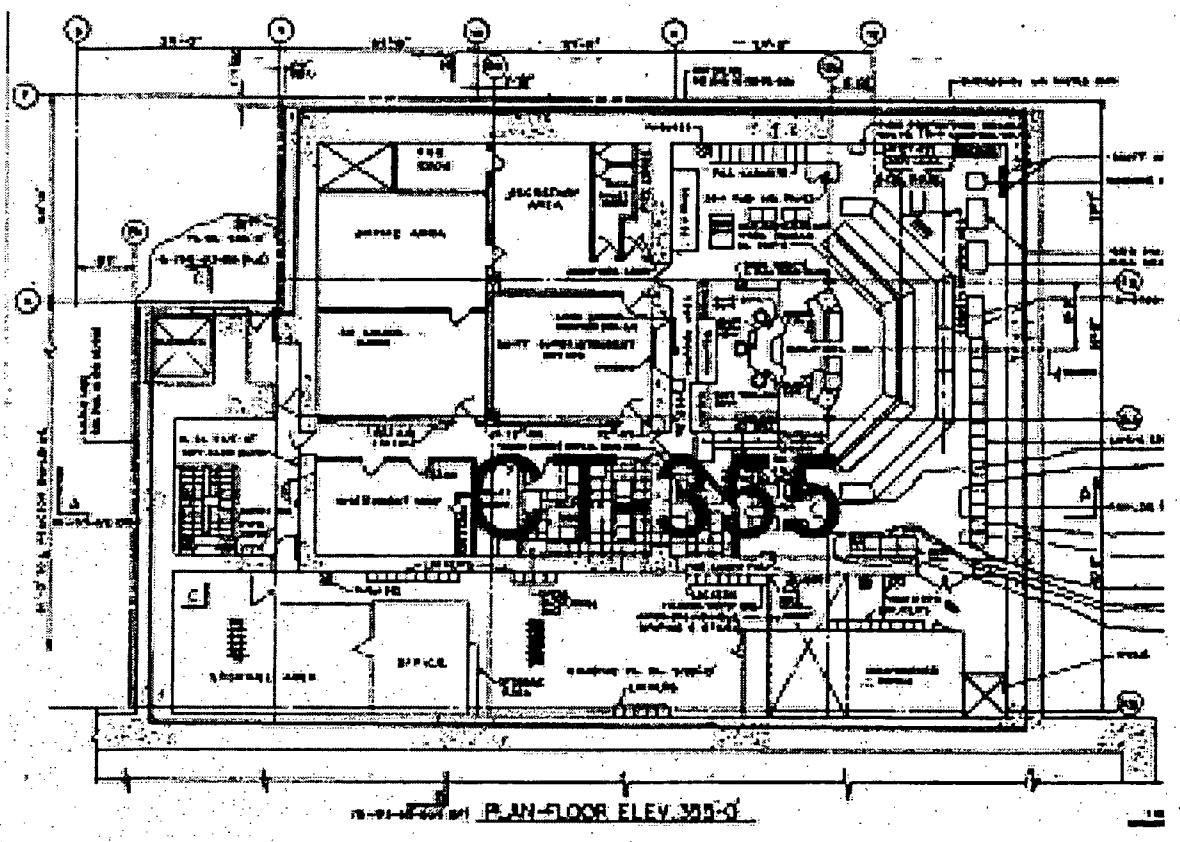


FIGURE G-11
CONTROL ROOM TOWER
380' ELEVATION

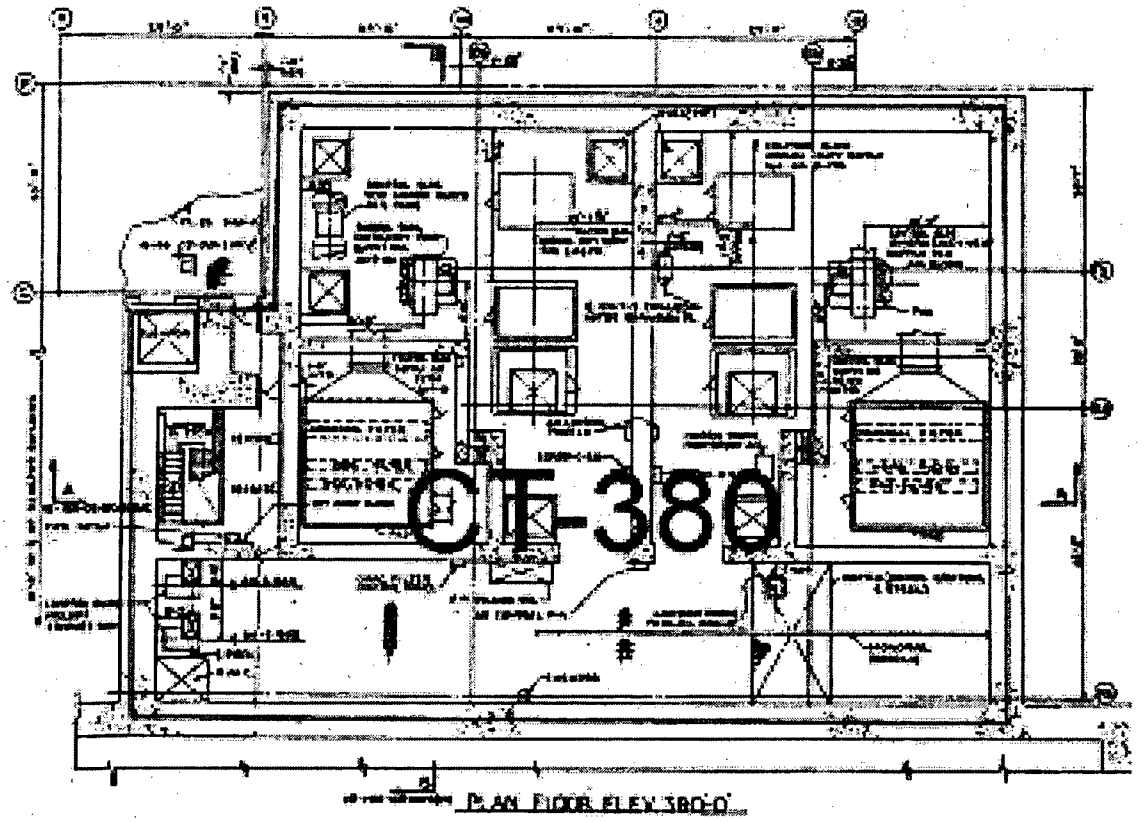


FIGURE G-12
DIESEL GENERATOR
305' ELEVATION

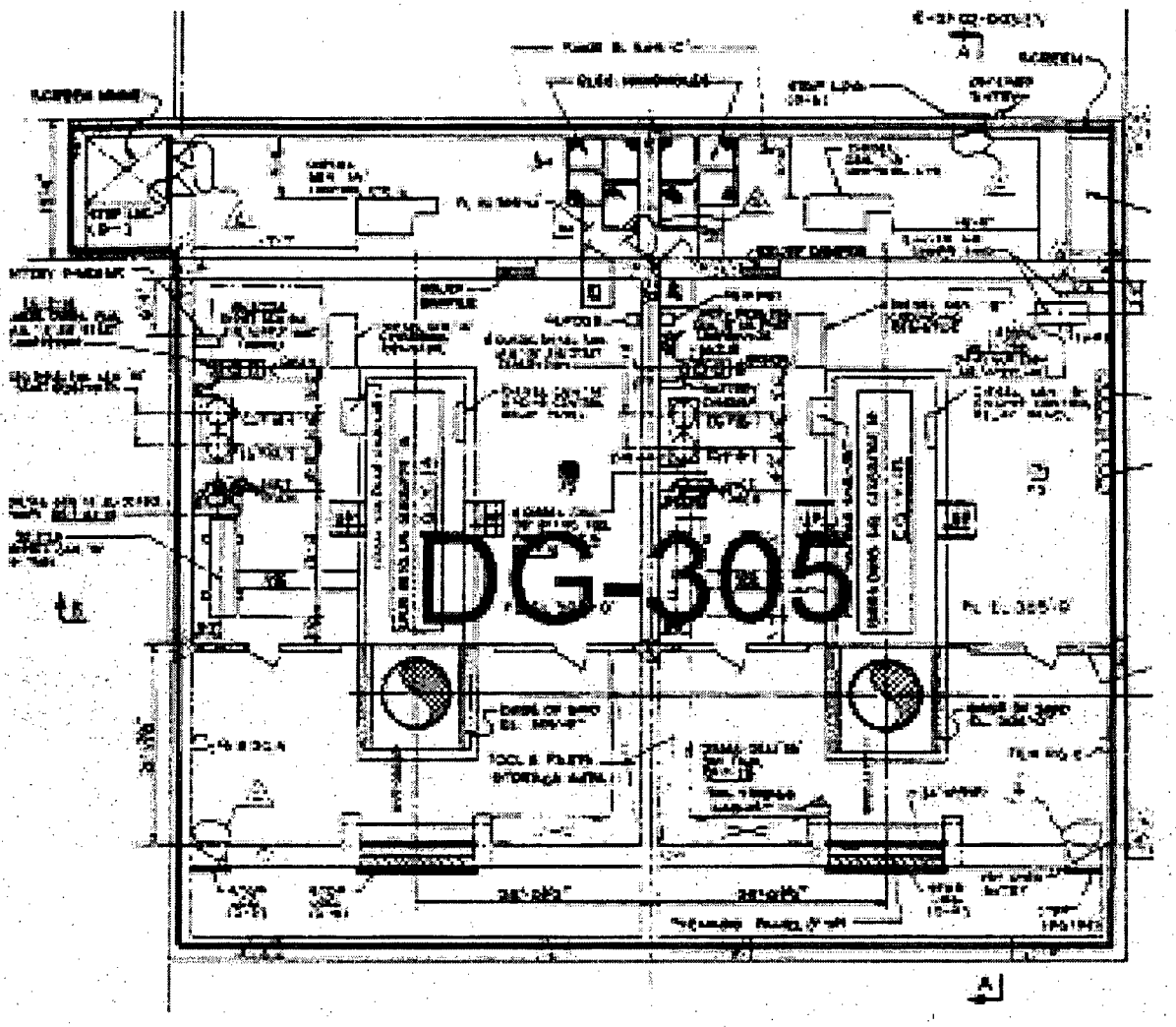


FIGURE G-13
INTAKE & SCREENWASH
& PUMPHOUSE

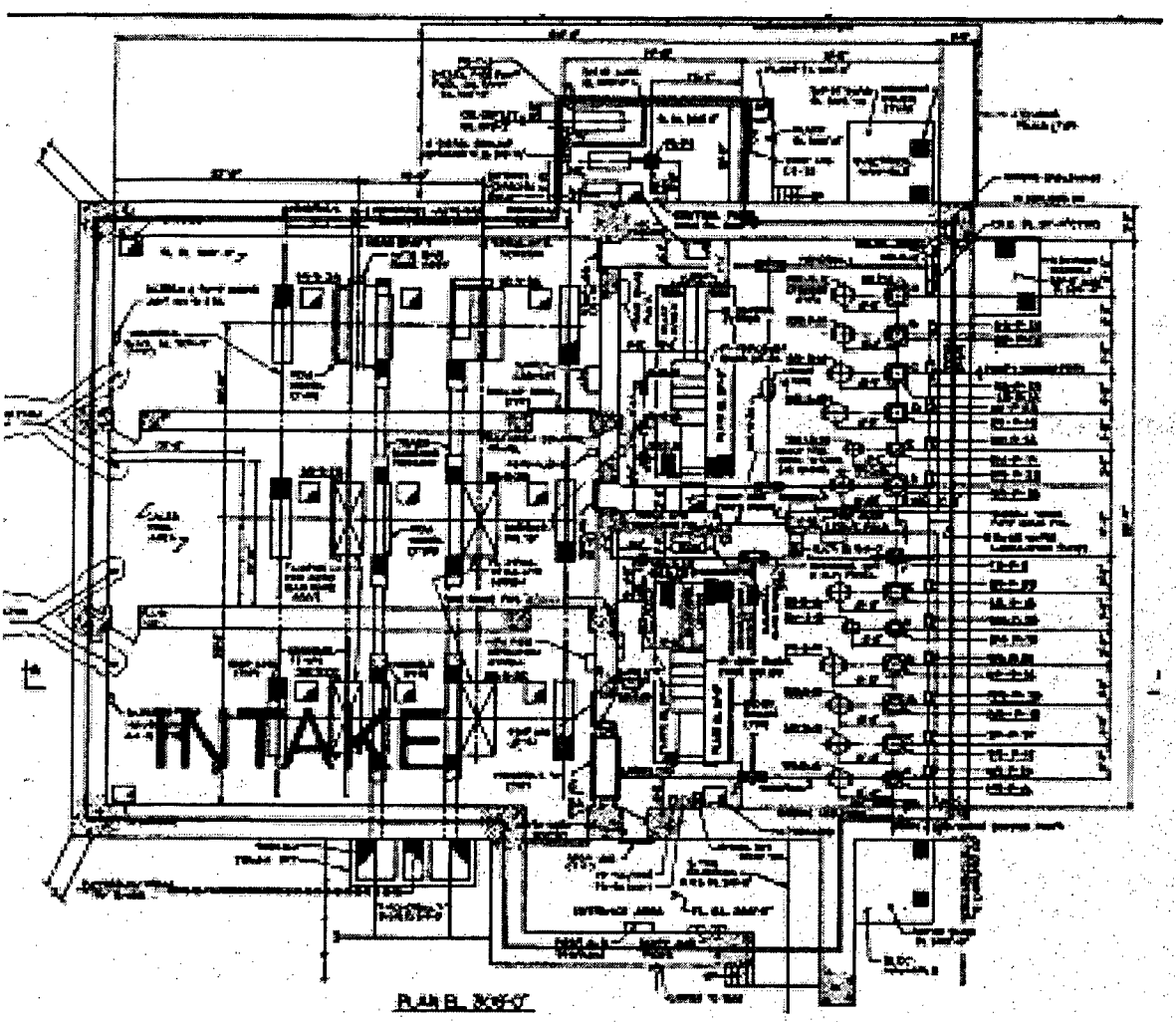


FIGURE G-14
INDUSTRIAL WASTE & SEWAGE TREATMENT
BUILDINGS

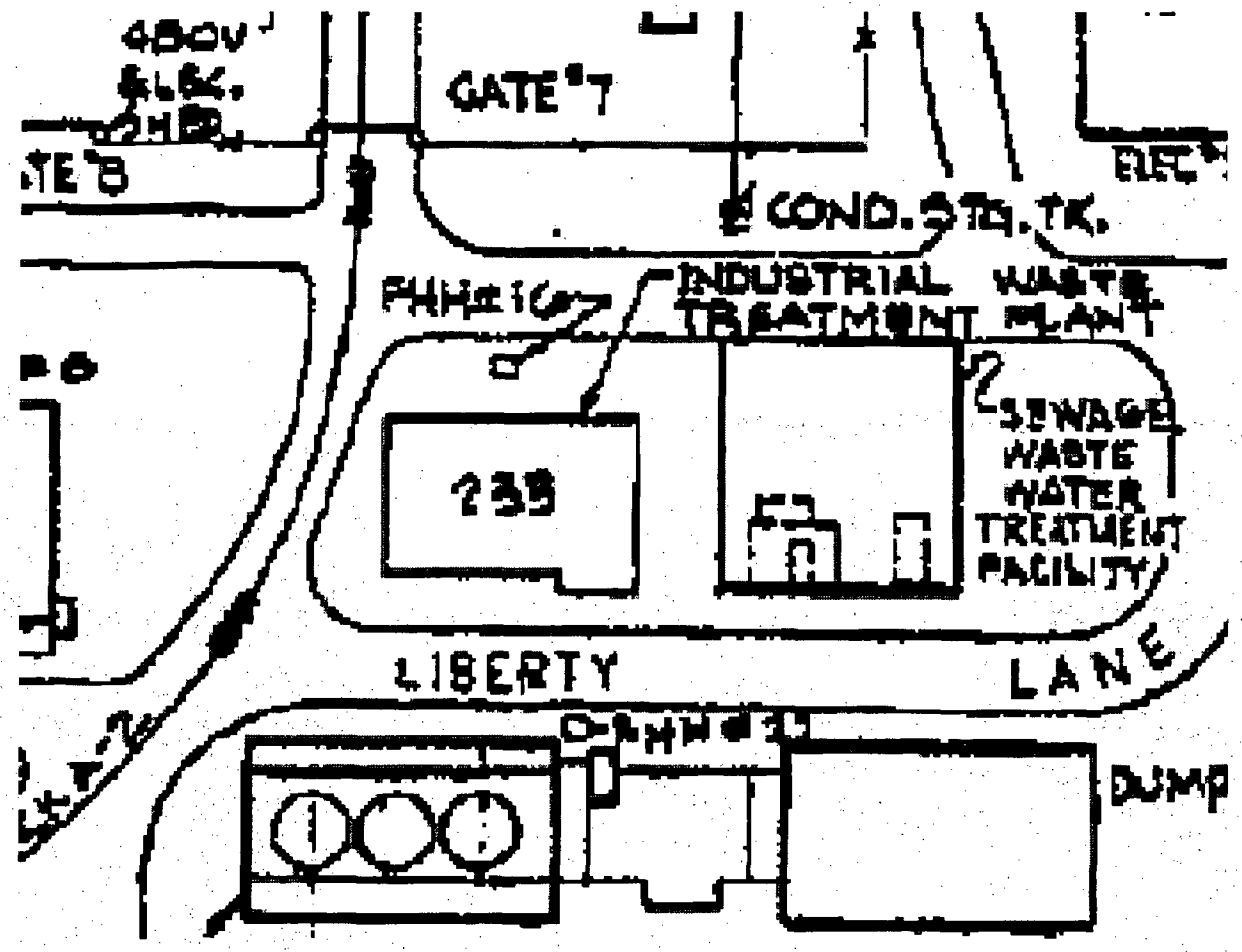


FIGURE G-15
INTERMEDIATE BUILDING
295' ELEVATION

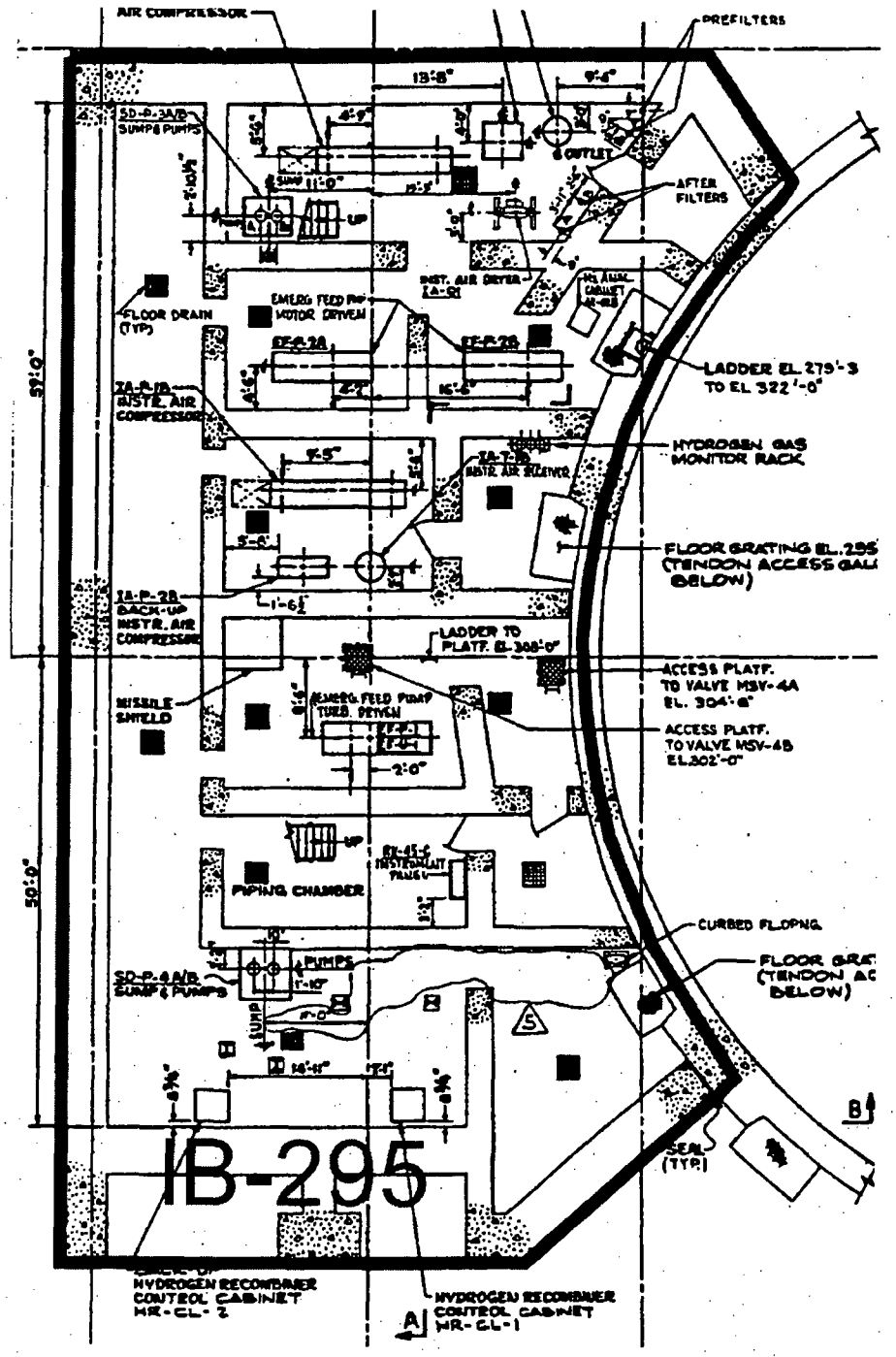


FIGURE G-16
INTERMEDIATE BUILDING
305' ELEVATION

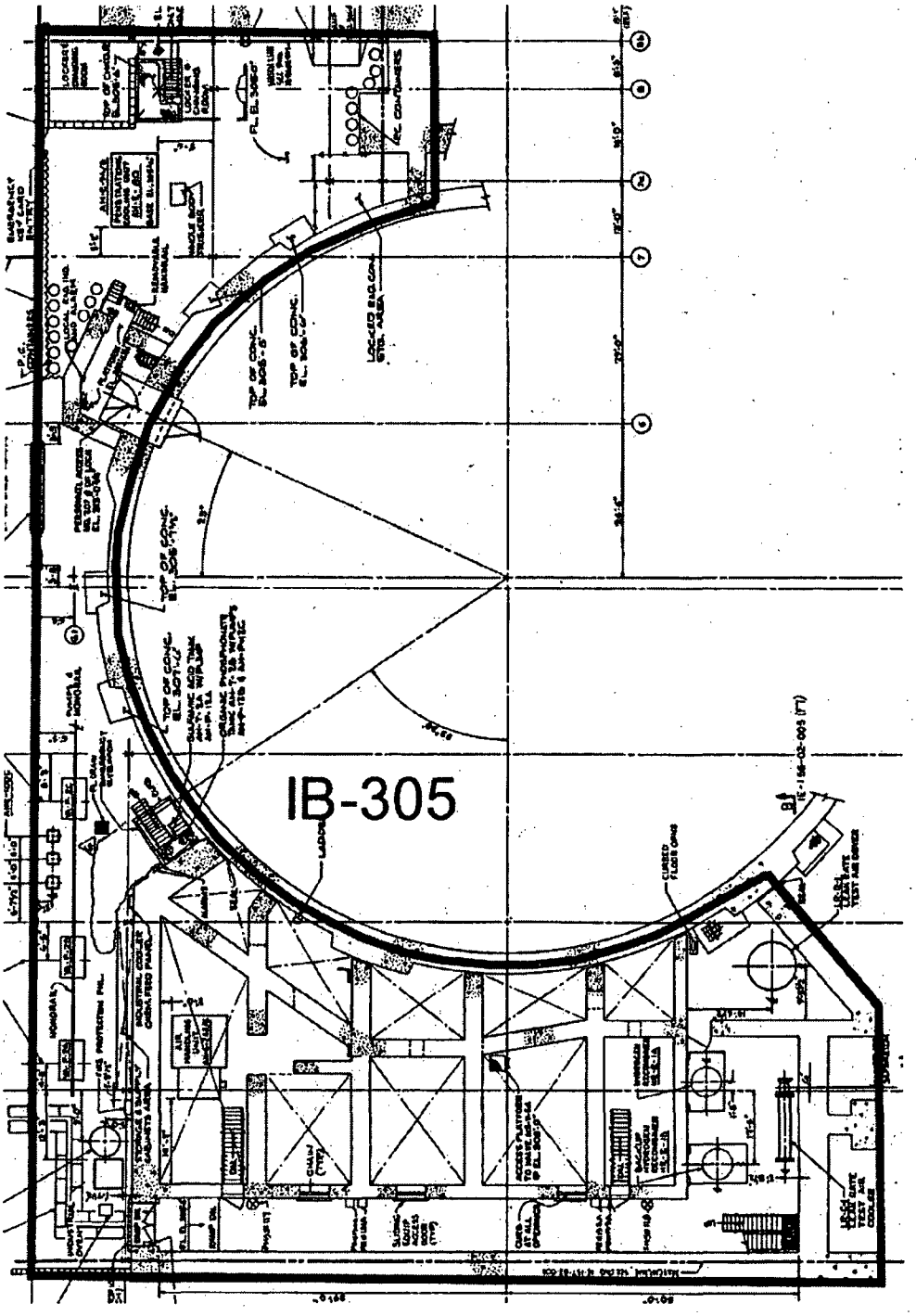


FIGURE G-17
INTERMEDIATE BUILDING
322' ELEVATION

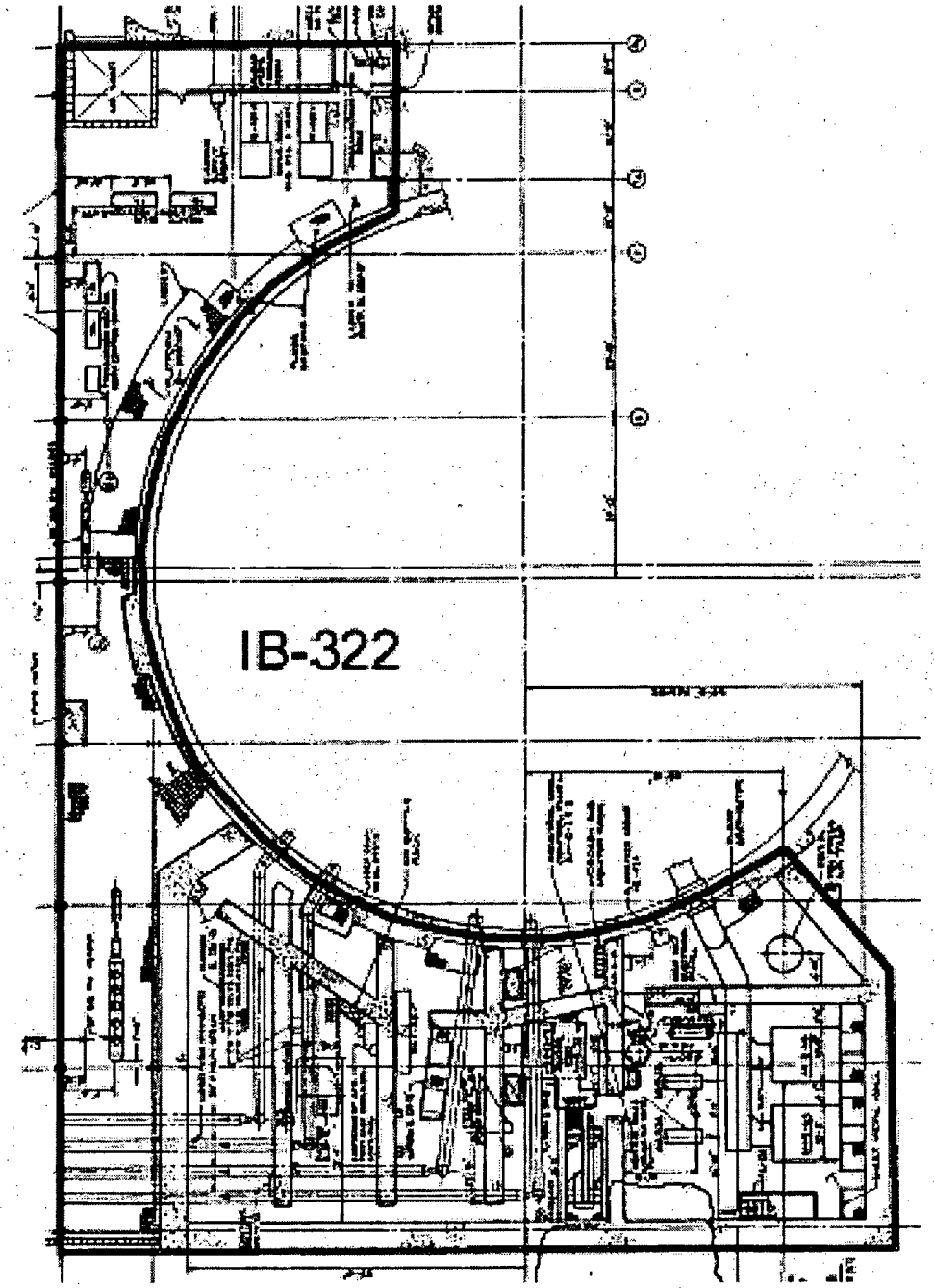


FIGURE G-18
INTERMEDIATE BUILDING
355' ELEVATION

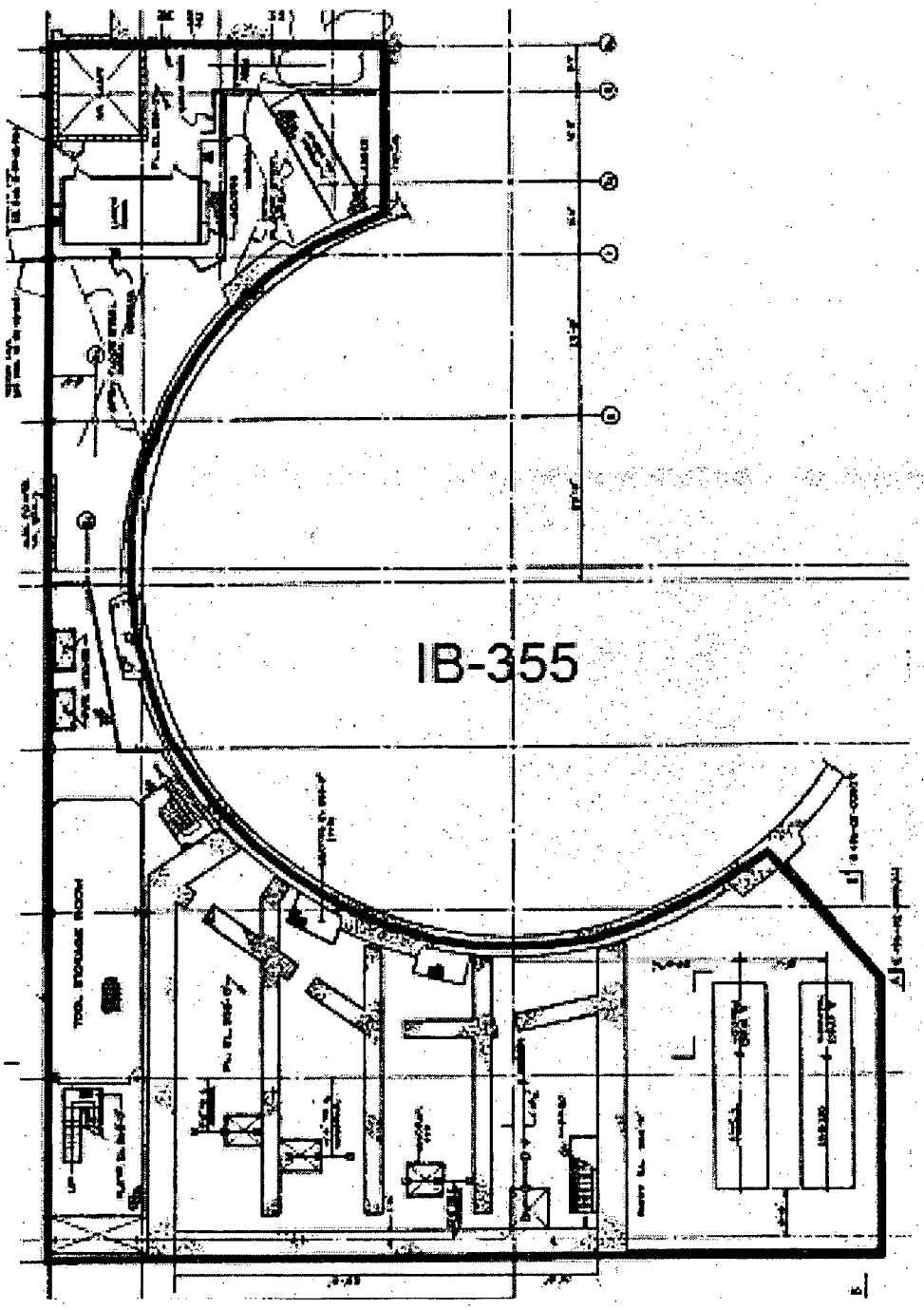


FIGURE G-19
REACTOR BUILDING BASEMENT
281' ELEVATION

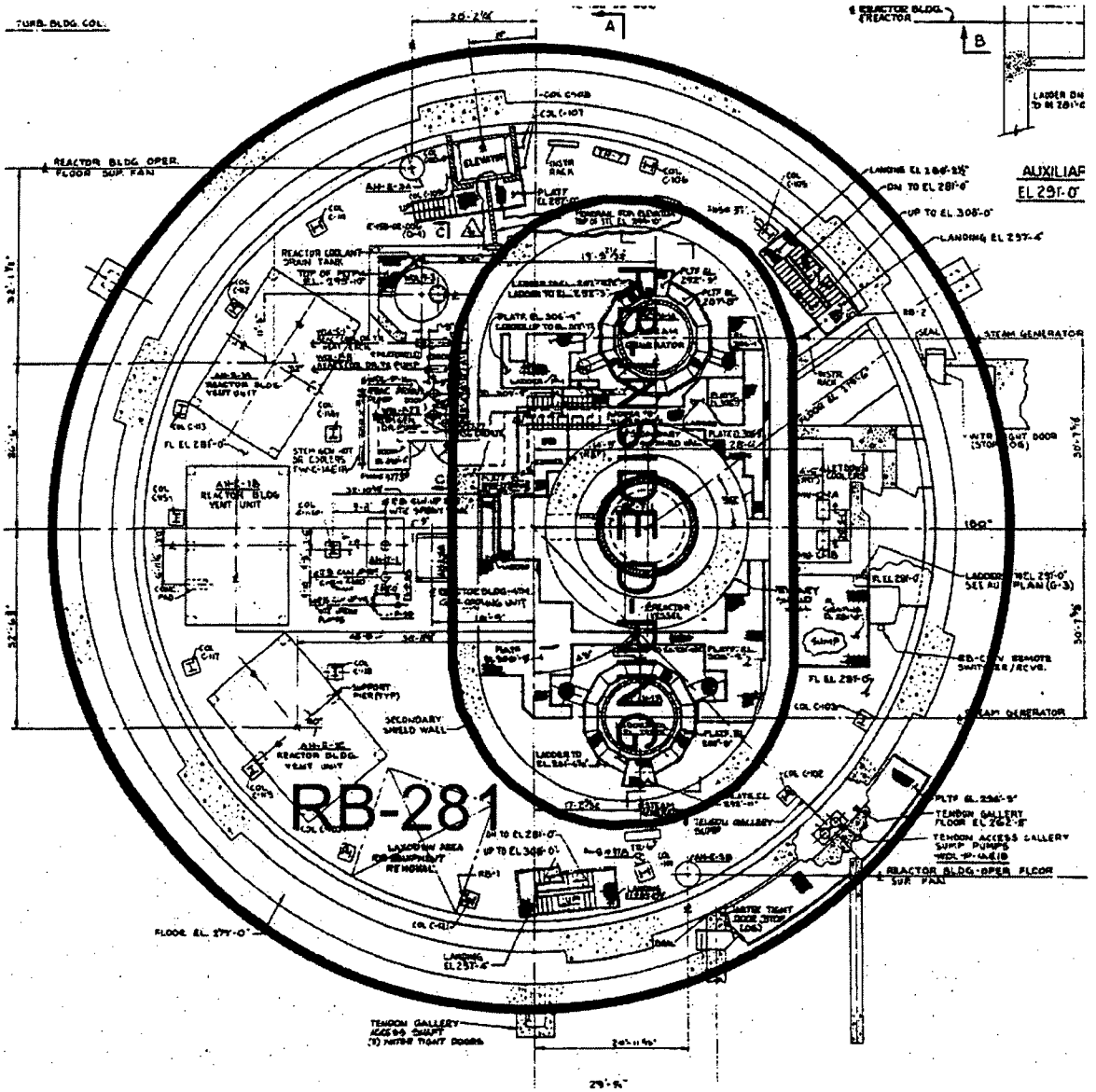


FIGURE G-20
REACTOR BUILDING MEZZANINE
308' ELEVATION

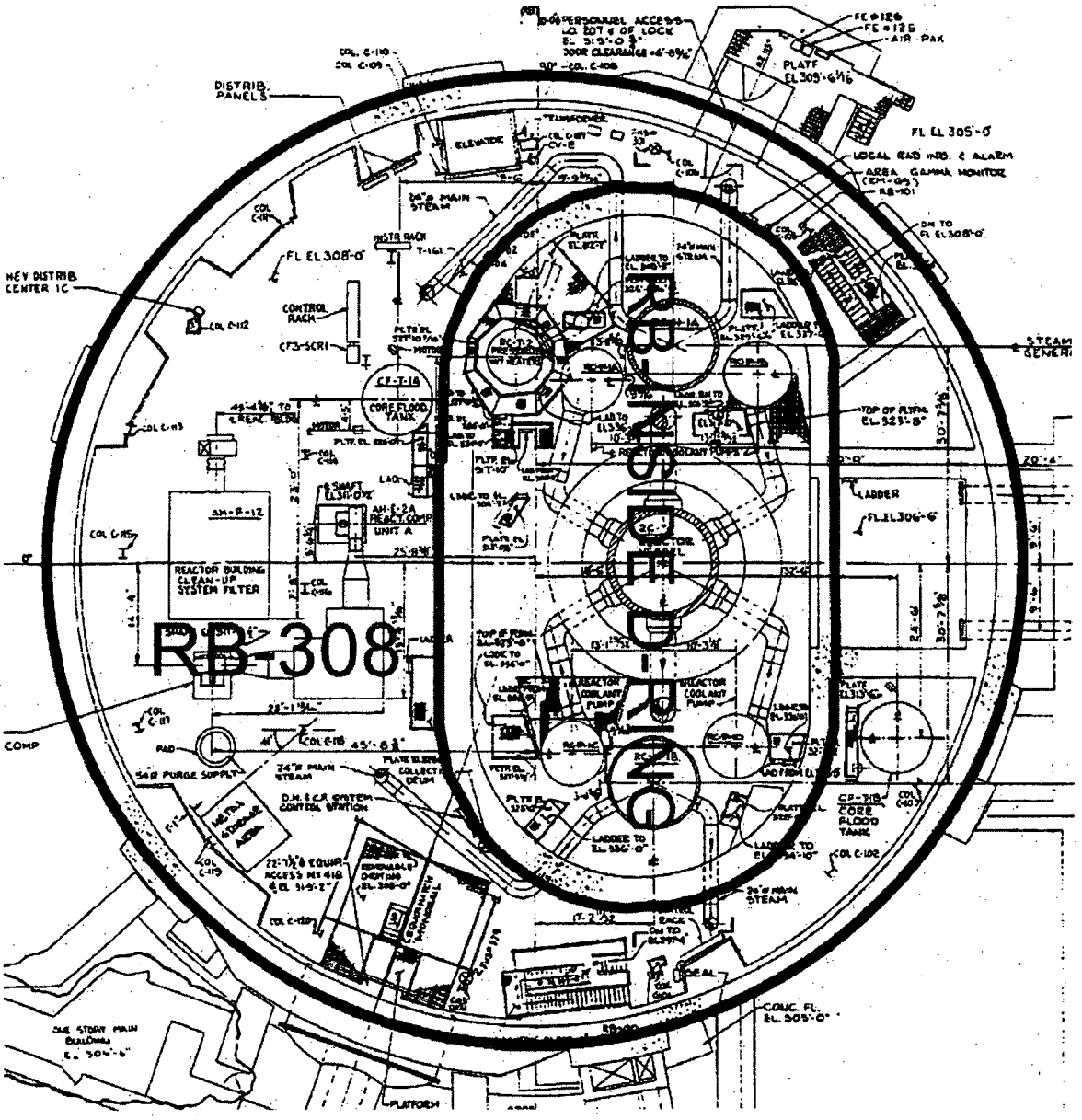


FIGURE G-21
REACTOR BUILDING OPERATING FLOOR
346' ELEVATION

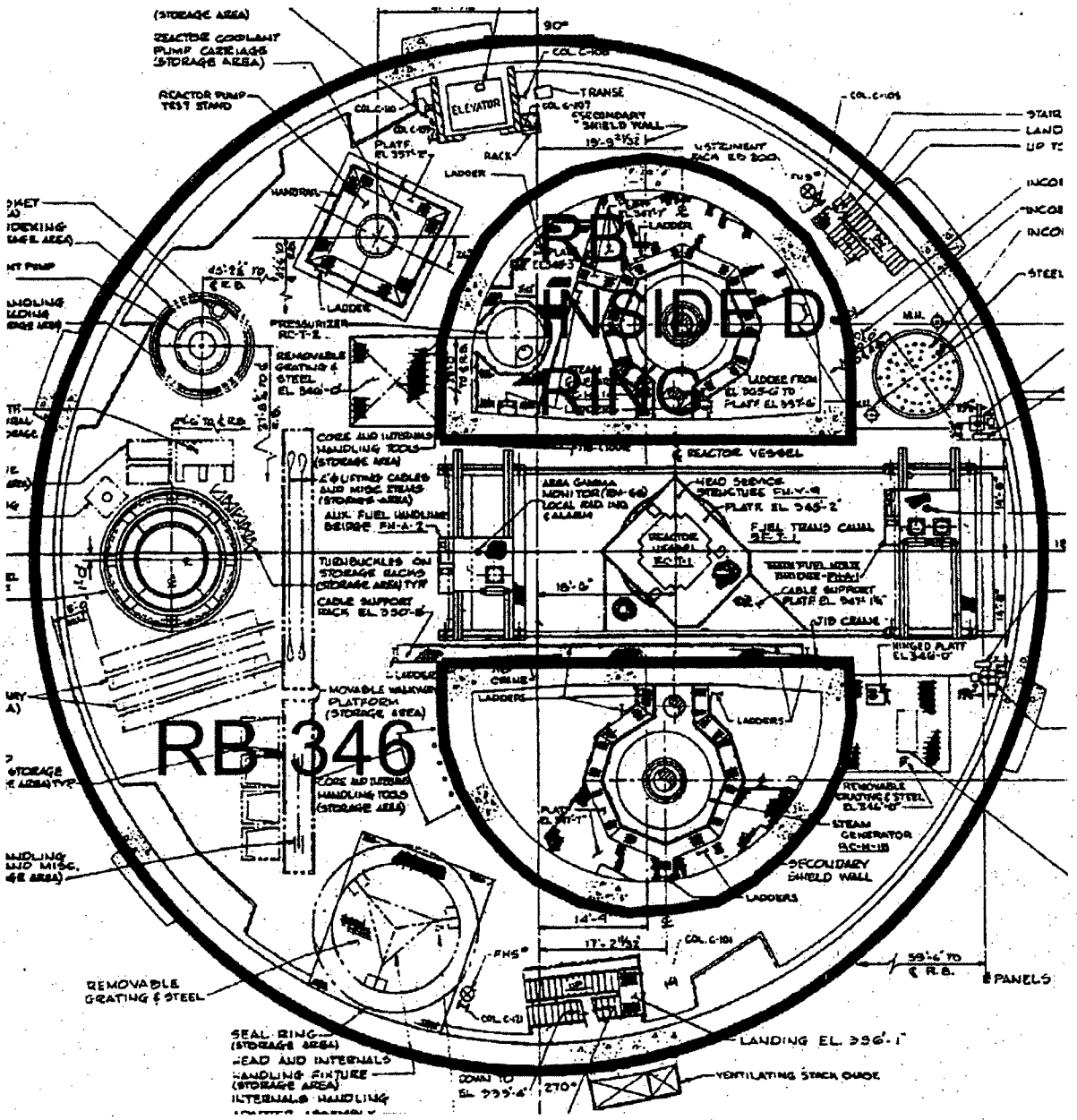


FIGURE G-22
REACTOR BUILDING
INSIDE D-RING ALL ELEVATIONS

RB-INSIDE D-RING

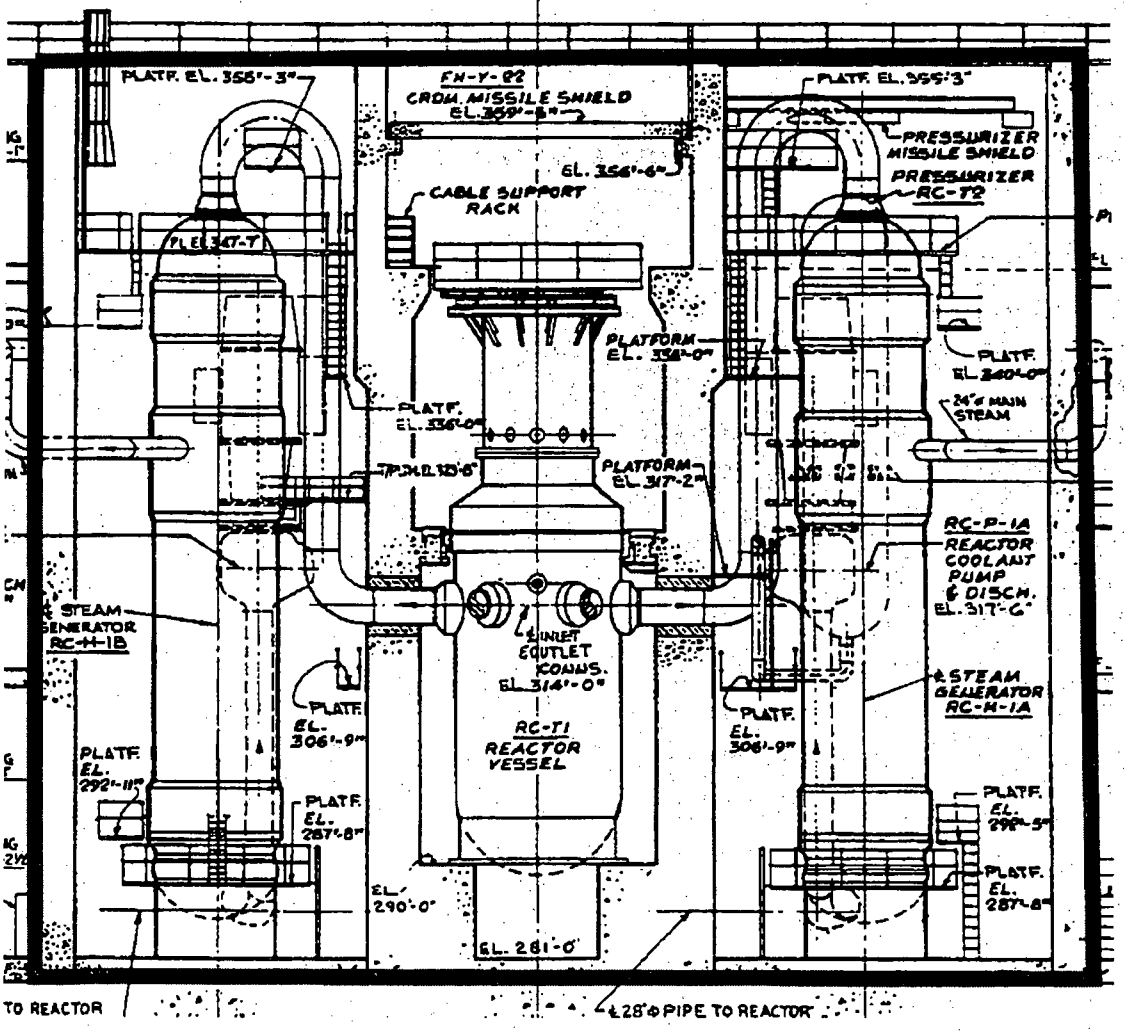


FIGURE G-23
TURBINE BUILDING GROUND FLOOR
305' ELEVATION [NORTH]

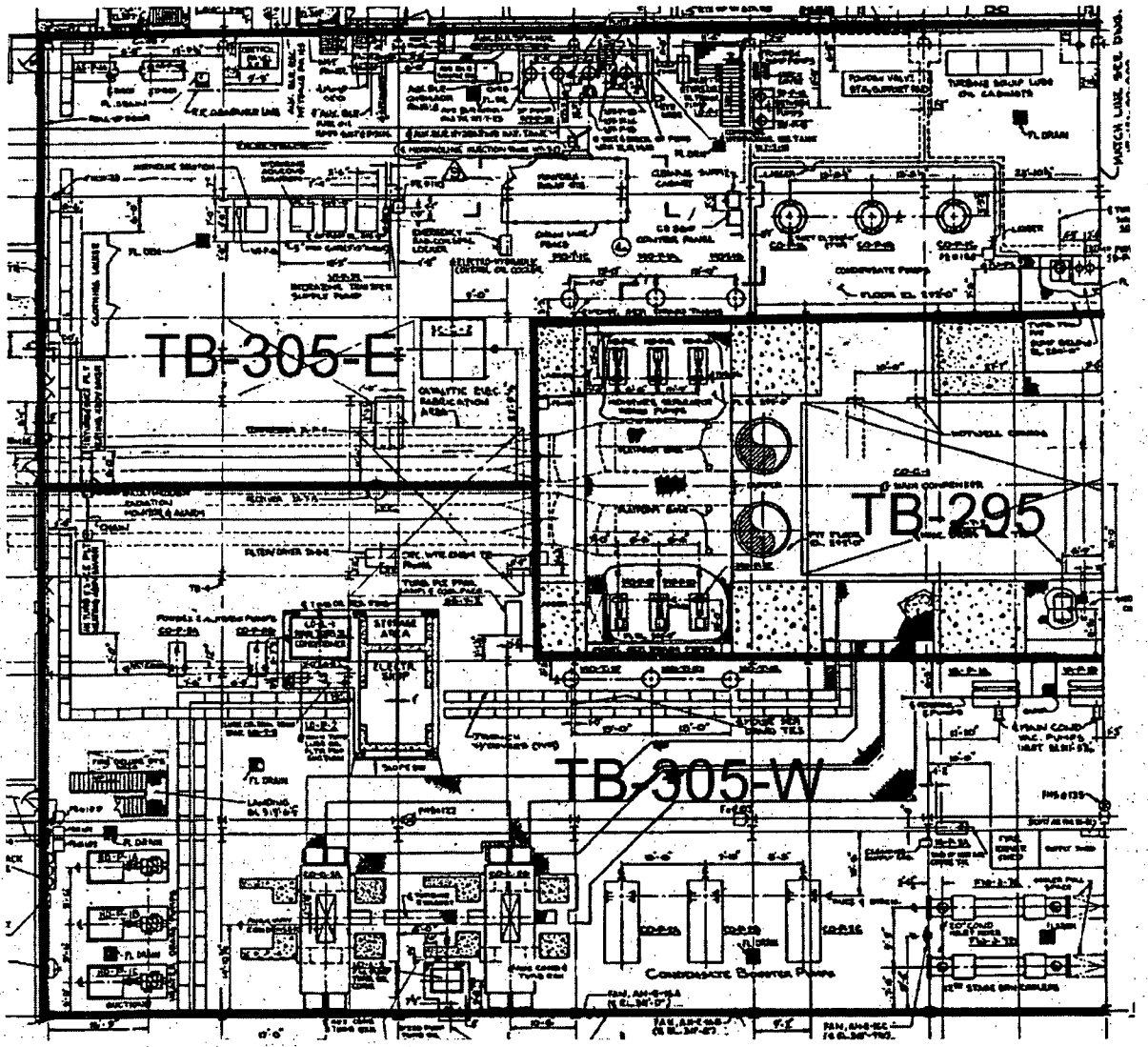


FIGURE G-24
TURBINE BUILDING GROUND FLOOR
305' ELEVATION [SOUTH]

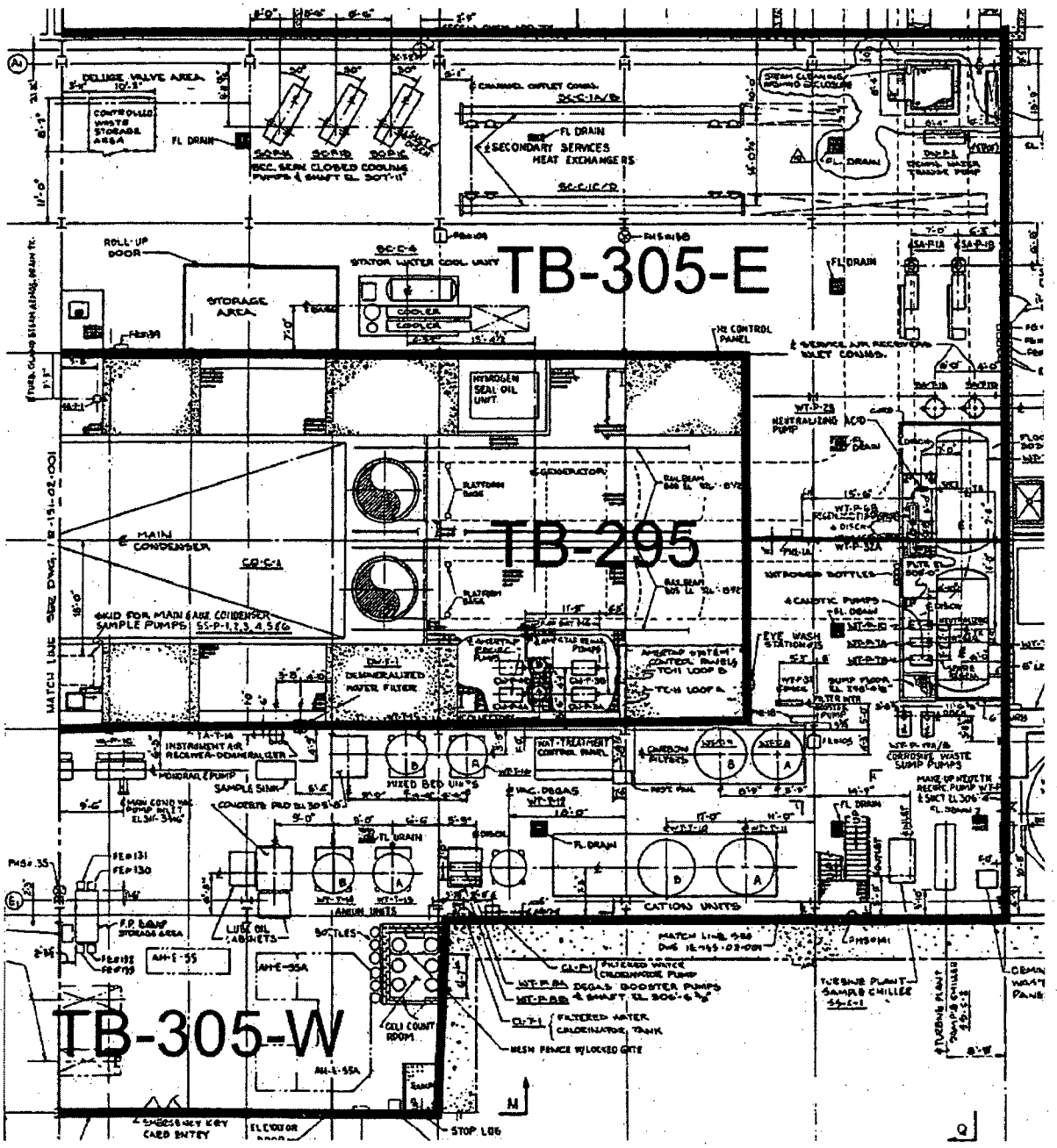


FIGURE G-25
TURBINE BUILDING MEZZANINE
322' ELEVATION [NORTH]

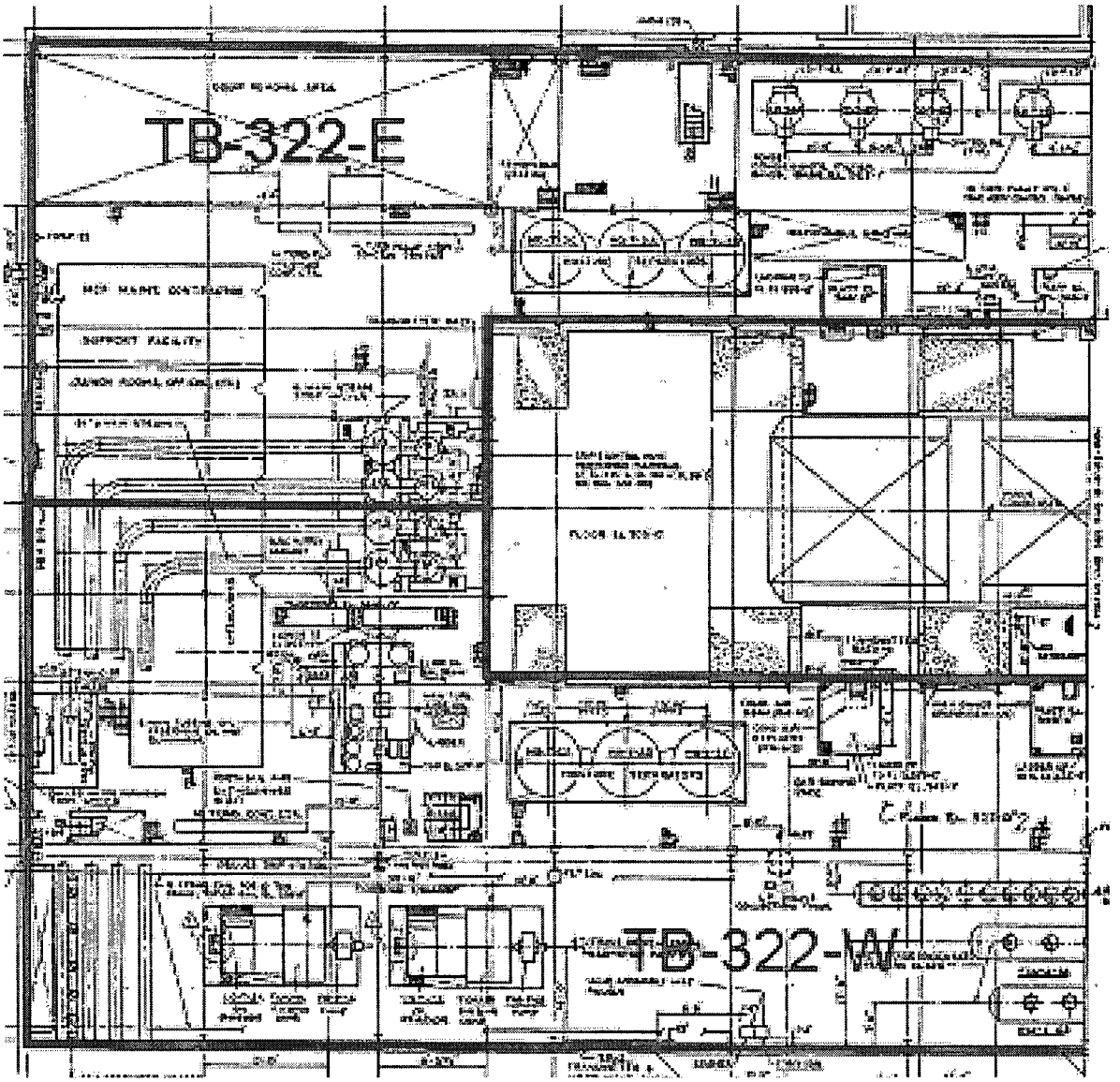


FIGURE G-26
TURBINE BUILDING MEZZANINE
322' ELEVATION [SOUTH]

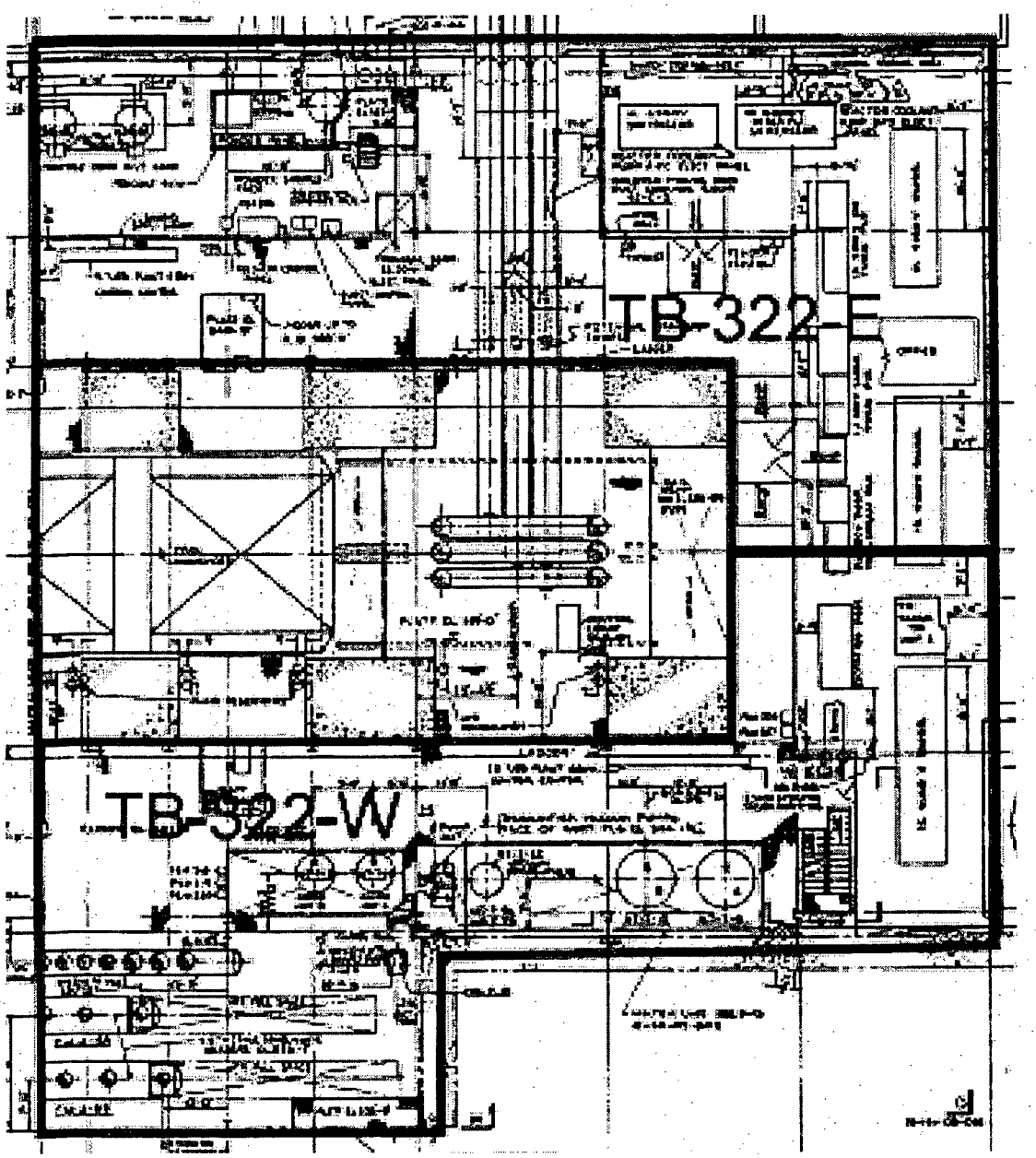


FIGURE G-27
TURBINE BUILDING OPERATING FLOOR
355' ELEVATION [NORTH]

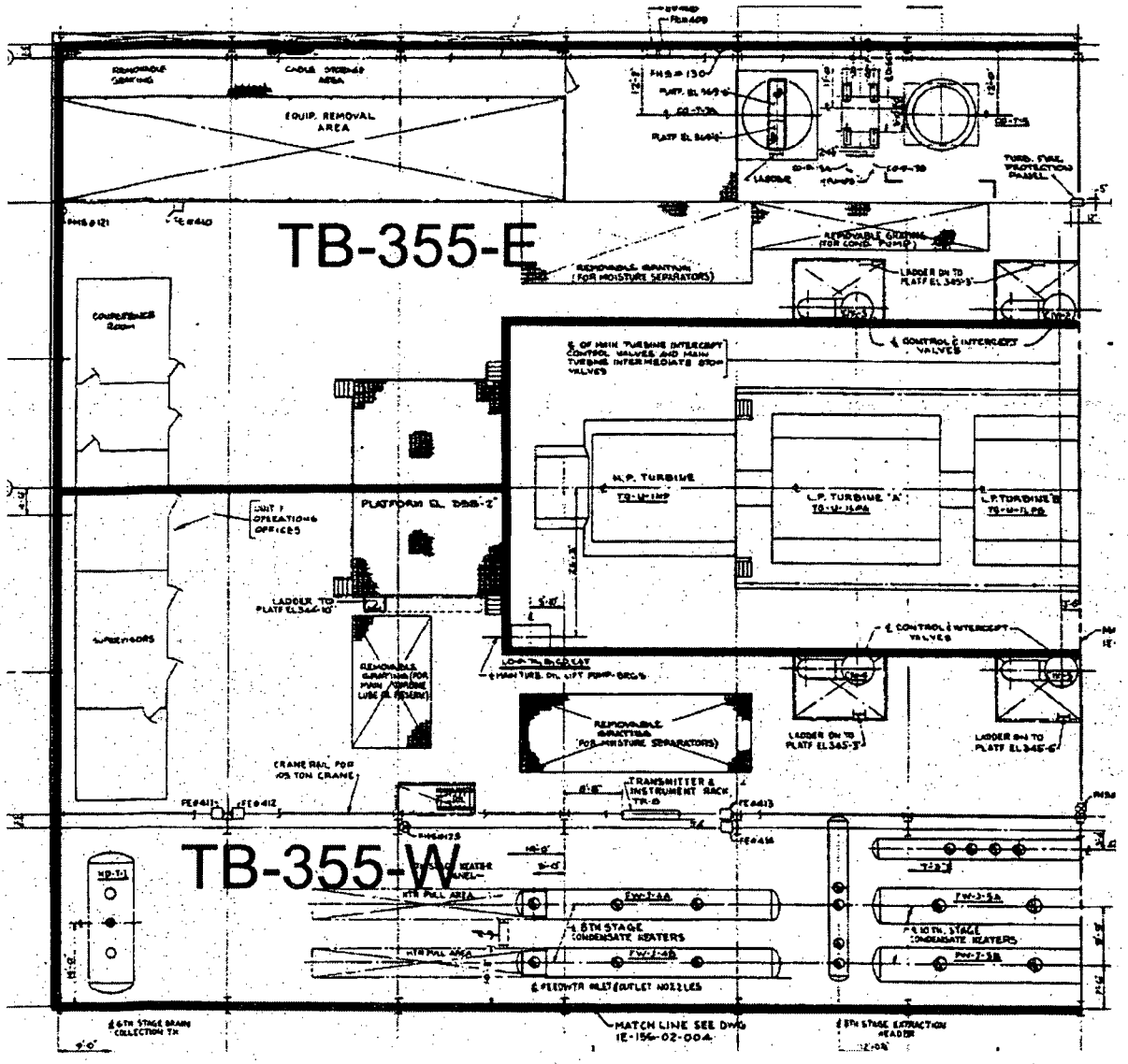


FIGURE G-28
TURBINE BUILDING OPERATING FLOOR
355' ELEVATION [SOUTH]

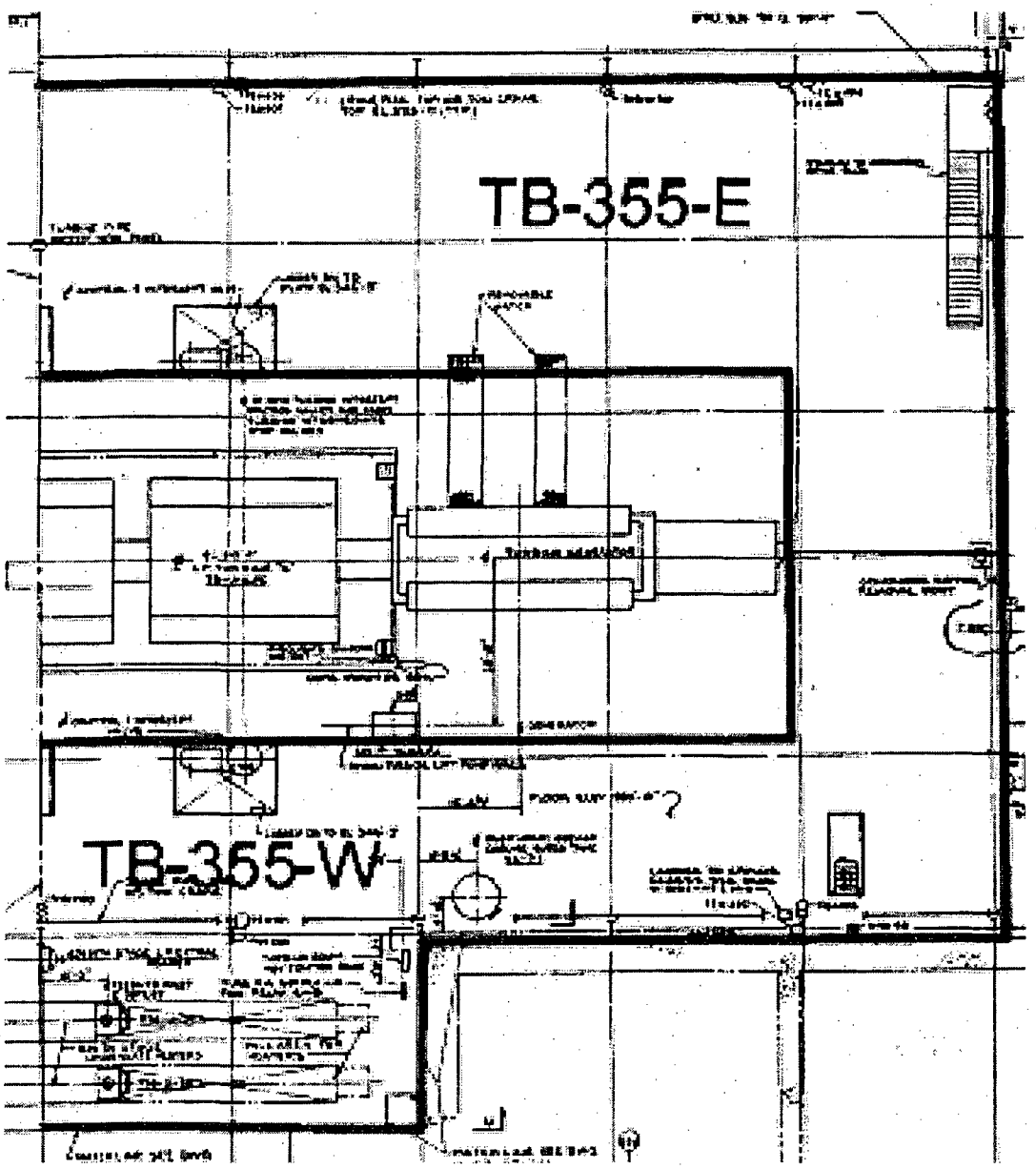


FIGURE G-29
TURBINE BUILDING HEATER BAY
380' ELEVATION

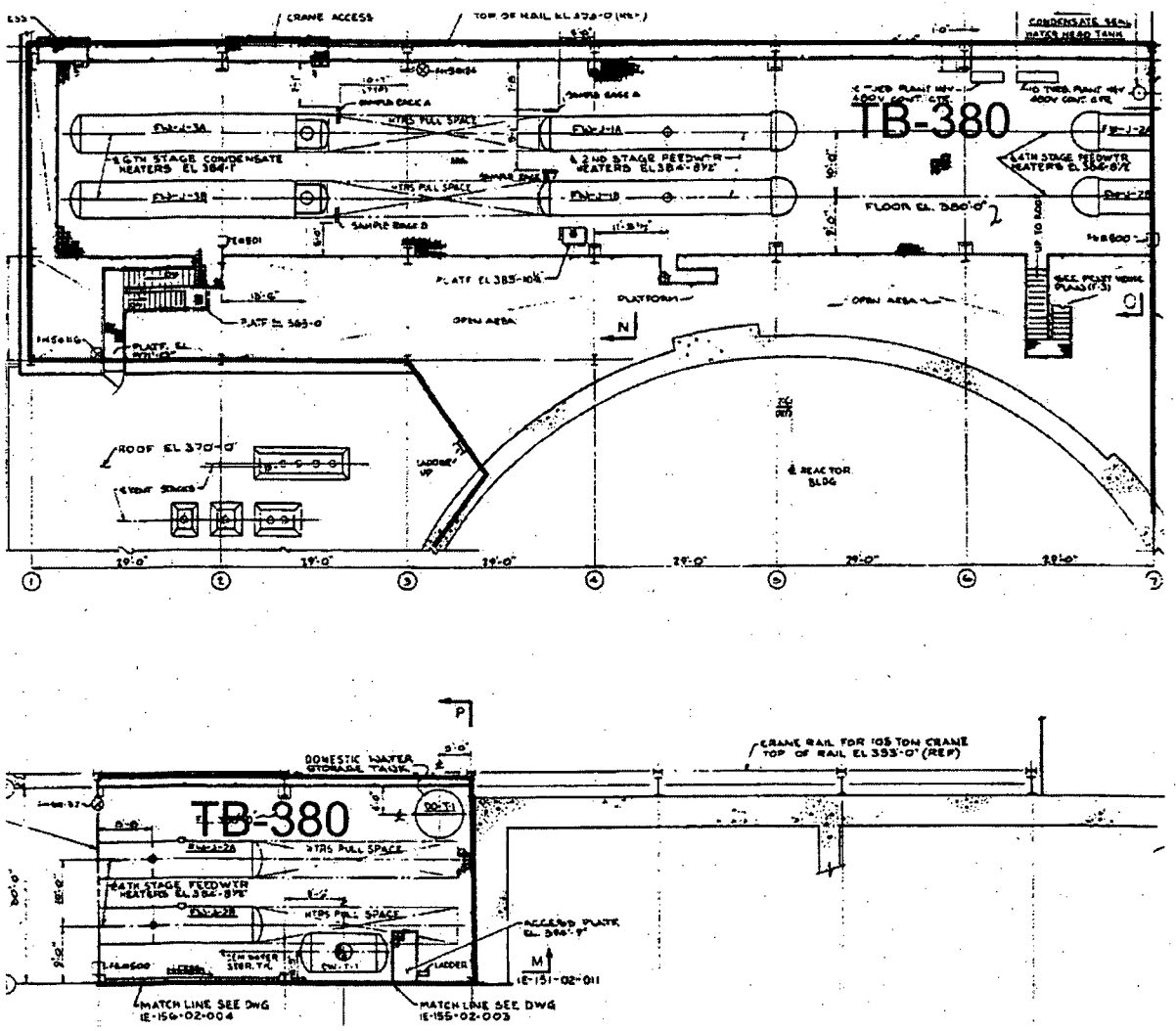


FIGURE G-30
PROTECTED AREA
301' ELEVATION

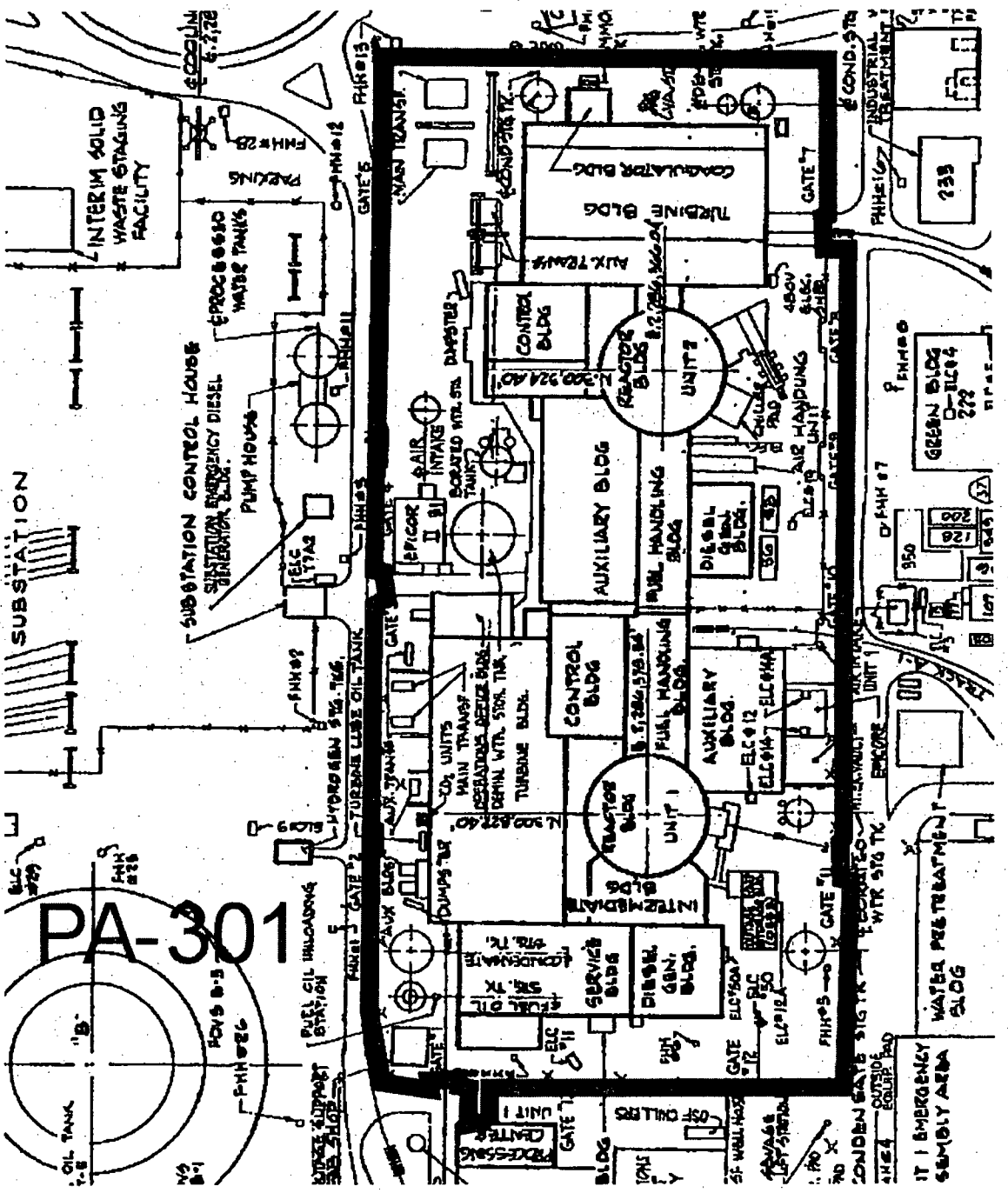
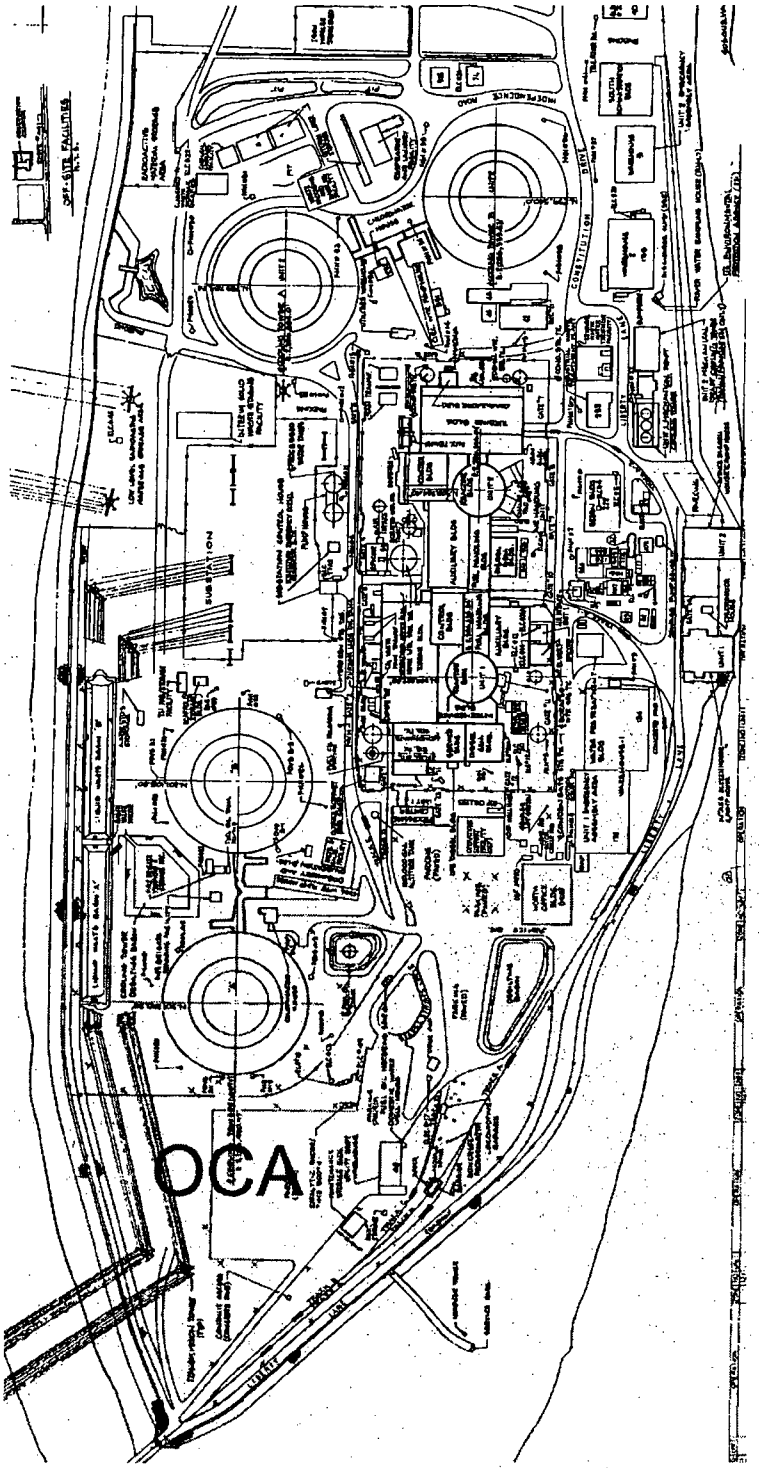


FIGURE G-31
OWNER CONTROLED AREA



ATTACHMENT 2

SPENT FUEL MANAGEMENT PLAN
FOR
THREE MILE ISLAND NUCLEAR STATION, UNIT 1

ATTACHMENT 2

**SPENT FUEL MANAGEMENT PLAN
FOR
THREE MILE ISLAND NUCLEAR STATION, UNIT 1**

Background

Exelon Generation Company, LLC (EGC) is seeking license renewal for TMI, Unit 1. The facility operating license for TMI, Unit 1 currently expires on April 19, 2014.

Attachment 1 is a preliminary decommissioning cost estimate provided in accordance with 10 CFR 50.75(f)(3) for Three Mile Island Nuclear Station (TMI), Unit 1. This preliminary decommissioning cost estimate evaluated three (3) options for decommissioning TMI, Unit 1 and assumes that TMI, Unit 1 is granted license extension. This assumption was used in the cost estimate, since it is intended to reflect the most likely decommissioning scenario for TMI, Unit 1.

For the purpose of demonstrating the adequacy of funding to meet regulatory requirements, the SAFSTOR decommissioning option has been selected and evaluated based on the current license expiration date. This spent fuel management plan is similarly based on the SAFSTOR analysis and premised on the current license term, although the discussion below includes all three decommissioning options. EGC has not made a final determination of the decommissioning approach for TMI, Unit 1. EGC reserves the right to choose the ultimate decommissioning option in accordance with our business needs, recognizing that we need to assure the chosen option meets U. S. Nuclear Regulatory Commission requirements for decommissioning funding.

Attachment 3 contains the projected annual cash flow required for decommissioning TMI, Unit 1 based on the SAFSTOR scenario from the Attachment 1 cost estimate, in thousands of 2008 dollars, including projected spent fuel management costs. The costs presented in Attachment 3 occur 20 years earlier than those in the Attachment 1 preliminary decommissioning cost estimate to model the current shutdown license expiration date.

Spent Fuel Management Strategy

The U. S. Nuclear Regulatory Commission requires (as discussed in 10 CFR 50.54(bb)) that licensees establish a program to manage and provide funding for the caretaking of all irradiated fuel at the reactor site until title and possession of the fuel is transferred to the U. S. Department of Energy (DOE). Interim storage of the fuel, until the DOE has completed the transfer, will be in the storage pool and/or an Independent Spent Fuel Storage Installation (ISFSI) located on the TMI, Unit 1 site.

An ISFSI, operated independent of power reactor operations, will be built to support decommissioning operations. For the DECON and SAFSTOR scenarios, the ISFSI facility is sized to accommodate the inventory of spent fuel generated during operation of the facility, at the conclusion of the required cooling period. Once emptied of fuel, the reactor building can be either decontaminated and dismantled or prepared for long-term storage. In the delayed DECON scenario, only the spent fuel pool would remain operational and used for the interim storage of the fuel until such time that the DOE can complete the transfer. The balance of the facility will be placed in a SAFSTOR condition.

The DOE's generator allocation/receipt schedules are based upon the oldest fuel receiving the highest priority. Given this scenario and an anticipated rate of transfer, spent fuel is projected to remain at the site for approximately 14 years after the cessation of operations at the end of the current license term, assuming DOE begins removing spent fuel from commercial facilities in 2018. Consequently, costs are included within the estimate noted below for the long-term caretaking of spent fuel at the TMI, Unit 1 site through the year 2028.

The total inventory of assemblies that will require handling during decommissioning is based upon several assumptions. The pickup of spent fuel from TMI, Unit 1 is assumed to begin in the year 2026. The maximum rate at which spent fuel is removed from the commercial sites is based upon an annual capacity of 3,000 metric tons of uranium (MTU). Any further delay in DOE operations or decrease in the rate of acceptance will correspondingly prolong the transfer process and result in spent fuel remaining at the site longer.

In the DECON and SAFSTOR decommissioning scenarios, the ISFSI will continue to operate until such time that the transfer of spent fuel to the DOE can be completed. Assuming that the DOE commences operation in 2018, spent fuel is projected to be removed from the TMI, Unit 1 site by the end of the year 2028. In the delayed DECON scenario, the spent fuel pool is used to store spent fuel. Operation and maintenance costs for the storage facilities are included in the cost estimate and address the cost for staffing the facilities, maintenance of necessary operational requirements as well as security, insurance, and licensing fees. The estimate includes the costs to purchase, load, and transfer the fuel storage canisters to the ISFSI, as required by the decommissioning scenario.

A discussion of site-specific considerations for the management of spent fuel at TMI, Unit 1 under each decommissioning scenario may be found in Section 3.5.1 of Attachment 1.

In the event that TMI, Unit 1 does cease operations in 2014, TMI, Unit 1 will continue to comply with existing NRC licensing requirements, including the operation and maintenance of the systems and structures needed to support continued operation of the TMI, Unit 1 spent fuel pool and ISFSI, as necessary, under the decommissioning scenario ultimately selected. In addition, TMI, Unit 1 will also comply with applicable license termination requirements in accordance with 10 CFR 50.82, "Termination of

license," with respect to plant shutdown and post-shutdown activities including seeking U. S. Nuclear Regulatory Commission approvals and on schedules as necessary to satisfy these requirements consistent with the continued storage of irradiated fuel.

Cost Estimate and Funding For Spent Fuel Management Based on the SAFSTOR Decommissioning Option

As of December 31, 2008, the TMI, Unit 1 decommissioning trust fund balance was $371.4 million. The projected amount necessary at shutdown (April 19, 2014) for radiological decommissioning costs is $358.9 million for the SAFSTOR scenario (assuming a 2% real rate of return through the decommissioning period). To the extent that the trust fund balance exceeds costs required for radiological decommissioning, trust fund monies, in conjunction with EGC operating revenues, will be used to pay for spent fuel management costs.

Annual costs for spent fuel management range from approximately $3 million to $12 million, depending upon the decommissioning scenario selected.

NRC Approvals

This spent fuel management plan contemplates potential withdrawals from the decommissioning trust for spent fuel management purposes. Prior to any such withdrawals, EGC will make appropriate submittals for an exemption in accordance with 10 CFR 50.12, "Specific exemptions," from the requirements of 10 CFR 50.82(a)(8)(i)(A) in order to use the decommissioning trust funds for spent fuel management expenses. EGC will monitor the funding level of the decommissioning fund to ensure that spent fuel management withdrawals will not inhibit the ability of the licensee to complete radiological decommissioning.

ATTACHMENT 3

ANNUAL SAFSTOR DECOMMISSIONING CASH FLOW
FOR
THREE MILE ISLAND NUCLEAR STATION, UNIT 1

ATTACHMENT 3

**ANNUAL SAFSTOR DECOMMISSIONING CASH FLOW
FOR
THREE MILE ISLAND NUCLEAR STATION, UNIT 1**

(thousands of 2008 dollars)

Year	License Termination Cost	Spent Fuel Management Cost	Site Restoration Cost	Total Cost
2014	33,474	25,723	-	59,197
2015	56,387	22,652	-	79,038
2016	4,539	22,557	-	27,096
2017	4,526	22,495	-	27,022
2018	4,526	22,495	-	27,022
2019	4,524	19,792	-	24,315
2020	4,520	3,155	-	7,676
2021	4,508	3,147	-	7,655
2022	4,508	3,147	-	7,655
2023	4,508	3,147	-	7,655
2024	4,520	3,155	-	7,676
2025	4,508	3,147	-	7,655
2026	4,508	5,159	-	9,667
2027	4,508	6,597	-	11,105
2028	4,520	6,597	-	11,117
2029	4,481	-	-	4,481
2030	4,481	-	-	4,481
2031	4,481	-	-	4,481
2032	4,494	-	-	4,494
2033	4,481	-	-	4,481
2034	4,481	-	-	4,481
2035	4,481	-	-	4,481
2036	4,494	-	-	4,494
2037	4,481	-	-	4,481
2038	4,481	-	-	4,481
2039	4,481	-	-	4,481
2040	4,494	-	-	4,494
2041	4,481	-	-	4,481
2042	4,481	-	-	4,481
2043	4,481	-	-	4,481
2044	4,494	-	-	4,494
2045	4,481	-	-	4,481
2046	4,481	-	-	4,481
2047	4,481	-	-	4,481
2048	4,494	-	-	4,494
2049	4,481	-	-	4,481

ATTACHMENT 3

ANNUAL SAFSTOR DECOMMISSIONING CASH FLOW FOR THREE MILE ISLAND NUCLEAR STATION, UNIT 1

(thousands of 2008 dollars)

(Continued)

Year	License Termination Cost	Spent Fuel Management Cost	Site Restoration Cost	Total Cost
2050	4,481	-	-	4,481
2051	4,481	-	-	4,481
2052	4,494	-	-	4,494
2053	4,481	-	-	4,481
2054	4,481	-	-	4,481
2055	4,481	-	-	4,481
2056	4,494	-	-	4,494
2057	4,481	-	-	4,481
2058	4,481	-	-	4,481
2059	4,481	-	-	4,481
2060	4,494	-	-	4,494
2061	4,481	-	-	4,481
2062	4,481	-	-	4,481
2063	4,481	-	-	4,481
2064	4,494	-	-	4,494
2065	4,481	-	-	4,481
2066	4,481	-	-	4,481
2067	4,481	-	-	4,481
2068	25,085	-	369	25,454
2069	56,432	-	1,280	57,712
2070	127,651	-	2,301	129,952
2071	53,237	841	539	54,616
2072	53,383	843	540	54,766
2073	43,733	461	295	44,489
2074	9,693	878	25,088	35,659
2075	104	1,252	35,770	37,126
2076	28	343	9,800	10,172
Totals	**692,814**	**177,582**	**75,982**	**946,378**