HOLTEC INTERNATIONAL

Holtec Center, One Holtec Drive, Marlton, NJ 08053
Telephone (856) 797- 0900
Fax (856) 797 - 0909

NON-PROPRIETARY VERSION

Holtec International & Eddy Lea Energy Alliance (ELEA) Underground Consolidated Interim Storage Facility - Decommissioning Plan

Holtec Report No: HI-2177558

Holtec Project No: 5025

Sponsoring Holtec Division: NPD

Report Class : NOT SAFETY RELATED

REVISION LOG

Revision	Revision Changes
0	Initial revision.

TABLE OF CONTENTS

1.0 INTRODUCTION

Holtec International (Holtec) is currently seeking a Nuclear Materials License from the Nuclear Regulatory Commission (NRC) requesting authorization to construct and operate a Central Interim Storage (CIS) Facility (HI-STORE) to store 500 sealed canisters containing spent fuel and discharged reactor internal parts from commercial US nuclear power plants. This CIS Facility would remain in operation until such time that the Department of Energy is prepared to accept Spent Nuclear Fuel (SNF) and Greater Than Class C (GTCC) wastes from commercial nuclear plant licensees. When the requested CIS Facility license is issued by the NRC, Holtec subsequently anticipates requesting an amendment to the license to request authorization to possess and store an additional 500 canisters for each of 19 subsequent expansion phases to be completed over the course of years. Ultimately, Holtec anticipates that approximately 10,000 SNF canisters would be stored at the CIS Facility upon completion of all 20 phases.
This document is the initial Decommissioning Plan to describe the proposed plan to decommission the HI-STORE CIS Facility.

2.0 REGULATORY COMPLIANCE

This initial Decommissioning Plan was developed to comply with 10 CFR 72.30 [Ref. 4.1] to describe the proposed plan to decommission the HI-STORE CIS Facility. A Final Decommissioning Plan detailing activities and procedures for decommissioning will be submitted to NRC prior to start of the decommissioning activities.

3.0 DEFINITIONS

None.

4.0 REFERENCES

4.1 10 CFR 72.30, Financial Assurance and Recordkeeping for Decommissioning.
4.2 NUREG-1757 Volume 1, “Consolidated Decommissioning Guidance.”
4.3 NUREG-1757 Volume 3, “Consolidated Decommissioning Guidance, Financial Assurance, Recordkeeping and Timeliness.”
4.4 Holtec International, HI- 2177565 Holtec International & Eddy Lea Energy Alliance (ELEA) CIS Facility - Decommissioning Cost Estimate and Funding Plan, Rev. 0.
4.5 R.S. Means, Construction Cost Data, 2017.
4.6 Holtec International, Holtec Final Safety Analysis Report on the HI-STORM UMAX Canister Storage System, Holtec Report HI-2115090, Revision 2, July 11, 2014.
4.7 10 CFR 72.120, Criteria for Decommissioning.

5.0 RESPONSIBILITIES

None.

6.0 DECOMMISSIONING PLAN

6.1 Decommissioning Objective

The objective of decommissioning activities at HI-STORE CIS Facility is to verify that any potential radioactive contamination is below established release limits, and in the unlikely event of contamination, to identify and remove radioactive contamination that is above the NRC release limits, so that the site may be released for unrestricted use and the NRC license terminated.

6.2 Decommissioning Activities

A Final Decommissioning Plan detailing activities and procedures for decommissioning will be provided after the spent nuclear fuel (i.e., canisters) is removed from the facility. The HI-STORE CIS Facility is configured to be operated as a "clean" facility. All components of the facility including the transport casks and storage canisters are designed to minimize the potential for any contamination. Continual radiological survey throughout the life of the facility will be performed to identify any possible contamination and to verify that the facility remains clean. The actual decommissioning activities presented in the Final Decommissioning Plan will depend on the operating history of the facility and the results of the initial characterization survey performed at the beginning of the decommissioning period. This initial plan will outline the planned approach to decommissioning.

The HI-STORE CIS Facility will be operated as a "clean" facility. Residual radioactive contamination is not anticipated at the HI-STORE CIS Facility for several reasons:

- Canisters are surveyed and decontaminated at the generator facility to ensure the outer surfaces are clean before shipment to HI-STORE CIS Facility.
- Canisters are welded shut and sealed to prevent leaks.
- Canisters will not be opened during transport to HI-STORE CIS Facility during handling or during storage at the HI-STORE CIS Facility at any time.
- Radiological activation of Vertical Ventilated Modules (VVMs) and concrete pad materials is expected to be insignificant with radiation levels below the applicable NRC criteria for unrestricted release.

The Final Decommissioning Plan will address final status survey of the site and termination of the license. The Final Decommissioning Plan will include detailed information on the following:

1. A current description of the existing conditions of the site including all facilities sufficient to evaluate the acceptability of the plan;
2. The decommissioning and a description of the activities involved including:
    - Organization
    - Site Preparation
    - Design activities
    - Procurement
    - Outside contractors

- Procedures for decontamination
- Procedures for radiological survey
- Schedule

3. A description of controls and limits on procedures and equipment to protect occupational and public health and safety;
4. A description of the planned final radiation survey;
5. An updated detailed cost estimate for the decommissioning activities, a comparison of that estimate with present funds set aside for decommissioning, and a plan for assuring the availability of adequate funds for completion of the decommissioning including means for adjusting cost estimates and associated funding levels over any surveillance period;
6. A description of technical specifications and quality assurance provisions in place during decommissioning.

The final plan will evaluate NRC criteria for decommissioning to ensure all requirements are satisfied. Decommissioning activities will be planned using ALARA principles and in a manner that protects the public and environment during the process.

6.3 Decontamination Tasks

Once all of the canisters stored at HI-STORE CIS Facility have been shipped off-site and the decommissioning period begins, a Historical Site Assessment will be performed to identify through record review and personnel interviews any incidents that may have caused contamination to an area of the site. Those areas in which a contaminated event may have occurred will be assessed in more detail to determine the extent of any residual contamination. Detailed characterization surveys will be performed to verify that the VVMs and the concrete pads are free of contamination and all other areas of the site determined to be non-impacted will have a confirmation survey conducted. It is anticipated that the VVMs and concrete pads will not be contaminated and will be left in place or removed as determined by HI-STORE CIS Facility.
NRC limits for unrestricted release using conventional decontamination techniques will be used which minimize the volume of waste. Any waste generated will be sent to a licensed facility for disposal.

6.4 Decommissioning Organization

Successful planning and execution of the decommissioning plan will include utilizing individuals within the CIS Facility organization. In addition to CIS Facility staff, many of the decommissioning activities will be performed by contractors. The Final Decommissioning Plan will provide information on HI-STORE CIS Facility.

6.5 Waste Products Generated During Operations

There are minimal radioactive wastes generated at the HI-STORE CIS Facility. Gaseous and liquid wastes are not generated at the HI-STORE CIS Facility. Small volumes of solid radioactive waste may be produced from routine operations involving contamination surveys and decontamination activities involving incoming and outgoing transportation casks and equipment. Potential solid

waste streams are collected and temporarily stored on site until authorization under HI-STORE Low Level Radioactive Waste (LLRW) License allows for processing and disposal.

7.0 RECORDS

Pursuant of 10 CFR 72.30(f), records of importance to the decommissioning of the HI-STORE CIS Facility will be maintained until the site is released for unrestricted use. Records will include:

- Records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site.
- As-built drawings and modifications of structures and equipment used in the storage of radioactive materials.
- A list containing all areas designated as a restricted area.
- The decommissioning funding plan cost estimate and records of the funding method used for assuring funds are available for decommissioning.

8.0 DECOMMISSIONING COST ESTIMATE

Pursuant to 10 CFR 72.30, a decommissioning cost estimate was prepared and is presented in the Decommissioning Funding Plan (DFP) [Ref. 4.4]. The DFP discusses the decommissioning cost estimate and financial funding assurance per 10 CFR 72.30(e). The decommissioning cost estimate following the guidance of NUREG-1757 “Consolidated Decommissioning Guidance” [Refs. 4.2 and 4.3] for activities that will allow the NRC license to be terminated and the remaining facility and site may be released for unrestricted use in accordance with 10 CFR 72.30(b)(2)(iii).

8.1 Facility Description

This initial decommissioning plan is based on Phase 1 of the CIS Facility that include two Holtec International Storage Module Underground MAXimum Capacity (HI-STORM UMAX) pads that will allow storage of 500 canisters of SNF and GTCC waste from commercial nuclear reactors as well as small quantity of spent mixed-oxide fuel. Canisters will be stored in the in-ground HI-STORM UMAX VVMs. The VVM consists of a Cavity Enclosure Container (CEC) and divider shell.

8.2 Decommissioning Activities

Decommissioning tasks are based on activities after all the canisters have been removed from the facility. All planning activities and submittal of the Final Decommissioning Plan for NRC review and approval are conducted as the initial tasks. The physical decommissioning activities will commence with the radiological survey and decontamination activities (if any). Although no residual radioactivity requiring remediation or decontamination is expected at the time of decommissioning, the decommissioning cost estimate for funding conservatively assumes that the VVMs will require removal and disposal offsite.

Final reports and records will be submitted to the NRC for approval to document that the decommissioning activities were performed and the radiation survey demonstrates that the facility is suitable for release and termination of the Part 72 license.

8.3 Cost Estimate Approach

Resource costing approach is used to estimate the costs associated with radiological surveys and decontamination activities. The estimated labor costs are based on an RS Means 2017 [Ref. 4.5] that will allow an independent third party to assume the responsibility and carry out the decommissioning project. Non-labor costs include equipment and security. Per Appendix A of NUREG-1757 Volume 3, a 25 percent contingency factor was applied to both labor and non-labor costs.

9.0 FACILITATE DECOMMISSIONING

Provisions were made in the layout and design of the HI-STORE CIS Facility, operations of the CIS Facility, and use of the HI-STORM UMAX storage system to facilitate decontamination of structures and equipment, minimize the quantity of radioactive wastes and contaminated equipment, and facilitate the removal of the canisters to permanently decommission the facility as required by 10 CFR 72.130 [Ref. 4.7]. The HI-STORE CIS Facility is designed so that decommissioning activities can be completed rapidly, safely, and efficiently.

9.1 Design and Operations of the HI-STORE CIS Facility

The HI-STORE CIS Facility will be operated as a “clean” facility. Canisters are already welded shut and sealed at the generator facility to prevent leaks. Planning and operations procedure will be established to ensure the following items are executed to minimize any potential contamination:

- Canisters are surveyed and decontaminated at the generator facility to ensure the outer surfaces are clean before shipment to HI-STORE CIS Facility.
- Canisters will not be opened during transport to HI-STORE CIS Facility or during storage at the HI-STORE CIS Facility at any time.
- Canisters will be surveyed prior to acceptance into the HI-STORE CIS Facility.
- No canisters will be stored in any building.

9.2 HI-STORM UMAX Storage System

The decommissioning considerations for the design and licensing of a HI-STORM UMAX storage system are discussed in Section 2.11 of the HI-STORM UMAX FSAR [Ref. 4.6]. The consideration for decommissioning is listed as follow:

- Canisters can be removed from the VVM.
- The Divider Shell is not attached to the CEC, which allows convenient removal for decommissioning. Welding or unfastening of bolts is not required for removal of the Divider Shell.

- The CECs can be removed by excavating the surrounding subgrade or filled with suitable material and left in place.
- No residual contamination is expected to be left behind on the concrete pads.

Additionally, the HI-STORM UMAX system will be constructed as a new facility so there will no contamination when constructing the storage system and fabricating the VVMs.

9.3 Design and Operational Features of the CIS Facility that Facilitate its Eventual Decontamination

The HI-STORE CIS Facility has design features that provide benefits to the eventual decommissioning of the facility. These design features have evolved over the development of the Holtec dry fuel storage systems and culminate in the versatile and robust HI-STORM UMAX storage system.

By design, there will not be any repackaging of the canisters containing SNF or GTCC wastes at the CIS Facility site. These canisters are packed, dried, filled with inert gas, and seal welded at the individual nuclear stations. When the canisters arrive at the CIS Facility they are ready to be stored in their monolithic form. Waste products from repackaging the canisters do not and will not exist.

In the context of this discussion, overpack casks are used to protect the canisters against damage during movements of the canisters and are also used to protect workers from the high radiation doses present from the canisters contents. The over the road/rail Transportation Cask for the canisters has a gas sampling system wherein Technicians at the HI-STORE CIS Facility can sample the air space that the canister has rested in while on its journey to the CIS Facility. If radioactive gases are detected during the receipt testing, the canister will be remanded to its nuclear plant of origin for repair or repackaging as appropriate.

The transfer of the canisters from the Transportation Cask to the onsite VVMs is done using a Transfer Cask designed to minimize occupational dose to workers and to minimize the potential spread of contamination to other areas or equipment. All cask to cask transfer operations occur in the Cask Transfer Building. The Transportation Cask is up righted from its horizontal shipment position and placed over the Canister Transfer Facility (CTF) opening using single-failure proof crane equipment. The Transportation Cask is lowered into the CTF cavity and an adapter plate is placed over the top of the Transportation Cask. The Transfer cask is lifted into position and placed to rest on the adapter plate with the Transfer Cask shield gate in the open position. The canister is then lifted up into the Transfer Cask, the shield gate is closed, and the canister is set to rest on the shield gate. Using a mover, the Transfer Cask is driven to the storage location for that canister, positioned over and then lowered into the VVM. A shielded lid is then placed over the VVM for long term storage of the canisters. Following transfer operations, the equipment is cleaned of any residual contamination from the canister that was transferred. In this manner the Cask Transfer Building is maintained in a non-contaminated condition.

The HI-STORM UMAX storage system has design features that minimize the creation of contaminated waste. For instance, the HI-STORM UMAX VVMs are sized to accept any commercially available US vendor supplied spent fuel canister. This is the key to avoiding the need to repackage the contents of the incoming canisters. Additionally, the VVMs are equipped with a liner that serves to protect the VVM from contamination from its resident canister. These liners are easily cleaned of smearable contamination and, if necessary, can be compacted and disposed of as LLRW at a licensed facility. The entirety of the VVM is protected from such contamination, should it occur, by this innovative liner.

10.0 APPENDICES

None.