



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION I
475 ALLENDALE ROAD, SUITE 102
KING OF PRUSSIA, PA 19406-1415

August 4, 2023

Kelly Trice
President
Holtec Decommissioning International, LLC
Krishna P. Singh Campus
1 Holtec Blvd.
Camden, NJ 08104

**SUBJECT: HOLTEC DECOMMISSIONING INTERNATIONAL, LLC, PILGRIM NUCLEAR
POWER STATION - NRC INSPECTION REPORT NO. 05000293/2023002**

Dear Kelly Trice:

On June 30, 2023, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection under Inspection Manual Chapter 2561, "Decommissioning Power Reactor Inspection Program," at the permanently shutdown Pilgrim Nuclear Power Station (PNPS). On-site focused topical inspections were conducted on April 17 – April 21 and May 22 – May 26, 2023. Additional inspection activities (in office reviews) were conducted remotely during the inspection period. The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and the conditions of your license. The inspection consisted of observations by the inspectors, interviews with site personnel, a review of procedures and records, and plant walk-downs. The results of the inspection were discussed with John Moylan, Site Vice President, and other members of your staff on July 5, 2023, and are described in the enclosed report.

Within the scope of this inspection, no violations of more than minor safety significance were identified.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if any, will be made available electronically for public inspection in the NRC Public Document Room or from the NRC document system (ADAMS), accessible from the NRC Website at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response, if any, should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the Public without redaction.

Current NRC regulations and guidance are included on the NRC's website at www.nrc.gov; select **Radioactive Waste; Decommissioning of Nuclear Facilities**; then **Regulations, Guidance and Communications**. The current Enforcement Policy is included on the NRC's Website at www.nrc.gov; select **About NRC, Organizations & Functions; Office of Enforcement; Enforcement documents**; then **Enforcement Policy** (Under 'Related Information'). You may also obtain these documents by contacting the Government Printing Office (GPO) toll-free at 1-866-512-1800. The GPO is open from 8:00 a.m. to 5:30 p.m. EST, Monday through Friday (except Federal holidays).

K. Trice

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No reply to this letter is required. Please contact Harold (Harry) Anagnostopoulos of my staff at 610-337-5322 if you have any questions regarding this matter.

Sincerely,

Anthony Dimitriadis, Chief
Decommissioning, ISFSI, and Reactor
Health Physics Branch
Division of Radiological Safety and Security

Docket No. 05000293

License No. DPR-35

Enclosure: Inspection Report 05000293/2023002
w/Attachment

cc w/encl: Distribution via ListServ

K. Trice

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SUBJECT: HOLTEC DECOMMISSIONING INTERNATIONAL, LLC, PILGRIM NUCLEAR
POWER STATION - NRC INSPECTION REPORT NO. 05000293/2023002
DATED AUGUST 4, 2023

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U.S. NUCLEAR REGULATORY COMMISSION
REGION I

INSPECTION REPORT

Inspection Report No. 05000293/2023002

Docket No. 05000293

License No. DPR-35

Licensee: Holtec Decommissioning International, LLC (HDI)

Facility: Pilgrim Nuclear Power Station (PNPS)

Location: Plymouth, Massachusetts

Inspection Period: April 1, 2023, to June 30, 2023

Topical Inspection Dates: April 17, 2023, to April 21, 2023
May 22, 2023, to May 26, 2023

Inspectors: Harold Anagnostopoulos, Senior Health Physicist
Decommissioning, ISFSI, and Reactor Health Physics Branch
Division of Radiological Safety and Security

Katherine Warner, Senior Health Physicist
Decommissioning, ISFSI, and Reactor Health Physics Branch
Division of Radiological Safety and Security

Approved By: Anthony Dimitriadis, Chief
Decommissioning, ISFSI, and Reactor Health Physics Branch
Division of Radiological Safety and Security

EXECUTIVE SUMMARY

Holtec Decommissioning International, LLC (HDI)
Pilgrim Nuclear Power Station (PNPS)
NRC Inspection Report No. 05000293/2023002

A routine announced routine decommissioning inspection was completed at Pilgrim Nuclear Power Station (PNPS) on June 30, 2023. On-site focused topical inspections were conducted on April 17 – April 21, 2023, and May 22 – May 26, 2023. Additional inspection activities were conducted remotely during the inspection period. The inspection included an assessment of the program for safety reviews, design changes, and modifications, spent fuel pool maintenance, surveillance and safety, problem identification and resolution, and occupational radiation exposure. The inspection consisted of observations by the inspectors, interviews with site personnel, a review of procedures and records, and plant walk-downs. The NRC's program for overseeing the safe decommissioning of a shutdown nuclear power reactor is described in Inspection Manual Chapter (IMC) 2561, "Decommissioning Power Reactor Inspection Program."

Based upon the results of this inspection, no violations of more than minor safety significance were identified.

REPORT DETAILS

1.0 Background

On June 10, 2019, Entergy Nuclear Operations, Inc. (ENOI) certified cessation of power operations and the permanent removal of fuel from the PNPS reactor vessel (ADAMS Accession Number: ML19161A033). This met the requirements of 10 CFR 50.82(a)(1)(i) and 50.82(a)(1)(ii). On June 11, 2019, the NRC notified PNPS that the NRC would no longer perform its oversight activities in accordance with the Operating Reactor Assessment Program per IMC 0305 and that oversight would be conducted under the provisions outlined in IMC 2561 “Decommissioning Power Reactor Inspection Program” (ADAMS Accession No. ML19162A033). On August 27, 2019, an amendment was issued transferring the license from ENOI to Holtec International, LLC., (HDI) (ADAMS Accession No. ML19235A050). On December 14, 2021, HDI notified the NRC of the permanent removal of all spent fuel assemblies from the spent fuel pool, with their placement in dry storage within the ISFSI II cask storage pad (ADAMS Accession No. ML21348A748).

At the time of the inspection, PNPS was in the active decommissioning phase with no fuel in the spent fuel pool, as described in IMC 2561.

2.0 Decommissioning Performance and Status Review

2.1 Inspection Procedure 37801, “Safety Reviews, Design Changes, and Modifications at Permanently Shutdown Reactors”

a. Inspection Scope

The inspectors conducted document reviews and interviews with site personnel to determine if HDI procedures and processes were adequate and in accordance with the regulations and guidance associated with 10 CFR 50.59, and to determine if changes made by HDI under 10 CFR 50.59 required prior NRC approval.

The inspectors reviewed an engineering change document which authorized the addition of electric submersion heaters to the flooded reactor cavity of the reactor building. The inspectors reviewed the engineering change to determine if it was in accordance with the Offsite Dose Calculation Manual and Decommissioning Safety Analysis Report. The inspectors performed walk downs of the area and interviewed site personnel.

b. Observations and Findings

The inspectors determined that the process applicability determination reviews and screenings had been properly performed in accordance with 10 CFR 50.59. The inspectors determined that selected changes under 10 CFR 50.59 did not require prior NRC approval and safety reviews were performed for design changes and modifications in accordance with applicable regulatory requirements, license conditions and the Decommissioning Safety Analysis Report.

The inspectors determined that there was a reasonable justification for adding electric submersion heaters to the flooded reactor cavity. The engineering change indicated that this was done to raise the bulk water temperature and improve the vacuum drying time for

irradiated hardware waste boxes when they were removed from the cavity. The inspectors observed slightly improved environmental conditions on the 117-foot elevation of the reactor building as a result of raising the ambient temperature for workers who are performing reactor internal segmentation work. The inspectors found that releases of tritium through the reactor building ventilation pathway, which will likely increase slightly due to increased evaporation of water in the reactor cavity, were described and bounded by the Offsite Dose Calculation Manual. This increase will be significantly lower than the routine releases experienced during plant operation, when newly-spent reactor fuel was stored in the spent fuel pool.

c. Conclusions

No violations of more than minor safety significance were identified.

2.2 Inspection Procedure 40801, "Problem Identification and Resolution at Permanently Shutdown Reactors"

a. Inspection Scope

The inspectors assessed the implementation and effectiveness of HDI's corrective action program (CAP) by reviewing a sampling of issue reports, program procedures, and causal evaluations. The inspectors reviewed a representative selection of CAP documents to determine if a sufficiently low threshold for problem identification existed, if follow-up evaluations were of sufficient quality, and if HDI assigned timely and appropriate prioritization for issue resolution that was commensurate with the significance of the issue. The inspectors evaluated the effectiveness of the licensee's management oversight and quality assurance assessments of HDI activities in accordance with the Decommissioning Quality Assurance Program (DQAP). The inspectors interviewed site personnel and the Employee Concerns Program (ECP) representative to determine if an adequate nuclear safety culture existed on-site.

b. Observations and Findings

The inspectors determined that issues had generally been identified, entered into the CAP, and evaluated commensurate with their safety significance through document review, interviews, and observation of a management review committee meeting. The inspectors reviewed corrective action documents for several of the previous NRC violations and also for radiation protection instrumentation calibration concerns. The inspectors noted a lack of detail in Issue Report (IR) documentation but through discussions with site personnel and additional document reviews, the inspectors concluded that issues were being appropriately resolved. HDI wrote a new IR to initiate a self-assessment of this area.

The inspectors conducted a focused follow-up review of IR PIL-02989, which documented the Severity Level IV non-cited NRC violation associated with the wrong manifest information for a Type A, Radioactive III waste package shipment shipped in January 2021. This violation was documented in the first quarter 2021 inspection report (ML21133A273). The inspectors reviewed the corrective actions, procedure revisions, and an effectiveness review and concluded that appropriate actions were taken and completed.

The inspectors determined that HDI had performed activities as described in the DQAP as were required. Additionally, the inspectors noted that the HDI ECP representative was present on-site during this inspection period for a routine familiarization visit.

c. Conclusions

No violations of more than minor safety significance were identified.

2.3 Inspection Procedure 83750, "Occupational Radiation Exposure at Permanently Shutdown Reactors"

a. Inspection Scope

The inspectors observed the routine radiological calibration of an AMP-100 gamma radiation detector, a RO-20 ion chamber, and an AMS-4 beta-gamma sensitive continuous air monitor. The inspectors observed the routine daily source response checking of a bench sample counter, a SAM12 small article monitor, a personnel contamination monitor, and a portal monitor. The inspectors examined the last two calibration verification tests of the Shepherd model 89-400 instrument calibration source and the TechOps bench-top instrument calibration source.

The inspectors conducted a walk-down of the reactor building ventilation radiation monitor and observed a routine weekly particulate filter sample collection from that monitor. The inspectors observed the analysis of the particulate filter via gamma spectroscopy in the chemistry laboratory and reviewed the associated sample calculations. The inspectors discussed the periodic calibration of the gamma spectroscopy system with staff from the chemistry department and reviewed the history and results of the routine quality assurance checks that were performed on the system prior to use. The inspectors examined the equipment that was used to draw routine grab samples from the reactor building ventilation monitor for tritium and discussed the sample analysis methods used by HDI. The inspectors reviewed the engineering change document which evaluated the retirement of the automatic monitoring and alarm functions for the reactor building ventilation monitor.

The inspectors reviewed and commented on several radiological survey plans and subsequent survey reports associated with releases for unrestricted use. The inspectors interviewed HDI Radiation Protection personnel to determine if radiation protection staffing was adequate for ongoing and future site activities. The inspectors observed portions of a waste shipment, including loading of the waste onto the flatbed, dose rate surveys, and radiation protection oversight of the activities to determine if workers performed the work in accordance with site procedures and As Low As Reasonably Achievable (ALARA) principles.

The inspectors performed walk downs of the radioactive material storage areas and observed radiological postings and labels to determine if they met the requirements of 10 CFR 20 Subpart J. The inspectors performed a tour of the Augmented Offgas Building and observed work to remove hydraulic control units in the reactor building.

b. Observations and Findings

The inspectors observed the calibration of two RO-20 ion chambers and noted that both failed their calibration checks. The inspectors reviewed the last two source calibrations that were performed on the TechOps bench-top instrument calibrator and an associated IR that was written following the last calibration of the source by a licensed service provider. The inspectors noted an anomaly with the calibration curves for the source and also noted that a concern was raised with use of one radiation attenuator on the source. HDI found difficulty with the calibration of its MircoRem/hr meters using the TechOps source as well. Calibration of certain radiation protection instruments using the TechOps source required further evaluation. HDI wrote issue reports IR-PIL-05982, 06021, 06022, 06030, 06039, 06042, and 06054 to address these concerns.

Following the inspectors' observations, HDI moved the TechOps source to a new location which eliminated the effects of scattered radiation from a nearby wall and subsequently had the source re-calibrated. The inspectors assessed the calibration and determined that these efforts resolved the problems with the source and the apparent failed calibration checks that were previously observed by the inspectors.

During a review of the routine quality control checks of the gamma spectroscopy systems, the inspectors examined the control charts for one detector. The inspectors noted instances of long runs of data, on several different quality parameters, that fell consistently below the mean. The inspectors noted that this indicated bias in the system or a problem in the establishment of the control chart acceptance values. Based on the inspectors observations, HDI wrote issue report IR-PIL-06096 to address this concern.

The inspectors noted that the Fastscan whole body counter, used for the assessment of internal intakes of radioactive material into the body, had been repaired by the manufacturer and that both gamma-sensitive detectors were now functional and as designed. The inspectors found that the retirement of the monitoring and automatic alarm functions of the reactor building ventilation monitor was justified and reasonable. The original design of the monitor limited the monitoring function to radioactive gases (in particular, noble gases). Following the permanent removal of fuel and placement of all spent fuel into dry fuel storage, this form of radioactive gas is no longer present. In addition, the monitor was causing routine unwarranted nuisance alarms which served no function under these conditions. The inspectors verified that routine grab sampling of particulate and tritium from the reactor building ventilation monitor was continuing as required by the Offsite Dose Calculation Manual.

The inspectors verified that radiological postings in the New Thermex room and the torus temporary water filter processing area (on the 23-foot elevation of the reactor building) were appropriate to the actual conditions of the areas.

c. Conclusions

No violations of more than minor significance were identified.

2.4 Inspection Procedure 71801, “Decommissioning Performance and Status Reviews”

a. Inspection Scope

The inspectors attended and observed HDI meetings that plan, review, assess, and/or schedule the conduct of facility decommissioning activities and discussed these activities with site personnel. The inspectors evaluated the performance and documentation of required preventative maintenance at the site.

b. Observations and Findings

The inspectors identified several issues in the PSDAR that had been superseded or required updating. HDI generated an issue report (IR-PIL-06194) to document these observations.

The inspectors verified that HDI had updated the Defueled Safety Analysis Report (DSAR) and the Post Shutdown Decommissioning Activities Report (PSDAR) as required. The inspectors verified that HDI had identified and stored records that are important to decommissioning in accordance with 10 CFR 50.75(g).

c. Conclusions

No violations of more than minor safety significance were identified.

3.0 **Exit Meeting Summary**

On July 5, 2023, the inspectors presented the inspection results to John Moylan, Site Vice President, and other members of the HDI staff. No proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

J. Moylan - Site Vice President
D. Noyes - Senior Compliance Manager
M. Lawson - Radiation Protection Manager
A. Steward - RP Supervisor
J. Buckley – Waste Management Lead
N. Coderre – RP Supervisor
D. Love – RP Instrumentation Specialist
R. Hargat – Chemistry Specialist
G. Madison – Certified Health Physicist (contractor)
D. Cooke, Employee Concerns Program Representative
A. Lombardo – RP Supervisor

ITEMS OPEN, CLOSED, AND DISCUSSED

None

LIST OF DOCUMENTS REVIEWED

50.59 and PAD qualification list, April 5, 2023
C&C Irradiator Service Report
Calibration Form, air sampler, Eberline RAS-1 S/N 308 dated 9/26/2022
Calibration Form, AMP-100 S/N 5013-153 dated 3/9/2023
Calibration Form, AMP-100 S/N 5003-170 dated 4/11/2023
Calibration Form, RO-20 S/N 151 dated 10/2/2022
Calibration Form, Telepole-WR S/N 6608-132 dated 3/13/2023
Calibration Form, SAM12 S/N 264 dated 1/13/2023
Calibration package, TechOps 773 Bench Calibrator (N-273) dated 5/8/2023
Calibration Report, Calibration of the Canberra Fastscan WBC System and the Holtec Pilgrim Nuclear Power Station, dated 5/25/2022
Calibration Report, JL Shepherd Model 89-400 S/N 8196, C&C Irradiator Service LLC, dated 2/27/2023
Calibration Report, TechOps S/N 220, C&C Irradiator Service LLC, dated 2/28/2023
CD-020, Decommissioning Quality Assurance Program, Revision 02
Certificate of Calibration, Cs-137 source 6-0334, Eckert & Ziegler
Certificate of Conformance, digital air flow calibrator model D-812V.2-1 S/N 3657, dated 2/9/2022
DPP-PIL-MNT-001, Class B/C Non-Fuel Waste Transfer and Temporary Storage at PNPS, Revision 0
DSP-RA-001, Corrective Actions Program, Revision 1
EC PNP-2022-068, Install Immersion Heaters, Revision 0
Human Performance Evaluation (HUE) for PIL-IR-06089
Internal Audit Report, Independent Spent Fuel Storage Installation-Only (ISFSI-O) Quality Assurance Program, Audit 2022-I-09, dated 11/4/2022
Issue Reports PIL-IR-01958, 02603, 02989, 03848, 04280, 04322, 04406, 04426, 04461, 04533, 04590, 04628, 04704, 04727, 04780, 04823, 04833, 04912, 05078, 05119, 05225, 05269, 05294, 05315, 05322, 05336, 05342, 05372, 05506, 05507, 05527, 05330, 05597, 05631, 05697, 05718, 05772, 05956, 05982, 06009, 06160 through 06170

List of Current and Upcoming QA Audits, Revision 1
P-EN-RP-108, "Radiation Protection Postings", Revision 24
P-EN-RW-102, Radioactive Shipping Procedure, Revision 19
Procedure 6.5-335, "Calibration of the MGPI AMP-100 and DRM-1/2", Revision 7
Procedure 6.5-346, "Calibration of the AMS-4 Monitor", Revision 5
Procedure 6.6-113, "Source Calibration", Revision 12
Procedure 6.6-117, "Operation and Calibration of Small Article Monitors", Revision 13
Radiological Engineering Evaluations 19-039 Addendum 22, 23, 24, 25, 26, 28, 29
Process Applicability Determination for EC PNP-2022-068, dated 2/14/2023
Process Applicability Determination Form, DSP-RA-001, Corrective Actions Program,
Revision 0
Radiological surveys 2022-1220, 1221
Radiological surveys 2023-0683, 0769, 0551, 0550, 0548

Radiological Survey Plans and subsequent survey reports: "Release for Unrestricted Use Survey Plan for Security Diesel Generator Building", "Release for Unrestricted Use Survey Plan for Security Central Alarm Station (CAS) Building", "Release for Unrestricted Use Survey Plan for Station Blackout (SBO) Diesel Generator Building", "Release for Unrestricted Use Survey Plan for the Safety Enhancement Program Building", "Release for Unrestricted Use Survey Plan for Security Central Alarm Station (CAS) Building Cable Vault and Electrical Pit", "Release for Unrestricted Use Survey Plan for Secondary Access Point", "Release for Unrestricted Use Survey Plan for Upper SOCA (MAC) Building", and the "Release for Unrestricted Use Survey Plan for Shorefront Buildings."

Self-Assessment Report, Radiation Protection Department Calendar Year 2022,
dated 12/31/2022

LIST OF ACRONYMS USED

ADAMS	Agency-wide Document and Access Management System
ALARA	As Low As Reasonably Achievable
CAP	Corrective Action Program
CAS	Central Alarm Station
CFR	Code of Federal Regulations
DQAP	Decommissioning Quality Assurance Program
DSAR	Decommissioning Safety Analysis Report
ECP	Employee Concerns Program
ENOI	Entergy Nuclear Operations, Inc
GPO	Government Printing Office
HDI	Holtec Decommissioning International, LLC
IMC	Inspection Manual Chapter
ISFSI	Independent Spent Fuel Storage Installation
IR	Issue Report
NRC	U.S. Nuclear Regulatory Commission
PSDAR	Post Shutdown Decommissioning Activities Report
PNPS	Pilgrim Nuclear Power Station
RP	Radiation Protection
SBO	Station Blackout