



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

December 7, 2022

EA-22-066

Emma Kennedy, Director
University of Hawaii
Radiation Safety Program
Office of the President
2444 Dole Street
Honolulu, HI 96822

SUBJECT: UNIVERSITY OF HAWAII - NRC INSPECTION REPORT 030-07517/2022-001

Dear Emma Kennedy:

This letter refers to the announced routine inspection that was performed on April 6, 7, and 13, 2022, at your facilities in Honolulu, Hawaii. The inspection continued with in-office review through October 25, 2022. The inspection was conducted to examine activities conducted under your license as they relate to public health and safety and to confirm compliance with the U.S. Nuclear Regulatory Commission (NRC) rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of an examination of selected procedures and representative records, observation of licensed activities and facilities, independent radiation measurements, and interviews with personnel. The enclosed report presents the results of this inspection. The inspector discussed the preliminary inspection findings with Dr. Kenneth Rubin, Chairman, Radiation Safety Committee; Nancy Miyake, (former) Radiation Safety Officer; and you on April 13, 2022, at the conclusion of the onsite portion of the inspection. A final exit briefing was conducted via videoconference with Dr. Rubin; Michael Soles, Radiation Safety Officer; Matthew Carradine, Radiation Specialist; and you on November 21, 2022.

Based on the results of this inspection, seven apparent violations were identified and are being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC website at <http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html>. The apparent violations involve the failure to: (1) notify the NRC of the permanent cessation of licensed activities at several sites; (2) properly label containers with byproduct materials; (3) perform physical inventories of licensed materials; (4) perform tests for leakage or contamination of sealed sources; (5) have a lock on the handle or case of a portable nuclear gauge in storage; (6) establish administrative controls and provisions relating to organization and management, procedures, record keeping, material control, and accounting and management review that are necessary to assure safe operations; and (7) confine the possession and use of byproduct material to the purposes authorized in the license. The circumstances surrounding these apparent violations, the significance of the issues, and the need for lasting and effective corrective action were discussed with you during the exit meeting on November 21, 2022.

Before the NRC makes its enforcement decision, we are providing you an opportunity to: (1) respond in writing to the apparent violations addressed in the inspection report within 30 days of the date of this letter; (2) request a predecisional enforcement conference (PEC); or (3) request alternative dispute resolution (ADR). If a PEC is held, it will be open for public observation and the NRC may issue a press release to announce the time and date of the conference. Please contact Dr. Lizette Roldán-Otero, Chief, Materials Inspection Branch, at 817-200-1455 or Lizette.Roldan-Otero@nrc.gov within 10 days of the date of this letter to notify the NRC of your intended response to either provide a written response, participate in a PEC, or pursue ADR. A PEC should be held within 30 days and an ADR session within 45 days of the date of this letter.

If you choose to provide a written response, it should be clearly marked as a "Response to Apparent Violations in NRC Inspection Report 030-07517/2022-001; EA-22-066" and should include for each apparent violation: (1) the reason for the apparent violation or, if contested, the basis for disputing the apparent violation; (2) the corrective steps that have been taken and the results achieved; (3) the corrective steps that will be taken; and (4) the date when full compliance will be achieved. Your response may reference or include previously docketed correspondence if the correspondence adequately addresses the required response. To the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the public without redaction.

Your written response, should you choose to provide one, should be sent to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with identical copies mailed to Mary Muessle, Director, Division of Radiological Safety & Security, Region IV, 1600 East Lamar Boulevard, Arlington, TX 76011, and emailed to R4Enforcement@nrc.gov within 30 days of the date of this letter. If an adequate response is not received within the time specified or an extension of time has not been granted by the NRC, the NRC will proceed with its enforcement decision or schedule a PEC.

If you choose to request a PEC, the conference will afford you the opportunity to provide your perspective on these matters and any other information that you believe the NRC should take into consideration before making an enforcement decision. The decision to hold a PEC does not mean that the NRC has determined that a violation has occurred or that enforcement action will be taken. This conference would be conducted to obtain information to assist the NRC in making an enforcement decision. The topics discussed during the conference may include information to determine whether a violation occurred, information to determine the significance of a violation, information related to the identification of a violation, and information related to any corrective actions taken or planned. In presenting your corrective actions, you should be aware that the promptness and comprehensiveness of your actions will be considered in assessing any civil penalty for the apparent violations. The guidance in NRC Information Notice 96-28, "Suggested Guidance Relating to Development and Implementation of Corrective Action," may be helpful in preparing your response (Agencywide Documents Access and Management System (ADAMS) Accession No. ML061240509).

In lieu of a PEC or written response, you may request ADR with the NRC in an attempt to resolve this issue. Alternative dispute resolution is a general term encompassing various techniques for resolving conflicts using a neutral third party. The technique that the NRC employs is mediation. Mediation is a voluntary, informal process in which a trained neutral mediator works with parties to help them reach resolution. If the parties agree to use ADR, they select a mutually agreeable neutral mediator who has no stake in the outcome and no power to make decisions. Mediation gives parties an opportunity to discuss issues, clear up

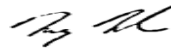
misunderstandings, be creative, find areas of agreement, and reach a final resolution of the issues. Additional information concerning the NRC's ADR program can be obtained at <http://www.nrc.gov/about-nrc/regulatory/enforcement/adr.html>. The Institute on Conflict Resolution at Cornell University has agreed to facilitate the NRC's program as a neutral third party. Please contact the Institute on Conflict Resolution at 877-733-9415 within 10 days of the date of this letter if you are interested in pursuing resolution of this issue through ADR.

Please be advised that the number and characterization of apparent violations described in the enclosed inspection report may change as a result of further NRC review. You will be advised by separate correspondence of the results on our deliberations in this matter.

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

If you have any questions concerning this matter, please contact Dr. Lizette Roldán-Otero of my staff at 817-200-1455.

Sincerely,



Signed by Muessle, Mary
on 12/07/22

Mary C. Muessle, Director
Division of Radiological Safety & Security

License No.: 53-00017-23
Docket No.: 030-07517

Enclosure:
NRC Inspection Report 030-07517/2022-001

cc w/Enclosure:
Thomas Lileikis, Chief
State Department of Health
Indoor and Radiological Health Branch
99-945 Halawa Valley Street
Aiea, HI 96701

UNIVERSITY OF HAWAII - NRC INSPECTION REPORT 030-07517/2022-001 - DATED
DECEMBER 7, 2022

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**U.S. NUCLEAR REGULATORY COMMISSION
REGION IV**

Docket No.: 030-07517

License No.: 53-00017-23

Inspection Report No.: 030-07517/2022-001

EA No.: EA-22-066

Licensee: University of Hawaii

Locations Inspected: University of Hawaii

- Manoa Campus
2444 Dole Street
Honolulu, Hawaii 96822
- Environmental Health and Safety Office
2040 East-West Road
Honolulu, Hawaii 96822
- Cancer Research Center of Hawaii
1236 Lauhala Street
Honolulu, Hawaii 96813
- School of Medicine, Leahi Hospital
3675 Kilauea Avenue
Honolulu, Hawaii 96816
- Core Laboratory Building, Snug Harbor
1 Sand Island Access Road
Honolulu, Hawaii 96818

Inspection Dates: April 6, 7, and 13, 2022; continued in-office review through October 25, 2022

Exit Meeting Date: November 21, 2022

Inspector: Janine F. Katanic, PhD, CHP
Senior Health Physicist
Materials Inspection Branch
Division of Radiological Safety & Security, Region IV

Approved by: Lizette Roldán-Otero, PhD
Chief, Materials Inspection Branch
Division of Radiological Safety & Security, Region IV

Attachment: Supplemental Inspection Information

Enclosure

EXECUTIVE SUMMARY

University of Hawaii (UH) NRC Inspection Report 030-07517/2022-001

On April 6, 7, and 13, 2022, the NRC performed an announced, routine inspection of UH. The University of Hawaii is an Academic Type A Broad Scope licensee authorized under NRC Materials License No. 53-00017-23 to possess and use byproduct, source, and special nuclear material. Inspection activities were performed at the licensee's Manoa Campus, its Environmental Health and Safety Office located just north of the Manoa Campus. Inspection activities were also performed at three off-campus locations in Honolulu: UH Cancer Research Center of Hawaii, UH School of Medicine at Leahi Hospital, and UH Core Laboratory Building at Snug Harbor. The inspector continued in-office review through October 25, 2022. The scope of the inspection was to examine the activities conducted under the UH license and to confirm compliance with the NRC's rules and regulations and with the conditions of the UH license. Within these areas, the inspection consisted of a selected examination of procedures and representative records, observations of licensed activities, independent radiation measurements, and interviews with personnel. (Section 1)

The inspection identified that UH failed to adequately implement corrective actions to address an inspection finding from an NRC inspection in 2019, related to the licensee's failure to notify the NRC of the permanent cessation of licensed activities at a site in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 30.36(d). The inspector found that the three off-campus locations that were visited were no longer used for the possession and use of licensed materials. Permanent cessation of licensed activities had occurred at each of the three locations greater than 90 days prior to the inspection, but the licensee failed to notify the NRC. For one location, licensed activities had been ceased permanently in 2016, and the facility had been completely razed to the ground when visited by the inspector. (Section 2)

The UH Environmental Health and Safety Office, which is the organization that implements the licensee's radiation safety program, was the largest possessor of licensed materials. In areas under the purview of the UH Environmental Health and Safety Office, several deficiencies were identified. Drums of radioactive waste that were staged for disposal were not properly labeled; several radioactive sources and devices possessed by the UH Environmental Health and Safety Office were not accounted for during licensee inventories of radioactive materials; several radioactive sources and devices were not tested for leakage or contamination by the licensee, one for over 21 years; and one portable nuclear gauge stored by the UH Environmental Health and Safety Office was not secured to prevent unauthorized or accidental removal of the sealed source from its shielded position. (Section 3)

The Radiation Safety Officer (RSO), and then later the Radiation Safety Committee (RSC), authorized the use of portable nuclear gauges for research activities, a purpose not authorized in the UH license. In authorizing the use of the portable nuclear gauges, the RSO and RSC did not perform a safety evaluation of the proposed use that took into consideration such matters as the adequacy of facilities and equipment, training and experience of the users, and the operating or handling procedures for safety and security. (Section 4)

The inspector also identified that the licensee possessed a Troxler Model 3450 portable nuclear gauge that was not a model of portable nuclear gauge authorized to be possessed under the license. (Section 4)

As a result of the deficiencies identified by the inspector, seven apparent violations were identified regarding the licensee's failure to: (1) notify the NRC of the permanent cessation of licensed activities at several sites; (2) properly label containers with byproduct materials; (3) perform physical inventories of licensed materials; (4) perform tests for leakage or contamination of sealed sources; (5) have a lock on the handle or case of a portable nuclear gauge in storage; (6) establish administrative controls and provisions relating to organization and management, procedures, record keeping, material control, and accounting and management review that are necessary to assure safe operations; and (7) confine the possession and use of byproduct material to the purposes authorized in the license. (Section 7)

Following the onsite inspection, as corrective actions, the licensee: (1) withdrew its December 29, 2021, amendment request to authorize portable nuclear gauges for use "as approved by the RSC"; (2) submitted an amendment request to remove the Core Laboratory at Snug Harbor, Honolulu, Hawaii, from the license; (3) submitted an amendment request to authorize the possession and use of Troxler Model 3450 portable nuclear gauges for moisture and surface density measurements of construction materials; and (4) began processes to update its radiation safety program software. (Section 6)

REPORT DETAILS

1 Program Overview (Inspection Procedure (IP) 87126)

1.1 Program Scope

The University of Hawaii (UH or licensee) is an Academic Type A Broad Scope licensee authorized under NRC Materials License 53-00017-23 to possess and use byproduct, source, and special nuclear material for research and development, as standards or for calibration of instruments, for sample analysis, for instructional purposes, and for use in portable nuclear gauges for moisture and density measurements on construction materials. The licensed materials are authorized to be used at the licensee's facilities in Hawaii on Oahu, Maui, and Hawaii island. At the time of the inspection, the licensee had radioactive materials use or storage locations at 4 fixed locations on Hawaii island, 12 fixed locations on Oahu, and 2 fixed locations on Maui. The licensee was also authorized to use licensed materials on UH research ships and other contracted vessels at sea and was authorized for the use of portable nuclear gauges at temporary job sites.

1.2 Observations and Findings

On April 6, 7, and 13, 2022, the NRC performed an announced, routine inspection of UH. Inspection activities were performed at the licensee's Manoa Campus and its Environmental Health and Safety Office located just north of the Manoa Campus. Inspection activities were also performed at three off-campus locations in Honolulu: UH Cancer Research Center of Hawaii; UH School of Medicine at Leahi Hospital; and UH Core Laboratory Building at Snug Harbor. The inspector continued in-office review through October 25, 2022. The scope of the inspection examined activities conducted under the UH license to confirm compliance with the NRC's rules and regulations and with the conditions of the UH license. Within these areas, the inspection consisted of a selected examination of procedures and representative records, observations of licensed activities, independent radiation measurements, and interviews with personnel.

2 Follow-up from NRC's 2019 Inspection (IP 87126)

2.1 Inspection Scope

On April 6, 7, and 13, 2022, the NRC performed an announced, routine inspection of UH. The inspection included a review of the licensee's corrective actions to address a previously issued violation. To evaluate this matter, the inspector reviewed records, procedures, and documents maintained by the licensee, observed licensed facilities, and interviewed personnel.

2.2 Background

On November 1, 2019, NRC Inspection Report and Notice of Violation (NOV) 030-07517/2019-001 was issued (ML19308A113). The Inspection Report and NOV identified a Severity Level IV violation related to the licensee's failure to notify the NRC of the permanent cessation of licensed activities at a site in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 30.36(d). (030-07517/2019-001-01)

Title 10 CFR 30.36(d) requires, in part, that the licensee provide notification to the NRC within 60 days of the occurrence of the licensee decision to permanently cease principal activities at an entire site or in any separate building or outdoor area that contains residual radioactivity.

The NOV described that a location that was authorized on the license, the UH Institute of Pacific Islands Forestry, at the Pacific Southwest Research Station, in Hilo, Hawaii, had been used as a location for the use and storage of licensed materials, specifically carbon-14. The location itself was a U.S. Forest Service building in which UH had a laboratory for the use of licensed materials. In April 2017, the UH researcher permanently ceased licensed activities at the location. The licensee's Radiation Safety Officer (RSO) performed surveys to determine if there was any radioactive contamination, and subsequently released the laboratory to the U.S. Forest Service. The licensee, however, failed to notify the NRC in writing of its decision to permanently cease principal activities at this site.

On November 27, 2019, the licensee responded in writing to the NOV (ML19343A885). The licensee noted that as corrective actions, on October 23, 2019, it submitted an amendment request to the NRC, which is not publicly available, and requested to remove the location from the license. The licensee provided information to the NRC, including the results of radiation surveys of the laboratory, to support its request. In its response, the licensee attributed the failure to notify the NRC to the RSO not bringing the matter to the attention of the licensee's Radiation Safety Committee (RSC). The licensee stated that any permanent stoppage of licensed activity will be brought to the attention of the RSC in a timely manner for their approval and that the NRC would be notified upon this occurrence. On January 22, 2020, the NRC issued Amendment No. 58 to the license, removing the subject location from the license, after determining that the location was suitable for release for unrestricted use (ML20028D527).

2.3 Observations and Findings

On April 6, 7, and 13, 2022, the NRC performed an announced, routine inspection of UH. In order to review the licensee's corrective actions for the previous violation, the inspector, who was on Oahu, selected 3 off-campus locations to visit. The inspector was accompanied by the RSO and Radiation Specialist during these visits.

The inspector visited the UH Cancer Research Center of Hawaii, located at 1236 Lauhala Street, Honolulu, Hawaii, 96813. The inspector and licensee personnel had difficulty accessing the building, due in part, to the building being controlled by The Queen's Medical Center. Upon gaining access to the building and arriving at the specific location in the building where UH licensed materials had been used or stored, the RSO noted that it appeared that specific location had been completely remodeled. The area where the UH laboratories were once located was instead modern conference rooms and other office-type workspaces. The licensee no longer had control of the specific location since it belonged to The Queen's Medical Center. At the time of the inspection, the RSO could not specify the exact date or time frame that UH had ceased licensed activities at the site but acknowledged that it had occurred at least 60 days prior to the inspection. It was offered by the licensee that the discontinuation occurred circa 2013 when the licensee opened the new UH Cancer Center at 701 Ilalo Street, in Honolulu, Hawaii, which is an authorized location on the license.

The inspector visited the UH School of Medicine, Leahi Hospital, at 3675 Kilauea Avenue, Honolulu, Hawaii, 96816. The inspector and licensee personnel had difficulty accessing the specific locations within the Leahi Hospital campus, due in part, to the facility being controlled by the Hawaii Health Systems Corporation and no longer affiliated with UH. The RSO took the inspector to several areas where UH licensed materials had been previously used or stored. Each location visited was no longer controlled by the licensee and had been turned over to the Hawaii Health Systems Corporation. Some of the former UH areas, which were primarily laboratory space, had been turned into classrooms, general equipment storage rooms, or could not be accessed. At the time of the inspection, the RSO could not specify the exact date or time frame that UH had ceased licensed activities at the site but acknowledged that it had occurred at least 60 days prior to the inspection. It was offered by the licensee that the discontinuation occurred after the licensee's medical school was moved to a new, modern facility in 2005, located at the John A. Burns School of Medicine, 651 Ilalo Street, in Honolulu, Hawaii, which is an authorized location on the license.

The inspector visited the location of the UH Core Laboratory Building at Snug Harbor, 1 Sand Island Access Road, Honolulu, Hawaii, 96818. Upon arrival to the location, it was found to be an active construction area with loaded dump trucks filled with debris leaving the site. The inspector observed that there were no intact structures at the site. The inspector observed that the site had been razed and that the facilities that had been used by the licensee for the use and storage of licensed materials were no longer present. The facility was no longer controlled by UH as indicated by a sign at the property entrance referring to the ongoing project as the new State of Hawaii Kapalama Container Terminal Wharf and Dredging. At the time of the inspection, the RSO could not specify the exact date that UH had ceased licensed activities at the site but acknowledged that it had occurred at least 60 days prior to the inspection. The licensee offered that the discontinuation occurred circa 2016, when it opened a new marine facility at the UH Marine Science Center at Pier 35, in Honolulu, Hawaii, which is an authorized location on the license.

The inspector discussed the previous violation of 10 CFR 30.36(d) with the licensee. Although the licensee took corrective actions in response to the NOV by providing the NRC with sufficient information to remove a location from the license, it did not appear that they had reviewed their license to determine the extent of condition and if there were other locations where licensed activities had been permanently ceased. During the current inspection, the inspector visited the three off-campus locations and observed that licensed activities had ceased at each of them. In each case, the NRC was not notified within 60 days of the occurrence of the licensee decision to permanently cease principal activities at the sites. The licensee's corrective actions for the previous violation were insufficient and inadequate to prevent recurrence of the violation. Accordingly, the violation cannot be closed and will remain open for review during a future inspection. Additionally, an apparent violation of 10 CFR 30.36(d)(2) was identified regarding the three off-campus locations observed by the inspector.

At the conclusion of the inspection, the licensee was asked by the inspector to perform a review of all the locations listed on the license and determine if there were any others where the licensee had decided to permanently cease principal activities, but the NRC had not been notified. The licensee was also requested to provide information to the NRC regarding any radiation surveys performed by the licensee prior to them releasing the locations at the former: (1) UH Cancer Research Center of Hawaii, 1236 Lauhala

Street, Honolulu, Hawaii; (2) UH School of Medicine, Leahi Hospital, 3675 Kilauea Avenue, Honolulu, Hawaii; and (3) UH Core Laboratory Building at Snug Harbor, Honolulu, Hawaii.

Apparent violation of 10 CFR 30.36(d)(2)

Title 10 CFR 30.36(d)(2) requires, in part, that the licensee provide notification to the NRC within 60 days of the occurrence of the licensee decision to permanently cease principal activities at an entire site or in any separate building or outdoor area that contains residual radioactivity.

License Conditions 10.D, 10.H, and 10.J of NRC license No. 53-00017-23, Amendment Nos. 58 and 59 state, in part, that licensed material may be used or stored at the licensee facilities located at: (10.D) 1236 Lauhala Street, Cancer Research Center of Hawaii, Honolulu, Hawaii, 96813; (10.H) 3675 Kilauea Avenue, University of Hawaii, School of Medicine, Leahi Hospital, Honolulu, Hawaii, 96816; and (10.J) 1 Sand Island Access Road, Core Laboratory Building, Snug Harbor, Honolulu, Hawaii, 96818.

Contrary to the above, on April 6, 2022, the licensee failed to provide notification to the NRC within 60 days of the occurrence of its decision to permanently cease principal activities at an entire site or in any separate building or outdoor area that contains residual radioactivity as evidenced by the following three examples:

1. License Condition 10.D. states that licensed material may be used or stored at the licensee's facilities located at: 1236 Lauhala Street, Cancer Research Center of Hawaii, Honolulu, Hawaii, 96813. The licensee's laboratory research space and other facilities that had been used for licensed activities had been remodeled into conference rooms that were no longer controlled by the licensee. This occurred more than 60 days prior to April 6, 2022.
2. License Condition 10.H. states that licensed material may be used or stored at the licensee's facilities located at: 3675 Kilauea Avenue, University of Hawaii, School of Medicine, Leahi Hospital, Honolulu, Hawaii, 96816. The licensee's laboratory research space and other facilities that had been used for licensed activities had been repurposed and were no longer controlled by the licensee. This occurred more than 60 days prior to April 6, 2022.
3. License Condition 10.J. states that licensed material may be used or stored at the licensee's facilities located at: 1 Sand Island Access Road, Core Laboratory Building, Snug Harbor, Honolulu, Hawaii, 96818. The licensee's laboratory research space and other facilities that had been used for licensed activities had been completely razed to the ground and the property was no longer controlled by the licensee. This occurred more than 60 days prior to April 6, 2022.

The licensee's failure to provide notification to the NRC within 60 days of the occurrence of the licensee decision to permanently cease principal activities at licensed sites was identified as an apparent violation of 10 CFR 30.36(d)(2). (030-07517/2022-001-01)

3 UH Environmental Health and Safety Office (IP 87126, IP 87124)

3.1 Inspection Scope

On April 6, 7, and 13, 2022, the NRC performed an announced, routine inspection of UH. The inspector reviewed the licensee's administrative controls and provisions to assure that licensed materials will be safely used and possessed under the NRC license. The inspector also observed selected laboratories where radioactive materials were used or stored on the licensee's Manoa Campus and observed the radioactive materials storage and waste staging area at its Environmental Health and Safety Office. To evaluate the licensee's implementation of its radiation safety program, the inspector reviewed records, procedures, and documents maintained by the licensee, observed licensed activities, performed independent radiation measurements, and interviewed personnel.

3.2 Observations and Findings

The UH Environmental Health and Safety Office is the organization that implements the licensee's radiation safety program. The RSO reports to the Director of the Environmental Health and Safety Office. At the time of the inspection, the UH radiation safety program was being implemented by the RSO, who was assisted by one individual who served as a Radiation Specialist.

The UH Environmental Health and Safety Office possessed a significant quantity of radioactive materials and maintained a large, secured building where licensed materials were stored. The inspector observed the storage area, which contained rows of shelving for segregation and storage of licensed materials. The licensed materials consisted of dry and liquid radioactive waste that had been collected from various UH locations of use. Legacy materials were also stored, including disused radioactive sources and a freezer with radioactively contaminated animal carcasses that had been in storage for many years. The licensee stored portable nuclear gauges in this room until there was a UH user need for one, at which point it would be provided to the user. The licensee also had a radioactive waste compactor.

The licensee had a separate metal sea-land type shipping container, which was adjacent to the radioactive materials storage building. Periodically, the RSO and Radiation Specialist would go to the storage area to separate and segregate waste and place it into 55-gallon metal drums. The licensee would compact the wastes into the drums and move them out to the adjacent shipping container, where they would be stored pending disposal. When enough drums were staged, the licensee would contract the services of a waste broker to facilitate the disposal of the licensed materials. Inside of the shipping container, the licensee also stored 65-gallon poly-overpack salvage drums. The drums were used to contain liquid radioactive waste pending disposal.

3.2.1 Labeling of Containers

In the shipping container, the inspector observed that the 55-gallon drums of dry radioactive waste and the 65-gallon poly-overpack salvage drums that contained liquid radioactive waste were not labeled in accordance with NRC requirements.

Apparent violation of 10 CFR 20.1904(a)

Title 10 CFR 20.1904(a) requires, in part, that the licensee shall ensure that each container of licensed material bears a durable, clearly visible label bearing the radiation symbol and the words “CAUTION, RADIOACTIVE MATERIAL,” or “DANGER, RADIOACTIVE MATERIAL.” The label that must provide sufficient information (such as the radionuclide(s) present, an estimate of the quantity of radioactivity, the date for which the activity is estimated, radiation levels, kinds of materials, and mass enrichment) to permit individuals handling or using the containers, or working in the vicinity of the containers, to take precautions to avoid or minimize exposures.

Contrary to the above, on April 6, 2022, the licensee failed to ensure that each container of licensed material bore a durable, clearly visible label with the radiation symbol and the words “CAUTION, RADIOACTIVE MATERIAL,” or “DANGER, RADIOACTIVE MATERIAL,” that provided sufficient information (such as the radionuclide(s) present, an estimate of the quantity of radioactivity, the date for which the activity is estimated, radiation levels, kinds of materials, and mass enrichment) to permit individuals handling or using the containers, or working in the vicinity of the containers, to take precautions to avoid or minimize exposures. Specifically, 24 55-gallon metal drums that contained dry radioactive waste and 3 65-gallon poly-overpack salvage drums containing liquid radioactive waste did not have durable, clearly visible labels with the radiation symbol and the words “CAUTION, RADIOACTIVE MATERIAL,” or “DANGER, RADIOACTIVE MATERIAL,” or labels that provided sufficient information (such as an estimate of the quantity of radioactivity, the date for which the activity is estimated, and radiation levels) to permit individuals handling or using the containers, or working in the vicinity of the containers, to take precautions to avoid or minimize exposures.

The licensee’s failure to ensure that each container of licensed material bears a durable, clearly visible label that must provide sufficient information to permit individuals handling or using the containers, or working in the vicinity of the containers, to take precautions to avoid or minimize exposures, was identified as an apparent violation of 10 CFR 20.1904(a). (030-07517/2022-001-02)

3.2.2 Inventory of Licensed Materials and Leak Tests of Sealed Sources

The licensee utilized a software program for radioactive materials called HP Assistant. The software program was used by the licensee to manage the UH radiation safety program. The software program was used to track items including lists of permits and authorizations, lists of sealed sources possessed under individual permits, leak test records, and inventory by isotope. The RSO provided the inspector with the list of sealed sources possessed under the license, “Current Inventory by Isotope” that was generated by the HP Assistant software. The inspector, RSO, and Radiation Specialist used the list to perform a spot-check of the sealed sources and devices stored in the licensee’s waste storage area.

License Condition 13 of NRC license No. 53-00017-23, requires, in part, that the licensee conduct a physical inventory every 6 months to account for all sealed sources and/or devices possessed under the license. Based on discussions with licensee personnel, there was no systematic approach utilized to perform a physical inventory verification every 6 months. The inspector noted that several sealed sources and devices observed in the waste storage area were not listed on the licensee’s inventory

records. It was unclear why these items were not captured in the inventory, but for some sources, the licensee attributed this, in part, to not having an updated version of the HP Assistant software program. The inspector noted that for one portable nuclear gauge observed in the storage area, the licensee's inventory records indicated that it had been disposed of when it had not and was still possessed by the licensee. Therefore, this item was not inventoried and there was no indication of when the next test for leakage and/or contamination was due.

The licensee considered several sealed sources and devices to be legacy items in long term storage pending disposal. These items were kept in a difficult to access corner of the waste storage area, and a fair amount of lead shielding and other debris had been placed on top of these items. In order to inventory the items, the lead shielding would have needed to be removed. The licensee did not understand that sources in legacy storage still needed to be inventoried. Furthermore, because the area was difficult to access, and covered in shielding, it was assumed by the licensee that the sources were present although they had not been accounted for through a routine physical inventory.

License Condition 12.E of NRC license No. 53-00017-23, Amendment Nos. 54-59, requires, in part, that sealed sources need not be tested if they are in storage and are not being used. However, when they are removed from storage for use or transferred to another person and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source shall be stored for a period of more than 10 years without being tested for leakage and/or contamination. Similar to the licensee's misunderstanding of inventory requirements, the licensee also did not understand that legacy sources in storage were required to be tested for leakage and/or contamination every 10 years. It also was not understood that if sources that were stored and were removed from storage, a test for leakage and/or contamination was required to be performed if the sources not been tested within the required leak test interval.

Apparent violation of License Condition 13

License Condition 13 of NRC license No. 53-00017-23, Amendment Nos. 54-59, requires, in part, that the licensee conduct a physical inventory every 6 months to account for all sealed sources and/or devices possessed under the license.

Contrary to the above, from April 11, 2018, to April 6, 2022, the licensee failed to conduct a physical inventory every 6 months to account for all sealed sources and/or devices possessed under the license. Specifically, the licensee failed to perform a physical inventory for many sealed sources that were in storage, including but not limited to: (1) one approximately 50 millicurie cesium-137 sealed source, (2) one approximately 100 millicurie cesium-137 sealed source, (3) one Troxler Model 3411-B portable nuclear gauge, (4) one CPN Model MC-M Hydrotector portable nuclear gauge, (5) one approximately 9.5 millicurie americium-241 sealed source in a variable x-ray device, and (6) one approximately 60 millicurie cesium-137 source in a TechOps Model 773 instrument calibrator.

The licensee's failure to conduct a physical inventory every 6 months to account for all sealed sources and/or devices possessed under the license was identified as an apparent violation of License Condition 13. (030-07517/2022-001-03)

Apparent violation of License Condition 12.E

License Condition 12.E of NRC license No. 53-00017-23, Amendment Nos. 54-59, requires, in part, that sealed sources need not be tested if they are in storage and are not being used. However, when they are removed from storage for use or transferred to another person and have not been tested within the required leak test interval, they shall be tested before use or transfer. No sealed source shall be stored for a period of more than 10 years without being tested for leakage and/or contamination.

Contrary to the above, from April 11, 2018, to April 6, 2022, the licensee stored sealed sources for a period of more than 10 years without being tested for leakage and/or contamination, and the licensee failed to test sealed sources when they are removed from storage for use and have not been tested within the required leak test interval before use as evidenced by the following four examples:

1. One approximately 50 millicurie cesium-137 sealed source was placed into storage in 1990, remained in storage on April 6, 2022, and was last tested for leakage or contamination in August 1990, a period of more than 10 years.
2. One approximately 100 millicurie cesium-137 sealed source was placed into storage in 1997, remained in storage on April 6, 2022, and was last tested for leakage or contamination in June 1997, a period of more than 10 years.
3. One Troxler Model 3411-B portable nuclear gauge containing an approximately 8.6 millicurie cesium-137 sealed source and an approximately 40 millicurie americium-241/beryllium sealed source was placed into storage in 2011, remained in storage on April 6, 2022, and was last tested for leakage or contamination in June 2011, a period of more than 10 years.
4. One CPN Model MC-M Hydrotector portable nuclear gauge containing an approximately 50 millicurie americium-241/beryllium sealed source was placed into storage in 2004 and was last tested for leakage or contamination in April 2004. The specified leak test interval in the Sealed Sources and Devices Safety Evaluation is 1 year. The portable nuclear gauge was removed from storage and used during June-August 2019. The source in the portable nuclear gauge was not tested for leakage or contamination within the required leak test interval and before use.

The licensee's failure to test sealed sources stored for a period of more than 10 years for leakage and/or contamination, and to test sealed sources for leakage and/or contamination when they are removed from storage for use and have not been tested within the required leak test interval, was identified as an apparent violation of License Condition 12.E. (030-07517/2022-001-04)

3.2.3 Storage of Portable Nuclear Gauges

The inspector observed three portable nuclear gauges stored in the waste storage area: (1) Troxler Model 3450, serial number 68384; (2) Troxler Model 3411-B, serial number 12477; and (3) CPN Model MC-M, serial number MM4095601. All three portable nuclear gauges were observed to be secured with a minimum of two independent physical controls that form tangible barriers to secure them from unauthorized removal.

However, when gauges are in storage or when not under direct licensee surveillance, License Condition 28 of NRC license No. 53-00017-23, Amendment No. 59, also requires that each portable nuclear gauge shall have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position.

The inspector observed that two of the portable nuclear gauges had outer locked containers. One portable nuclear gauge, the Troxler Model 3450, did not have a lock on the gauge or an outer locked container.

Apparent violation of License Condition 28

License Condition 28 of NRC license No. 53-00017-23, Amendment No. 59, requires that each portable nuclear gauge shall have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. The gauge or its container must be locked when in transport, storage, or when not under the direct surveillance of an authorized user.

Contrary to the above, on April 6, 2022, for a portable nuclear gauge in storage and not under the direct surveillance of an authorized user, the licensee failed to have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. Specifically, the licensee had a Troxler Model 3450 portable nuclear gauge in storage, and it was not under the direct surveillance of an authorized user. The portable nuclear gauge did not have a lock or outer locked container.

The licensee's failure to ensure that each portable nuclear gauge shall have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position was identified as an apparent violation of License Condition 28. (030-07517/2022-001-05)

4 Academic Type A Broad Scope Activities (IP 87126)

4.1 Inspection Scope

On April 6, 7, and 13, 2022, the NRC performed an announced, routine inspection of UH. The inspector reviewed the licensee's administrative controls and provisions to assure that licensed materials will be safely used and possessed under the NRC license. The inspector also observed selected laboratories where radioactive materials were used or stored on the licensee's Manoa Campus and observed the radioactive materials storage and waste staging area at its Environmental Health and Safety Office. To evaluate the licensee's implementation of its Academic Type A Broad Scope authorization, the inspector reviewed records, procedures, and documents maintained by the licensee, observed licensed activities, performed independent radiation measurements, and interviewed personnel.

4.2 Observations and Findings

For broad scope licenses, 10 CFR 33.13(c)(3) requires, in part, that the licensee establish administrative controls and provisions relating to organization and management, procedures, record keeping, material control, and accounting and

management review that are necessary to assure safe operations, including the establishment of administrative procedures to assure: (i) control of procurement and use of byproduct material; (ii) completion of safety evaluations of proposed uses of byproduct material which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user, and the operating or handling procedures; and (iii) review, approval, and recording by the RSC of safety evaluations of proposed uses prepared in accordance with 10 CFR 33.13(c)(3)(ii) prior to use of the byproduct material.

Type A licenses of broad scope are typically the largest NRC licensed materials programs and encompass a broad range of uses of an equally broad range of licensed materials. In order to satisfy the requirements in 10 CFR 33.13(c)(3), these types of licensees establish an RSC, appoint a qualified RSO, and establish criteria to review and approve all uses of licensed material and users under the license.

As an Academic Type A Broad Scope licensee, UH had processes, some formal and others informal, to review and process program applications and approvals, referred to as permitting. Through the permitting process, principal users submit applications to the RSC for review and approval. The applications should describe such matters as the type and quantity of licensed material to be used, the facilities and equipment to be used, and the training and qualifications of the proposed Authorized Users (AUs). The role of the RSC, under the leadership provided by the Chairman of the RSC, and with technical input from the RSO, is to review the permit applications and take action as appropriate to approve or deny the requested authorizations.

The licensee provided the inspector with a list of active permits generated by its HP Assistant software program, "Listing of Permits by Principal Investigator." The list indicated that there were 50 active permits. However, upon further review by the inspector, it was revealed that at least 25 of them were in fact not active permits or were never issued a permit. One former AU, who was deceased since November 2020, was still listed as an active permit holder with licensed materials possessed under the AU's permit. Other AUs, who were no longer employed with UH, still had active permits indicating that licensed materials were possessed under the permit. The RSO described that although these permits were listed as possessing licensed materials, that the licensed materials had either been transferred to other AUs or moved to the Environmental Health and Safety Office waste storage area.

One of the listed active permits was for the Radiation Safety Program (Environmental Health and Safety Office). The "Listing of Permits by Principal Investigator" indicated that the Radiation Safety Program appeared to have the broadest range of permitted isotopes and quantities. Even more so, many of the active permits that were actually inactive had transferred those permitted materials to the Radiation Safety Program, so those materials needed to be considered as well. The inspector requested to review the actual permit issued by the RSC to the Radiation Safety Program (Environmental Health and Safety Office). Although the Radiation Safety Program (Environmental Health and Safety Office) was listed as a permittee with permitted isotopes and permit possession limits, the RSO informed the inspector that the Radiation Safety Program (Environmental Health and Safety Office) did not have a permit issued by the RSC for the possession and use of licensed materials.

On December 29, 2021, the licensee submitted an amendment request to the NRC, which is not publicly available. The request was to amend the UH license to authorize Troxler Model 3411-B and Model 3451 portable nuclear gauges for use “as approved by the RSC.” The licensee provided information to NRC regarding an AU’s recent request to utilize a portable nuclear gauge as a neutron source for research related to neutron detectors. During the inspection, the inspector reviewed the amendment request in order to support NRC’s technical review. The inspector reviewed records related to the license amendment request, interviewed personnel, and observed licensee facilities.

The inspector determined that in 2019, individuals in the UH Department of Physics & Astronomy wanted to perform research to develop a new type of radiation detector. To facilitate the research, they needed a neutron-emitting source. Although the licensee possessed actual neutron-emitting sealed sources that could be used for research purposes, as opposed to for moisture and surface density measurements, the individuals did not want to use those sources because they emitted too many neutrons for the needed purpose, and the individuals did not want to procure a new neutron source that would meet their needs. Therefore, the individuals approached the RSO about using a portable nuclear gauge that contained a neutron-emitting americium-241/beryllium sealed source.

The user need for the neutron-emitting sealed source was not formalized through a request to the RSC for a new permit or a request to amend an existing permit. Instead, this matter was informally discussed with the RSO. The RSO possessed a CPN Model MC-M Hydrotector portable nuclear gauge in the radioactive materials storage area, controlled under Radiation Safety Program (Environmental Health and Safety Office). The RSO temporarily “loaned” the individuals from the UH Department of Physics & Astronomy a CPN Model MC-M Hydrotector portable nuclear gauge containing an approximately 50 millicurie americium-241/beryllium sealed source.

The RSO stated that the portable nuclear gauge was not used by the individuals as a portable nuclear gauge but rather as a neutron source for the research project. The “loaning” of the portable nuclear gauge was not reviewed or approved by the RSC. The RSO informally approved the transfer of the portable nuclear gauge although there was no safety evaluation of the proposed use that took into consideration such matters as the adequacy of facilities and equipment, training and experience of the proposed users, and the operating or handling procedures necessary for safe use and security of the device. Furthermore, the NRC license for UH only authorized CPN Model MC-M series portable nuclear gauges to be used for “moisture and surface density measurements on construction materials.” Meaning, the UH license did not authorize the use of a CPN Model MC-M Hydrotector portable nuclear gauge for research and development purposes or as a neutron-emitting source for those purposes.

Records maintained by the licensee indicated that the CPN Model MC-M Hydrotector portable nuclear gauge was loaned to the individuals in the UH Department of Physics & Astronomy from June 20 to July 1, 2019, and again from August 14 – 19, 2019. The RSO stated that, in their recollection, there were other occasions when the CPN Model MC-M Hydrotector portable nuclear gauge was loaned to the UH Department of Physics & Astronomy, but that those occasions were not documented.

In 2021, an existing AU in the UH Department of Physics & Astronomy applied to the RSC to have their permit amended to authorize the possession and use of a Troxler

Model 3451 portable nuclear gauge containing an approximately 9 millicurie cesium-137 sealed source, and an approximately 44 millicurie americium-241/beryllium sealed source. The portable nuclear gauge was proposed to be used for the continuation of the research performed in 2019 with the loaned CPN Model MC-M Hydrotector portable nuclear gauge, for the purposes of conducting a study to develop a neutron detector. The Troxler Model 3451 requested to be used under the AU's permit had previously been possessed and used under a permit for an AU in the civil engineering department that had passed away in November 2020. As a result, the portable nuclear gauge had been in the radioactive materials storage area since that time and was not being used.

The NRC license for UH only authorizes Troxler Model 3451 portable nuclear gauges to be used for "moisture and surface density measurements on construction materials." Meaning, the UH license did not authorize the use of a Troxler Model 3451 portable nuclear gauge for research and development purposes or as a neutron-emitting source for those purposes. The RSC met in May 2021 to discuss the AU's request and approved it, resulting in the transfer of the portable nuclear gauge to the AU for the requested research use as a neutron-emitting source.

The RSO stated that the Troxler Model 3451 was used by individuals working under the AU's permit for the research project, but that funding was lost. The portable nuclear gauge was subsequently returned to the radioactive materials storage area in November 2021. Although the funding was unavailable and for all intents and purposes the research project concluded, the licensee still submitted the subject amendment request to the NRC in December 2021.

At the time of the inspection, all of the portable nuclear gauges possessed by the licensee were possessed by the Radiation Safety Program in the radioactive materials storage area. The inspector observed the licensee's three portable nuclear gauges and noted to the RSO that there was no Troxler Model 3451 in the storage area. Therefore, it was unclear which portable nuclear gauge had been used by the AU for the research project and returned. The inspector did, however, observe a Troxler Model 3450 portable nuclear gauge, serial number 68384. The Radiation Safety Specialist noted that the licensee possessed leak test results for a Troxler Model 3451 and for a Troxler Model 3450, and that both listed the exact same sealed source serial numbers for the cesium-137 and americium-241/beryllium sources.

The inspector and RSO contacted the vendor for additional information, and it appears that in 2014, the original AU at UH had sent the Troxler Model 3451 to the vendor without informing the RSO. The Troxler Model 3451 was a unique device that interfaced with a handheld personal digital assistant. These gauges became unusable when the personal digital assistants became defunct. It appeared that the vendor, Troxler, at the direction of the former AU, took the sources out of the licensee's Model 3451 and placed them into a Model 3450 with a scaler interface. The Model 3450, with its own unique device serial number, but the same source serial numbers, was sent to the AU at UH, without coordination with the RSO. Therefore, the RSO continued to believe that it possessed a Model 3451 when in fact it possessed a Model 3450, and all of the UH records still reflected the possession of a Troxler Model 3451.

The Troxler Model 3450 "Road Reader Plus" and Troxler Model 3451 "Enhanced Road Reader Plus" are essentially identical devices other than their user interfaces being scalar, or through a personal digital assistant, respectively. Both models are described in

the same Registry of Radioactive Sealed Sources and Devices Safety Evaluation Certificate No. NC-646-D-832-S. However, the UH license specifically authorized the possession of the Troxler Model 3451, and not the Troxler Model 3450. The licensee was unaware that it possessed a Troxler Model 3450 until it was pointed out by the inspector during the inspection. Therefore, the portable nuclear gauge used by the AU for the physics project was actually the Troxler Model 3450 and not the Troxler Model 3451 as requested by the AU and approved by the RSC.

The inspector interviewed individuals associated with the neutron detector project and observed the laboratory facilities that had been used: (1) when a portable nuclear gauge was "loaned" for the project, and (2) when the RSC approved a portable nuclear gauge to be used for the project. The inspector observed laboratory optical benchtops where the gauges (first a CPM Model MC- M Hydrotector, then a Troxler Model 3450) were used. A professor who was familiar with the project stated that the portable nuclear gauge was removed from its transport container and placed on one of three benchtops where a novel detector prototype was placed inside of a custom-made darkened wood box. The portable nuclear gauge would be left in this configuration for several hours, overnight, or over a few days, to collect measurements to determine the novel detector efficiency and angular resolution for direction-sensitive prototype detectors. When the portable nuclear gauge was set up overnight, users would not be physically present but would instead monitor the data collection remotely via computer.

The inspector identified many deficiencies associated with the project and the use of the portable nuclear gauges as neutron-emitting sources for research. For example, when the project was approved by the RSC in May 2021, the RSC did not consider the radiation safety need for the availability and use of a survey meter capable of detecting neutrons, or for the use of neutron-sensitive dosimeters for personnel working on the project. The RSC also did not consider how the portable nuclear gauge would be secured when it was being used on the benchtop in the experimental apparatus. None of the individuals interviewed by the inspector was able to describe how the portable nuclear gauge was secured to prevent unauthorized removal. Although the research experiment took place in a laboratory with a door that was capable of being locked, the RSO and RSC did not consider if there was an additional physical control to secure the gauge. The RSO and RSC did not consider provisions to ensure that the portable nuclear gauges had a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source. The radiation surveys provided to the RSC for project approval, as well as provided to the NRC in the license amendment request, were taken with an ion chamber survey meter that was not sensitive to neutrons and therefore not representative of the total radiation hazard from the gamma- and neutron-emitting sealed sources.

Following the inspection, on April 28, 2022, the licensee withdrew its December 29, 2021, amendment request (ML22119A055). On June 21, 2022, the licensee submitted an amendment request for authorization to possess and use Troxler Model 3450 portable nuclear gauges for moisture and surface density measurements on construction materials (ML22175A167). On July 18, 2022, the NRC approved the amendment request and issued Amendment No. 61.

Apparent violation of 10 CFR 33.13(c)(3)

Title 10 CFR 33.13(c)(3) requires, in part, that the licensee establish administrative controls and provisions relating to organization and management, procedures, record keeping, material control, and accounting and management review that are necessary to assure safe operations, including the establishment of appropriate administrative procedures to assure: (i) control of procurement and use of byproduct material; (ii) completion of safety evaluations of proposed uses of byproduct material which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user, and the operating or handling procedures; and (iii) review, approval, and recording by the RSC of safety evaluations of proposed uses prepared in accordance with 10 CFR 33.13(c)(3)(ii) prior to use of the byproduct material.

Contrary to the above, on April 6, 2022, the licensee failed to establish appropriate administrative procedures to assure: (i) control of procurement and use of byproduct material; (ii) completion of safety evaluations of proposed uses of byproduct material which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user, and the operating or handling procedures; and (iii) review, approval, and recording by the RSC of safety evaluations of proposed uses prepared in accordance with 10 CFR 33.13(c)(3)(ii) prior to use of the byproduct material as evidenced by the following three examples:

1. Regarding the licensee's control of the use of byproduct material: Although the licensee's listing of permit holders identified the Radiation Safety Program, the licensee's largest possessor and user of licensed materials, as a permit holder, the Radiation Safety Program did not have a permit issued by the RSC for the possession, use, or storage of licensed materials.
2. Regarding the licensee's control of the procurement of byproduct material: In 2014, an AU sent a Troxler Model 3451 portable nuclear gauge to the vendor for refurbishment without informing the RSO or RSC and seeking approval. The vendor removed the sealed sources from the Troxler Model 3451 portable nuclear gauge and placed them into a Troxler Model 3450 portable nuclear gauge and sent the new portable nuclear gauge to the AU. The licensee was unaware that this had occurred and continued to list the device in its inventory as a Troxler Model 3451 portable nuclear gauge.
3. Regarding the completion of safety evaluations of proposed uses of byproduct material and the review, approval, and recording by the RSC:
 - a. During June – August 2019, a portable nuclear gauge was transferred by the RSO to individuals in the Department of Physics & Astronomy for temporary use in a research project. The RSO failed to identify that the UH license did not authorize the use of portable nuclear gauges for research purposes and that such authorization would require prior NRC review and approval. The RSC did not review or approve this use of byproduct material and the licensee did not perform a safety evaluation of the proposed use that took into consideration such matters as the adequacy of facilities and equipment, training and experience of the users and the operating or handling procedures.

- b. In May 2021, the RSC approved the transfer of a portable nuclear gauge to an AU in the Department of Physics & Astronomy for use during a research project. The RSC failed to identify that the UH license did not authorize the use of portable nuclear gauges for research purposes and that such authorization would require prior NRC review and approval. Furthermore, the licensee did not perform a safety evaluation of the proposed use that took into consideration such matters as the adequacy of facilities and equipment, training and experience of the users, and the operating or handling procedures.

The licensee's failure to establish administrative controls and provisions relating to organization and management, procedures, record keeping, material control, and accounting and management review that are necessary to assure safe operations was identified as an apparent violation of 10 CFR 33.13(c)(3). (030-07517/2022-001-06)

Apparent violation of 10 CFR 30.34(c)

Title 10 CFR 30.34(c) requires, in part, that each person licensed by the NRC pursuant to the regulations in 10 CFR Part 30 and parts 31 through 36 and 39 shall confine his possession and use of the byproduct material to the purposes authorized in the license.

License Conditions 6.T through Y to 9.T through Y of NRC license No. 53-00017-23, Amendment Nos. 53-59, authorized the possession and use of americium-241/beryllium and cesium-137 sealed sources, to be used in specified portable nuclear gauging devices (CPN Model MC-M series; Troxler Model 3320/3330 series, Model 3411-B, and Model 3451) for moisture and surface density measurements of construction materials or depth and moisture determinations.

Contrary to the above, from 2014 to April 6, 2022, the licensee failed to confine its use of byproduct material to the purposes authorized in the license, as evidenced by the following two examples:

1. In 2014, the licensee received, acquired, owned, and possessed an approximately 40 millicurie americium-241/beryllium sealed source and an approximately 8 millicurie cesium-137 sealed source in a Troxler Model 3450 portable nuclear gauge, which was a model of portable nuclear gauge that was not authorized to be possessed under the license.
2. In 2019-2021, the licensee used portable nuclear gauges (CPN Model MC-M Hydrotector and Troxler Model 3450) as neutron sources for a laboratory benchtop physics research project, a type of use that was not authorized under the NRC license.

The licensee's failure to confine the possession and use of byproduct material to the purposes authorized in the license was identified as an apparent violation of 10 CFR 30.34(c). (030-07517/2022-001-07)

5 Causal Evaluation

The inspector did not perform a formal causal factors analysis as it was beyond the scope of the inspection. The inspector observed that the RSC met routinely to discuss

radiation safety matters, such as the review of prospective new AUs. It appeared, however, that the roles and responsibilities of the RSC, RSO, and the AUs were not well understood. For example, the RSO handled some radiation safety and permitting matters informally, without bringing them to the RSC's attention. As a result, some actions involving permits were not subject to the type or level of formal review that is required of an NRC broad scope licensee. Based on the inspector's observations and discussions with AUs, radiation workers, and the RSC Chairman, there has been an ongoing erosion and diminishment of the authority of the RSO and RSC at UH. Some users appeared to "work around" the RSO and RSC, under the perception that the RSO and RSC were an impediment to necessary research, and that the UH processes and procedures for the use of radioactive materials were overly bureaucratic and unnecessary.

As previously noted, the UH radiation safety program consisted of the RSO and one Radiation Specialist. Although the RSO and Radiation Specialist performed routine audits of the active permits, these activities were inadequate for the size and scope of the program, resulting in deficiencies in areas such as performing physical inventories and leak tests. The inspector observed that there was a licensee perception that the radiation safety program was "small" and did not require much oversight or resources. Although the scope and use of licensed materials at UH was perhaps not as expansive as it once was, it was still an active program with several active users, multiple use locations at the Manoa Campus on Oahu, as well as more than a dozen off-campus use locations on Oahu, Maui, and Hawaii island, and regular use on UH vessels at sea. As a result, the day-to-day implementation and oversight of the UH radiation safety program has been challenging for the limited staff resources.

Furthermore, the licensee used a software program to keep track of its permits, inventory, possession limits, etc. but the licensee failed to utilize the software to its fullest extent, such as entering the NRC license possession limits or sealed source leak test due dates. Therefore, this software program was not as valuable a tool as it could have been to help manage and implement the UH radiation safety program.

6 Corrective Actions

At the conclusion of the onsite inspection on April 13, 2022, the inspector discussed the preliminary inspection findings with licensee personnel and discussed the importance of prompt and lasting actions to correct the identified deficiencies and prevent recurrence.

Following the inspection, on April 28, 2022, the licensee withdrew its December 29, 2021, amendment request to authorize Troxler Model 3411-B and Troxler Model 3451 portable nuclear gauges for use "as approved by the RSC" (ML22119A055).

On May 3, 2022, the licensee submitted an amendment request (this and other related documents are not publicly available because they contain security related information) to remove the Core Laboratory at Snug Harbor, Honolulu, Hawaii, from the license. The NRC performed a preliminary review of the amendment request and requested that the licensee provide additional information to support its request (ML22179A335). The licensee provided additional information on July 27, 2022, which is not publicly available. The NRC requested additional clarifying information. The licensee provided additional information on September 26, 2022, which is not publicly available. On October 6, 2022, the NRC sent a letter to the licensee indicating that the NRC staff have found that the

amendment request and supplemental information was lacking in significant required information, such that NRC was unable to complete its detailed safety evaluation of the amendment request in its entirety and was discontinuing its review (ML22278A254). The licensee was requested to provide the requested information within 30 days. On October 13, 2022, and October 18, 2022, the licensee provided responses to the NRC, which are not publicly available. As of November 1, 2022, the information was still under NRC review and consideration.

As of November 1, 2022, the licensee has not submitted any information to the NRC regarding the permanent cessation of licensed activities at the UH Cancer Research Center of Hawaii, Honolulu, Hawaii, or the UH School of Medicine, Leahi Hospital, Honolulu, Hawaii.

Regarding the possession of a Troxler Model 3450 portable nuclear gauge that was not a model of portable nuclear gauge authorized on the license, following the inspection, on June 21, 2022, the licensee submitted an amendment request (ML22175A167). On July 18, 2022, Amendment No. 61 was issued, which is not publicly available, authorizing the possession and use of Troxler Model 3450 portable nuclear gauges for moisture and surface density measurements of construction materials. The AU's permit was amended by the RSC to no longer authorize the possession and use of portable nuclear gauges for any purposes.

On June 26, 2022, the RSO informed the inspector that they were in the process of obtaining a quote to upgrade their HP Assistant software to a more current version of the software that would better facilitate tracking and license compliance. The RSO noted that a researcher on Hawaii island had left, and that a closeout survey would be performed to remove the location from the UH license. As of November 1, 2022, the licensee had not submitted any requests regarding the removal of a location on Hawaii island.

Although not a corrective action, since the NRC inspection, there was a major programmatic change due to the RSO's retirement. On September 15, 2022, the licensee submitted an amendment request, which is not publicly available, to authorize a new individual as RSO on the license. On October 17, 2022, Amendment No. 62 was issued, which is not publicly available, authorizing a new individual as RSO.

7 Conclusions

Seven apparent violations were identified regarding the failure to: (1) notify the NRC of the permanent cessation of licensed activities at several sites; (2) properly label containers with byproduct materials; (3) perform physical inventories of licensed materials; (4) perform tests for leakage or contamination of sealed sources; (5) have a lock on the handle or case of a portable nuclear gauge in storage; (6) establish administrative controls and provisions relating to organization and management, procedures, record keeping, material control, and accounting and management review that are necessary to assure safe operations; and (7) to confine the possession and use of byproduct material to the purposes authorized in the license.

8 Exit Meeting Summary

On November 21, 2022, a final exit meeting was conducted via videoconference with Emma Kennedy, Director, Environmental Health and Safety Office; Dr. Kenneth Rubin, Chairman, RSC; Michael Soles, RSO; and Matthew Carradine, Radiation Specialist; to discuss the inspection findings. The NRC representatives discussed the content of the inspection report, described the NRC's enforcement process, and described the options for the licensee to: (1) respond in writing to the apparent violations described in the inspection report; (2) request a predecisional enforcement conference, or (3) request alternative dispute resolution. The licensee did not identify any proprietary information.

Supplemental Inspection Information

PARTIAL LIST OF PERSONS CONTACTED

Emma Kennedy, Director, Environmental Health and Safety Office
Kenneth Rubin, PhD, Chairman, RSC
Nancy Miyake, RSO
Matthew Carradine, Radiation Specialist
Thomas Browder, PhD, Professor, Department of Physics & Astronomy
John Learned, PhD, Professor, Department of Physics & Astronomy
Sven Vahsen, PhD, Professor, Department of Physics & Astronomy
Kurtis Nishimura, PhD, Assistant Professor, Department of Physics & Astronomy

INSPECTION PROCEDURES USED

87124 Fixed and Portable Gauge Programs
87126 Industrial/Academic/Research Programs

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

030-07517/2022-001-01	AV	Failure to provide notification to the NRC within 60 days of the occurrence of the licensee decision to permanently cease principal activities at licensed sites. (10 CFR 30.36(d)(2))
030-07517/2022-001-02	AV	Failure to ensure that each container of licensed material bears a durable, clearly visible label that must provide sufficient information to permit individuals handling or using the containers, or working in the vicinity of the containers, to take precautions to avoid or minimize exposures. (10 CFR 20.1904(a))
030-07517/2022-001-03	AV	Failure to conduct a physical inventory every 6 months to account for all sealed sources and/or devices possessed under the license. (License Condition 13)
030-07517/2022-001-04	AV	Failure to test sealed sources stored for a period of more than 10 years for leakage and/or contamination, and to test sealed sources for leakage and/or contamination when they are removed from storage for use and have not been tested within the required leak test interval. (License Condition 12.E)
030-07517/2022-001-05	AV	Failure to ensure that each portable nuclear gauge had a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. (License Condition 28)

030-07517/2022-001-06	AV	Failure to establish administrative controls and provisions relating to organization and management, procedures, record keeping, material control, and accounting and management review that are necessary to assure safe operations. (10 CFR 33.13(c)(3))
030-07517/2022-001-07	AV	Failure to confine the possession and use of byproduct material to the purposes authorized in the license. (10 CFR 30.34(c))

Discussed

030-07517/2019-001-01	VIO	Failure to notify the NRC in writing within 60 days of the decision to permanently cease principal activities at a site. (10 CFR 30.36(g))
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Closed

None

LIST OF ACRONYMS AND ABBREVIATIONS USED

10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
ADAMS	Agencywide Documents Access and Management System
ADR	Alternative Dispute Resolution
AU	Authorized User
AV	Apparent Violation
IP	Inspection Procedure
NRC	U.S. Nuclear Regulatory Commission
PEC	Predecisional Enforcement Conference
RSC	Radiation Safety Committee
RSO	Radiation Safety Officer
UH	University of Hawaii
VIO	Violation