

Licensee: Department of the Navy Radiological Controls & Health (N45) Energy and Environmental Readiness Division

License No.: 45-23645-01NA

Docket No.: 030-29462

Event No.: EN 55813

Location Inspected: Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility (PHNSY&IMF)  
Building 1443  
Joint Base Pearl Harbor-Hickam, Hawaii 96860

Inspection Date: April 15, 2022

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

Inspection Procedure Used: IP 87103 Inspection of Materials Licensees Involved in an Incident or Bankruptcy Filing

Inspection Scope:

On April 15, 2022, the NRC performed an independent inspection of the licensee's activities associated with an event notification regarding a leak test of a nickel-63 (Ni-63) source in a generally licensed device at the licensee's facility at the Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility, Joint Base Pearl Harbor-Hickam, Hawaii. The inspector reviewed records, procedures, and documents maintained by the licensee; observed facilities; performed independent radiation measurements; and interviewed personnel.

Observations and Findings:

At the time of the inspection, the laboratory at PHNSY&IMF possessed three gas chromatographs containing Ni-63 sources in electron capture detectors. The gas chromatographs are used to characterize shipyard waste and to test and validate materials to be brought onboard vessels.

The Agilent Technologies Model 7890B gas chromatograph system, serial number US17103009, was acquired by PHNSY&IMF in March 2017. It contained two Agilent Technologies Model G2397A electron capture detectors (NR-0348-D-111-B). Model G2397A is distributed under a general license. The Ni-63 beta ionization foil sources in the electron capture detectors were Eckert & Ziegler Isotope Products Model NER-004P, serial numbers U30541 and U30532, each containing 15 millicuries of Ni-63 (CA-0406-S-S). The leak test frequency for the electron capture detector is 6 months.

On March 18, 2022, the Assistant Radiation Safety Officer (RSO) for the PHNSY&IMF collected leak test samples each electron capture detector (serial numbers U30541 and U30532) as part of the routine leak testing program. Samples were collected at each electron capture detector's

entrance inlet port, detector housing, and exit outlet port. The samples were sent to National Leak Test Center for analysis (New York State Department of Health License No. C2323).

On March 30, 2022, PHNSY&IMF received the leak test analysis results. The results indicated 0.006 microcuries of removable contamination on the entrance inlet port of serial number U30532. The detection of 0.005 microcuries or more of removable contamination is reportable to NRC in accordance with 10 CFR 31.5(c)(5). The electron capture detector housing and exit outlet port of serial number U30532, as well as the entrance inlet port, detector housing, and exit outlet port of serial number U30541 had removable contamination levels that were well below the reportable value. The licensee immediately suspended operation of the gas chromatograph containing the source. The gas chromatograph was taken out of service through the use of a prominent hold tag. The licensee's Radiological Affairs Support Program was notified of the leak test exceedance.

On March 31, 2022, the RSO for the PHNSY&IMF made a telephonic notification to the NRC's Headquarters Operations Office that a routine leak test of a Ni-63 source detected 0.0006 microcuries of removable radioactive contamination. The report was made to the NRC under the provisions of 10 CFR 31.5(c). These provisions only require a 30-day written report, but the licensee conservatively provided a telephonic notification to the NRC.

Also on March 31, 2022, the Assistant RSO cordoned off the entire benchtop area where the gas chromatograph was located. The Assistant RSO acquired swipes for removable radioactive contamination of additional gas chromatograph components and of the area in the vicinity of the gas chromatograph. These included: inside the gas chromatograph oven, the door of the gas chromatograph oven, inside the electron capture detector housing compartment, the benchtop, the floor in front of the gas chromatograph, and the tool used to handle the electron capture detector. These samples were sent to National Leak Test Center for analysis. The results of the analysis, which were received on April 5, 2022, had removable contamination levels that were well below the reportable value and indicated no evidence of removable contamination.

On April 6, 2022, the PHNSY&IMF RSO provided a written report regarding the leaking source to the Radiological Affairs Support Office.

The inspector reviewed previous leak test analysis results for the nickel-63 source. Leak tests were previously performed on June 24, 2021, September 24, 2021, and December 9, 2021. None of the prior leak test analysis results indicated any trending or evidence of leakage or removable contamination.

Although the efficiency of a typical pancake type Geiger Mueller detector for Ni-63 is probably less than 1 percent, the inspector nonetheless performed radiation surveys of the gas chromatograph and the benchtop area where the gas chromatographs were located, in order to rule out any potential radiological contamination from other radionuclides. Independent radiation surveys were performed with Ludlum Model 3-IS, serial 257114 with Ludlum 44-9 probe, serial PR287529, calibration due September 8, 2022, and Thermo RadEyeG, serial 30931, calibration due November 12, 2022. Detected radiation levels were consistent with background radiation levels.

The licensee plans to follow the instructions provided by Agilent Technologies to return the Ni-63 source for disposal.

#### Conclusions:

On March 31, 2022, the licensee made a telephonic notification to the NRC related to 10 CFR 31.5(c). A routine leak test of an electron capture detector containing a 15 millicurie Ni-63 foil source detected 0.0006 microcuries of removable radioactive contamination. The generally licensed gas chromatograph containing the electron capture detector was immediately removed from service. No additional areas of removable radioactive contamination were identified by the licensee.

Partial List of Persons Contacted:

Andrew Taylor, Laboratory Director  
Melissa Nagata, Branch Supervisor  
Mark Tamashiro, Radiation Safety Officer  
Matthew Scarfone, Assistant Radiation Safety Officer

List of Acronyms and Abbreviations Used:

Ni-63	nickel-63
PHNSY&IMF	Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility
RSO	Radiation Safety Officer