



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
2443 WARRENVILLE RD. SUITE 210
LISLE, IL 60532-4352

August 26, 2022

Eduardo Mojica
Radiation Safety Officer
City of Detroit
DPW-CED
2 Woodward Ave.
Ste. 601
Detroit, MI 48226

Dear Eduardo Mojica:

Enclosed is Amendment No. 8 renewing your NRC Material License No. 21-24406-02 in accordance with your request. Please note that your license format has been updated based on our new licensing process. In addition, based on the licensing policy we have modified the following License Conditions: Condition No. 10 regarding the jurisdiction of temporary job sites, Condition No. 11 regarding designation of authorized gauge users, Condition No. 13 regarding the sealed source leak tests requirement, and Condition No. 15 regarding records retention for physical inventories. We updated Condition No. 17 regarding the requirements for locking the device, and to remove the requirement to have two security barriers for portable gauges because this requirement is stated in the regulations under 10 CFR 30.34(i). We removed Condition No. 19 in the previous amendment regarding the transportation requirement because this requirement is stated in the regulations in 10 CFR part 71.

In your application dated February 24, 2022, you requested to implement the model leak test program published in Appendix I of NUREG-1556, Volume 1, Revision 2, "Consolidated Guidance About Materials Licenses: Program- Specific Guidance About Portable Gauge Licenses," which allows licensees to collect and preform the analysis of sealed source leak tests. We are unable to approve this request at this time because we will need additional information. Specifically, we will need documentation which names the individuals who will independently perform leak test analysis. In addition, this documentation must provide the on-the-job training that the individuals have received, and it must outline the facilities and equipment which will be used to perform analysis in accordance with the guidance outlined in Appendix I of NUREG-1556, Volume 1, Revision 2. You are authorized to continue to use leak test kits to collect leak test samples, but Analysis of leak test samples and/or contamination shall be performed by persons specifically licensed by the U.S. Nuclear Regulatory Commission or an Agreement State to perform such services.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region III office at (630) 829-9887 so that we can provide appropriate corrections and answers.

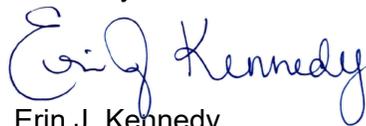
You will be periodically inspected by NRC. Failure to conduct your program in accordance with NRC regulations, license conditions, and representations made in your license application and

supplemental correspondence with NRC will result in enforcement action against you. This could include issuance of a notice of violation, or imposition of a civil penalty, or an order suspending, modifying or revoking your license as specified in the General Statement of Policy and Procedure for NRC Enforcement Actions. Since serious consequences to employees and the public can result from failure to comply with NRC requirements, prompt and vigorous enforcement action will be taken when dealing with licensees who do not achieve the necessary meticulous attention to detail and the high standard of compliance which NRC expects of its licensees.

The NRC's Safety Culture Policy Statement became effective in June 2011. While a policy statement and not a regulation, it sets forth the agency's *expectations* for individuals and organizations to establish and maintain a positive safety culture. You can access the policy statement and supporting material that may benefit your organization on NRC's safety culture Web site at <http://www.nrc.gov/about-nrc/regulatory/enforcement/safety-culture.html>. We strongly encourage you to review this material and adapt it to your particular needs in order to develop and maintain a positive safety culture as you engage in NRC-regulated activities.

In accordance with Title 10 of the Code of Federal Regulations (CFR) 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Sincerely,



Erin J. Kennedy
Health Physicist
Materials Licensing Branch

License No. 21-24406-02
Docket No. 030-34061

Enclosure: Amendment No. 8
Appendix I of NUREG-1556, Volume 1, Revision 2

APPENDIX I
MODEL LEAK TEST PROGRAM

Model Leak Test Program

Training

Before allowing an individual to perform leak testing, the licensee must ensure that he or she has sufficient classroom and on-the-job training to show competency in performing leak testing and sample analysis independently.

Classroom training may be in the form of lecture, online, video, hands-on, or self-study, and should cover the following subject areas:

- principles and practices of radiation protection
- radioactivity measurements, monitoring techniques, and instrument use
- mathematics and calculations used for measuring radioactivity
- biological effects of radiation

Appropriate on-the-job-training consists of the following:

- observing authorized personnel collecting and analyzing leak test samples
- collecting and analyzing leak test samples under the supervision and in the physical presence of an individual authorized to perform leak testing and sample analysis

Facilities and Equipment

- To ensure achieving the required sensitivity of measurements, analyze leak tests in a low-background area.
- Use a calibrated and operable radiation survey instrument to check leak test samples for gross contamination before they are analyzed.
- Analyze the leak test sample using an instrument that is appropriate for the type of radiation to be measured [e.g., NaI (TI) well-counter system for gamma-emitters, liquid scintillation for beta-emitters, and gas-flow proportional counter for alpha-emitters].
- If the sensitivity of the counting system is unknown, determine the minimum detectable activity (MDA). The MDA may be determined using the following formula:

$$MDA = \frac{2.71 + 4.65\sqrt{bkg \times t}}{t \times E}$$

where: *MDA* = minimum detectable activity in disintegrations per minute (dpm)
bkg = background count rate in counts per minute (cpm)
t = background counting time in minutes
E = detector efficiency in counts per disintegration

For example,

$$\begin{aligned} \text{where: } bkg &= 200 \text{ cpm} \\ E &= 0.1 \text{ counts per disintegration (10 percent efficient)} \\ t &= 2 \text{ minutes} \end{aligned}$$

$$MDA = \frac{2.71 + 4.65 \sqrt{200 \text{ cpm} \times 2 \text{ minutes}}}{2 \times 0.1} = \frac{2.71 + 4.65 \sqrt{400}}{0.2}$$

$$= \frac{2.71 + 4.65(20)}{0.2} = \frac{2.71 + 93}{0.2} = \frac{95.71}{0.2}$$

$$= \frac{478.55 \text{ disintegrations}}{\text{minute}}$$

$$\text{becquerels (Bq)} = \frac{1 \text{ disintegration}}{\text{second}}$$

$$MDA = \frac{478.55 \text{ disintegration}}{\text{minutes}} \times \frac{\text{minute}}{60 \text{ seconds}} = 7.976 \text{ Bq}$$

Note: The MDA equation shown above assumes that counting times for the background measurement and for the sample will be equal. MDA equations for non-equal counting times, as well as derivations of equations and discussions of limitations, can be found in “Decommissioning Health Physics—A Handbook for MARSSIM Users,” Eric W. Abelquist, published by Taylor & Francis Group, 2001.

Frequency for Conducting Leak Tests of Sealed Sources

Leak tests will be conducted at the frequency specified in the respective Sealed Source and Device registration certificate. If a sealed source is not registered, leak tests should be conducted at 6 month intervals, unless a different interval is established during the licensing process. Leak testing of sealed sources may be required by license condition.

Procedure for Performing Leak Testing and Analysis

- For each source to be tested, list identifying information such as sealed source serial number, manufacturer, model number, radionuclide, and activity.
- Use a radiation survey meter to monitor exposure.
- Prepare a separate wipe sample (e.g., cotton swab or filter paper) for each source.
- Number each wipe to correlate with identifying information for each source.

- Wipe the most accessible area where contamination would accumulate if the sealed source were leaking (see manufacturer’s instructions).
- Select instrumentation that is sensitive enough to detect 185 Bq [0.005 microcuries] of the radionuclide contained in the gauge.
- Using the selected instrument, count and record background count rate.
- Check the instrument’s counting efficiency using a standard source of the same radionuclide as the source being tested or one with similar energy characteristics. The calibration source must be in the same configuration as the sample. Accuracy of standards should be within plus or minus 5 percent of the stated value and traceable to primary radiation standards such as those maintained by the National Institute of Standards and Technology.
- Calculate the counting efficiency of the detector.

$$\text{Efficiency in cpm/Bq} = \frac{[(\text{cpm from std}) - (\text{cpm from bkg})]}{\text{activity of std in Bq}}$$

where: cpm = counts per minute
 std = standard
 bkg = background
 Bq = becquerel

- Count each wipe sample; determine net count rate.
- For each sample, calculate and record estimated activity in Bq (or microcuries). The activity of the sample in becquerels may be calculated using the following formula:

$$\text{Activity of sample [Bq]} = \frac{[(\text{cpm from wipe sample}) - (\text{cpm from bkg})]}{\text{efficiency in cpm/Bq}}$$

- Sign and date the list of sources, data, and calculations. Retain records for 3 years [under Title 10 of the *Code of Federal Regulations* (10 CFR) 20.2103(a)].
- If the wipe test activity is 185 Bq [0.005 microcurie] or greater, notify the radiation safety officer so that the source can be withdrawn from use and disposed of properly. Also, notify the U.S. Nuclear Regulatory Commission.