

Device Performance Testing

NRPP Performance Testing and Calibration Policy

Since the inception of the program, the NRPP has required that Standard and Analytical professionals using analytical devices, including Responsible Parties for Analytical labs, these professionals must complete initial calibration and performance test for Certification and that the Performance Test has to be repeated on a biennial basis (every two years) in order to maintain certification and the calibration must be done annually. Analytical Laboratories should reference detailed requirements for calibration on this page: http://www.nrpp.info/measurement_lab_calibration.shtml

Overview and History

Device Performance Testing is a NRPP entry and renewal requirement for residential measurement “Standard and Analytical (S&A)” services providers and Analytical Laboratories. Device performance tests require that radon measurement devices be exposed to a known amount of radon gas or decay products, as applicable, in a NRPP-approved radon chamber facility. The chamber returns the devices to the company performing the analysis services. The device(s) are analyzed to determine the radon or radon decay product concentrations during their exposure in the radon chamber. The results are then submitted to the chamber that grades the analytical results against the chamber values. Each device must measure within 25% of the chamber value for a passing test result.

The US EPA established Device Performance Testing for radon measurement devices in 1986. These tests were the cornerstone of the US EPA’s Radon Measurement Proficiency (RMP) Program and were applicable to all RMP participants who offered any type of analytical services for radon measurements. In the mid-1990s the US EPA merged their three separately operated radon programs into a single program known as the US EPA Radon Proficiency Program (RPP). Device performance testing remained as the measuring stick for those with analytical capabilities. It was the closure and privatization of the EPA RPP that led to the birth of the NEHA’s National Radon Proficiency Program (NRPP). NRPP continues to operate on much of the framework put in place by the EPA and continues to seek opportunities for improvement in an attempt to become the most professional and credible program possible.

The EPA RPP defined analytical services as “radon measurement services or activities, at a specific business location, that include the capability to extract, read, analyze or manipulate the radon/WL data from the measurement device(s) and calculate the final concentration for the client test report. These capabilities include, but are not limited to, reading and recording initial and final electret voltages, printing continuous monitor data tapes, recording radon or WL concentrations from a data window, or downloading the radon/WL data to a PC for test report generation. This was formerly known as a “primary” in the RMP Program.”¹ NRPP continues to use this definition to determine when analytical services are being performed..

When NEHA-NRPP opened in 1998, program materials indicated that Standard and Analytical providers and Analytical Laboratories would eventually be required to pass device performance tests but at that time the policies and procedures were still being developed. Since that time NRPP has developed these procedures as well as established an approval process for private performance testing radon chambers. NRPP has approved two radon chamber facilities for performance testing, Bowser-Morner, Inc. of Dayton, OH (937) 236-8805 x259 and Radon Measurements Lab of Colorado Springs, CO (719) 255-3584. The two certified radon chambers have been supplied with the specific rules and procedures for the device

testing (numbers of devices, exposure limitations, reporting logistics, etc.) and can help you determine how to best meet the NRPP program requirements. The chambers also have information to help you determine which test devices require their own tests and which ones may have been grouped together due to similarities in their design.

1 US EPA Radon Proficiency Program Handbook, EPA 402-R-95-013, July 1996.

Calibrations and Spiking

NRPP has received questions wanting to know the difference between device performance tests, spiking and calibration services, especially as applicable to continuous radon monitors. Although the three services are related and may be similar in that a radon chamber is utilized, they have three distinct purposes.

Calibration is done for the purpose of establishing that the equipment is functioning properly. The chamber operator or manufacturer most commonly does this without any input from user or owner of the monitor. The monitors are cleaned, serviced and sent back to the owner with a certificate or sticker showing that calibration has been completed successfully. This is very similar to taking your automobile in for a tune-up, in that an expert services the car, replaces any worn-out parts and gives it back in the best shape possible. Calibration is needed for every unit in ones continuous monitor inventory on at least an annual basis. Calibration of other types of devices, such as activated charcoal or alpha track detectors, are much more laborious requiring many chamber exposures and requires the laboratory to ensure that the calibration factors are adjusted according to the information gathered from the device exposures.

Spikes are also done in a radon chamber, but are done on an ongoing basis to ensure that the equipment is still operating as well as possible. After the radon chamber exposures are completed, the devices are returned to the owners with an explanation of the radon chamber environment, including the pCi/L (and/or working levels), temperature, relative humidity and length of exposure. The owner has to determine whether the equipment is still functioning according to the last set of calibrations or whether service may be needed on the system. For users of activated charcoal, liquid scintillation and alpha track detectors, spiking provides important information about the quality of the laboratory analysis since the devices are submitted to the lab without their prior knowledge that they were actually spiked.

Device performance testing is unique in that the analytical service provider is now being graded on their ability to produce accurate and reliable radon test results. Although there is knowledge that the tests are taking place, there is no prior knowledge of the radon chamber environment. The results of the performance tests are going to be related to the quality of the calibration and maintenance services, but more importantly, the device performance test indicates whether or not the user knows his/her equipment well enough to produce an accurate assessment of the radon chamber conditions. This is very similar to the every day scenario of testing a house. Although you know your going to go into the house to perform a test, are you going to be able to give your client a report that is truly indicative of the radon levels inside? Unlike calibrations, which are required for every unit in inventory, device performance tests are required for only one unit of each type device utilized by the provider. For example, if an inspector has five identical continuous monitors, a single test is needed to assure NRPP that he/she can provide accurate results with that type of unit. However, if an inspector has two different types of equipment requiring different operation, (start/stop, memory clearing, printing, etc.), then one test is needed for each type of monitor utilized.