



Welcome to nuclear inspector school

March 10, 2020

You have no doubt heard news reports about nuclear inspectors traveling to a country to examine its use of nuclear materials. These inspectors are from the International Atomic Energy Agency, more commonly known as the IAEA, which works with its member states and multiple partners worldwide to promote the peaceful use of nuclear technology. The IAEA, based in Vienna, Austria, also works to inhibit the use of civilian nuclear materials for any military purpose, including nuclear weapons.

One of the IAEA's principal missions focuses on safeguards to deter the spread of nuclear weapons by early detection of the misuse of nuclear materials or technology. These safeguards ensure that countries can use nuclear material and technologies for peaceful purposes, while the IAEA provides credible assurance to the world that the nuclear facilities are not misused and nuclear material is not diverted.

To carry out this mission, the IAEA sends out teams of nuclear inspectors who scrutinize nuclear facilities around the world to ensure that their nuclear materials are used only for peaceful purposes. So, just who are these nuclear inspectors and where do they learn their jobs?

A nuclear inspector is typically a physicist, chemist or engineer. Each year, the IAEA receives approximately 250 applications for the position. Of these, about 15 to 25 are hired.

Inspectors go through training at Los Alamos National Laboratory, in one of the Laboratory's nuclear facilities, as part of their requirements to become qualified inspectors. The reason is simple: Los Alamos has been doing this work for a long time and, consequently, is home to abundant expertise in all things nuclear.

Today, in addition to developing advanced technologies and providing training, Laboratory scientists and engineers also help facilitate the IAEA's international engagements.

A key part of this nuclear inspector training is learning about detection instruments, their use, and how to interpret the results. The instruments run the gamut from handheld devices to bulky detectors, and all are designed to identify and measure the contents of nuclear materials inside various types of containers or other structures. These instruments perform measurements quickly and without having to get inside whatever holds the material in question. Like fingerprints, nuclear materials have distinct signatures – this means that they're almost impossible to fake. Because of this characteristic, instruments that use nondestructive assay technology – meaning the composition of a substance can be determined without altering or destroying it – help confirm the accuracy of any country's declaration of nuclear materials in a given facility.

In other words, these instruments verify the type and amount of nuclear materials claimed by an inspected country.

Although training at the school includes lectures on the fundamentals of nondestructive assay, the school emphasizes hands-on experience so nuclear inspectors can become comfortable with all the instruments they will use and encounter. It also provides an extensive inventory of real nuclear materials so that inspectors quickly learn to identify the signatures and quantity of the “real deal.”

Today, as nuclear technology continues to evolve, nuclear safeguards must continue to evolve along with it. The scientists and engineers at Los Alamos are keenly aware of this and are actively involved in the latest research to address new issues, such as monitoring the process behind advanced fuel cycle facilities and vulnerabilities related to cybersecurity. As these new challenges come to the forefront, the nuclear inspector school will be there to ensure that the international community is prepared – and that nuclear materials remain secure.

A longer version of this article first appeared in the [Albuquerque Journal](#).

Los Alamos National Laboratory

www.lanl.gov

(505) 667-7000

Los Alamos, NM

Managed by Triad National Security, LLC for the U.S Department of Energy's NNSA

