



Project Summary:

K-25 Nondestructive Assay Program Review and Verification

Location:

K-25 Gaseous Diffusion Process Building at the East Tennessee Technology Park (Oak Ridge, TN)

Government Agency:

U.S. Department of Energy

Project Timetable:

2006 – present

In 2006, the U.S. Department of Energy (DOE) requested health physics experts from Oak Ridge Associated Universities (ORAU) to perform independent reviews and data validation for the Nondestructive Assay Program (NDA) at the K-25 site. The site contractor was developing and implementing a program to perform NDA measurements of special nuclear material (SNM) hold-up in process piping and components. Because of the overwhelming safety significance of the NDA program, DOE selected ORAU to support the independent verification effort.

The size (44 acres under one roof) and complexity of K-25 presents an unprecedented decommissioning challenge. In addition to the miles upon miles of piping, the building contains more than 3,000 stages, each of which consists of two electric motors, axial flow compressors, a converter containing a large surface area of barrier material, and associated valves and piping. By some estimates, there are more than 1.5 metric tons of enriched uranium hold-up in the remaining piping and process equipment that must be detected and quantified for criticality and waste disposal purposes.

In order to support DOE's mission to successfully complete the decontamination and decommissioning of the K-25 building, the ORAU survey team:

- Conducted substantial technical reviews of more than twenty NDA program documents, including the program plan, technical basis documents, procedures and performance test and validation plans (PTVPs) for various nondestructive assay (gamma and neutron) instruments.
- Served as technical team members for several Criticality Incredible program readiness assessments led by the DOE.
- Developed and implemented an independent verification program for validation of NDA measurements at K-25, which included the use of a specialized measurement system (HMS-4) to quantify U-235 holdup in piping.
- Performed independent laboratory analyses of foamed process pipe samples to quantify various radionuclides, including U-234, U-235, U-238, Tc-99 and Sr-90.

Partnerships for Innovation



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