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Safely Delivering the U.S. Department of Energy's Vision for the East Tennessee Technology Park Mission

For Immediate Release

Media contact: Allen Schubert
allen.schubert@ettp.doe.gov
(865) 576-5684

Demolition Begins at K-25's Last Section Standing

Oak Ridge, Tenn., September 17, 2013: Demolition work began today at the last section standing of the K-25 building at the East Tennessee Technology Park (ETTP).

URS | CH2M Oak Ridge LLC (UCOR) workers began tearing down the final six units of the mile-long Manhattan Project-era gaseous diffusion building that once was the largest building under one roof in the world.

The original building was in the shape of a U. The west wing was demolished under a previous contractor. In the first two years of its contract, UCOR safely and successfully demolished the north end and the east wing, except for six units that were presumed to be contaminated with technetium-99 and required further deactivation. Tc-99 is a very mobile, slow-decaying radioactive material and presented unique challenges.

“Beginning this final stage of demolition marks the end of an era,” said Steve Dahlgren, UCOR’s D&D manager. “This building served the nation well for over 60 years and played a role in ending World War II and the Cold War. Now it will soon be safely on the ground and in the history books.”

Getting the last six units to this point was a long, difficult road, said Dahlgren. When UCOR arrived at ETTP in August of 2011, they found unexpected challenges, including large sections of K-25 that were still deemed “crit credible” – meaning materials were still present that could theoretically cause a nuclear criticality to occur. Workers had to perform all the work necessary to declare the area “crit incredible,” which meant finding ways to remove and dispose of a number of these challenging materials. Then the building had to be rendered “cold, dark and dry,” which means all hazardous materials removed and all sources of energy cut off. Then, the building was condemned.

“I can’t say enough about the performance of these crews,” said Dahlgren. “Every day, they faced all the issues and challenges associated with the work, in particular the work involved in deactivating and tearing down a 70-year-old, extremely complex building. They have performed brilliantly, and their performance – especially their safety performance – has been remarkable.”

Years ago, during west wing demolition, materials for which a disposition path had not been determined were moved out and into other parts of the building so that demolition could continue. In an area called Vault 1X, a litany of legacy waste had been collected. There was a collection of tanks that had been part of the process and had been disconnected and placed in the south end of the east wing. There were also components called NaF (sodium fluoride) traps, which were used during operations to separate uranium from intermediate gases in the process system. There was no history indicating that these traps were purged before K-25 operations ceased.

In the north end, which has now been demolished, UCOR also discovered items that had been removed from the west wing before demolition, including a collection of high-risk equipment (HRE) and items called monoliths, which turned out to be large blocks of uranium-containing components encased in concrete.

“Back in the day, they encased these components in concrete to protect them for security purposes,” said Dahlgren.

The most urgent, “critical path” issues identified for the demolition of the building were the monoliths and high-risk equipment (HRE) in the north end, and Vault 1X, surge tanks, and the NaF traps in the Tc-99 area, because demolition could not proceed in those areas until those materials were removed.

The monoliths and HRE had to be moved out of the building before that section of the building could be deemed critical. The concrete in the monoliths had to be chipped away and the uranium content mined out of the components in an on-site facility called the segmentation shop. The HRE had to be opened, mined and repackaged to meet disposal criteria. Depending on the contents, they were either disposed of at the on-site Environmental Management Waste Management Facility or shipped west to either Nevada or Utah.

In the case of the surge tanks, UCOR built enclosures around them where they stood, bought special cutting tools, and trained people to do the work. The uranium was mined out of the tanks and the hulls stayed in place to be disposed as part of the building demolition.

When K-25 was operational, the NaF traps were part of the final uranium removal process. Sodium fluoride pellets were used to trap the uranium, and these particular traps still contained

uranium materials from when the facility was shut down decades ago. The NaF traps are each about the size of a household hot water heater and range in weight from 150 pounds to 800 pounds each. They are especially hazardous to workers because they contain fluorine compounds that can generate hydrogen fluoride when they come into contact with moisture in the air. First, UCOR had to find ways to work safely in the deteriorating building. The walls, floors and ceiling have gaping holes, and workers couldn't walk on the floor safely without reinforcements.

The NaF traps were lifted through holes cut in the roof and were stored until they could be characterized and a final disposition path determined. Lessons learned were subsequently used to safely remove similar NaF traps at K-25's sister facility, K-27.

Prior to UCOR's arrival, the prevailing thought was that due to the chemical characteristics of technetium – it is extremely mobile and travels quickly – the last Tc-99 section in its entirety would need to be packed up and shipped west. Through characterization, however, it was determined that most of the building structure and some of the process gas equipment could be disposed on site at EMWMF, saving significant dollars.

With a new "Go Orange" initiative, work that previously would have been tediously done by workers in the buildings will now be done more safely and expediently in the field during the demolition process.

Under the previous approach, workers in the Tc-99 area would have spent weeks cutting out contaminated pipes that can't be disposed on site, then loading them for shipment. Instead, they painted them with bright paint and left them in place. As the last six units are demolished, these bright components will be segregated and loaded by heavy equipment in the field.

Compressors and converters were previously an issue because they were taken into the non-destructive assay (NDA) shop, where NDA was performed. Instead, as part of the deactivation and demolition of the Tc-99 units, these components will be decontaminated and sprayed with fixative in the demolition field. The NDA equipment will be brought into the field, and a packaging, assay, and ship production line will be established. Heavy equipment will also be used to package piping in the field for shipping.

In addition to deactivating and demolishing the K-25 building, UCOR is responsible for other specific scopes of work at ETTP, the Y-12 National Security Complex, and the Oak Ridge National Laboratory.

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Workers began demolishing the remaining section of the K-25 building today (Sept. 17).