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USACE FULFILLS A TALL ORDER

The U.S. Army Corps of Engineers, New York District, works to remove a tall smokestack at the Brookhaven National Laboratory in New York.

By JoAnne Castagna, Ed.D.

The U.S. Army Corps of Engineers (USACE), New York District, continues to demonstrate its unique engineering and construction capabilities in providing tangible, real-world solutions for some of the nation's toughest challenges. The latest example involves the Brookhaven National Laboratory.

Over the years, the lab has been on a mission to remove old buildings on its property that contain legacy radioactive material that was a result of past work. Many have been removed or decommissioned so far, but one high-profile structure has remained: a tall smokestack. Now it is being safely removed by the New York District using the latest in demolition technologies.



*At the top of the stack, a MANTIS Demolition System is set up to safely and efficiently dismantle the structure at the Brookhaven National Laboratory.
Photo Credit: JoAnne Castagna.*

The stack stands 320 feet tall and has a tapered cone shape; its interior base diameter is almost 27 feet, and the interior top diameter is almost 19 feet.

Col. Matthew Luzzatto, commander of the New York District, says, “This project is another example of the exceptional work New York District does on a daily basis. I couldn’t be prouder of our team because they are addressing unique challenges, working closely and transparently with contractors and our partners at the Department of Energy, and ensuring safe and effective execution of the work.”

To perform this work, the Army Corps is partnering with contractor Olgoonik-FPM Joint Venture and its subcontractor, ICC Commonwealth, and the U.S. Department of Energy’s (DOE) Office of Environmental Management, which is responsible for the environmental remediation of the High Flux Beam Reactor (HFBR) Stack at Brookhaven National Lab.

The lab is in the town of Brookhaven on eastern Long Island, New York, 60 miles east of New York City. Since 1947, this multipurpose research institution — known for its seven Nobel Prize-winning discoveries — has performed pioneering research in physical, biological and environmental sciences, as well as in energy technologies, computation and national security.

The Lab’s 5,300 acres of property sits on the former site of the U.S. Army’s Camp Upton. Near the center of the site, stand-

ing like a beacon, is a tall, red-and-white concrete stack. The stack marks where the 13-acre HFBR complex, formerly used for research purposes up until 1996, sits.

The complex includes two research reactors: the HFBR and the Brookhaven Graphite Research Reactor (BGRR). The BGRR was decommissioned and dismantled over a decade ago; the HFBR has been similarly dismantled except for the reactor vessel, which will be removed in the future.

These reactors performed outstanding work in their day. The HFBR is known for many accomplishments, including being a dependable source of neutrons — the subatomic probes crucial to a wide array of scientific research programs. It is also known for discovering new uses for radioactive isotopes for treating cancer, cardiovascular disease, arthritis and other medical conditions.

The BGRR had its share of achievements, including being the world’s first reactor built solely to perform scientific research on peaceful uses of the atom after World War II.

Exhaust air from these reactors was transported by lines and ducts through filters to the stack. The stack stands 320 feet tall and has a tapered cone shape; its interior base diameter is almost



Col. Matthew Luzzatto, Commander, New York District, U.S. Army Corps of Engineers (center), reviewing the district’s dismantling of the stack at the Brookhaven National Laboratory. Photo Credit: JoAnne Castagna.





27 feet, and the interior top diameter is almost 19 feet.

The stack was used to discharge cooling air from the BGRR and later to ventilate equipment and rooms in the HFBR and other support buildings on the complex. This exhaust included radioactive material.

This hazardous material contaminated the interior of the stack, up to three-fourths of an inch in depth. In addition, the red-and-white paint on the stack's exterior contained asbestos and lead. Removal of the stack is one of the last remaining actions related to the cleanup plan for the complex. USACE offered the lab and DOE a safe and efficient alternative solution to do this, using the latest demolition technology.

First, the contractors removed the contaminated paint. A hydro-blasting technique was applied that uses high-pressure water to remove the paint from the concrete. The paint was then vacuumed up at the point of removal from the stack's surface and contained in a closed system. This procedure

minimized the release of any hazardous material and eliminated the need for workers to directly handle the contaminated waste.

Next, the contractors began dismantling the stack using what is called the MANTIS Demolition System, which is an unmanned (remotely operated) hydraulic machine used to dismantle large chimneys.

"With this system, the equipment actually sits on top of the stack and walks its way down as it chips away. Each piece of concrete is broken out, the rebar supports are cut and it all falls inside the stack for removal. By the stack collecting its own waste, it keeps workers and the surrounding area protected from hazardous material," says Matthew Creamer, project manager for the New York District. "The system also produces limited vibration, which protects nearby lab equipment from being damaged."

Additional safety measures are in place to protect workers and the surrounding environment. Water sprayers were installed on the MANTIS equipment and at the bottom of the stack to suppress dust from the concrete. In addition, air monitoring samples are being continually taken to make sure there are no contaminants in the work area, and silt fencing was set up around the work area to prevent any contaminated water from running off the site.

All contaminated soil, debris and material is being removed and transported to approved off-site waste disposal sites. When the project is completed, a final survey of the site will be performed, and the land will be graded with clean soil. The project is expected to be completed this summer.

"Removing this stack is a significant milestone for Brookhaven National Lab's overarching environmental restoration program that supports the health and well-being of our community and environment," says Peter Genzer, manager in the media and communications office at Brookhaven National Laboratory.

Brookhaven National Laboratory's army of research scientists are hard at work performing research on a wide range of disciplines. The Army Corps is making sure that where they do this critical work for the nation, it is safe. ▢



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The MANTIS Demolition System being placed on top of the stack at Brookhaven National Laboratory. Photo Credit: USACE.



*This is an example of what the MANTIS Demolition System looks like at work. This photo was not taken at this project.
Photo Credit: USACE.*



The MANTIS Demolition System is an unmanned (remotely operated) hydraulic machine used to dismantle large chimneys.



*The MANTIS Demolition System being placed on top of the stack at Brookhaven National Laboratory.
Photo Credit: USACE.*



The stack standing next to a domed building that is part of the decommissioned High Flux Beam Reactor. Photo Credit: USACE.

