

CT scanner checks on well-being of aging U.S. nuclear weapons

January 25 2010, By Suzanne Bohan

A sophisticated X-ray machine co-developed by Lawrence Livermore National Laboratory scientists began providing its inaugural batch of high-resolution images of nuclear weapons' innards this month.

The National Nuclear Security Administration, which oversees the nation's weapons laboratories, is hailing the machine as a breakthrough in assuring the safety and reliability of the nation's aging nuclear weapons stockpile.

"We are fortunate to have dedicated scientists working together from across the nuclear security enterprise to develop cutting-edge tools to monitor aging in critical weapons components," said Thomas D'Agostino, administrator of the agency.

The 20-foot-long CT scanner is installed at the Pantex Plant near Amarillo, Texas, where the nation's only nuclear weapons assembly and disassembly facility is operated. Researchers there teamed with Livermore scientists to develop it.

Because of a congressional ban on building new nuclear weapons, many warheads in the nation's stockpile are decades old. Yet it's essential to assure their continued reliability to serve as a credible deterrent against attack, nuclear security agency officials say.

The CT scanner, which goes by the acronym CoLOSSIS, is modeled after the same machines used in medicine to look inside the human body

without making an incision. But X-rays from this machine are much more powerful, enabling them to move through heavy metal. CT scanners yield precise 3-D images.

Until the scanner became fully operational this month, the other alternative for determining if critical nuclear weapons components were defective or sound was to cut into weapons and disassemble critical parts. With a federal ban on even reassembling the component -- also a costly procedure -- it meant the component was ruined.

"One of the exciting things about this is it's nondestructive," said Patrick Allen, deputy program manager for the Livermore Lab's enhanced surveillance program, which monitors the [nuclear weapons](#) arsenal.

The first user of the [CT scanner](#) is Los Alamos National Laboratory in New Mexico. The lab is using it to assess critical components in the Air Force's B61 gravity bomb, which is designed for deployment by high-speed aircraft.

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