

Y-12 adds more specialized machines in Cold War efforts

Through the years after the Manhattan Project, Y-12 continually developed more and more capabilities to produce nuclear weapons components, especially uranium parts. The highly specialized machine shop that Y-12 was developing into was a direct result of the ever-increasing demands for more and better nuclear weapons. The Cold War race was on.

The first X-ray machine was brought to Y-12 in February 1949. It was a 1,000 KV system installed in Building 9981-1 in the heart of what is known even today as "Area 5." That was but the first of many such X-ray machine purchases. Some of the X-ray machines purchased by Y-12 may well be among the largest and most powerful in the world. Working with the dense materials such as uranium required high-powered X-ray machines to penetrate the material sufficient to detect any flaws in the metal working and machining process.

The need to "see" inside the nuclear weapons components to assure that welds were perfect and that the various parts fit together just so, dictated X-ray technology as being the best method. Throughout the 1950's, 1960's and into the 1970's, additional X-ray machines were purchased and non-destructive testing took on a larger and larger role at Y-12. Some of the testing techniques developed first at Y-12 are now standard industrial methods.

A Primary Rolling Mill with a capacity to roll uranium up to 66 inches wide and four inches thick was purchased late in 1957 and installed in 1958. A 7,500 Ton Press was purchased in 1958, the largest press at Y-12.

A 42 inch rolling mill was installed in one of the areas where highly enriched uranium was processed. Building 9212's capacity to reclaim and purify uranium-235 was expanded as production processes grew more numerous and additional metal working and machining capacity was added in all areas of Y-12.

Nuclear weapons cases were growing larger and larger requiring Y-12 to obtain the capability to form parts of larger sizes. Fabricating uranium parts was becoming routine, and new techniques for working uranium were being developed regularly.

This unique specialized equipment enabled Y-12 to continue to expand mission capability and support the nation's growing nuclear weapons program. Y-12 was embarking on a most unusual race in numbers of nuclear weapons produced that would ultimately result in helping win the Cold War.

An additional machine shop for very large machining capability was completed in 1958. Y-12 began pressing and machining tungsten for the nation's developing missile program. A nuclear powered rocket program required special fuel element fabrication at Y-12.

The COLEX process continued to operate to separate lithium-6. However, some of the mercury used in this process was beginning to find its way to the East Fork of Poplar Creek and migrating off site.

This would be a major issue in the 1980's when that information was declassified, and Y-12 had to go and dig up the creek banks to return the mercury contaminated soil to the site. While the levels were low, the studies advised removal as the safe option.

This is the only environmental insult the city of Oak Ridge has experienced from being so close to Y-12. The specialized work here requires the use of many materials that could be hazardous if not properly managed. Y-12's environmental management efforts over the years have contained other potentially hazardous materials and kept them safely stored or handled in a safe manner.

In addition to the very intense effort to separate lithium-6 using the COLEX (column exchange) process primarily in Building 9201-4 (Alpha 4), several other advances took place in Y-12 in the decade of the 1960's. A strong leadership team consisting of John P. Murray, Roger F. Hibbs, George A. Strasser, R. A. (Dixie) Walker, Robert C. Olson, Dan H. Rader, George W. Flack, J. W. (Bill) Ebert, Ed C. Ellis and Jack M. Case were taking Y-12 to the next level in nuclear weapons production as the Cold War was raging.

Much of the history of Y-12 that is being published here was documented first by Bill Wilcox and a group of Y-12 retirees who helped him create *An Overview of the History of Y-12, 1942 – 1992*. I am much indebted to Bill and his "helpers": Edward W. Bailey, Harry Bailey, N. Ken Bernander, William R. Bibb (DOE), Robert D. Ellingson, Gordon G. Fee, H. D. Hickman (DOE), James W. Hodges, V. C. Jackson, George R. Jasny, Harvey Kite, Ron Miskell, Fred Mundt, John M. Napier, Harwell Smith, Joseph E. Smyrl, Kenneth W. Sommerfeld, John W. Strohecker, William H. Thompson, Jr., Paul R. Vanstrum, M. C. Wiest, Paul E. Wilkinson, and W. Jack Yaggi.\

That list of colleagues reads much like a list of Who's Who in the history of Y-12, and the small booklet they created is ever by my side as I research Y-12's unique and awe-inspiring history. You may purchase a copy at the American Museum of Science and History's Discovery Shop or online at the Secret City Store, www.secretcitystore.com.