

Y-12 reopens Buildings 9201-4 and 9201-5

Buildings 9201-4 and 9201-5 are literally twins. They were both built in 1944 when concern grew that the K-25 Gaseous Diffusion Plant might not be able to enrich uranium beyond a small amount. This turned out to be unfounded, as K-25 actually became the workhorse of weapons grade uranium enrichment and ultimately was the source of ALL enriched uranium in today's nuclear weapons.

But in January 1944, Robert Oppenheimer and General Leslie Groves were nervously feeling their way along the various paths to enriching uranium. Because the barrier material, required for the gaseous diffusion process, had yet to be developed and thus the K-25 gaseous diffusion process was still unproven, they were looking for ways to increase the output of the Y-12 electromagnetic separation process.

When Y-12 was being built starting in February 1943 and the first operation of calutron units began in Building 9731 in November 1943, there were significant difficulties in Building 9201-1 (Alpha 1). The calutrons failed when the coils shorted out because of dirty cooling oil. While the units had to be removed and sent back to Allis Chalmers to be reworked, E. O. Lawrence was busy promoting a significant expansion to Y-12.

This slow down at Y-12 to rework the Alpha Calutrons and the concern that K-25 might not be able to enrich uranium in the isotope 235 to a very high level meant the K-25 product might well have to be fed into the Alpha Calutrons rather than directly into the Beta Calutrons. This also did not prove to be true, but in early 1944 this was enough of a concern to cause a significant expansion of Y-12.

There was confusion about this decision in a meeting of the S-1 Committee on March 30, 1944 when Lawrence, Oppenheimer and Groves all intended to promote the expansion of Y-12 but because of the overriding concerns regarding K-25, the specific decision regarding Y-12 expansion did not come up. This was an example of simple misunderstanding, but caused a significant delay at a time when delays were troublesome to say the least.

Consequently, the expansion was delayed at least six weeks until it dawned on Lawrence that both Oppenheimer and Groves had thought he opposed the expansion by his continuing focus on the problems associated with Y-12. He corrected this misunderstanding and the decision was made to add Buildings 9201-4 and 9201-5.

These two huge (approximately 500,000 square feet) buildings were completed in May of 1944 (Alpha 5) and October of 1944 (Alpha 4) using the same drawings. So, they are literally identical twin buildings. The Alpha calutrons were operated in these two buildings but for a short time. They were Alpha II rectangular racetracks.

In early 1945 when the S-50 Thermal Diffusion Plant was brought on line the enriched uranium feed material produced by that process was found to exceed the enrichment levels attainable using the Alpha calutrons. Thus, the uranium material from S-50 was fed directly into the Y-12 Beta Calutrons.

The Alpha units were soon shut down in September 1945. The Beta units continued to operate until December 1946 when all calutrons at Y-12, except for those in Building 9731 and Building 9204-3, were shut down and removed.

When the Atomic Energy Commission was charged by President Truman on January 31, 1950 to develop the hydrogen bomb and on March 10, 1950 told the AEC to expand facilities as necessary to complete the task, the AEC took him seriously. While expansion was being done and new facilities built as needed, progress was by no means as fast as the Manhattan Project had been.

However, the United States did succeed in exploding its first "super" or hydrogen bomb on November 1, 1952. Then the Soviet's first thermonuclear test happened on August 12, 1953, and the Cold War race increased considerably in intensity.

One of the key things learned from the Soviet thermonuclear test was the use of Lithium in the device. This had a direct and immediate impact on Y-12. The priority and pressure on Y-12 to succeed in separating lithium 6 on a large scale intensified even more than it had been.

The COLEX process was installed in Buildings 9201-4 and 9201-5, the twin buildings built to house the Alpha II Calutrons of the Manhattan Project. They were now entering into service in Y-12's second "Manhattan Project" type effort, that to separate lithium 6 in sufficient quantities to build large numbers of thermonuclear weapons.

Y-12 was once again striving to produce something for our nation's security that could not be done elsewhere and was both technically challenging and required manufacturing expertise that Y-12 alone could provide. The best minds of Y-12, including that of Dr. John Googin, the Y-12 Scientist, designed, built and operated the COLEX process for some eight years from 1955 to 1963.