

## Beta 3 at Y-12

Along with the several research and development organizations that were transferred from Y-12 to ORNL management, several buildings were also occupied by ORNL scientists such as the Biology Complex. Among the buildings was one that has gained substantial historic significance over the years. Building 9204-3 (Beta 3), on March, 1950, was transferred to ORNL management for use in the stable isotope program.

Beta 3 had served as one of the primary beta calutron buildings that separated the uranium 235 for Little Boy. The feed material from first the Alpha calutrons, next the S-50 Thermal Diffusion Plant and finally the output of the K-25 Gaseous Diffusion Plant was further enriched to the point necessary for Los Alamos to use it for building the world's first atomic bomb ever used in warfare.

As a result of this war-time use, the building was included among eight Manhattan Project Signature Facilities identified by the Department of Energy in December, 1999. It is intended to be preserved for posterity as the sole remaining example of the electromagnetic separation production facility in the nation.

In a national survey at the turn of the millennium, journalists and historians ranked the dropping of the atomic bomb and the surrender of Japan to end the Second World War as the top story of the twentieth century. These eight facilities played key roles in that world-changing event. Beta 3 is the sole surviving production-level electromagnetic separation facility in the United States.

This building has continued to be used for that purpose over the years and remained operational until 1998. Beta 3 has been used to separate the isotopes of many of the elements in the periodic table. For many years, Beta 3 was one of only two production electromagnetic isotope enrichment facilities in the world. The other one is in Sverdlovsk, Russia. It still operates today.

In testimony to the long-term isotope separation history of Beta 3 there is found, near the calutrons in the center of the high bay of the building, a unique wooden chart of the elements depicting the various isotopes that have been separated in Beta 3's calutrons. It is mounted on the wall and is lighted for display. Next to the display is another item, the "peg board" that was used to display the active or inactive status of each of the various calutrons.

This is the second such wooden periodic table chart to exist at Y-12. The first one was in Building 9731 and was a large wooden board that was hung on the center wall in the high bay of that building and the researchers would write the names of the various elements that were being separated into their isotopes and designate the date of first separation. This historic and unique hand-made artifact was lost to history when the building was cleaned up and the periodic chart table inadvertently discarded and buried.

Chris Keim, the person who first started the stable isotope program, was irate when he learned of the clean up and that his hand-drawn periodic chart was gone. They tried to locate it and even went so far as to dig up the landfill in search of it. It was never located and thus a most unique piece of history was lost.

Another display that stands tall in the high bay of Beta 3 is the calutron simulator that was saved from salvage by Joe Tracy. He kept it hidden for years and when the opportunity presented itself in 2005, Joe was able to get the simulator refurbished. Congressman Wamp used it to demonstrate how a calutron works when he came through with the public tours in 2005.

It was during this 2005 event that the public was allowed entrance into Beta 3 for the first time ever to see the equipment that was used to separate the uranium for Little Boy and also the stable isotopes that were used in the medical isotope program. Connie Bolling, a supervisor of the calutron operators, and Gladys Owens, one of the calutrons girls who operated the calutrons, served as hosts.

The building has served many varied uses over the years. The most recent use has been to provide a training simulation for the operations required to store enriched uranium in the Highly Enriched Uranium

Materials Facility. By using some of the available space in Beta 3, substantial cost was avoided and the training expedited.

Building 9731 with its two Alpha Calutrons and two Beta Calutrons had begun the separation of isotopes other than uranium and by 1950, the effort had expanded to the point that additional calutrons were needed.

It is significant to note that the same science that created Little Boy also created stable isotopes that were then used to create radioisotopes for medical diagnostics and treatment and industrial uses. Beta 3 played a huge role in both these accomplishments.

Next we will look at other expanding missions at Y-12.