

## Post World War II missions emerge for Y-12

During the period immediately after World War II, Y-12 underwent tremendous change. A location built for one purpose alone - that being to separate uranium 235 for the world's first atomic bomb actually used in war - had done that mission and done it well. The war was over!

But little time was actually taken for celebration of Y-12's achievement, rather the focus was on the winning of the war, not precisely how it was done. Oh, there was the "E-Awards" ceremony (I wish I could find that original "E" flag!), and there were the "A" pins (these can be found on e-Bay on occasion).

I am sure there were many celebrations and much ado about the achievement, but somehow I think all that paled in the face of the kind of reduction in jobs that Bob Ellingson mentioned last week. Imagine a place going from 22,000 to 1,600 (or whatever the lowest number was – I have heard several numbers quoted).

Imagine shutting down eight of the nine huge calutron buildings. The place must have seemed oddly silent and deserted. Tennessee Eastman management quickly realized things were changing. They had accomplished what General Groves had asked of them. Now they needed to close out the project and get back to company business.

Fred R. Conklin had been the "works manager" throughout the entire existence of Y-12 from 1943 until May 4, 1947 when C. Nelson Rucker took over with Carbide Carbon Chemical Company and Tennessee Eastman left. President Truman signed the Atomic Energy Act on August 1, 1946 creating the Atomic Energy Commission. The responsibility for atomic energy transferred from military to the civilian hands of the AEC effective January 1, 1947.

Y-12 struggled during this transition period. This is when the stable isotope program began in Building 9731. Beta 3 was attempting to compete with K-25 in the separation of uranium without success. The Beta Chemical Division was shutting down. Buildings 9207, 9208, 9204-1, -2, -4 and 9211 were closed down and turned over to standby operations.

Interestingly Building 9207 was being prepared to turn over to the Atomic Energy Commission "for subsequent disposition to another contractor." This statement was found in the Tennessee Eastman report by the Beta Chemical Division on April 1, 1947. Looks like this might be the beginnings of the Biology Division!

The ORNL Review, Vol 36, No 1, 2003, notes the following, "Alexander Hollaender, a world authority in radiation biology, came to Oak Ridge in 1946 to lead studies on the effects of radiation on micro-organisms, fruit flies, plants, and later mice. He built a broad program that once gave ORNL the largest biological laboratory in the world. Twenty researchers who have worked in the biological sciences at ORNL have been elected to the National Academy of Sciences."

"Under Hollaender, Bill and Liane Russell started a large-scale mouse-genetics project in 1947. They began to build up special mouse strains for study of the effects on offspring born to parents exposed to radiation. The mouse-genetics program eventually would accommodate a steady-state census of 250,000 mice."

Looks like when the Y-12 Beta Chemical Division shut down those buildings, the Biology Complex began shortly thereafter. Of course those buildings are now empty and the Oak Ridge National Laboratory's William L. and Liane Russell Laboratory for Comparative and Functional Genomics which opened in May 2004 now houses the mice for the Mouse Genetics Research Facility. But for nearly 50 years, biological research was conducted in the buildings first constructed as uranium chemical processing buildings for Y-12 during the Manhattan Project.

An exception to the rule was Building 9211. This building served from 1949 until 1952 as the location of the production process that implemented the nation-wide effort to find a method for freeing zirconium from its hafnium impurity thus making it suitable for cladding nuclear reactor fuels.

This successful operation at Y-12 helped to further establish the emerging reputation for accepting national challenges and accomplishing major achievements supporting the nation's growing nuclear industry. In short order, this process was turned over to private industry. The term "National Prototype Center" was not invented then, but that may well have been the first such prototype work done at Y-12.

From 1952 until 1960, Building 9211 was used for chemical recovery of uranium. In 1960 it was turned over to the growing ORNL Biology Division during the time when that complex was a beehive of activity and growing all the time.

An interesting side note on Y-12 transitions after World War II was the growth of the Oak Ridge National Laboratory on the Y-12 site. The Chemical Development Department of Y-12 located in Buildings 9733-1 and 9733-2 were asked to solve this problem for the nation. Within a year of being asked to take on this task the department was transferred from Y-12 management to the growing Oak Ridge National Laboratory.

The story of the transition of the Manhattan Project's Graphite Reactor at X-10 into the Clinton National Laboratory in 1947 and then to the Oak Ridge National Laboratory in 1948 is a great one. It is also an amazing result of a few key individuals who joined together and took that prototype demonstration reactor, built to just prove the principle that plutonium could be generated in a uranium reactor, and transitioned it into a major basic science research tool.

From this genesis a great mainstay of our nation's scientific research, often referred to by Dr. Alvin Weinberg's term "Big Science," now exists in Bethel Valley and atop Chestnut Ridge. World renowned and world record holding, the Oak Ridge National Laboratory seems to be in full stride. Who knows what the future will bring, but I am sure the advances in science coming from ORNL will continue to increase with all the people in the world being the beneficiaries.

It was good to see the American Chemical Society award its *National Historic Chemical Landmark* designation to the laboratory on March 6, 2008. A fitting recognition for the transition I mentioned above.

As noted in the program for that award ceremony, "On June 14, 1946, in *Science* magazine, a catalogue of reactor-produced isotopes ... for scientific and medical uses" was available. "On August 2, 1946, Eugene Wigner, standing in front of the Graphite Reactor, presented a small container of carbon-14 to the director of the Barnard Free Skin and Cancer Hospital of St. Louis. That presentation marked the beginning of the peacetime uses of atomic energy."

Next week we will continue to look at the changes that took place at Y-12 after World War II and into the 1950's. Both ORNL and Y-12 began to grow strong in support of the nation's increasing needs for nuclear energy related activities.