

AEC and Oak Ridge transitions

As early as November 12, 1946, the Atomic Energy Commission learned that the Y-12 electromagnetic separation process was going to be replaced by the K-25 and K-27 buildings using the gaseous diffusion process. By May 1947 this had happened.

Y-12 had transitioned from an electromagnetic separation plant to a machine shop by July 1947 when a uranium metal producing process was operational. The first uranium "button" (the name used to describe a piece of uranium metal that actually resembled a large button in shape) was finished in November 1947.

The first actual nuclear weapon part manufactured at Y-12 was shipped in late April 1948. By May 1948 a production process was operational and from that date forward, Y-12 has manufactured components for all the nuclear weapons in the United States arsenal.

The transition for X-10 from the Graphite Reactor to being named the Oak Ridge National Laboratory on February 1, 1948 was not as smooth or as easily defined. The focus in the very early days of X-10 was the creation of a manmade material that did not appear in nature, plutonium.

The plutonium first produced by the Graphite Reactor was purer than that produced later by the Hanford reactors causing the scientists at Los Alamos to need to recalculate the amount needed for the Gadget and Fat Man. This world's first industrial size nuclear reactor would go on to produce many high quality products and an enormous amount of scientific information over its 20 years of operation.

The Graphite Reactor began producing a sustained and controlled nuclear reaction on November 4, 1943. By March 1944 it had produced the world's first few grams of plutonium. Already it was known by the scientists at Clinton Laboratories that they had a tremendous research tool. Almost immediately the possibilities beyond its initial mission were being considered.

Enrico Fermi was at the Clinton Laboratories when the Graphite Reactor was built and first made operational. He was also at the first atomic pile at the University of Chicago's Stagg Field stadium on December 2, 1942 when the world's first atomic reactor proved the possibility of a controlled nuclear reaction. In less than two years, Fermi would start two more reactors and have the world's first plutonium production reactor.

On September 26, 1944, the "B" Reactor at Hanford Washington began operation. Fermi was there as well. He had succeeded in creating the world's first nuclear reactors and had advanced the science of nuclear energy by a huge margin. The Hanford "B" Reactor produced the plutonium used in the Trinity Test at Alamogordo, New Mexico on July 16, 1945, the plutonium used in Fat Man dropped on Nagasaki, Japan on August 9, 1945 and also the tritium used in the first thermonuclear weapons test on Bikini atoll in 1952.

The Graphite Reactor operated from 1943 to 1963 and continued to explore new research areas. The first electricity produced from nuclear energy was produced by the Graphite Reactor. The health hazards of radioactivity and the basic nature of matter were all studied using the reactor.

And, of course, in a teaming arrangement with the Y-12 Calutrons, the Graphite Reactor was the world's first and for many years the only producer of radioisotopes for medicine, agriculture and industrial uses. This science coming from the same equipment that produced materials for nuclear weapons now was producing medical isotopes destined to help millions of people through much improved diagnostic and treatment procedures.

Dr. Alvin Weinberg, who was with Fermi when two of the first three nuclear reactors were built, stated this "big science" of nuclear medicine was the most important contribution Oak Ridge made to the benefit of the world. He was right.

Oak Ridge can take much pride in this first of many such achievements that have benefited mankind over the years. This trend of dedicated research scientists, engineers and production personnel continue to produce world wide applications of unique and unusual materials and to improve steadily on the materials in everyday use. .

Additionally, many experiments surrounding the science of building nuclear reactors were explored. Such information as which materials absorbed neutrons and which ones didn't so proper choices could be made regarding which materials to use building subsequent reactors were the type decisions being made. Many other experiments were soon being undertaken and much new information was being obtained.

No wonder that a small group of individuals began to work in earnest to obtain the status of a "national laboratory" for the Oak Ridge facility. And in conjunction with the Atomic Energy Commission, that transition was accomplished.

The Oak Ridge National Laboratory was a reality. Oak Ridge transitioned from a war time town dedicated to winning World War II to a more stable and enduring city of promise for the future. Nuclear energy reactor use was born here and was just beginning to grow as the 1940's came to a close.