More radical changes at Y-12

The Manhattan Project in East Tennessee began with General Groves' action to secure a "plant location" on September 24, 1942 and came to a close with the transfer of responsibility for nuclear related activities from the Army to the Atomic Energy Commission on January 1, 1947. The AEC had been formed earlier on August 1, 1946, when President Truman signed the Atomic Energy Act, also known as the McMahon Act, but several months were needed to establish the organization and fill the needed positions.

At Y-12, the peak workforce of 22,482, reached at the end of the war in July/August 1945, began to be reduced almost immediately after the war ended. Several decisions in rather quick succession changed radically the type of work being done at Y-12 as well as the amount of uranium production related work being done there.

On September 4, 1945 the decision was made to begin shutting down the Alpha calutrons. By September 22, 1945, all Alpha units were removed from service. Plans began almost immediately to remove the Alpha calutrons to reclaim the sliver and to dispose of the rest of the equipment.

The K-25 gaseous diffusion process was producing uranium 235 at ever increasing levels of purity. By September, 1945, uranium enriched in isotope 235 to 15% was routinely being produced. K-25 was operating at $1/20^{th}$ the cost of operating Y-12.

S-50, the thermal diffusion plant hastily built in the summer of 1944 because of the availability of steam from the steam powered electrical generating plant - largest in the world at the time and intended to provide electricity to K-25 - had fulfilled its mission. The steam from the power plant was now being used to produce electricity for the K-25 building, as it was designed to do.

S-50 had contributed to the increased quality of the feed material for the calutrons at Y-12 sufficient to decrease the time to produce a sufficient quantity of weapons grade enriched uranium by approximately one week. The decision to shut down S-50 was also made on September 4, 1945.

K-25 had produced enough uranium feed material to decrease the time needed for a sufficient quantity of Uranium 235 for Little Boy by yet another two weeks. The race to end the war was pushing all Manhattan Project elements to their limits. The newly operational K-25 was meeting and even exceeding expectations in all areas of production. Also important to this increased production was the fact that Y-12 had ceased having the number of outages that had been so prevalent during the early months of operation.

The last two tracks of Beta calutrons built at Y-12 were just now coming on line. Beta 4 (Building 9204-4) was completed November 30, 1945. Because of improvements in the design of these units, increased production was being experienced and new records being set with each statistical review of Y-12's output.

However, Y-12's electromagnetic separation process was fast becoming obsolete for uranium isotope separation. While S-50 was being shut down and Y-12 was shutting down its Alpha calutrons, the gaseous diffusion process was flourishing.

The final group of K-25 gaseous diffusion stages became operational on August 15, 1945. By the end of September, 1945, K-27, a second huge building to house gaseous diffusion equipment, was 80 percent complete. Ultimately, there were five large buildings constructed at the K-25 site that housed gaseous diffusion equipment. Eventually, in support of the Cold War, gaseous diffusion plants were also built at Paducah, KY (built during1951 - 1956) and Portsmouth, OH (built during 1952 – 1956).

As these major changes were taking place in Oak Ridge, other Manhattan Project locations were also undergoing transition. Hanford began temporarily stockpiling plutonium rather than shipping it all to Los Alamos. The scientists at Los Alamos began to leave, considering their work for the war effort as completed they moved on to other research challenges.

On August 20, 1945, General Groves had Robert Oppenheimer brief the principle staff at Los Alamos regarding the War Department's legislative proposal scheduled to go before Congress in a few days. This proposal recommended the atomic project be put on a peacetime basis.

The legislation, which passed the House of Representatives but never to make it through the Senate, was the May-Johnson bill. Organized scientific opposition in Washington slowed the bill's progress, and Arthur H. Vandenberg of Michigan held it up in the Senate through a parliamentary maneuver.

In the May-Johnson Bill, control of the atomic project would remain with the Army. General Groves liked this bill, but many scientists did not. Ultimately, President Truman withdrew his support of the bill.

Vandenberg then attempted to establish a joint House-Senate special committee but failed. However, Senator Brien McMahon succeeded in creating a Senate's Special Committee on Atomic Energy. On December 20, 1945 McMahon introduced a substitute to the May-Johnson bill. General Groves opposed McMahon's bill. It provided for atomic weapons to be under civilian control.

Lengthy debate ensued over various provisions of the new version of the bill with scientists speaking at hearings and General Groves continuing to stress the need to retain military control of nuclear weapons. Many amendments were added that attempted to retain much of the old May-Johnson bill's flavor.

On June 1, 1946, the Senate approved the McMahon bill and the House approved it on July 20, 1946 with a subsequent conference committee eliminating most substantive amendments. President Truman signed the McMahon Act, known officially as the Atomic Energy Act of 1946, on August 1, 1946.

During this time of debate, operations at Oak Ridge, Hanford and Los Alamos continued to evolve. Two different things had to be accomplished at Los Alamos. One was the needed research to improve the Fat Man design and the second was to stockpile materials to support production work at Los Alamos. Hanford and Oak Ridge continued their singular material support roles of providing plutonium from Hanford and uranium from Oak Ridge. The Oak Ridge National Laboratory was being formed during this time.

On September 18, 1945, General Groves spoke to a meeting of division leaders at Los Alamos. Here he announced that President Truman's legislation called for a new federal agency to run the atomic project. Los Alamos was to continue as a weapons-research center. He also announced that Norris E. Bradbury would serve as the interim laboratory director since Oppenheimer was returning to his post at the University of California.

Bradbury's "interim" assignment, stated as intended to be six months or until the position was filled permanently, lengthened into a much longer term. He managed the Los Alamos Laboratory—"Scientific" was added to the name in 1947 making it the Los Alamos Scientific Laboratory and later the name changed to Los Alamos National Laboratory—as director from October 1945 until 1970.

While the transformation of X-10's Graphite Reactor into the Oak Ridge National Laboratory is attributed to the work of a group of individuals, the continuation of Los Alamos is contributed to Norris Bradbury. Senior fellow of Los Alamos National Laboratory, Louis Rosen, in the Winter/Spring 1983 issue of Los Alamos Science, said, "Oppenheimer was the founder of this Laboratory, Bradbury was its savior."

Next week we will continue to explore the transition of uranium work from Los Alamos to Y-12.