Y-12 and uranium history

On September 19, 1942, General Leslie R. Groves, who had just been named to lead the Manhattan Project, made the decision to locate the first plant site of the Manhattan Project in East Tennessee. This momentous and life changing decision for those who have lived here in Oak Ridge and who are here now, was made just two days after General Groves was given the assignment on September 17, 1942.

Groves was actually still a Colonel when he made the decision but had been promised a promotion to Brigadier General upon accepting the Manhattan Project assignment. The promotion did happen six days after he was given the assignment.

The history of uranium at Y-12 began with that decision, which will be commemorated on September 19, 2012, at Jackson Square with historical exhibits, brief history talks, a proclamation, an historic preservation award, a birthday cake and a free movie. Make plans NOW to be there at 3:00 PM – 8:00 PM on Wednesday and enjoy the festivities. The Jackson Square merchants will participate with some special observations as well.

Y-12 is the nation's center of excellence for all things uranium today. It has served that role from the Manhattan Project through the winning of the Cold War. Now, as the nation struggles with terrorist attacks and seeks to ensure the protection of uranium 235 worldwide to prevent it from falling into the wrong hands, Y-12 is engaged in the nation's uranium-related activities.

One example of recent involvement of Y-12 was the effort to replace highly enriched uranium research reactors around the world, for which Y-12 supplies the fuel, with the technology to allow low enriched uranium to be used with the same research capabilities.

A second example deals with the shortage of certain isotopes such as molybdenum 99. Y-12's uranium technological capabilities have been brought to bear as methods are examined for supplying that critical need in the medical field.

A third recent example is the method Y-12 developed for calibrating instruments used to detect uranium 235 with a standard that simulates uranium 235 using a combination of other materials. These technologies are the results of years of successful experimentation with uranium and the many applications Y-12 technicians and engineers have made regarding uranium in all its forms.

The history of uranium in the United States began with the vast quantity of uranium needed for the Manhattan Project. Before 1942, the uranium ore being mined was essentially a by-product that was stored without being used. That would soon change.

In 1938, culminating decades of research, German chemists, Otto Hahn and Fritz Strassman, successfully described a new term, nuclear fission, for their experiment that resulted in the first splitting of the uranium atom.

From this discovery in the laboratory would soon come the world's most elaborate and large scale military and industrial scientific effort, the Manhattan Project. Uranium was one of the most important elements and lots of it would soon be required.

In Stephane Groeff's book, *The Untold story of the Making of the Atomic Bomb,* the following story is told regarding Edgar Sengier. "Sengier was president of the Union Miniere du Haut-Katanga, the world's largest producer of uranium ore. He knew that the United States Government was looking for uranium and contacted Finletter [Thomas K. Finletter, then Assistant to the United States Secretary of State], who in turn alerted Colonel Nichols."

On September 18, 1942, Colonel Nichols went to see Sengier in New York City. Groeff's books states, "After identifying himself, Colonel Nichols said, 'I understand you have some uranium, Mr. Sengier,'

"'Are you a contracting officer?' Sengier asked. '…do you have authority to buy?'

"'Yes, Nichols replied, 'I have more authority, I'm sure, than you have uranium to sell!'

"The Belgian thought for a moment, then demanded abruptly, 'Will the uranium ore be used for military purposes?'…

"'You have that assurance,' Nichols said solemnly.

"'Good, then let's make a deal, Colonel! My company, the Union Miniere, has twelve hundred tons of uranium ore stored on Staten Island.'

"Nichols could hardly believe his ears. While they had been searching desperately for uranium all over the world, the precious ore had been lying unused in New York, right on their doorstep! Nichols was not only delighted but extremely puzzled. 'Tell me, Mr. Sengier, how does this ore happen to be in the United States?'

"'Very simple, really. In 1939 some European scientists informed me of uranium's potential military value. A year later, when Belgium fell, I had the twelve hundred tons of ore shipped to this country for safekeeping. It has been stored in steel drums in the Staten Island warehouse since 1940.'

Of course, to have the uranium ore was a good start for Colonel Nichols, but to have purified uranium metal of the type needed was another thing entirely. That is where Y-12 came into the picture. With Groves' decision to locate the first plant site of the Manhattan Project in East Tennessee, Y-12 and the need for separating uranium 235 was the primary reason for that decision.

General Groves said in his book, *Now it can be told,* "The electromagnetic plant (Y-12 to give its codename) was built in a restricted area of about 825 acres in the central-south-eastern part of the reservation, approximately five miles from the commercial district of Oak Ridge, which was the town site of the overall development. From the standpoint of employment, this plant was the largest in the Clinton works. It was the first on which construction was started (February, 1943) and the first to go into operation (the first units were ready in November, 1943). Indeed, for almost a year it was the only plant that was operating, and until December 31, 1946, the only plant that was turning out the final product – that is, the fully enriched uranium needed for an atomic bomb." This was only the beginning.

Today, Y-12 disassembles nuclear weapons components, manufactures uranium components for nuclear weapons, cases, and nuclear components comprising canned subassemblies; performs quality evaluation and surveillance activities on subassemblies and components; stores and maintains quantities of special nuclear materials; conducts component dismantlement, storage, and disposition of their nuclear materials; assists in the nonproliferation of nuclear materials worldwide; and supplies highly enriched uranium for use in naval reactors.

Y-12 continues to serve the nation and the world as a center of excellence for uranium in all its various uses.