

## **Union Carbide's Last 20 Years in Oak Ridge – part 2**

As we continue with Bill Wilcox's personal review of the last 20 years of Union Carbide's tenure in Oak Ridge, Bill now takes us from the general overview to some of the specific milestones of accomplishment or significant events from 1964 until 1984.

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Here now are a few of the many programmatic highlights of Carbide's last 20 years as they might have appeared on the agenda of Roger Hibbs' top management staff meetings. They proved to be a kaleidoscope of ever changing and ever challenging scientific, technology and management problems, of budget dollar increases and decreases, and of the needs to shift managers to meet new challenges.

**1964.** K-25's Technical Division had a steadily growing team of technical specialists to work on a uranium enrichment idea that if successful could make the gaseous diffusion process obsolete! By 1964, using their know-how in cascade theory and practice they had already proved the feasibility of using a cascade of centrifuges. This program was to grow and be a hot topic over the next 15 years, ending up with a machine that was commercially viable.

**1961.** The first numerically controlled milling machine was successfully operated in Y-12's A-2 Wing of 9212. It was an Excello template grinder controlled by a Bendix vacuum-tube punched-tape system. It is the beginning of a new era in milling machine development. With the advent of Lawrence Livermore Lab as a nuclear weapons design Lab, much more sophisticated weapon parts are being called for to meet state of the art specs. Numerically controlled machines and carefully made templates are now a top Y-12 priority to meet the Weapons Lab's tightening specs.

**1961.** The Atomic Energy Commission's Oak Ridge Operations office authorized Oak Ridge National Laboratory to build the Health Physics Research Reactor to provide health physicists with vitally needed information needed to design dosimeters, simulate human body exposures, develop radiation alarms, and set radiation exposure limits. It began operation in 1963 and was in effective use until finally shut down in 1987. (Rosenthal).

**1962.** A chemical explosion at the Paducah Gaseous Diffusion Plant resulted in a fire with damages estimated at \$2 million.

**1963.** The Graphite Reactor at ORNL was shut down after 20 years of major contributions. During World War II it succeeded in its wartime mission of supplying gram quantities of plutonium for development of production-scale methods for separating it from U and the fission products at Hanford. Its postwar production of radioisotopes for nuclear medicine and countless applications in industry, and its many advances in nuclear science brought it the Department of Interior's National Historic Landmark award in 1966, and Landmark Awards by the American Nuclear Society and American Chemical Society.

**1964.** President Johnson in his State of Union address announces there would be major cutbacks in both enriched U-235 at K-25 and in plutonium production at Hanford. AEC's Oak Ridge Operations Office followed through with orders to Carbide to stop operations of the World War II K-25 "U" building. It would avoid the spending of millions of dollars in power costs and the loss of a number of jobs.

**1965.** This was the year the High-Flux Isotope reactor went critical at ORNL, suited to the production of californium and other very heavy elements. It was to operate successfully for 20 years when it was shut down for reviews, upgraded and is still operating today – now ORNL's only reactor.

**1967.** A massive Y-12 capital improvement program called “68-2A” was being planned as a separate line item for the 1968 Congressional Budget. Its purpose was to expand the Y-12 weapons components production facilities for producing the nuclear weapon “secondaries” and other components needed for seven new weapons systems including the Spartan and the Polaris (submarine) warheads. The program cost for the five ensuing years was estimated at \$168 million.

**1968.** This was the year that NASA called upon Y-12’s very advanced machining capability to design and fabricate the very special “Moon Boxes” for taking to the moon and bringing back rocks without contaminating either the moon or the earth with each other’s atmospheres.

**1969.** AEC Headquarters in Washington and ORO announced the start of the “Toll Enrichment” program using its K-25, Portsmouth, and Paducah facilities. K-25 helped design the program which would provide low enrichment (3-5%) uranium hexafluoride for civilian power reactors all over the world. The program was to be a matter of continued interest to Carbide management for the next 15 years, bringing in to the U.S. Treasury hundreds of millions of dollars before foreigners began building their own enriching plants in the latter 1970s, shrinking our market share.

**1970.** The last of the \$400 million (14,700 tons) of silver borrowed from the U. S. Treasury for use in making the 1,152 Calutron magnet coils because of a shortage of copper during the war was returned. A few of the magnet coils had been held for the last few years by the ORNL Thermonuclear Division for possible use, but they were finally released, cut up and sent back. Building 9731 XAX Alpha calutrons held the last 67 tons of the silver and were used to separate stable isotopes until 1974.

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Thanks, Bill. Look for more of the milestones next week.