

Y-12's favorite stories, part 2

We continue to look at some favorite Y-12 stories taken from *An Overview of the History of Y-12, 1942–1992: A Chronology of Some Noteworthy Events and Memoirs*, by William J. Wilcox, Jr., published by Bill in August 2001. These are “common tales” told about incidents and events in Y-12's history.

This story was told by John Googin.

The 9202 extension (for capacity expansion) had been designed around the old Bulk Treatment process with iron hydroxide and ammonium cake collected in large basket centrifuges and peroxide on the rotary vacuum filters before discharge into the vacuum dryers and then the calciners. The precipitation vessels were 750 gallons rather than the previous 250 gallons; the settling tanks were several thousand gallons.

The 9202 extension was eventually operated on slightly enriched uranium, 0.8% and 0.9% uranium-235, from the thermal diffusion plant at S-50 (located at the K-25 powerhouse) and the diffusion plant at K-25 beginning in the late summer of 1944. S-50 was shut down as soon as K-25 got to these assays (September 1945).

By early fall, the 9202 extension was running and the process was being revised to the direct and then the cold peroxide precipitation to increase the capacity of the plant. There were interesting problems because the nature of the agitation in the 750-gallon tanks was different than in the 250-gallon tanks, so the process that scaled up well from the beakers to the 250-gallon size did not scale as well to the 750-gallon vessels.

There are hazards with peroxide processes other than the delicate nature of the crystallization process of the uranium precipitate. One pleasant day in the spring of 1945, the author (John Googin) was standing in line at the cafeteria, which now houses the technical library, for a chance at a noon meal. He along with Ted Sprague and Tom Strickland had come down from the new laboratory in the partially finished 9207. The line waiting to get into the cafeteria extended down the road as it always did near noon.

During the morning of this day, there had been an accident in the 9202 extension. The hydrogen peroxide head tank to one of the reactors had blown its vent, apparently because incorrect valve operation on the manifold that fed the peroxide to the vessel had backed some of the feed solution into the concentrated peroxide in the head tank and caused its rapid decomposition. Some of the peroxide had been moved to a large storage tank that was supposed to be clean but was not.

While standing in line, a loud whistle was heard and his head turned just in time to hear a bang and see some of the concrete roof sections of the 9202 extension lift off and settle down in the yard below. The storage tank had blown its top.

Fortunately no one was hurt, but the author spent a lot of time in the new laboratory in 9207 determining the kinetics of the decomposition reactions of hydrogen peroxide contaminated with feed solutions. His report for that week contained descriptions of a number of experiments that ended with the words “the apparatus exploded.”

During the 1944 and 1945 period, there were security people that came around to ask what you knew about the project and how well it was going. Since the object had been obvious (to John) from the first day of work and his work involved the basic feed to the facility, much added information could be derived.

These folks always seemed to be amazed that a lowly junior chemist was current with the production and efficiency of the facility with no access to the official output data. This happens when one is in control of the plant feed (quantities) and you can guess at the losses.

John Googin was the “Scientist of Y-12” and as such was involved directly in every single production process developed during his time working at Y-12. He was born in Lewiston, Maine, on May 2, 1922, and earned his bachelor’s degree in chemistry in March 1944 from Bates College in his hometown. In May 1944, he came to work in Oak Ridge at Y-12, having been placed in 4F category for the military and thus accepted by Tennessee Eastman Co. as a junior chemist.

While working at Y-12 as a chemist, Googin completed his graduate work at the University of Tennessee and went on to obtain a doctorate degree in physical chemistry in 1953. Googin’s career at Y-12 spanned 49 years and eight months and was spent providing technical assistance and guidance on all major Y-12 production processes, as well as many of those at K-25.

He was awarded an honorary Doctor of Science degree by Bates College in 1968, and was made a Fellow of the American Society for Metals in 1974. He was made a Research Fellow of Union Carbide Corporation in 1976, received the Industrial Research Magazine’s IR-100 award several times, and was awarded McGraw-Hill’s Chemical Engineering Magazine’s Award for Outstanding Personal Achievement in Chemical Engineering in 1982.

Googin was made a Corporate Fellow of Martin Marietta Energy Systems Inc., in 1984, and a Senior Corporate Fellow in 1987. He was given the 1987 William J. Kroll Zirconium Medal of the W. J. Kroll Institute for Extractive Metallurgy in 1988 and also made a member of the National Academy of Engineering in 1988.

He was given the American Society of Materials International Gold Medal for life-long contributions to the field of materials technology in 1989.

Googin’s long career at Y-12 saw him engaged in everything from the chemistry associated with the electromagnetic separation of uranium-235 using calutrons, to zirconium and hafnium separation, to lithium-6 separation, to various other chemical processes throughout Y-12 and over all programs including many at other sites such as K-25.

The library in the Y-12 History Center is named in John Googin’s honor.

Next we will look at more of the favorite Y-12 stories collected by Bill Wilcox in his brief history of Y-12.