

## **Y-12's environment, safety and health history**

The environmental sensitivity, safety culture and proactive health emphasis present at the Y-12 National Security Complex today has evolved over time. It can be seen in the requirements placed on the supervision, the workers, and the organizations as this evolution took place. The funding devoted to these areas has also evolved. The key element has been the responsiveness of all the people who work at Y-12!

Over the years Y-12 has been managed by a number of contractors, ranging from the Tennessee Eastman Company (January 1943 – May 1947); to the Carbide and Carbon Chemicals Company that became the Union Carbide Nuclear Division (May 1947 – March 1984); to Martin Marietta Energy Systems, which became Lockheed Martin Energy Systems (April 1984 – October 2000); to BWXT Y-12, which became B&W Y-12 (November 2000 – June 2014); to Consolidated Nuclear Security (July 2014 –). Each of these contractors has added to the composite history of the environment, safety and health culture that now exists at Y-12.

In the early years of Tennessee Eastman Company's management, there was a strong emphasis on the line supervisor as the person responsible for the safety of operations. There was not a formal environmental focus at that time. The situation whereby the workers were not informed of what they were working on contributed to increased supervisory responsibility and kept the workers from being knowledgeable enough of the processes to determine safe actions. So, significant emphasis was placed on the workers to do ONLY what they were instructed how to do and to do their work in very specific ways.

This approach has changed drastically over the years with the ability to place more and more technical and detailed analysis information at the workers' hands so they can more fully understand and appreciate the need for safe handling of the materials needed to do their work. A look back at our history confirms that has not always been the case.

During the history of Y-12 there have been 24 fatalities. Seventeen of them were in the 1940s during the Manhattan Project and were the result of the construction of the site. There have been other serious accidents at Y-12 over the years, and each of them has brought resulting improvements in safety, as each has been thoroughly investigated and its lessons learned used to avoid future such incidents.

One of the key aims of all safety efforts is to avoid or prevent accidents, the rule being an accident that does not happen because of preventive actions cannot cause serious injury or death. It is the aim of Y-12 to drive accidents to zero and safety to the top of all considerations.

When the Tennessee Eastman Company was chosen, in January 1943, by General Leslie R. Groves to manage the Y-12 electromagnetic separation plant, it was because they had proven experience in managing complex systems and had a reputation for having strong and powerful leadership. Safety was a part of that strong leadership.

In June 1942, Tennessee Eastman Company was first chosen to manufacture the powerful explosive "RDX," cyclotrimethylenetrinitramine, an explosive more powerful than dynamite or TNT. The result was the Holston Ordnance Works at Kingsport, TN, along the Holston River. Again, safety was a major consideration in this hazardous work.

One of the unique managerial tools used by Fred Conklin, Works Manager for Y-12, was the Kodak Period reporting system. The year was broken into 13 equal periods, and detailed reports were prepared by each operational unit and rolled up to Conklin. These reports gave insight into what was actually happening on the working floor. Accidents were always reported, and safety was emphasized as being among both management's and workers' most important duties.

A significant accident occurred at Y-12 on May 14, 1956, when zirconium powder exploded and two men died. A third man was severely injured, having his arm blown 85 feet from the blast. This incident first came to my attention when the supervisor of the two fatalities was himself near death and asked his son, my friend, to write the details of the accident to help warn others of the danger from the buried zirconium.

Another accident, and likely the most significant incident in Y-12's history, was the June 16, 1958, nuclear criticality accident in Building 9212, C-1 wing. Eight individuals were exposed to radiation. They quickly evacuated the area, limiting their exposure.

However, they were hospitalized for 44 days and struggled with radiation-related health issues for several months. There were no fatalities, and all eight people returned to work.

There was extensive review and many revisions to operating practices as a result of this accident. Within a year of the 1958 Y-12 event, there were criticality accidents at Los Alamos and Idaho nuclear facilities. Improvements in nuclear criticality safety resulted in all cases.

Next we will look at a more recent history of Y-12's environment, safety and health.