

Y-12 finishes the 1980s in award winning fashion

The 1980s was a time of extremely heavy workload for Y-12. The Strategic Defense Initiative required a huge amount of nuclear weapons components for both nuclear tests as well as the ever increasing number of nuclear warheads being added to the nation's arsenal of active weapons. The Cold War was being won, but that was not apparent until very late in the decade.

At Y-12, the mission was clear. The nation was depending on us. The mutually assured destruction or MAD doctrine, as it was known in military circles, called on Y-12 to produce components at the highest rate of production that had ever been seen at Y-12.

Buildings that were Manhattan Project-era structures were retrofitted with ultramodern machine tools, and computers were placed on machines that had formerly been numerically controlled machines using magnetic tape to program the machine tools. Y-12's reputation for precision machining and inspection had resulted in additional work being brought to the site.

Many of these new jobs were unusually difficult machining operations. The moon box of the late 1960s and early 1970s required long cutting sequences to remove the inside materials to make a seamless box from a block of aluminum. Work coming to Y-12 in the 1980s required precision and details unheard of only a few years before.

In 1986, Y-12 won a special award for having the best computer-integrated manufacturing program in the nation. The award is described on the Manufacturing Engineering website as: "Every year the Computer and Automated Systems Association of SME (CASA/SME) presents its Leadership and Excellence in the Application and Development of Integrated Manufacturing (LEAD) award to one industrial firm and one academic organization. Winners must demonstrate that they have achieved an outstanding success in innovative, leading-edge integrated manufacturing."

Gordon Fee was the Y-12 plant manager from 1982 until 1990, and recently found the award banquet ceremony brochure for this event held November 11, 1986. He brought the brochure to me, and we have it in the Y-12 History Center. We are now trying to locate the actual LEAD award to create a display exhibit of the historic award.

Other members of the team accepting the LEAD Award in addition to Gordon Fee were Mike Cuddy, Tommy Douglass, Vernon Gordon, George Jasny, Fred Jones, Ron Miskell, Sam Murphy and Colman Wright. Colman Wright, the manager of Computer-Aided Design and Engineering at the time, recently brought me a tri-fold pamphlet Y-12 Computer-Integrated Manufacturing (CIM) Program.

In May, 1987, *Tooling & Production* magazine published a five-page article titled *CIM yields big gains at Oak Ridge plant*. The article begins, "Since formal start-up two years ago, a large-scale, multifaceted, computer-integrated manufacturing (CIM) program at Martin Marietta Energy Systems, Inc.'s, Y-12 plant has yielded a 50-percent reduction in the time needed for production of certain parts, and a productivity gain of more than 250 percent in design of parts and tooling."

The article went on to say, "Application of CIM technologies also has reduced work-in-process on one major material stream by 40 percent, increased yields from materials production by 25 percent, and slashed design time for press tooling by 80 percent." All of this was highlighted in seminars held in Oak Ridge during May and June of 1987 by Mike Cuddy, Y-12 CIM program manager.

The five-page article continued to describe in detail the advances in manufacturing being made at Y-12 to include flexible manufacturing cells, local area networks, Computer Aided Design, Computer Aided Engineering, and Computer Aided Manufacturing. The article concludes with, "The gains realized thus far from Y-12's CIM program are certainly award-worthy, but Martin Marietta has set long-range goals that could produce even more spectacular results."

Y-12 has maintained the cutting-edge lead in manufacturing technology and even today has a Gantry Mill that is pushing the state-of-the-art in machining speed and depth of cut beyond anything seen before. When it comes to precision machining, Y-12 remains second to no one!

In 1988, the Navy requested help to machine the propulsor for the Seawolf submarine. It was called a "propulsor" rather than a propeller. Y-12 agreed to cut the contours required by the Navy.

A special very large machine tool was purchased and a building constructed around it, just for this project. At first Y-12 was asked to make a ¼ scale prototype of the propulsor. After that was completed, there was still no private industry that could take on the enormous task of machining the full scale unit. Y-12 was asked to do the work.

Also on March 23, 1983, President Reagan announced the Strategic Defense Initiative and Y-12 found itself in the middle of some exotic work involving ceramics and other materials not normally machined or used in manufacturing at Y-12 in the past. Building 9201-5 was a hub of this activity and served to support what was popularly known as "Star Wars." Alpha 5 was already one of the main bases of activity for much of the nuclear weapons work of the 1980s so adding Star Wars work up on the third floor was easy enough to do.

In 1987, the Soviet Union claimed to have a program similar to the United States' SDI. We were in the last round of the Cold War. The Soviet Union was hanging on by a thread, but we did not realize that just yet. They were still attempting to match every move we made with one of their own.

The fall of the Berlin Wall in November, 1989, signaled the coming end of the Cold War that occurred with the collapse of the Soviet Union between March 11, 1990 and December 25, 1991. This collapse of the Soviet Union formally ended the Cold War leaving the United States as the dominant military power. Russia took possession of all the Soviet Union's nuclear weapons.

Soon after the end of the Cold War, the United States increased the emphasis on the important but long and difficult work of nuclear nonproliferation by accepting the responsibility to secure nuclear materials that might be subject to misuse or were not adequately protected. The Project Sapphire venture into Kazakhstan was the first of many such actions to secure inadequately protected nuclear materials.

Y-12 personnel were heavily involved in that project along with Oak Ridge National Laboratory personnel. The weapons grade uranium located in the Ulba Metallurgical Plant was repackaged, transported to the airport nearby Ust-Kamenogorsk, the once "Secret City," and loaded on C-5 airplanes for the trip to the United States.

Other such nonproliferation actions have been taken over the years with the latest one to be made public known as "Golden Llama" where nuclear materials were removed from Chile. This removal actually occurred during the earthquake that closed the port intended to be used by the extraction team.

Some records indicate nuclear materials have been removed from 18 countries since 1994's Project Sapphire, according to Andrew Bieniawski, the leader of the Chile removal. Y-12 continues to play a role in support of the Oak Ridge National Laboratory's lead in many of these projects.