Y-12

OAK RIDGE Y-12 PLANT

LOCKHEED MARTIN

Project Accomplishment Summary for 91-Y12P-050-A1

MANUFACTURING TECHNOLOGY EDUCATION DEVELOPMENT PROJECT

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September 25, 1996

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U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

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PROJECT ACCOMPLISHMENT SUMMARY

Title: Manufacturing Technology Education Development Project
DOE TTI Number: 91-Y12P-050-A1
Partner: Tennessee Department of Education

BACKGROUND

This project began with a need perceived by both principals that the primary workforce available to the Oak Ridge facilities needed additional and improved preparation at the high school level. This need was particularly evident in the sciences and mathematics relevant to careers in manufacturing. Most laboratories lacked good examples of modern computer controlled manufacturing technologies. Furthermore, the level of awareness of manufacturing technologies among high school teachers needed to be raised. The project provided the mechanism to couple the manufacturing expertise of the Oak Ridge Y-12 Plant with the educational structure available through the Tennessee Department of Education. Thus, the project used Y-12's knowledge to construct and test the mobile laboratory and the knowledge of the educators to administer its use.

DESCRIPTION

The purpose of the project was to provide a set of supplemental instructional equipment and materials to Tennessee high school students to raise their level of knowledge about manufacturing technologies with the hope that some of the "best and brightest" would choose manufacturing as a career path. The role of the Y-12 Plant was primarily technical: renovate the portable classroom; select and purchase appropriate equipment; install and test the equipment; assist in the development of the curriculum; train the initial group of teachers; and provide technical assistance where needed after the laboratory was deployed. The role of the Department of Education was to provide the mobile facility; assist in the design of the laboratory; lead the development of the curriculum; deploy the trailer; and develop the structure for administering the selection of schools, training teachers, and movement of the laboratory. The Department of Education as subcontracted with Middle Tennessee State University to handle the details of laboratory deployment.

In January, 1997 the laboratory will have been in use by Tennessee schools for three years. Five schools per year utilize the laboratory for about five weeks each. An average of about 1000 students per school gain considerable use of the laboratory. Many schools invite other schools in their area to tour the laboratory. A number of schools have subsequently purchased permanent laboratory equipment similar to that found in the mobile lab. For the 96-97 academic year a desktop videoconferencing system was added to the lab for communication with other schools, the Y-12 Plant, and Middle Tennessee State University. The Department of Education is having ISDN telephone lines installed at each of the schools to enable the use of this equipment.

Comments from the participating schools have been unanimously positive and appreciative. Each school holds a local public relations event for their community and the press to visit the laboratory. Several students have gained summer employment by virtue of their experience in the laboratory.

BENEFITS TO DOE

This project improved the educational infrastructure of the Tennessee public schools. Direct benefits to the Department of Energy resulted from developing the training tools used in implementing the mobile laboratory facility, these tools included basic machines and how to maintain them. These training tools were kept current and have been used to upgrade internal programs for training of DP workers in basic manufacturing skills. Other indirect benefits are

realized by both the Department of Energy facilities and industry. Improved students from Tennessee schools will be hired by DOE facilities and the contribution to the level of competence of the students will be significant. Literally thousands of students have designed and manufactured parts, programmed robots and programmable logic controllers, and learned about various sensing devices.

ECONOMIC IMPACT

The impact of the use of the mobile lab on the school systems was immediate. As previously mentioned a number of schools have already invested their own resources in technology learned in the mobile lab. The teachers involved have already increased their knowledge about manufacturing. Some of the students have already entered the workforce. Since the single, most frequently mentioned barrier to increased sales/profitability/growth by Tennessee manufacturers is "workforce skills", the mobile lab will certainly have an effect.

PROJECT STATUS

This project was originally closed at the end of FY94. Unused Technology Transfer Initiative funds (\$54K) were redirected to this project to permit continued support of the mobile laboratory by Lockheed Martin Energy Systems personnel. The project will again be closed at the end of FY96.

COMPANY SIZE

The Tennessee public school system includes 120 high schools with 210,541 students in grades 9-12. Although the mobile lab visits only five schools per year, it affects the education of roughly 5000 students per year.

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PROJECT EXAMPLES

An Internet webpage was created to describe the mobile laboratory for prospective schools. The URL is "<http://www.ornl.gov/orcmt/deploy/moblearn.html>". Numerous examples of plastic machined parts are available. Finally, a videoconference with the laboratory can be arranged for a live conversation with teachers and students.

TECHNOLOGY COMMERCIALIZATION

Telephone calls from many school systems throughout the US have been received at the Oak Ridge Y-12 Plant, the Department of Education, and at Middle Tennessee State University regarding the project. Several states have similar mobile laboratories although most operate as short term demonstrations (a few days visit to a given site) rather than a hands-on laboratory which develops real skills during the period of participation. The project did not include a commercialization plan.

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