NASA Project Leads to Portable Alloy Analysis Technology

Richard Booth, left, Marshall Engineering Directorate, and Wanda Hudson, ATK Thiokol, use the scanner to analyze materials in an F-1 engine, which was used to boost the Saturn V rocket from earth's orbit and carry astronauts to the moon (NASA/CXC).

Collaboration between engineers at NASA's Marshall Space Flight Center and KeyMaster Technologies, Kennewick, Wash., has resulted in development of a 4-lb, handheld vacuum X-ray fluorescent analyzer that performs on-the-spot chemical analyses of alloys in materials such as welding electrodes — a task previously possible only in a chemical laboratory.

The analyzer can identify and characterize a wide range of elements, including those with low atomic numbers such as sodium, aluminum, and silicon. Aluminum alloy verification is of particular interest to NASA because large amounts of high-strength aluminum are used in the space shuttle propulsion system. Silicon can be detrimental to welding operations, but now can be identified and removed before welding begins.

The product has potential for use in industries that depend heavily on materials analysis such as the automotive and pharmaceutical industries. Materials can be scanned as they come in the door and faulty products rejected. In addition, corrosion can be detected through paint.

F-35 Production Facilities Near Completion at Lockheed Martin

An array of advanced and highly accurate manufacturing machines that will produce major subassemblies for the F-35 Joint Strike Fighter are in the final stages of assembly and testing at Lockheed Martin in Ft. Worth, Tex.

Final assembly for the F-35, a stealthy, supersonic, multirole fighter, will take place at the plant. Production of the center fuselage began May 18 at Northrop Grumman in Palmdale, Calif. Lockheed Martin will start production of the forward fuselage and wings at Ft. Worth later this summer, and BAE Systems will begin the aft fuselage and tails at Samlesbury, England, shortly after. The three major subassemblies will be joined at Ft. Worth beginning next year and the first flight is planned for 2006.

The Laser Ultrasonic Technology (Laser UT) machine, a laser-based system designed to detect imperfections that would cause a part to be rejected, will handle inspection of the aircraft's carbon-fiber wing skins and other composite components. Laser UT inspects parts at a rate ten times faster than current water-coupled ultrasonic inspection machines.

Other production equipment includes a flexible overhead gantry that will mill the inside surface of the composite skin to ensure the aircraft's outer form is exact, ensuring proper stealth performance. The machine is accurate to within 50 microns. The forward-fuselage and wing autodrill cells will be able to operate around the clock to help meet the ultimate production goal of one aircraft per day. The factory also includes a precision milling machine with an equipment enclosure that is temperature controlled to ±1°F. Temperature stability helps ensure precision in the manufacturing process.

An automated guided vehicle prepares to load an F-35 wing-tooling fixture on the Lockheed Martin factory floor. An operator is shown monitoring the work but the vehicle ultimately will be fully automatic, moving parts from one workstation to the next. Among the new production machines and tools being installed in the factory is a Laser UT machine.

Zetec Acquires R/D Tech's Power Generation Business

Zetec Inc., Issaquah, Wash., recently acquired the Power Generation Business of R/D Tech Inc., Quebec, Canada. The acquired assets are located primarily in facilities in Quebec, Charlotte, N.C., and Deep River, Ont., Canada.

Assets include the rights to current and planned products developed by the Power Generation Business and transfer of approximately 100 employees. Zetec will support, develop, and promote under its brand the former R/D Tech product line that includes equipment employing eddy current, remote field, magnetic flux leakage, and ultrasound technologies. Whenever feasible, the products will be integrated with Zetec products and services.

SBA Honors Aircraft Maintenance and NDE Company

Epps Air Service, Atlanta, Ga., was one of four Lockheed Martin subcontractors to receive the SBA Administrator's Award of Excellence during Small Business Week, May 17–21.

The company, which has been in business 38 years and employs approximately 180 people, supplies S-3 Viking and P-3 Orion aircraft maintenance and nondestructive examination services. The company's technicians and mechanics earned the highest award from the Federal Aviation Administration in the Aviation Maintenance Training Award programs and their work received the highest obtainable rating from the American Society of Nondestructive Testing.

The other Lockheed Martin subcontractors that were recognized were Summa Technology, Jennings Engineering, and Interconnect Wiring.