A Blast From the Past

Dave Eggleston is the Electronics Inc. Quality Control Engineer. He has tremendous experience in the blast cleaning industry including his involvement in the hull cleaning system for Trident-class submarines.

Dave was the product manager for Wheelabrator Frye in the early 1980’s when the United States Navy contracted for the design and fabrication of a system to remove paint, rust, scale and marine growth from the hull of Trident-class submarines.

The Materials Cleaning Systems Division of Wheelabrator-Frye, Inc. was the prime contractor and supplied the blast head and dust collector. Barnes & Reinecke, Inc., as the first-tier subcontractor, designed the chassis, boom and cab, together with hydraulic and electrical installations, and assembled the two vehicles which comprised the system in their facilities at Elk Grove, Illinois. A 47-foot test tower, simulating sections of the submarine hull, was erected for use in U.S. Navy acceptance testing and for operator training.

The conventional method of cleaning a ship’s hull was sandblasting. Crews of workers direct sandblasting nozzles at the hull to knock the rust, old paint, barnacles, etc. off it. But sandblasting caused problems, according to project personnel from Wheelabrator-Frye Inc. and their subcontractor, Barnes & Reinecke, Inc. The process created a clean-up problem on the dry dock floor and contaminated the air. Also, both OSHA and the environmental laws limited its applicability.

Nonetheless, the Navy felt it must clean the hulls of Trident submarines regularly.

The design engineers at Wheelabrator-Frye and Barnes & Reinecke created an automated, closed cycle, self-propelled shot-blasting system for cleaning the hulls of Trident submarines. The hull cleaner’s shot-blasting head was mounted on a multi-element boom. Steel shot was hurled out of the head at 18,000 ft/min by a centrifugal blast wheel rotating at 3600 rpm.

A 40-hp, electric motor powered the wheel. Magnets surrounded the rectangular opening through which the shot passes. Steel shot collected on the magnets, forming a seal that prevented loss of shot during the hull-cleaning operation. After striking the submarine, shot rebounded into the head, along with debris blasted off the hull. A vacuum was maintained inside the head's rebound chamber and pulled off the powdered debris; the heavy shot was recycled.

When asked about his involvement with the project, Dave said, “Working on the Trident was an unbelievable experience because of the size of submarine which was 700 ft. long and 42 ft. in diameter. That length is three football fields!”

The hull cleaner in action as it strips the coated hull surface to “near white” blast condition at the rate of 900 sq. ft. per hour, performing a task which formerly required the efforts of a dozen workers.