Case Studies & News from E.H. Wachs

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APPLICATION REPORT

LDSF Large Diameter Split Frame Steam Generator Replacement Onsite Machining

Volume 3 ▸ Issue 2

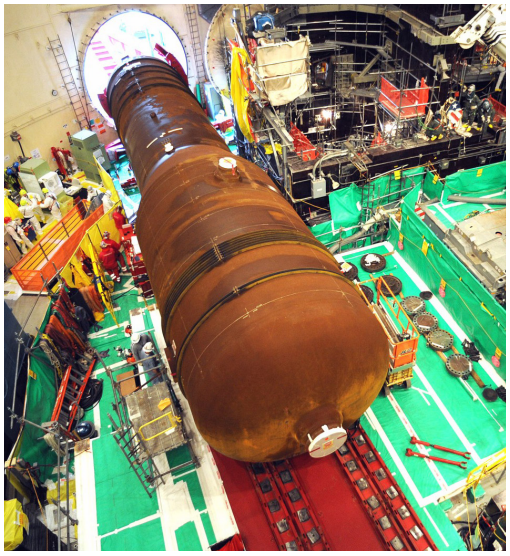

Figure 1 - Typical Steam Generator Replacement

The Project

Westinghouse, one of the world's premier service companies specializing in nuclear power plant maintenance, was awarded a contract for steam generator replacement (SGR) (Figure 1) at a Candu nuclear facility in Argentina. The scope of this project included reuse of the steam drums from the existing steam generators (SG). The existing drums required in situ sectioning from the old SG assembly, then precision machining of the welding surfaces of both the drums and the new steam generators to ensure perfect fit up.

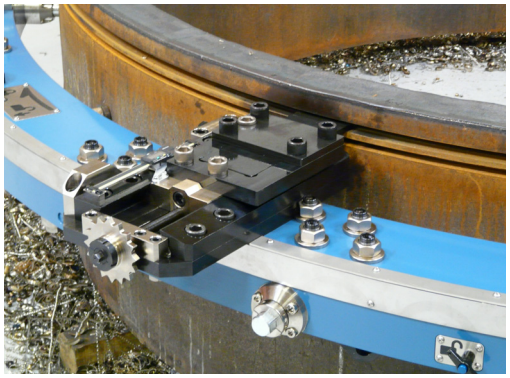

Figure 2 - SG Heavy Wall 2.75" (70mm) Parting Detail

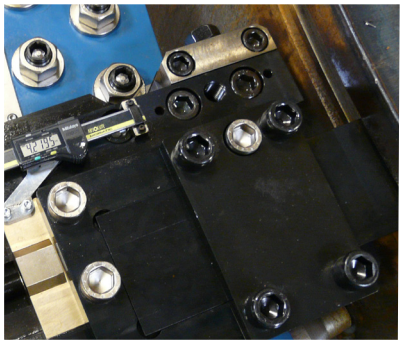

Figure 3 - LDSF Custom Radial Index Feed Tool Slide

The Challenge

Designed to convert water into steam from the heat produced by a nuclear reactor, the steam generators in the Argentine project were 108" (2743mm) nominal outside diameter at the machining point potentially up to 2" (51mm) out of round. The new SGs were fabricated with 2.75" (70mm) heavy wall high alloy steel, with the existing steam drums and the new SGs requiring precision parting (cutting) (Figure 2), compound beveling and deep counterboring to a depth of 12" (305mm).

The Solution

E.H. Wachs the ideal machining equipment technology partner for the project, utilized their newest and largest split frame, the LDSF Large Diameter Split Frame. Serving as the machining platform for this large circumference SG, the LDSF features all steel construction for rigidity with a quadrant frames design for ease of transport and installation.

For the heavy wall parting operation, radial index feed slide assemblies with digital feed indicators (Figure 3) replaced the LDSF's standard OD tracking slides. Custom axial autofeed single point tool slides with a cam feed trip mechanism and digital feed indicators (Figure 4) capable of multiple weld profile configurations were employed for bevel and counterboring operations.

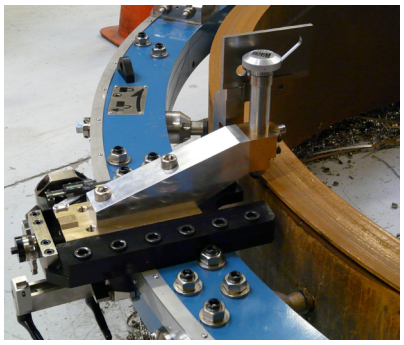

Figure 4 -LDSF Custom Axial Autofeed Single Point Tool Slide

The Technology

The project presented multiple challenges - precise, heavy wall parting and beveling in a compact operating envelope on a large diameter vessel that was potentially out of round by a couple of inches (up to 51mm). In addition, the deep counterbore offered minimal clearance between the outer SG wall and the inner tube shielding, solved with our counterbore module's slim design (Figure 5).

In a nuclear plant outage, where downtime is measured in thousands or hundreds of thousands of dollars a day, failure or delay is not an option. Choosing E.H. Wachs, an experienced technology partner, can be an important first step toward a successful outcome. Like the high tech solution developed for this demanding application, every Wachs machine is engineered for ease of transport, ease of installation, and built in, legendary reliability.

Figure 5 -LDSF Custom Deep Counterbore Module

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Executive Summary

As part of a steam generator replacement (SGR) project at a nuclear power plant in Argentina, the contractor partnered with E.H. Wachs for the equipment needed for precision parting, beveling and counterboring on the existing and new heavy wall steam generators. The project required removal and installation of the existing steam drums onto the new steam generator fabrications prior to connection.

LDSF Split Frame for SG Replacement

Today E.H. Wachs has one of the world's largest lines of weld preparation machine tools. They're designed for cutting, beveling and counterboring pipe, tube and vessels from .5" to 120" (12.7-3048mm) with larger sizes available by special order.

If your existing machine tool supplier doesn't have the equipment and experience necessary for safe and successful in situ machining in the nuclear power industry, look to E.H. Wachs. Our proven track record dates back over 60 years to our pioneering machining work on the reactor of the USS Nautilus, the first nuclear submarine. Contact your E.H. Wachs representative today for additional information.

E.H. Wachs Sales, Service and Rental Centers

The best machine tools in the world are no help if they're not available at the right time and place. Stocked with the entire range of E.H. Wachs and Orbitalum machine tools and accessories, Sales, Service, & Rental Centers are located in:

- Illinois
- California
- New Jersey
- Louisiana
- Texas
- Toronto, Canada
- Edmonton, Canada
- United Kingdom
- Germany
- India
- Singapore
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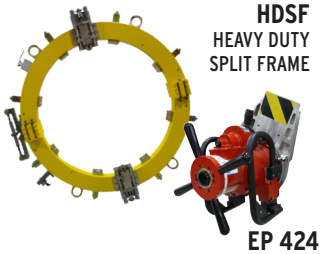
Wachs and Orbitalum products are also available worldwide through our international dealer network.

Contact E.H. Wachs

For additional information visit us at ehwachs.com, email us at info@ehwachs.com, or call us at +1.847.537.8800 (1.800.323.8185 in the US & Canada). Ask for a no cost, no obligation quotation or demonstration of our Superior Equipment. Complete Support.™

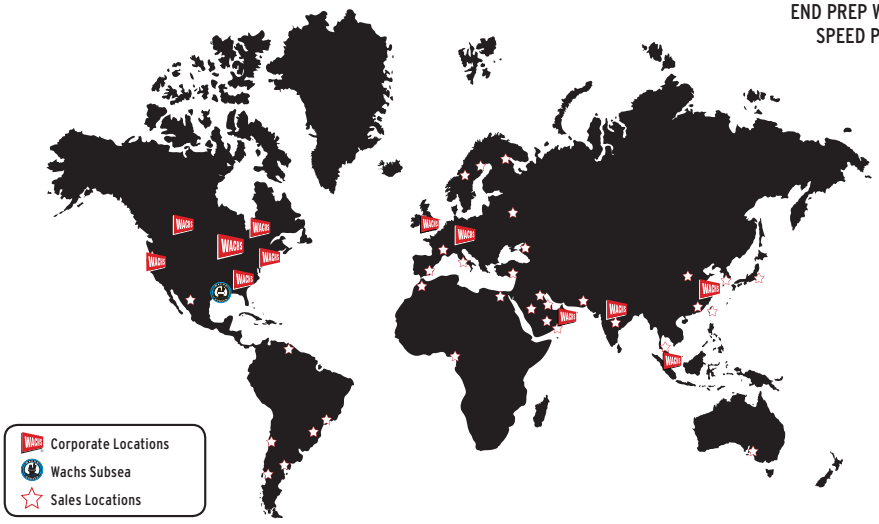
E.H. Wachs® Industrial Division

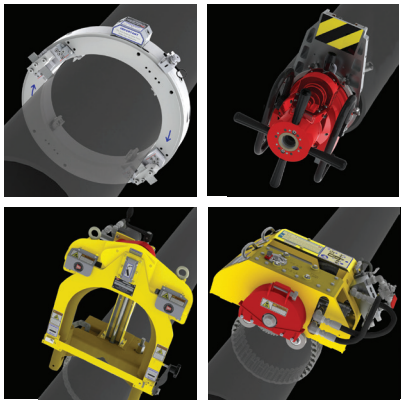
- Industrial Pipe Cutting and Beveling Machine Tools
- Portable Weld Prep Machines & Tooling, Sales and Rentals
- Split Frames, Guillotine® Pipe Saws, Trav-L-Cutter®
- End Prep Machines, Flange Facers, Valve Operators
- Orbitalum Tube Saws, Facers and Orbital Welding Systems



HDSF
HEAVY DUTY SPLIT FRAME

EP 424
END PREP WITH SPEED PREP





Clockwise:
LCSF Low Clearance Split Frame • EP 424 Speed Prep Trav-L-Cutter® • Guillotine® Pipe Saw

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