



PANDJIRIS,[®] INC.

PIPP

**PARTNERS IN
PROFITS &
PROGRESS**

PRODUCT BULLETIN FOR LINCOLN PARTNERS

SEPTEMBER 2005

SYSTEM FOR OVERLAY OF PROPULSION SHAFTS

As a result of their Partnership, and a successful history of working with shipyards throughout the United States; representatives of both Pandjiris and Lincoln Electric were given the task of developing and building a propulsion shaft overlay system utilizing Pandjiris state-of-the-art fixed automation equipment and Lincoln's new Power Wave submerged arc welding technology.

At the heart of the system requirements were the abilities to handle a variety of shaft sizes (including tapers) and a minimized heat input. The combination and expertise of both Pandjiris' fixed automation equipment and PLC precision torch positioning system, teaming with the latest in Lincoln's submerged arc welding technology, produced yet another success story. The system will replace manual welding of the ID and OD surfaces on propulsion shafts.



The system requirements included both step-over and spiral overlay and tapered surfaces at up to 2" per foot. Internal overlay requirements were for diameters as small as 15" and up to 12" in depth. The turning rolls utilized for the system are the exclusive Pandjiris Missouri Mule series with vertical adjustment to provide precision alignment of the propulsion shaft for the overlay process.

The operator interface for the system is a touch screen which allows manual operation of all axes of motion along with programming surface speed, pitch and taper. The system PLC automatically initiates motion with arc start and automatically adjusts part rotation speed on tapered parts to maintain a constant surface speed during the welding operation.

Representatives of the shipyard, Lincoln Electric, and Pandjiris participated in the system commissioning at Pandjiris in St. Louis, Missouri. The end user was trained by Lincoln's and Pandjiris' technicians both in the operation of the Powerfeed Control and in the operation of the complete Automated System. In addition, weld procedures were developed for multiple modes of operation of the weld package including conventional DC as well as AC modes.

As a result of this very successful collaboration, multiple packages have either been placed, or are projected to be placed at shipyards throughout the U.S. for the overlay process. The system has exceeded the customer applications and generated great excitement amongst the operators who will no longer have to perform the overlays as a manual operation.

Pandjiris and Lincoln Electric continue to team together to offer fully integrated Turnkey Systems and Fixed Automation Solutions for customers here in the United States and throughout the world.



SYSTEM FEATURES

- Lincoln Power Wave AC/DC submerged arc weld package
- Multiple axes of programmable motion utilizing open loop vector, closed loop vector and stepper drives
- Precision linear bearings and cam followers for both vertical and longitudinal positioning
- Weld head oscillation via Lincoln Spreadarc
- Capability for both circumferential ID and OD as well as longitudinal welding
- Touch screen operator interface
- PLC control
- Pandjiris Model MM-65/33 Power Turning Roll for part rotation
- High capacity thrust rollers to maintain shaft position on turning rolls
- Custom steel wheeled idler rolls with manual infinite vertical adjustment
- Weight capacity of 65 tons
- Length capacity of 60'
- Weld Engineering flux recovery and feed system

