

New motors powering NMMU pipeline technology

TECTRA Automation has been contracted to supply Bosch Rexroth motors and control systems, which are essential in the production of the patented WeldCore technology, a result of a 15-year research relationship between Nelson Mandela Metropolitan University (NMMU) and Eskom.

WeldCore is able to determine the lifespan, predict the maintenance requirements and hence prevent the failure of high-temperature steam pipes in refineries and power stations.

Ideal for older processing plants, WeldCore utilises a specialised sampling technique to provide information on whether a pipeline or other high value component needs replacement. WeldCore can defer downtime for unnecessary maintenance, predict end-of-life dates and can play a crucial role in the prevention of premature failure by identifying problems.

The process involves removing a cylindrical sample from the pipeline wall or part of the component primarily exposed to high pres-

sure and temperature, this sample is used for advanced testing.

The WeldCore machine then repairs the blind hole using a solid-state welding technique, friction tapered hydro pillar processing (FTHPP), which provides a repaired site with mechanical properties almost identical to the parent material.

By analysing an actual sample of the pipeline or component, this method provides more accurate results than traditional non-destructive testing (NDT) methods such as dye-penetrant, X-Ray and magnetic particle inspection. In addition, friction welding takes only a minute while traditional weld repair can cost the plant hours of downtime.

WeldCore relies on a rotating spindle that can maintain its speed accurately despite a wide range of torques. To achieve this, WeldCore utilised a Bosch Rexroth MSK071E servo motor paired with HCS03.1 servo drive to accurately maintain speed throughout both

the low speed coring and high speed welding processes.

Mobility is a key differentiator of WeldCore, and the Bosch Rexroth motor used is the only one on the market that can deliver the power required while still being small enough to be carried by one or two people. A motor from another manufacturer would require overhead rigging in order to assemble the machine each time it is positioned to take a sample.

The Bosch Rexroth servo drive provides an automated system with a simplified interface that makes WeldCore easy to operate, and reduces human error and the likelihood of damage to the plant.

The project is a result of more than a decade's research, prototypes and testing at NMMU, Port Elizabeth, involving students, engineers and local manufacturing companies.

The final assembly, wiring and the software was completed internally by eNtsa, based at NMMU, resulting in an integrat-



From left: Prof Danie Hattingh (eNtsa Director - NMMU), Mr Phillip Doubell (Eskom Chief Researcher / Inventor), Dr Ian Wedderburn (eNtsa Deputy Director / Inventor) and Dr Phil Mjwara (Director General - Department of Science and Technology).

ed machine that works predictably and reliably. WeldCore is available to the market through Mantacor, a branch of the NMMU. Tectra Automation is a member of the Hytec Group of Companies.