Traditional Ultrasound Inspection on Cladding or Weld Overlay

Introduction

Frequently, the material that can withstand corrosion in a specific application's environment, lacks structural strength. It may also necessitate the use of uneconomically thick portions due to its poor strength. A cost-effective option is to apply a coating of corrosion-resistant material of appropriate thickness to the equipment's contact surfaces, composed of a cost-effective and structurally sound material such as carbon steel. Cladding or lining is a method of merging two layers of different materials.

While the term "lining" is non-specific and can refer to a variety of materials, "cladding" refers to a corrosion-resistant layer that is metallic and well-bonded to the surface. As a result, the word cladding is commonly applied to steel-fabricated equipment such as pressure tanks and shell-and-tube heat exchangers.

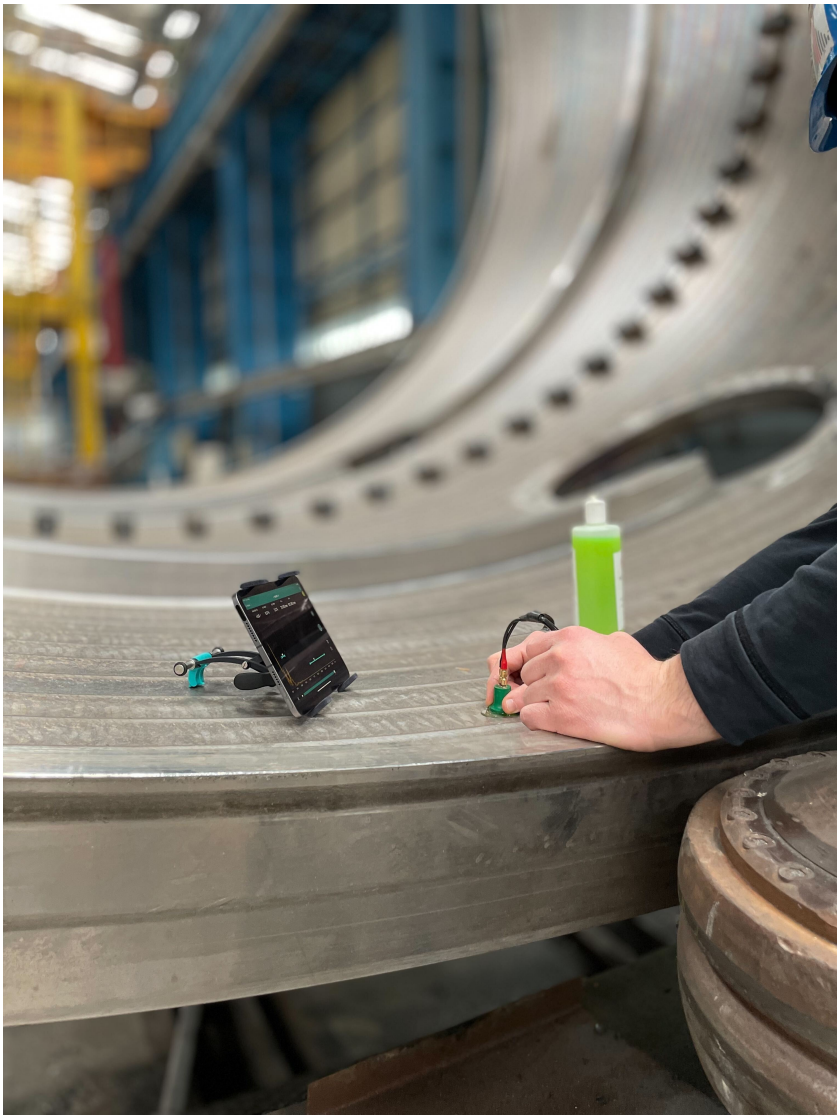
Cladding, on the other hand, is not necessarily the greatest technical-economical option. Cladded vessel construction is a time-consuming and costly process. Thermal cycling also causes issues at the weld points of sleeves and nozzles. In clad-metal construction, cracks or corrosion can also occur at the welds where adjacent sheets are linked.

Challenge

This kind of component inspection is dependant on the norm requested by the customer.

To verify the correct fusion between the coating and the base metal, first view the specimen with a standard TR probe. Then, if your spec is ASME, you must make a DAC block that is comparable to the workpiece (according to ASME sec V and with the same thickness of clad and workpiece) and reverse engineer your Ultrasonic Testing (UT) set using this block!

Specifically, you must take the MAX peak from the DAC block's edge, edit your index and actual machine angle with this peak, vary the velocity until your UT set is calibrated, then draw a DAC curve and inspect your specimen.



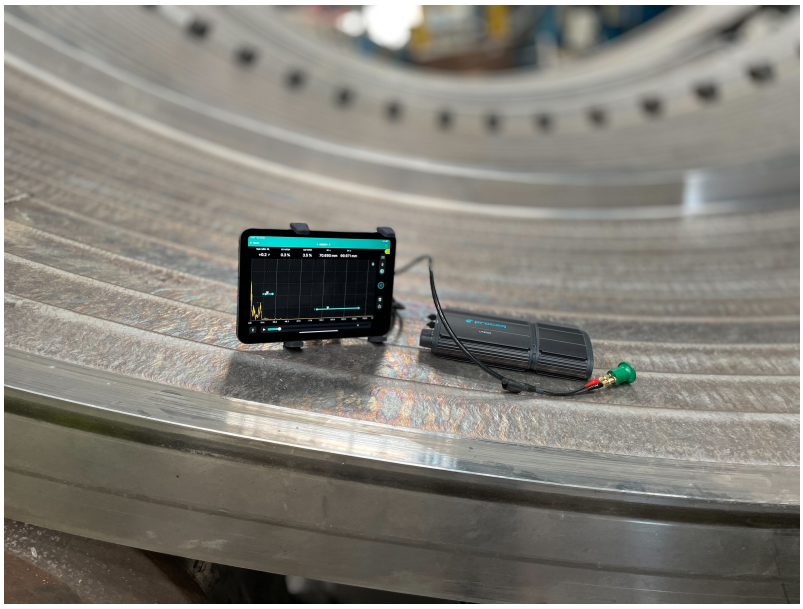
Solution

This application is made interesting by the Proceq UT8000's unique pulser, which has a low signal/noise rate and a 400 V square pulse.

The technician has a very low noise level when using a 1-2 MHz probe with a crystal diameter of roughly 20mm (TR probe) to help him identify the flaw or lack of fusion.

DAC creation will be easier to construct and edit, resulting in increased productivity.

The instrument will then record all of the data, including defect echo, setup, and traceability, and upload it to the Workspace platform. This will provide for complete control, traceability and the opportunity to repeat the inspection at a later time using the same configuration setting.



Learn more about ultrasound inspections with the UT8000 on our Tech Hub.