Draka Engineered Specialties

Digital x-ray imaging for non destructive testing

The Gulf of Mexico incident with the drilling rig Deepwater Horizon has drawn attention to the significance of reliable equipment, which is so critical in oil and gas field exploration. A very important aspect of that reliability is non-destructive testing (NDT). So far, the industry has relied largely on film-based radiographic systems to monitor the integrity of its equipment. But there is a move towards digital imaging technologies. Draka Engineered Specialties (DES) in New Jersey (US) is playing an important role in NDT with the production of "flatpacks" and tubing. These products can be many miles in length and are installed in a gas or oil well for system monitoring and chemical injection. Although Draka has a long history of using film-based imaging for oil and gas well infrastructure products, it is introducing digital x-ray imaging.

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The deep sea oil and natural gas industry is relying heavily on dependable equipment for safe operations. More than ever before, the industry and society as a whole are aware of the consequences of failing equipment causing leaks, spills or worse. The risks are the result primarily of pipe manufacturing, joint welding, and pipeline corrosion or fatigue. Non-destructive testing (NDT) has acquired an important part in the monitoring of that infrastructure. Until now, the industry has relied largely on film-based radiographic systems for NDT purposes, but digital imaging technologies are making their entry.

Building trust

Changing an NDT inspection system is not easy to accomplish, even if there are time, efficiency and inherent safety benefits in choosing digital imaging over film. The process of gaining acceptance for a new testing method can be lengthy. Often, the new approach must be qualified by three or four parties. According to Jack Zsakany, General Manager of Draka Engineered Specialties, digital radiography has had to overcome not only industry resistance to change but also fundamental resolution concerns and file storage standardization. "But with new technology, resolution can be much higher than traditional film," Zsakany said. And new standards about image storing and database management too have done a lot to gain credibility for digital radiography.

Flatpacks

Draka Engineered Specialties' New Jersey facility (formerly Pressure Tube Manufacturing or PTM) produces specialised seam-welded tubing in diverse outside diameters. With the acquisition of PTM, Draka integrates wire products into corrosion-resistant tubing. One of DES' distinguishing capabilities is the manufacture of tube-encapsulated cable and pressure tube bundled together with multiple tubes to create a polymer-encapsulated "flatpack." These flatpacks can be many miles in length and are installed in a gas or oil well for system monitoring, chemical injection, and control. Although the company has a long history of using film-based imaging for oil and gas well infrastructure, it wanted to introduce digital x-ray imaging.

How it works

Draka sought bids from several digital x-ray suppliers, ultimately choosing Envision CmosXray LLC of Anchorage, Alaska. The company's CMOS(*) Tubing Inspection Cabinet (TIC) is the highest-resolution system available for small tubing inspection. Envision's TIC is designed for imaging weld joints for deep-sea oil and gas applications. Hook-ups to wellheads require a massive infrastructure to control underwater oil and gas facilities. High-pressure specialized tubing is used to connect hydraulic controls to production valves. These tubes are manufactured from rolls of various grades of stainless steel in short segments, which are taken out to sea by barge, then hooked up to the oil-drilling platform. Each segment is welded to form the long pipeline, and these joints require NDT imaging to ensure the integrity of the joint. To inspect tubing and valves, the digital x-ray detector is placed on one side of the joint weld, an image is taken, and the detector is rotated 120° to take three views of the weld before moving on to the next one. All of this takes approximately 30 seconds. A technician receives the digital images within seconds, evaluates the weld and, if it's deemed solid, more tubing is uncoiled. The more traditional film-based process can take up to 45 min to load a film cassette, capture an image, develop the film, unhook the entire assembly mechanism and start the mechanism up again to capture the next image. Technicians would have to walk across campus with the film if further evaluation were deemed necessary. Greg Davall, Plant Manager for Draka: "The oil and gas industry is recognizing that digital x-ray imaging has its place and can deliver everything we need at a cost-efficient price."

(*) CMOS = Complementary Metal Oxide Semiconductor

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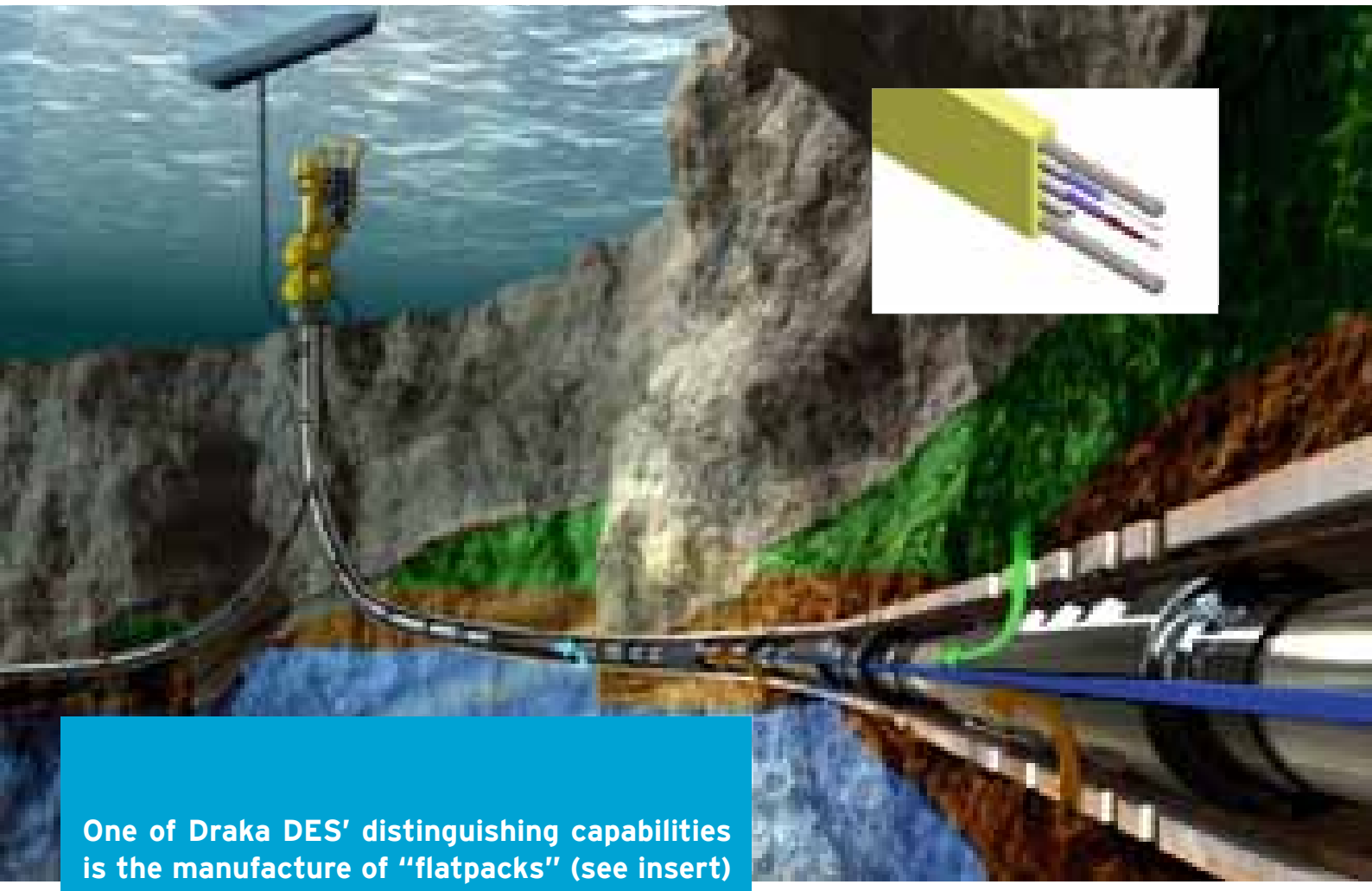

One of Draka DES' distinguishing capabilities is the manufacture of "flatpacks" (see insert) which are installed in a gas or oil well for system monitoring and control

An x-ray image shows a pipeline joint weld