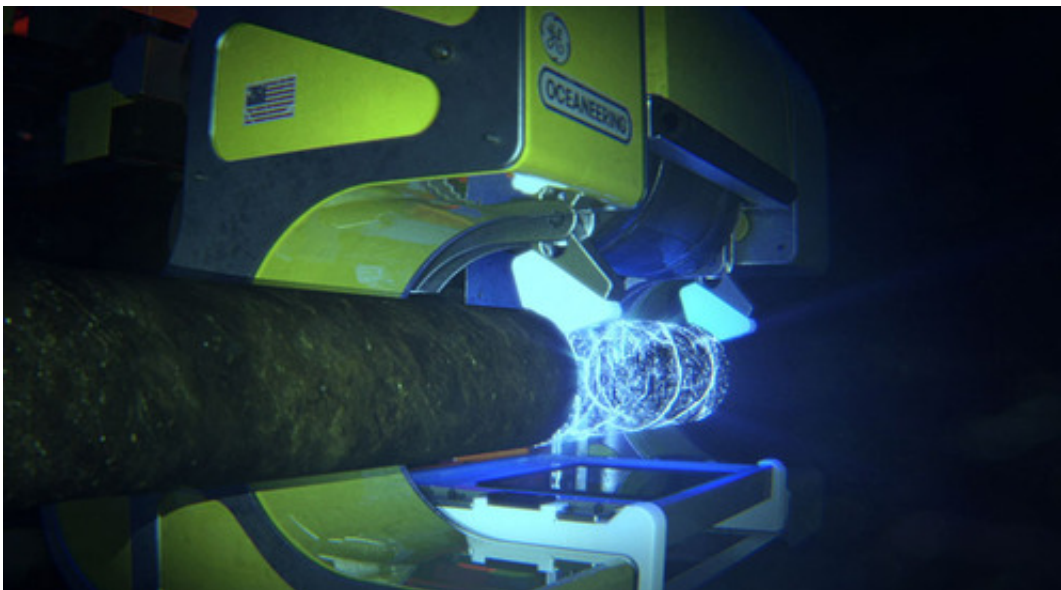


# GE and partners developing undersea pipeline x-ray technology

February 28 2014, by Bob Yirka

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General Electric and partners BP and marine engineering company Oceaneering have jointly adapted existing medical x-ray machines to crawl along undersea pipelines looking for cracks or other problems.

GE is of course a world leader in x-ray technology, mostly for medical applications. Other uses are for scanning pipes and other structures (airplane wings, bridge supports, etc.). Until now, however, there has not been a way to use existing x-ray devices to scan pipelines sitting on the floor of the ocean for defects (they don't actually sit on the ocean floor,

they are held slightly above it). In this new effort, researchers from the company's healthcare and oil and gas subsidiaries, along with the outside partners began with an existing medical x-ray machine, then modified it to be able to withstand the brutal environment that exists at the bottom of an ocean (300 atmospheres of pressure and 40 degree temperatures, for example). There is also the saltwater and constant motion of underwater currents to deal with.

Creating an enclosure for the device, which includes a very fragile and sensitive Digital Detector Array (flat TV screen sized with a glass front) was a challenge. Not only did the enclosure need to protect the x-ray machine electronics from the elements, it also needed to for allow for x-raying through the enclosure walls without them showing up on the images produced.

The next challenge lay in creating a remotely controlled submersible for holding the x-ray device—one that would allow for crawling along the pipe, taking x-rays as it went—without damaging the pipe or getting stuck when encountering straps or other material that is used to keep the pipeline securely in place.

The team reports that thus far they've been able to overcome all obstacles and have built all the parts, put them together and successfully tested them as a unit in high pressure chambers. The next step will be to test the device on a real pipeline beneath the sea.

If successful, the new x-ray machines could help find leaks, and more importantly, find trouble spots that could lead to major spills if a pressurized pipe bursts.

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Citation: GE and partners developing undersea pipeline x-ray technology (2014, February 28)

retrieved 18 April 2024 from

<https://techxplore.com/news/2014-02-ge-partners-undersea-pipeline-x-ray.html>

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