

New Partnership to Automate Offshore Platform Inspection



WFS Technologies, the University of Aberdeen and OGIC have announced a joint technology project to design and build the world's first ExtremeEdge OLM (On-line Monitoring) system for offshore subsea and platform structures. At present, asset integrity and fatigue monitoring of North Sea offshore subsea structures is largely carried out 'manually' by divers or remotely operated vehicles (ROVs). This is not only hazardous and expensive, but also means that information on the integrity of the structure is not available in real time. Furthermore, the quantity and quality of this data is insufficient to drive performance-enhancing big data analytic techniques. This can impact on production levels, or even lead to failure, due to sub-optimal predictive model correction and latency.

The project builds on WFS's Seatooth through-water wireless communications, Subsea Internet of Things (SIoT) and real time wireless fatigue monitoring technologies. Utilising an innovative ExtremeEdge distributed computing architecture, the project will deliver the first generation of dynamic, real time fatigue monitoring system driven by AI and designed to deliver a step reduction to operating costs and risks.

Subsea Internet of Things

The project, which is jointly funded by WFS and OGIC, will focus on advancing technology to monitor subsea structures using specially designed SIoT smart sensor devices incorporating edge AI. The completely autonomous SIoT devices will be attached to the structure with the capability to operate for more than ten years due to the use of intelligent algorithms that will optimise battery usage.

In addition to operating autonomously, the sensors will also be able to communicate with one another. This will allow critical information on fatigue and corrosion to be communicated to deliver field-wide, intelligent monitoring systems.

The project will involve building and testing a new generation of self-monitoring smart clamps designed for deployment by light-class ROVs operating from platforms. By removing the need to use vessels, deployment and maintenance costs are reduced dramatically. Using WFS's patented 'wine-rack' architecture, wireless sensors can be hot-swapped without the use of jumpers and connectors on Seatooth Smart Clamps.

Wave loading forces

The project will subject Seatooth Smart Clamps to load tests to confirm full operational capabilities under the wave loading forces they will be subjected to in the North Sea. Further development of the intelligent analytical techniques that optimise battery usage of the sensor devices will also form an important part of the project. Finally, WFS's real time fatigue system will be adapted for use on an SIoT architecture with local model correction at each smart node. This work will take the project from proof of concept at the start of the project to prototype demonstration upon project completion.



Seatooth Smart Clamp

Brendan Hyland, Founder and Chairman of WFS said: "We welcome the opportunity to continue joint R&D with the engineering and AI groups at the University of Aberdeen. We are grateful to the team at OGIC for facilitating this exciting project, which will herald a new generation of automated Underwater Inspection incorporating cutting-edge SIoT, Big Data analytics and AI technologies to deliver a step change in safety and operating costs of brown field assets and a step reduction in CAPEX of green field assets."

Artificial Intelligence

WFS Technologies Limited will provide background IP and initial design for the sensor, its associated clamp, and the initial fatigue model. The University of Aberdeen School of Engineering will play a core role in the testing phase of the project, designing the physical system of a novel strain sensor and associated smart clamp for installation and recovery by ROVs. This will require academic expertise from the University, in addition to access to the University workshop, laboratory and testing equipment in order to design the clamp and integrate the sensor.

Dr Andrew Starkey, University of Aberdeen said: "I am delighted to be involved in this hugely exciting project, which will harness the power of Artificial Intelligence to drive improvements in asset monitoring and safety for offshore oil and gas structures.

"The University of Aberdeen is world-renowned for its expertise in energy research, and this joint project with WFS Technologies and the

Oil and Gas Innovation Centre is yet another example of how we work closely with our industrial partners to bring about innovations for the benefit of the industry.”

<https://www.hydro-international.com/content/news/new-partnership-to-automate-offshore-platform-inspection>
