



Photo: © Eni Norge Goliath

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Improved offshore environmental monitoring

Risk of spills and leaks from offshore oil and gas production is a major challenge and threat to the environment. A new measurement method based on research and development can help prevent disasters, with major economic and environmental consequences.

Today's technology is not able to detect leaks at an early stage, hindering continuous monitoring of environmental effects of emissions. In cooperation with Kjeller Innovation, NGI (Norwegian Geotechnical Institute) is developing

a PAH-sensor, which enables online measurement and monitoring of hydrocarbons in water. The lack of available technology for such monitoring is currently a limiting factor for oil companies to monitor their own business, as well as the ability of the authorities to set requirements.

"Pollution from produced water dilutes in very large volumes at sea, which means that the substance you want to measure, will quickly disappear. Monitoring of hydrocarbon emission over time requires technology that has high precision at low concentrations. Our new PAH-sensor is capable of this, and enables online measurement and monitoring of hydrocarbons in water", says Espen Eek, NGI's Project manager and Technical Lead for Contaminated sediments.

Testing the technology

It is possible to measure with far higher sensitivity, precision, and stability than with current solutions, utilising the new groundbreaking method. The method for online monitoring and measurements close to background levels provide the authorities and oil companies with new opportunities to ensure a continuous identification of the risk of oil spills, based on real time data. This will also allow for early warning and localization of any oil leaks.

"Some of the best innovations are created through collaboration between research and industry", says Joachim Paasche, Director for business development at Kjeller Innovation. Together with the oil and gas operator Eni Norway, NGI and Kjeller Innovation are testing the method and the new equipment. As the operator of Goliath, the first producing oil field in the Barents Sea, ENI Norway would strives to be in the lead in terms of environmental monitoring.

A prerequisite from the authorities for the approval of new licenses in vulnerable areas, are significantly enhanced solutions for environmental monitoring. Prior to carrying out an offshore test during the 2018, the new technology will be thoroughly tested in the coastal environment in the Oslo fjord, Norway.

With the new PAH-sensor, Kjeller Innovation and NGI ensures that groundbreaking research benefits society – both now and in the future.



[Watch video on YouTube here](#)

Facts about IMiRO:

- The PAH-sensor is a result of a strategic research project, IMiRO, initiated and run by NGI, with financial support from The Research Council of Norway – FORNY2020.
- NGI has extensive experience within the development of monitoring systems, and has previously developed a system for monitoring gas leaks at the seabed. In addition, NGI has developed passive sampling methods, which monitors the concentrations of organic contaminants in sediments and water.

Facts about Kjeller Innovation:

- Kjeller Innovasjon is one of Norway's leading innovation companies. Together with 15 R&D institutions and industry partners, Kjeller Innovation develop ideas and R&D results commercially. The goal is to develop companies, which can contribute with technologies and solutions for the benefit of society.
- Kjeller Innovation works within the following areas: Energy – The Environment – Community safety – Bioeconomics.
- Kjeller Innovation is located at the heart of the Kjeller Research Park in Lillestrøm, Norway, with offices at education centres at Ås and in Oslo.

Facts about NGI:

- NGI is Norway's largest geotechnical specialist community and a leading centre of research and consultancy in engineering-related geosciences. We work within the fields of Offshore Energy - Building, Construction and Transportation - Natural Hazards - Environmental Engineering.
- NGI is a private commercial foundation with head office and laboratories in Oslo, branch office in Trondheim, avalanche research station on Mount Strynefjellet, subsidiaries in Houston, Texas, USA, and in Perth, Western Australia.
- NGI performs research and development within geotechnics and associated disciplines that create results in the form of new expertise, new methods and new technology. We develop knowledge and technology to be adopted, and our results shall be relevant to the market and be put into use.

The Norwegian Geotechnical Institute (NGI) is a leading international centre for research and consulting within the geosciences. NGI develops optimum solutions for society, and offers expertise on the behaviour of soil, rock and snow and their interaction with the natural and built environment.

NGI works within the markets Offshore energy; Building, construction and transportation; Natural hazards, and Environmental Engineering.

NGI is a private foundation with office and laboratory in Oslo, branch office in Trondheim, and daughter companies in Houston, Texas, USA, and Perth, Western Australia. NGI was established in 1953.

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