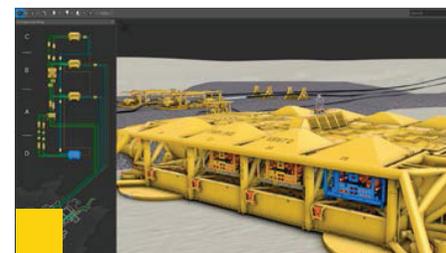


Oliver Harding, subsea project engineer

## SAVING TIME AND MAKING BETTER DECISIONS THROUGH VIRTUAL REALITY

Imagine navigating freely inside an advanced subsea installation. This is not science fiction, but a reality. A complete 3D environment has been developed for the Ormen Lange field. The application is VCog, an intuitive virtual information hub providing a powerful tool for familiarisation, training, collaboration and decision-making.



Ormen Lange Subsea (screenshot).



Nyhamna teaser (screenshot).

The complete virtual model of the Ormen Lange field is already available and being used both by the SURF department and by the subsea team in Operations. It has been created for Shell by Visco, a company specialising in visual management. The solution is called VCog, short for 'visual cognition'. According to subsea project engineer Oliver Harding, VCog has multiple uses and benefits.

"VCog provides us with a much better understanding than if we just had technical drawings and therefore allows for accurate and realistic planning. During familiarisation, preparation and training, people can easily navigate throughout the asset with a realistic and highly responsive experience," explains Harding.

The core of VCog is a fully interactive 3D environment in superior graphical quality representing the entire Ormen Lange field with all its physical installations including all subsea equipment and pipelines correctly positioned at a realistic seabed. Every component is there, equal 1:1 to all the engineering design models. "You can interact with the models and use Google maps like features, which help users to efficiently navigate through the asset. All items are tagged and the highway is open to any external data sources," says Øystein Stray, CEO of Visco.

One of the keys of VCog is that you are able to layer additional information into the model. Many of the source files that have gone into building up the application are similar to the source files for IMaps. "At the heart of VCog is a 3D model of the facilities, we have then layered the metadata from our EDW (Engineering Data Warehouse) in addition to bathymetric charts, flowline routes, well locations, and linked Smart Plant Foundation to it," says Harding.

"We are only starting to scratch the surface of what we can do with visualisation. Typically with software applications

the main barrier is the program application. Being able to stream live data from several databases in the same application is the future, and this is where VCog differentiates itself," adds Stray.

The Ormen Lange VCog was conceived while Shell was preparing for the operatorship to be handed over from Hydro back in 2006. "A terms of reference was put together to determine how we would use the information handed over, and to identify the requirements from the various disciplines involved in operating the field. The conclusion was that no product available at that time was suitable. However, Octaga was recommended for the top sides, and a recommendation was made to build a new model from scratch for the subsea assets," says Harding.

Visco was approached approximately 4-5 years ago to fulfil this recommendation, and the end result is the Ormen Lange Vcog.

"One of the main challenges that not many appreciate is how difficult it is to put together a subsea 3D model. I think many people can relate to PDMS (Plant Design Management System) files for a top side facility; however, this does not exist for subsea. This is mainly due to the complex nature and number of vendors and installation contractors involved. For topsides, there is generally one main contractor that is responsible for everything. Subsea is a different ball game, as there may be different vendors for all of the subsea hardware. Naturally, none of these are willing to take the responsibility to document what the other contractors have done. This leads to certain challenges," explains Harding.

To give an idea of the complexity of the application, the development of the Ormen Lange virtual asset involved the 3D modelling of 20,000 files in 18 different formats, each tagged with a unique ID and assembled into an accurate whole.

"The feedback has been very positive with direct gains and efficiencies experienced in intervention planning, data gathering for front end, and improved access to information via SmartPlant Foundation. We have also identified indirect benefits in training and familiarisation, flow assurance and input to engineering studies and HIRA/HSE risk assessments," says Harding.

Although the application was initially conceived to capture the Ormen Lange subsea facilities, Visco has recently refined the tool to also incorporate topside facilities. According to Stray, loading the topside files was the easy part.

"Recently, interest in the application and the technology has been expressed by our American counterparts as they consider this type of technology befitting of the Projects & Technology 2020 goal: Provide and deploy breakthrough and affordable technology that boosts our competitive position by materially contributing to capital efficiency and to a superior operational performance in our assets," says Harding.

### VISCO

VISCO is a Stavanger based company specialising in visualisation; including illustrations, 3D animations, film and video, virtual reality and interactive presentations.

Norske Shell has a frame agreement with VISCO for multimedia services.

[www.visco.no](http://www.visco.no)  
[www.vcog.no](http://www.vcog.no)