

Methane Hydrate Gas



CHIKYU

Atle Saure Lokøy, Specialist Engineer, Aker Solutions







Me and my Background on Methane Hydrate project – MH21

Atle Saure Lokøy



Japan - MH21





Aker Solutions leading positon in the Methane Hydrate Segment

Japan to secure their energy sourcing

- Japan is world largest importer of Liquefied Natural Gas (LNG)
- Diversification from Nuclear energy (Fukushima)
- Methane Hydrate is massive source of gas in Japan seabed



MH21 Project – Japan Drilling Company

- MH21 announced in July 2001
- Aker identified prospect in 2014.
- Study work to adopt existing technology to Methane Hydrate application
- System delivered Q1 2017 and shipped to Japan for Rig integration
- System installed on well May 2017 and test production started
- System retrieved from well April 2018 and Core samples collected



What is it and are there environmental downsides?

Methane Hydrates



Environmental issues?



Methane gas released directly to the atmosphere is a huge treat to the environment



Emissions after use of the Methane Hydrates is amongst the lowest of fossil fuels

Coal (anthracite)	228.6
Coal (bituminous)	205.7
Coal (lignite)	215.4
Coal (subbituminous)	214.3
Diesel fuel and heating oil	161.3
Gasoline	157.2
Propane	139.0
Natural gas	117.0

Pounds of CO2 emitted per million British thermal units (Btu) of energy for various fuels Natural gas is primarily methane (CH4), which has a higher energy content relative to other fuels, and thus, it has a relatively lower CO2to-energy content.



Aker Solutions role enabling methane gas test production

Test Production Phase





Aker Solutions role enabling methane gas test production

Test Production Phase





Weeks of gas production



Storm hang-off



Topside layout



Aker Solutions role enabling methane gas test production

Preparation Phase





Aker Solutions role enabling Methane gas test production

Running and Retrieval Phase



Development of a system for commercial production

- AKSO current business is well testing services with Workover technology
- The Field Development discussions have started
- Transit existing subsea technologies into a Methane Hydrate SPS application
- A MH field is characterized by low pressure, many wells, high sand content and need for pumping, hence a "simplified SPS with pumps" is a good starting point
- The time is now to develop concepts ahead of completion and protect IP with patent applications

A Subsea energy plant could be a future solution for Methane Production, with generated heat re-injected to boost production



Process from ongoing well test to commercial production

Well Test System

Test production required to understand reservoir behaviour, sand volumes, extractable reserves and expected flow rates



Commercial production (SPS)

India and Japan indicated fast track process to commercial production if test production was successful





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