



Decom Offshore 2020
Decommissioning Project Execution
27 August 2020

Background

- **Aker BP is preparing to abandon 30 wells on the Valhall platform**
- **Abandonment program planned to commence April 2020**
 - **Delayed to September 2020 due to Covid-19**
- **Planning began for Aker BP in 2016**
- **BiSN began discussions with Aker BP in 2017 for an “alternative” barrier**



The Problem

- Globally, the only “accepted” barrier material is cement
- Cement is porous and shrinks when it solidifies
- Cement barriers can develop cracks and micro-annuli over time



The Challenge

Find a material that:

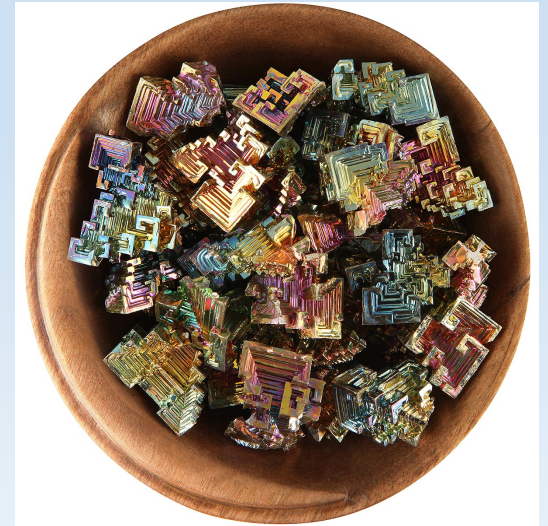
- Seals better than cement
- Lasts longer than cement
- Resists corrosion
- Can easily be deployed in any well
- Is accepted as a “barrier”



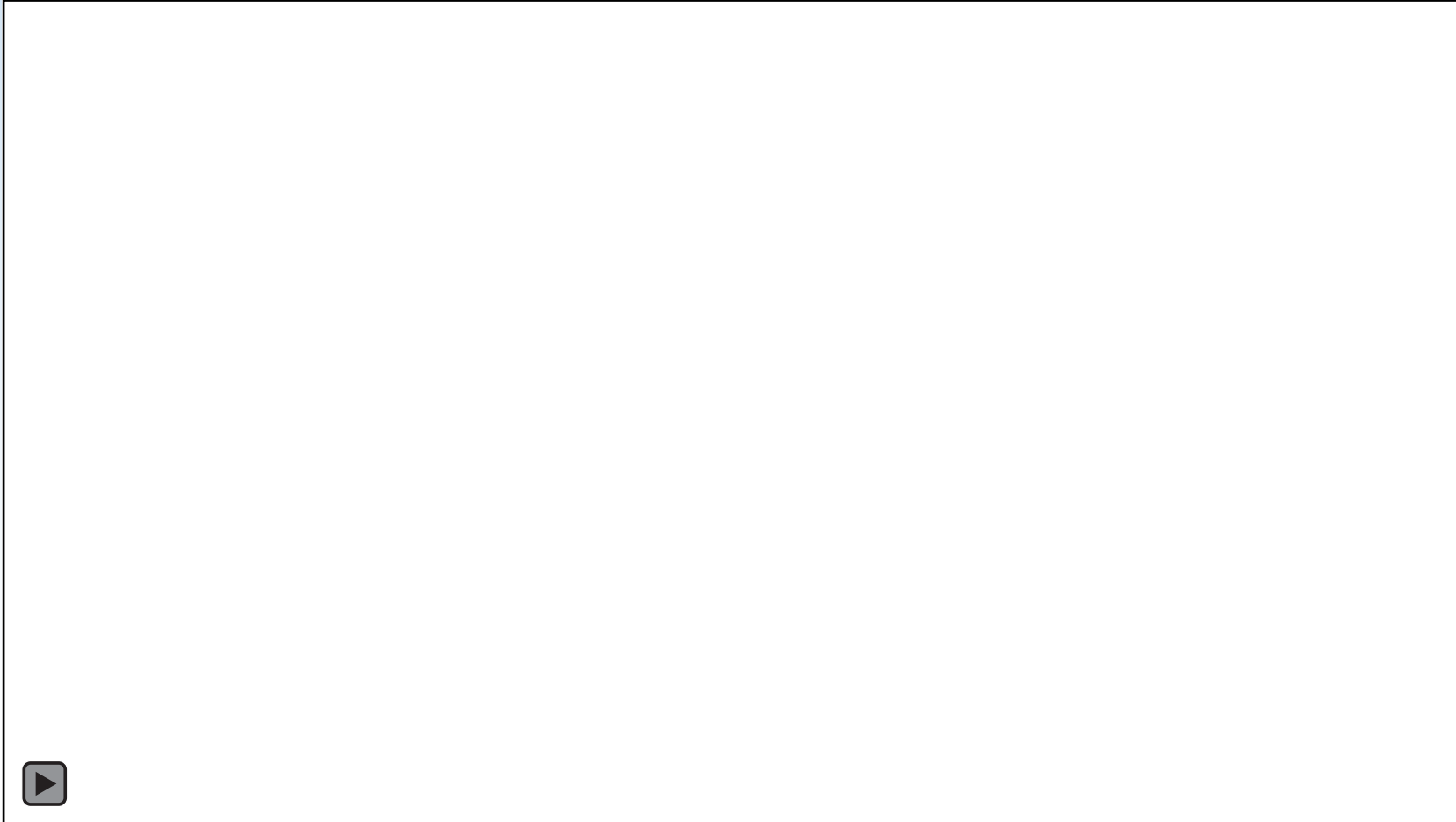
The Solution

BiSN's Wel-lok M2M technology

- ✓ **Seals better than cement**
 - V0 tested to 5,000 psi
- ✓ **Lasts longer than cement**
 - Corrosion studies and modelling provides +3,000 year life expectancy
- ✓ **Resists corrosion**
 - Successfully tested in H₂S & CO₂ environments
- ✓ **Can easily be deployed in any well**
 - Wireline deployable to any depth
- ✓ **Is accepted as a “barrier”**
 - Recently accepted by PSA in Norway



Bismuth Alloy Viscosity & Expansion



Wel-lok M2M in Glass Casing



Norway Environmental Plugs

**Aker BP – 30 well Offshore P&A campaign
(Valhall)**

- **Aker BP to use BiSN as “alternative” barrier for environmental plugs**
 - **13 3/8” x 20”**
 - **18 5/8” x 24”**
 - **20” x 30”**
- **BiSN conducted extensive testing over 3 ½ years**
- **Material characterization to be accepted as a barrier by local regulatory group (PSA)**



Norway Environmental Plug Field Trial

Long Term Monitoring of BiSN Plug

- Plug set in September 2018
- 13 3/8" casing section milled out to 18 5/8" casing
- 18 5/8" casing perforated below plug in a known shallow gas zone to ensure BiSN plug would see gas pressure / bubbles
- No pressure or bubbles seen above plug for 23 months
- Gauges installed below BiSN to measure pressure over 2-year period
- Plug to be milled out next month to retrieve gauges and evaluate data



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Wel-lok M2M