A Novel, Field-proven Reservoir Triggered Polymer for Enhancing the Economics of Mobility Control Floods

EXCELCEOR TECHNOLOGY

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Polymer flooding is an established technology (HPAM) to improve mobility ratio and sweep efficiency.

Limited use offshore due to challenges.

**CHALLENGES**
- Limited injectivity – lower oil production
- Shear degradation – 30-70% higher polymer dosage
- Severe conditions and regulations

**GOALS**
- Maintain injectivity with water-like viscosity
- Shear protection to reduce polymer consumption
- Formulated for North Sea conditions and regulations
Develop enhanced polymer technology through collaboration
Injects like water, then builds viscosity in reservoir
Excelceor delivers HPAM into the reservoir intact

- Shear protected package
- Water-like viscosity

- Reservoir-triggered polymer
- Viscosity builds to target
HPAM shear through chokes results in 30% to 70% loss in viscosity*
Field trial was run at 1/30th scale to represent chokes used in the North Sea
Pressure drop was controlled using flow rate and choke opening
Viscosity results indicate this novel polymer shows no shear degradation at all

Numerical Simulation and Forecast

- Faster & increased oil recovery
- No Reduction in Injection Rate, No Production Loss
- Reduced Production: Due to injectivity restrictions
- Start of Polymer flood
- Oil Recovery (% OOIP)
- Production Time (Days)
Field Implementation Concept

Critical Choke Point

Untriggered Helles Polymer
Triggering Begins
Fully Triggered Helles Polymer

2 days

Subsea Choke

Helles Polymers

No polymer shear degradation observed

30-75% polymer shear degradation observed
Texas Field Trial- All KPIs Met or Exceeded

1. Injection with a viscosity similar to water

2. Shear stability during injection

3. Triggering deep in the reservoir to achieve the target viscosity

SPE-188528-MS Successful Field Trial of a Shear-Resistant, High-Injectivity, Reservoir-Triggered Polymer (ADIPEC 2017)
More oil, faster with reduced chemical usage for offshore EOR

Enhanced polymer technology developed through five-year collaboration to address offshore challenges

Successful laboratory and scale pilot trials prove benefits over HPAM:

• Maintain injectivity with water-like viscosity
• Shear protection to reduce polymer consumption
• Triggers to achieve target viscosity in expected time

Closing Remarks: Deliver HPAM to the Reservoir Intact
Questions?

THANKS!