

Produced Water Society

Treating Seawater for Methanol Removal in Deepwater Production System

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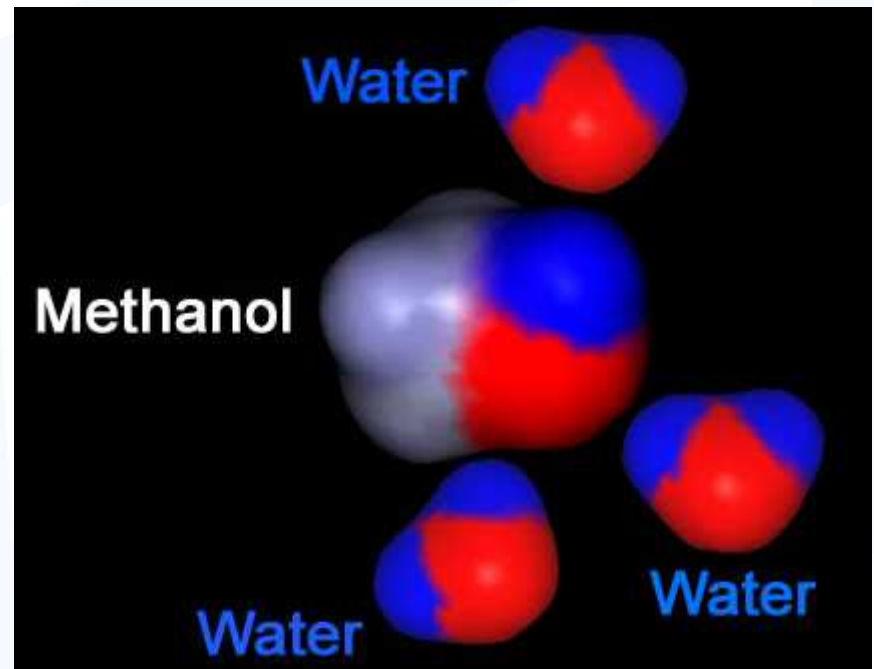
Introduction

- Justin Kuzniarek
- Baker Hughes Upstream Chemicals
- Texas A&M University
- Deepwater Experience
- Methanol Water Wash Experience

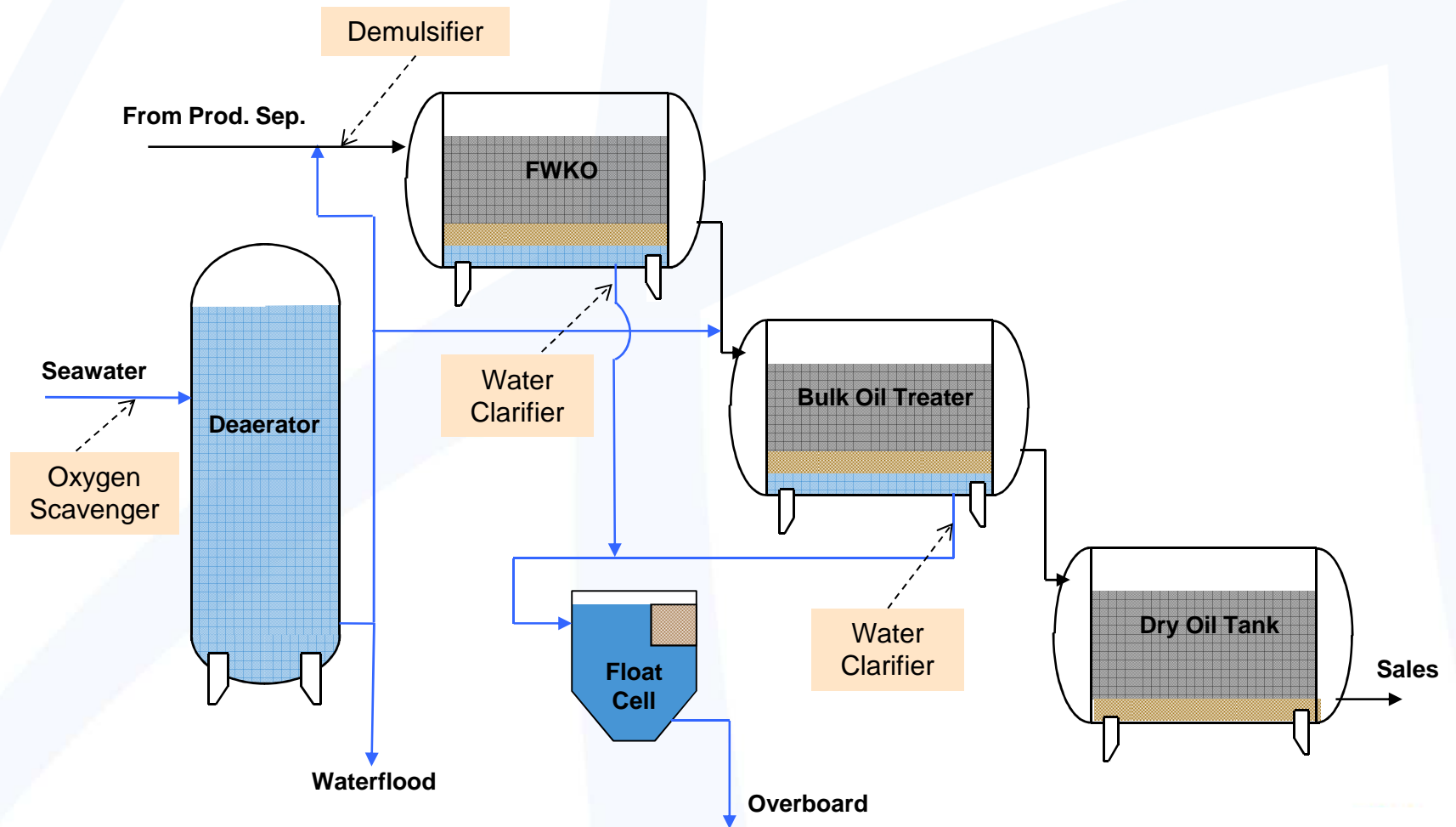


Background

- Methanol –Hydrate Prevention
- Refinery Issues
- Devalued Export Crude
- Methanol Water Wash



System Overview



Potential Issues/Solutions

- Raw Seawater
 - Treatment
- Process Fluid Separation
 - Demulsification
- Water Quality
 - Water Clarifier
- Scale Mitigation
 - Scale Inhibitor
- Export Methanol Content
 - System Optimization



Lessons Learned/Best Practices

- Proactive Approach
 - Pre-Treatment and Testing
 - Operational Training
 - Post Biocide Treatment and Testing
 - Startup Procedure
- Demulsification
 - BS&W Limits
- Water Quality
 - Demulsifier
 - Heat Management

Lessons Learned/Best Practices

- Scale Mitigation
 - Lab Testing
- Export Methanol Content
 - Field Test Method
 - BS&W
 - Seawater Injection Strategy

Lab Results

130°F / 100 psi

1000 ppm MeOH	
Water Rate / 1K Oil (Barrels)	ppm
10	18.16
50	3.61
100	1.8
500	0.36
1000	0.18

2500 ppm MeOH	
Water Rate / 1K Oil (Barrels)	ppm
50	9.09
100	4.52
500	0.9
1000	0.45

5000 ppm MeOH	
Water Rate / 1K Oil (Barrels)	ppm
50	18.36
100	9.1
500	1.8
1000	0.9
1500	0.6

7500 ppm MeOH	
Water Rate / 1K Oil (Barrels)	ppm
100	13.72
500	2.71
1000	1.35
1500	0.9
1800	0.75

10,000 ppm MeOH	
Water Rate / 1K Oil (Barrels)	ppm
100	18.38
500	3.62
1000	1.8
1500	1.2
1800	1

- 10% Seawater Wash per BBL Oil

Field Results

- Operating Conditions
 - 70,000 BOPD
 - 2000ppm MeOH
 - Seawater Wash 4,000 BWPD
 - (2000BBL to FWKO, 2000BBL to BOT)
- Results – MeOH Concentration Reduced to 30ppm
- 100% Export Compliance

Questions?

