BSEE Seminar:  
Offshore Oil and Gas  
Production and Development  
Permitting Issues

March 27, 2019  
BSEE Gulf of Mexico Region

“To promote safety, protect the environment and conserve resources offshore through vigorous regulatory oversight and enforcement.”
Agenda

9:00 - 9:30  INTRODUCTION and WELCOME  
   RICHIE BAUD, PD Regional Supervisor  
   MODERATOR: ROY BONGIOVANNI, PD Staff Geologists

9:30 - 10:00  APMs for SMART COMPELTIONS  
   CASEY KAVANAUGH, Petroleum Engineer, District Field Operations

10:00 - 10:30  DOWNHOLE COMMINGLING  
   PAUL EVANS, Petroleum Engineer, Resource Conservation Section

10:30 - 10:45  BREAK

10:45 - 11:15  PREMATURE ABANDONMENT  
   ANDREW CAMBUS, Petroleum Engineer, Development Unit

11:15 - 11:45  GAS CAPS  
   YVETTE TABLADA, Petroleum Engineer, Resource Conservation Section

11:45 - 12:00  QUESTIONS & ANSWERS
Welcome

• Safety moment

• Restrooms

• Format
  • 4 topics
  • 1 BSEE presenter for each

• Questions
  • BSEE Supervisors available
  • During/after each presentation
  • Any remaining questions at end
OOC Questions

• Shifting between completions (IWCs) – APMs
  • Process streamlined?
  • Data requirements?
  • Timing?

• DHC
  • Drill straight to completion – timing?
  • BSEE process & timing?
  • Considerations?

• Premature abandonment
  • When are conservation reviews triggered?
  • Info needed?
  • Timing?

• Gas caps
  • Process?
  • Timing?
BSEE & Operator Responsibilities

- Maximize ultimate recovery of economic developments
- Prevent damage to or waste of natural resources
- Protect correlative rights, including federal royalty interests
- Promote orderly exploration, development & production
- Expedite exploration & development
- Balance orderly energy resource development with environmental protection
- Ensure public receives fair & equitable return on OCS resources
- Safety
Applications

- Submit applications timely
  - Applications usually processed in order received
  - How long did it take you to perform G&G and engineering evaluations?
- Include required data
  - Table at 30 CFR 250.1167
- Demonstrate proposal satisfies regulations (e.g., maximizes ultimate recovery)

*Note – PD requests are often for exceptions to normal practices*
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QUESTIONS & ANSWERS
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Permitting Guidelines for Smart Wells
Casey Kavanaugh
Petroleum Engineer
GOMR District Field Operations Support

“To promote safety, protect the environment and conserve resources offshore through vigorous regulatory oversight and enforcement.”
Permitting Guidelines for Smart Wells

General Guidance

When an operator proposes to isolate productive zones in a wellbore through the shifting of sliding sleeves remotely, BSEE requires:

• Application of Permit to Modify (APM)
• Weekly Activity Report (WAR)
• End of Operations Report (EOR)

(30 C.F.R. § 250.505, 30 C.F.R. § 250.513, 30 C.F.R. § 250.605 & 30 C.F.R. §250.613)
Permitting Guidelines for Smart Wells

Three Scenarios

• Sleeve Shifts within an Approved Commingled Zone

• Sleeve Shifts not within an Approved Commingled Zone

• Shifting Sleeves during Initial Completion Operations
  • Cleanup/Flowback to Rig
  • Flowback to Platform
Permitting Guidelines for Smart Wells

Sleeve Shifts within an Approved Commingled Zone

- Operators may shift sleeves between zones approved for downhole commingling (DHC) to cycle valves and/or test individual productive zone(s) without an APM as long as:
  - The operator is returning all sleeves to their original position, and
  - The current BSEE-approved completion is the commingled sand.

Note: For this scenario, the operator is subject to the conditions set within the DHC approval letter which either (a) voids the DHC approval if the well is produced in a “non-commingled” state for more than 90 days, or (b) requires approval from the Office of Production and Development in order to deviate from the approved DHC configuration for more than 90 days.
Permitting Guidelines for Smart Wells

Sleeve Shifts within an Approved Commingled Zone (cont.)

- If at any time you do not return to the starting configuration and/or the DHC approval becomes invalid, an APM, WAR and EOR must be submitted to capture the completion configuration.

![Completion 1 of 5](image1)

- **Completion 1 of 5**
  - Type: S
  - Number: 2
  - Reservoir Name: Sand/Sand
  - Producing Sand(s): Sand/Sand
  - Completion Status Code: PRODUCING OIL WELL
  - Completion Date: 09/05/2018
  - Squeezed Date: No
  - H2S Present: Yes
  - H2S Concentration (PPM): No
  - Injection: No
  - Producing Zone Location: Lease, Area/Block, Latitude, Longitude, Datum (NAD27 or 83)
    - Lease: [Redacted]
    - Area/Block: [Redacted]
    - Latitude: [Redacted]
    - Longitude: [Redacted]
    - Datum (NAD27 or 83): NAD27
  - Tubing Specifications and Remarks: Size, Weight, Grade, Tubing Remarks
    - Size: 4.500
    - Weight: 15.50
    - Grade: 13CSr-110
    - Tubing Remarks: [Redacted]
  - Perforated Intervals:
    - Top (MD): 17343
    - Bottom (MD): 17399
    - Top (TVD): 17343
    - Bottom (TVD): 17399

![Completion 2 of 5](image2)

- **Completion 2 of 5**
  - Type: S
  - Number: 2
  - Reservoir Name: Sand/Sand
  - Producing Sand(s): Sand/Sand
  - Completion Status Code: PRODUCING OIL WELL
  - Completion Date: 01/14/2018
  - Squeezed Date: 09/05/2018
  - H2S Present: No
  - H2S Concentration (PPM): No
  - Injection: No
  - Producing Zone Location: Lease, Area/Block, Latitude, Longitude, Datum (NAD27 or 83)
    - Lease: [Redacted]
    - Area/Block: [Redacted]
    - Latitude: [Redacted]
    - Longitude: [Redacted]
    - Datum (NAD27 or 83): NAD27
  - Tubing Specifications and Remarks: Size, Weight, Grade, Tubing Remarks
    - Size: 4.500
    - Weight: 15.50
    - Grade: 13CSr-110
    - Tubing Remarks: [Redacted]
  - Perforated Intervals:
    - Top (MD): 16747
    - Bottom (MD): 16787
    - Top (TVD): 16747
    - Bottom (TVD): 16787
    - Top (MD): 17343
    - Bottom (MD): 17399
    - Top (TVD): 17343
    - Bottom (TVD): 17399
Permitting Guidelines for Smart Wells
Sleeve Shifts not within an Approved Commingled Zone

• Operators may never “temporarily” or permanently shift sleeves to isolate a productive zone(s) in order to test the production rate of another zone(s) or perform other operations without APM approval.
  • Allowing an operator to test the production rate of multiple zones within one APM is not allowed.
• For a “temporary” shift sleeve operation,
  • The APM must cover the isolation of the current zone, the temporary opening of the zone that is being tested, through the testing of that zone and end with the opening of the original producing completion.
  • The WARs should capture the sleeve shift through and upto the completion of the permitted operation. The WARs must capture daily production data (oil, gas & water) of the tested zone.
  • An EOR is not required, and therefore must be requested to be deleted, when all sleeves are returned to their original position.

Note: In the event that the sleeves will not be able to return to the original producing completion configuration, a RPM must be submitted to document the present completion configuration and the reason why the permitted operation could not return to the original configuration. An EOR is required to capture the productive completion configuration at the end of the permitted operation.
Permitting Guidelines for Smart Wells

Sleeve Shifts During Initial Completion Operations

Opening and closing sliding sleeves multiple times during the cleanup/flowback phase of a permitted initial completion operation is allowed. Upon completion of this operation, the well will come online with one or more of those zones open to flow.

Note: The simultaneous flow of multiple zones requires approval, even during initial completion operations.
Sleeve Shifts During Initial Completion Operations

Cleanup/Flowback to Rig

- Only one APM is required for this operation.
  - The APM should capture the initial completion operation including the flowback procedure through the demobilization of the rig.

- The WARs should capture all sleeve shifts through and upto the completion of the operation when the operator selects the zone(s) from which the well will begin production.
  - The WARs must capture daily production data (oil, gas & water) of the tested zone(s).

- One EOR is required for this operation. The EOR should capture only the zone(s) the well will begin production from at the end of the initial completion operation.
Two APMs are required for this operation.

- The first APM must capture the initial completion operation through the demobilization of the rig as discussed in the previous slide.

- The second APM should capture the entire flowback operation to the platform up to the completion of the operation when the operator selects the zone(s) from which the well will begin production.
  
  - The flowback should not last longer than 14 days per zone. The 14-day time interval begins the day the zone is opened for testing.
  
  - If the flowback is intended to last longer, approval must be obtained from the BSEE Development Unit (Office of Production and Development) prior to APM being approved.
There will be two sets of WARs.

- The first set of WARs should capture the initial completion operation up to the demobilization of the rig as discussed in previous slide of this presentation.
- The second set of WARs should capture from the start of the flowback operation up to the completion of the operation when the operator selects the zone(s) from which the well will begin production.
  - The WARs must capture daily production data (oil, gas & water) of the tested zone(s).

Two EORs are required for this operation.

- The first EOR should capture the zone(s) the operator intends to begin production from at the end of the platform flowback operation. The completion code should be a shut-in code.
- The second EOR should capture only the zone(s) the well will begin production from at the end of the platform flowback operation.
Questions?
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BSEE Seminar: Offshore Oil and Gas Production and Development Permitting Issues

Down Hole Commingling
Paul Evans
Petroleum Engineer
GOMR Production and Development
Resource Conservation Section

“To promote safety, protect the environment and conserve resources offshore through vigorous regulatory oversight and enforcement.”
Down Hole Commingling (DHC) Regulations

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 CFR 250.1158</td>
<td>How do I receive approval to DHC hydrocarbons</td>
</tr>
<tr>
<td>30 CFR 250.1167</td>
<td>What information must I submit</td>
</tr>
<tr>
<td>30 CFR 250.125</td>
<td>Service fees</td>
</tr>
<tr>
<td>30 CFR 250.126</td>
<td>Electronic payment instructions</td>
</tr>
</tbody>
</table>
Reasons for DHC

Producing uneconomic reserves by increasing flow rate
DHC Reasons Cont.

Produce uneconomic zones

Zone 1 (10’ Pay)
Zone 2 (13’ Pay)
Zone 3 (8’ Pay)
Zone 4 (14’ Pay)
DHC with Smart Technology

Using Smart technology

Zone 1

Zone 2
DHC Issues Encountered

- Failure of smart technology
- Water production
- Zone productivity differences
- Early abandonment
Revised DHC Process

- New letter terminology
- Include conditions of approval
  - Cycle valves
  - Individually test zones
BSEE starts technical review of “drill + complete” applications when all data, except well results, have been received.
Key Considerations

- Pressures
- Isolation capabilities
- Commingled vs. sequential EUR
- Hydrocarbon properties
- Drive mechanisms
- Rock properties

97% Approved or withdrawn (2018)
3% Denied (2018)
DHC Historic Timelines

- 2016: 40 Days
- 2017: 60 Days
- 2018: 120 Days

Categories:
- Waiting for Data
- BSEE analysis
- Total Application Time
Incomplete Applications

Top Reasons:

- Missing pressure data
- Missing logs (wells not drilled)
- Maps without annotations
Recommendations

- Submit: two or more months in advance
- Drill & complete: submit pre-drill
- Unsure? Submit an application
- No API? Use 000s for pay.gov
- Earlier is better, ALWAYS
Questions?
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APMs for SMART COMPELTIONS
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QUESTIONS & ANSWERS
Premature Zone Abandonment Program
Andrew Cambus
Petroleum Engineer
GOMR Production and Development
Development Unit

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Premature Zone Abandonment Overview

- Operators request to abandon a producing zone to recomplet to a new zone
  - 30.CFR.250.1712(a): Must provide “substantiating information demonstrating its lack of capacity for further profitable production…”

- PD & District offices work together - District refers an APM to PD if:
  - average rates for last 3 months of production exceed 300 MCFD or 50 BOPD,
    - NTL 2003-G02
    - 3 Month Production Rate = Completion 3 Month Production Total / Completion 3 Month Days Produced Total

- Development Unit reviews to ensure economic zones are not:
  - prematurely abandoned
  - bypassed

- Development Unit calculates remaining reserves & evaluates economics
- If still economic, Development Unit recommends denial of APM
Supporting Information

- Recent well test data
- Latest 12 months production data
- Pressure data
- Structure map showing present conditions
- Isopach map
- Uneconomic Cases
  - 12 month profit/loss statement
  - 12 month allocated OPEX
  - Economic model
### Zone 2
(Proposed Recomplete)

<table>
<thead>
<tr>
<th>Initial Rate Estimated</th>
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<tbody>
<tr>
<td>350 BOPD</td>
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### Zone 1
(Proposed Abandonment)

<table>
<thead>
<tr>
<th>Initial Rate</th>
</tr>
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<tbody>
<tr>
<td>430 BOPD</td>
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<table>
<thead>
<tr>
<th>Final Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 BOPD</td>
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</table>
Application Process

1. Receive Request from District Office or Operator
2. Supervisor Reviews and Assigns Review
3. 15 Days to Review
4. Does Conservation Issue Exist?
   - Yes
     - Need Additional Info?
       - Yes
         - Consult With Operator
       - No
         - Recommend APM Approval
     - No
       - Does Conservation Issue Still Exist?
         - Yes
           - Recommend APM Approval
         - No
           - Recommend APM Denial
5. Request Data from Operator
   - Yes
     - Recommend APM Approval
   - No
     - Recommend APM Denial
Premature Zone Abandonments

~25% reviews >1000’ WD and trending up to more complex deepwater environment
Impact of Premature Zone Abandonment Denials

MMBOE Saved by Premature Abandonment Reviews

Quarterly MMBOE

Cumulative MMBOE

Quarterly BOE (Bbjs)  Cumulative BOE (Since 2002)

Actual production – Not estimated
Impact of Premature Zone Abandonment Denials

DENIED CONSERVATION REVIEW PRODUCTION ROYALTIES

Actual Production – Not estimated
Well Tests

• Require PD review
• Maximum time allowed is 14 days
• Must be in the best interest of the tax payer
  • Maximizes ultimate recovery
• Completion history
• Contingencies of approval
  • 1) Notify PD when test starts and ends
  • 2) Provide data and analysis from test to PD
  • 3) Must return well to original downhole configuration or shut-in well and seek permit approval
Premature Abandonments
Enforcement

• Reinforce Regulations

• Prevent Waste
  • Ensure reservoirs produce until economically depleted

• Denial of APMs not in taxpayer’s best interest
  • 96% Approved (2013-2018)
  • 4% Denied or Withdrawn (2013-2018)
Questions?
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QUESTIONS & ANSWERS
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Permitting Guidelines for Gas Cap Production
Yvette Tablada
Petroleum Engineer
GOMR Resource Conservation Section

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Gas Cap Production

Applicable regulation 30 CFR 250.1157

Approval required:

• Before producing gas-cap gas from a completion in an oil reservoir known to have associated gas cap
• Continue production when oil well begins to show characteristics of a gas well
Required Information

- 30 CFR 250.1167 details requirements
- Maps
- Seismic data
- Logs
- Engineering data
- General info

Partial table from the regulation:

<table>
<thead>
<tr>
<th>$250.1166$</th>
<th>What additional reporting is required for developments in the Alaska OCS Region?</th>
</tr>
</thead>
<tbody>
<tr>
<td>$250.1167$</td>
<td>What information must I submit with forms and for approvals?</td>
</tr>
<tr>
<td>(a)</td>
<td>For any development in the Alaska OCS Region, you must submit an annual reservoir management report to the Regional Supervisor. The report must contain information detailing the activities performed during the previous year.</td>
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</table>

<table>
<thead>
<tr>
<th>(c) Engineering data:</th>
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<tbody>
<tr>
<td>(1) Well log sections with tops and bottoms of the reservoir and adjacent or existing perforations</td>
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<tr>
<td>(2) Structural cross-sections showing the subsea well and nearby wells</td>
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<td>NH</td>
<td>MHS-127 (2 copies)</td>
<td>GSP prep</td>
<td>Downhole commingling</td>
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<td>(a) Maps:</td>
<td></td>
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<tr>
<td>1. Base map with surface, boundaries, and completion locations with respect to the unit or lease line and the orientation of representative seismic lines or cross-sections</td>
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<tr>
<td>2. Structure maps with penetration point and subsea depth for each well penetrating the reservoir, highlighting subsea source locations; and original and current fluid levels</td>
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<tr>
<td>(b) Seismic data:</td>
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<td>1. Representative seismic lines, including inline and cross lines that confirm the structural integrity of the reservoir</td>
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<td>2. Amplitude section of seismic section, if applicable</td>
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Gas Cap Production

- Maximize ultimate recovery
- Economic development of reservoir
- Proper use of reservoir energy
Gas Cap - Considerations

- Is it a sound reservoir management practice?
- Does it maximize ultimate recovery?
- What is the oil rim size?
- Are there producing completions in the oil rim?
- Are there future completions/re-completions?
Gas Cap & DHC

- BSEE approval is needed when a gas reservoir is commingled with an oil reservoir
Application Process

BSEE Receives Request

Secretary records & distributes application

RC engineer and geo conduct completeness review

10 days

Receive Info from Operator

Application Complete

Clock STOP

Email operator with information request

Clock START

Send deemed complete email to operator

BSEE Technical Review

Management Review

Decision Letter Sent

6 weeks
Historic Timelines: Gas Caps

![Graph showing historic timelines for gas caps across different fiscal years, with data points for waiting for data, BSEE analysis, and total application time.](image-url)
Questions?

@BSEEgov

BSEEgov

Bureau of Safety and Environmental Enforcement

BSEEgov

www.bsee.gov