About Our Company

- Leading deepwater well containment system and technology provider for U.S. Gulf of Mexico
- Expertise in subsea containment and incident response training
- Independent company, not for the purpose of making a profit
- 10 members, representing 70% of the deepwater wells drilled in the U.S. Gulf of Mexico
- Each member has an equal share and an equal vote
- Investment of over $1 billion into system
- System available to all operators in the U.S. Gulf of Mexico as a member or as a non-member (per well basis)
- 125 permits citing MWCC’s containment system approved by BSEE
Interim Containment System (ICS)
MWCC Well Containment Enhancements

- SIMOPs Improvements
- Response Effectiveness
- Equipment Readiness
  - Long-term storage and preservation
  - Deployment preparations
Expanded Containment System (ECS)

Capabilities

<table>
<thead>
<tr>
<th>Capabilities</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth (ft) – Cap Only</td>
<td>10,000</td>
</tr>
<tr>
<td>Depth (ft) – Cap &amp; Flow</td>
<td>10,000</td>
</tr>
<tr>
<td>PSI</td>
<td>15,000</td>
</tr>
<tr>
<td>Fluid BPD (up to)</td>
<td>100,000</td>
</tr>
<tr>
<td>Gas MMCFD (up to)</td>
<td>200</td>
</tr>
<tr>
<td>Bore (inches)</td>
<td>18 1/8</td>
</tr>
<tr>
<td>Dispersant (gallons)</td>
<td>200,000</td>
</tr>
</tbody>
</table>
Advanced Capabilities: Subsea Containment Assembly

**Key Specifications**
- **Weight**: 170 tons
- **Water Depth**: 10,000 ft
- **Temperature Rating**: 250° F
- **Pressure Rating**: 15,000 PSI

**Capability Upgrades**

**Remote Operations**
SCA valves and chokes actuated via an umbilical

**Real-time Data**
Continuous pressure and temperature data collection via umbilical

**Recovery**
Provides hydrocarbon recovery and venting capability
Advanced Capabilities: Subsea Flowback Architecture

**Key Specifications**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Depth</td>
<td>10,000 ft</td>
</tr>
<tr>
<td>Flowline Length</td>
<td>5,000 ft</td>
</tr>
<tr>
<td>Riser System</td>
<td>500 – 10,000 ft</td>
</tr>
</tbody>
</table>

**Capability Upgrades**

**Decreased Congestion at Site**
Tankers to be up to 5,000 ft from wellhead site

**Increased Water Depth**
Cap and Flow up to 10,000 ft water depth
Advanced Capabilities: Modular Capture Vessels

Key Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Length</td>
<td>800 ft</td>
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<tr>
<td>Dynamic Positioning</td>
<td>Yes, DP2</td>
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<tr>
<td>Capture Capacity</td>
<td>100,000 BPD</td>
</tr>
<tr>
<td>Total fluids</td>
<td></td>
</tr>
<tr>
<td>Gas Handling</td>
<td>200 MMCFD</td>
</tr>
<tr>
<td>Flared gas</td>
<td></td>
</tr>
</tbody>
</table>

Capability Upgrades

Increased Capture Capacity
Enhanced: 100k BPD and 200 MMCFD
Current: 60k BPD and 120 MMCFD

Decreased Congestion at Site
Storage capacity of 700,000 barrels (total fluids), reducing shuttle tanker activity

Quick Disconnect Capability
Turret provides emergency and planned disconnect options
**Advanced Capabilities: Turret**

**Riser Turret Module Overview**

- Consists of a riser buoy, holding riser and umbilical, supported on an outrigger

- Outrigger supports slewing bearing, turntable, swivel stack, winches, HCU, HPU, slewing drives
  - Floating buoy
  - Separate gyro system from main vessel
  - Slew drives required because turret not moored
  - Planned and emergency (auto) disconnect capable

- Turret designed by Bluewater

- Outrigger supported on vessel deck

- Turret access structure with piping, crane

- Turntable deck with winches, sheaves, HCU

- Slew drives required because turret not moored

- Planned and emergency (auto) disconnect capable

- Riser Buoy contains hang off deck, BSDV, stab plate

- Spider deck with second SDV, buoy access
Advanced Capabilities: Processing Equipment

**Design aligned with deployment considerations**

- Installed topsides process modules on structural support frames
- Increased lift size to align with shorebase provider’s capabilities and minimize interconnect counts
- Maximized piping and cables permanently residing within tanker pipe racks to decrease deployment scope
- Optimized piping tie-in locations to create groupings of ‘hookup zones’
- Use of quick connection “plug-and-play” for electrical and instrumentation terminations
- Capability to lift and install the riser turret module as a single lift
- Stored in “warm” mode to assure reliability and optimized commissioning
Adapting Offshore Technology for Expanded System

**Subsea Containment Assembly (Capping Stack)**
- Utilizes proven technology seen in BOPs to cap a well
- Valves and chokes provide flow capability, such as those seen on wellheads, but in one unit

**Subsea Flowback Architecture**
- Subsea flexibles modified for deeper production needs and configured to connect to capture vessels at the surface
- Free-standing risers seen in day-to-day offshore operations modified for adjusting in varying water depths
- Umbilical-controlled subsea containment assembly

**Modular Capture Vessels (MCVs)**
- Converted Aframax tankers designed to have greater storage capacity with modular, adaptable process equipment – similar storage and offloading technology as seen in FPSO
- Deployable, modular processing facilities installed on MCVs, similar to well test packages used on drillships but with greater capacity
- Disconnectable turret designed to operate in a wide range of water depths
- Vessels are DP2 positioned using “follow the buoy” mode in deepwater applications
MWCC’s Expanded System required a number of firsts for the industry

- Deepest production risers ever built (10,000 ft. water depth)
- Shallowest free-standing risers ever built (2,000 ft. water depth)
- First free-standing risers adjustable for water depths
- Unique quick disconnect turret-buoy
- Deepest subsea flexibles ever supplied for production
- Deepest subsea dynamic umbilical ever built (10,000 ft. water depth)
- First production system designed for long term storage
Expanded System Progress

Suction pile offloading

Free-standing risers at SURF shorebase

Construction of the steel structure has begun

Buoyancy can on multi-axle transporter
Expanded System Progress

Offloading of a separator module onto cribbing

First module lifted onto MCV for integration

View from the deck of MCV EAGLE TEXAS

Turret testing underway before integration on MCV
MCV EAGLE TEXAS
Continuously Ready to Respond

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