



# CLEAR SOLUTIONS for complex fluids

## Fluid Handling Compliance and Innovation



### CHALLENGE

- Reverse-out package to handle high volumes of methanol, oil, and gas



### SOLUTION

- CETCO Energy Services (CETCO), designed a package to handle maximum fluid in a minimal footprint



### RESULTS

- Increased fluid holding volume and rate capacity, utilizing deck space while eliminating HSE concerns

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### CHALLENGE

CETCO was contacted to provide a reverse-out package of high volumes of methanol, oil, and gas on a deep water drillship in the Gulf of Mexico. On other locations, the Client had previously used open-top tanks and locally-vented gas busters for this application, but this did not meet the desired level of compliance. The Client needed to accommodate a 7,200 bbl/day max liquid rate, a 6,000 MMscfd max gas rate, a fluid holding capacity of about 600 bbl, and a max allowable working pressure of 15,000 psi on all components upstream of the choke, while also complying with location and regulatory standards.

### CETCO SOLUTION

After initial review of drilling contractor's standards and scope of work, it was determined remote venting and reclassification of the rig was required for this operation. CETCO assembled P&IDs, a safe chart, MTRs, a dispersion study, and a general arrangement for submission to regulatory groups and approving parties. With all parties' approval, the drillship's well test area was used to house the reverse-out package, which included three 300-bbl vertical, 400-series tanks and two custom cold vent booms. Due to deck capacity, spreader beams were installed under the 300-bbl vertical tanks to disperse the load.

The CETCO reverse-out package was designed to handle maximal fluid output in a minimum footprint. The choke manifold was used as a 15,000 psi pressure control and isolation device between the tanks and rig tie-in point. The 300-bbl tanks offered a total fluid holding capacity of 900 bbls. CETCO installed 25' spreader beams to increase the tanks' footprint and decrease deck loading. All fluid returns were batch-treated with biocide to decrease the likelihood of H<sub>2</sub>S generation. Gas was cold vented remotely, either through port or starboard vent booms, via a gas-diverting manifold.

Vent booms were designed 20' in length, from the edge of the rig to the tip of the vent, in compliance with our gas dispersion study, and API RP 500. Fluid transfer was efficiently managed with the 100 series 3" diaphragm pump skid. A closed-system filling operation was used when transferring fluid from the 300-bbl vertical tanks to the 25-bbl MPTs, returning the atmosphere within the 25-bbl MPTs to the 300-bbl tanks. A nitrogen purge system was used during both start-up and fluid transfer to ensure inert atmosphere within the tanks. LEL concentrations were monitored throughout the operation in both the well test area and along the edge of the rig. All safety systems were function tested on location in compliance with API RP 14C. The CETCO reverse-out package was operated by two specialists per 12-hour shift throughout operation.

### RESULTS

CETCO exceeded Client expectations with increased fluid holding volume, rate capacity, and thorough documentation to support the package design. The Client was able to sweep the wells free of hydrocarbons before pulling tubing. This eliminated the previous HSE concerns and non-productive time. Regulatory groups and approving parties accepted all submissions without resubmission or modifications. CETCO's innovative equipment design and expertly-trained personnel were cited as crucial to the overall success of the operation.

