REPLACING FULL MOORING SYSTEM FOR COOEC IN THE SOUTH CHINA SEA
Project summary

COOEC required the replacement of a full mooring system in Panyu 4-2/5-1 oil field. Utilising the specialisms of three Acteon companies, we were able to undertake detailed procedures and SIMOPS documentation to allow replacement mooring components to be deployed less than a meter from existing moorings.

The challenge:
This project presented multiple challenges. The client supplied vessel (a pipe laying vessel to be used for pile installation) was unconventional for this work. Additionally, 2 large vessels in close proximity (less than 1 meter apart) meant increased risks and complexities. Lastly, the chain in use wasn’t specified so contingency planning was necessary.

The Acteon FLS approach:
The conventional approach would have been to disconnect the FPSO and move it away before commencing the work, however, stopping production is very expensive. Our expertise and thorough planning allowed for simultaneous operations using tailor made methodologies whilst safely managing risks and constraints.

The results:
Employing a pragmatic approach allowed us to successfully manage risks and safely deliver the project without disrupting operations. We did this by applying our specialist expertise to build in contingencies which were required by project complexities. As a result, the project saved an estimated 7 weeks of NPT (non-productive time) with a potential value in excess of USD 40m.
Scope of work

<table>
<thead>
<tr>
<th>Site details</th>
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<tbody>
<tr>
<td>Location</td>
<td>Panyu 4-2/5-1 oil field is located in block 15/34 South China Sea</td>
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<tr>
<td>Region</td>
<td>South China Sea</td>
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<tr>
<td>Water depth</td>
<td>345ft (105m)</td>
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<td>Date</td>
<td>Q1-Q2 2014</td>
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• Full mooring system replacement
• Onshore and offshore project management, installation engineering, installation procedures and offshore personnel
• Installation of nine suction pile anchors and pre-set moorings for an APL buoy system within existing mooring pattern
• Assist COOEC with FPSO hook-up
• FPSO to remain connected and in service throughout
• Suction piles: 7.5m Ø 13m length 130t
Key parties and assets

Client(s):
• COOEC

Acteon Group contractors:
• Aquatic:
  Modular drive system, tensioner solution, offshore support personnel
• InterMoor:
  Onshore and offshore project management, installation engineering and procedures development, installation of suction piles and pre-set moorings
• Seatronics:
  Subsea suction pumps, offshore support personnel

Key assets:
• Maersk Attender AHTS
• SK1200 crane barge
Challenges

FPSO’s existing moorings remained in place resulting in tight tolerances for installing the system and SIMOPS in close proximity to FPSO (less than one metre).

Client-supplied vessel was a pipe laying vessel requiring detailed planning and procedures to allow piles, wire and chain to be deployed simultaneously.

At the last minute, the lengths of the upper chain sections were found to be different from those specified.
Detailed procedures and SIMOPS documentation were developed to allow mooring components to be deployed less than a meter from existing moorings and allow vessel to work safely in close proximity to the FPSO and offtake tankers without any interruption to production.

Client-supplied vessel was a pipe laying vessel requiring detailed planning and procedures to allow piles, wire and chain to be deployed simultaneously, saving time and cost.

A method was developed whereby each pile could be installed with its lower chain section and the wire section attached, which eliminated the associated subsea connections and saved time and money.

InterMoor developed new procedures to deploy chain from deck rather than gypsy to overcome delays.
Outcomes

Deployment of up to five suction piles in a single run offshore.

Installation was completed safely and on schedule with minimum disruption, despite the last-minute changes required when the lengths of the upper chain sections were found to be different from those specified.

The pre-set mooring system was successfully completed by InterMoor in May 2014 with zero LTIs.

Client was able to maintain production on the FPSO throughout the installation with no downtime.