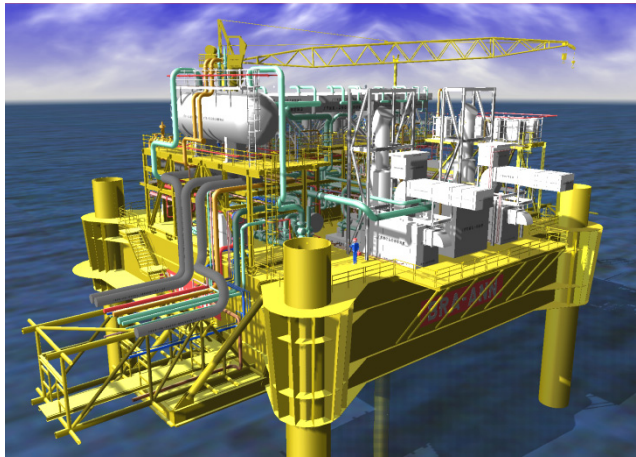


TALISMAN MALAYSIA EAST BUNGA RAYA - BR-D PLATFORM Substructure and MOAB Installation

In January 2002, ICON engineering was engaged by Talisman Malaysia to undertake the installation engineering for Clough Offshore on the Bunga Raya D Platform Substructure and Topsides Installation.

The platform to be installed was a Mobile Offshore Application Barge (MOAB) structure. The platform is used as a booster platform and is in 53.5m of water at the Bunga Raya field.



As installed Graphic

The facilities installation consisted of two floating components.

The **Substructure** is a four legged floating jacket complete with integrated suction can foundations at the base of each leg. The substructure was wet towed from the fabricators yard to the field. The substructure was then ballasted down and lowered to the seabed using assistance from a derrick barge crane. The pre-installed suction pumps were then used to complete the substructure installation.

Substructure under tow



ICON developed the installation procedures including detailed stability analysis for the tow and sinking of the substructure. A number of options were investigated for the lowering including the use of a lowering barge and support buoys. ICON performed geotechnical installation analysis, selected the suction pumps for installation of the suction piles and designed the ballasting umbilical system.



Substructure during ballasting for Installation

The **MOAB** Deck is self floating. The structure is of a barge type very similar to the hull of a jack up barge. Four unbraced legs, which have a diameter 2.6 m, were pre-installed through the main deck.



MOAB topside floated over substructure



MOAB topside elevated into position

The jackup legs were lowered down to stab in to cones on the substructure and then used to jack the 3120 t topsides to the design elevation.

Platform Data

Water Depth	53.5 m LAT
Substructure	1200 t, with 4 x Ø2.6m braced vertical legs to EL-20m at 31m x 31m centres
Foundation	4 x Ø9m x 8.3m high integrated suction piles
Topsides	3120t including a 30m x 30m x 7m deep MOAB (1000t), 1400t of topsides equipment and 720t of jackup legs)