

## TALISMAN MALAYSIA LIMITED BR-A ANNEXE – BRACED MONOPODS

### Conceptual design & installation engineering, offshore Malaysia

ICON Engineering was contracted by Talisman Malaysia Limited (TML) to provide the conceptual design & installation engineering, followed by the structural & geotechnical detailed design for the BR-A Annexe Monopods.

The Annexe is located in 54m of water in the Gulf of Thailand offshore Malaysia and is braced back to the existing BR-A CPP. The Annexe provides an additional plan deck area of 470m<sup>2</sup> for the support of 2no. 600t modules, a laydown area and hydraulic crane.

Icon initially screened various options to provide support for 2 no. 600t modules on/around the existing BR-A. Limiting deck space and existing BR-A pile capacities precluded attaching the modules to the platform therefore a separate annex structure was selected. The annexe comprises 2 monopods with a single suction pile each at the base.

The monopod caissons are braced back to the existing BR-A jacket at El.+3.000m. Lateral (environmental) support is provided by the existing platform whilst vertical (dead) load is transferred down the monopods and into the seabed.



Conceptual sketch of Annexe (MSF and BR-A not shown for clarity)

The monopod profile mitigates environmental loading and subsequently the lateral load into the existing platform. The seabed was ideally suited to a suction pile and a large vertical capacity was achieved. Differential settlement was factored into the design. Existing stock steel owned by TML was utilised substantially in the design of all components.

The lateral braces were installed first, pinned to the jacket and temporarily supported using slings back to the topsides. The monopods were floated out to location, upended by a crane barge and located into the open guide clamps. An option existed to use ballast tanks to



First monopod located into lateral braces

upend the monopods and float them into position. However in this instance TML had the services of a crane barge therefore this was not required.

After installation of both monopods, the MSF was lifted into position using the crane barge followed by the first of two planned process modules.

By using the braced suction pile monopod concept, the design and installation was simplified and the cost was significantly lower than installing an adjacent stand-alone structure. The BR-A Annexe Monopods were installed August 2006.



BRA Annexe installed with first process module in place

#### Platform Data

Water depth	54 m
Braces	54 t
Monopod weight	260 t (each x 2no.)
MSF weight	310 t
Suction pile size	8.0m diameter, 9.0m deep
Deck area provided	470m <sup>2</sup>