APACHE ENERGY LTD
SHALLOW WATER MINIMAL MONOPODS

Design and Installation – North West Shelf of Western Australia

ICON Engineering was commissioned by the Apache Energy Drilling Group to design shallow water monopod structures using specially reinforced 30" conductors as the platform legs. The philosophy requires that the conductors not only serve as surface casings of exploration wells, but they can also be retained for later conversion to minimal offshore structures in the event that a discovery is made.

Apache has used some seven of these structures on high probability wells in waters ranging to 6 m depth adjacent to their Carnarvon Basin production hub on Varanus Island. Six of these seven conductors were retained and supported completed and suspended wells, until design and fabrication of topsides modules and installation of connecting flowlines could be completed.

ICON documented the designs in such a manner that they could be retrospectively validated by a certification body at the time that they were completed as structures.

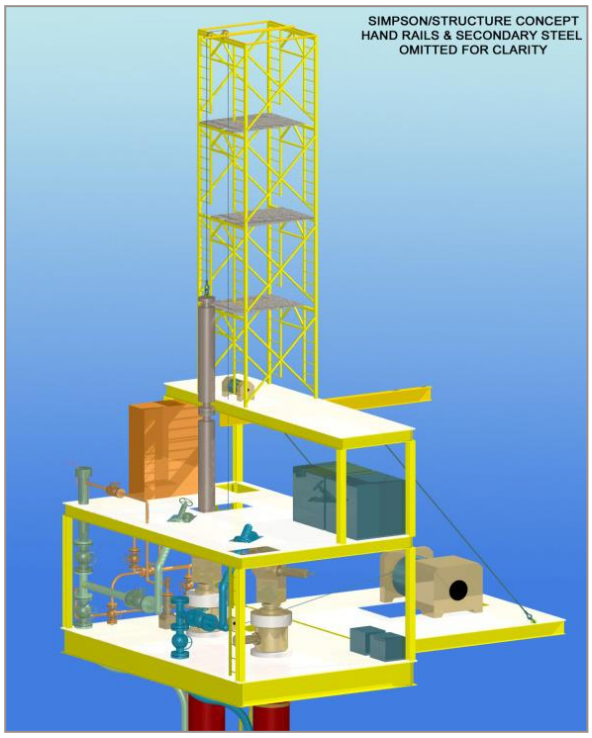
Several generic topsides modules were designed to provide Apache with a flexible array of platform completion options. Topsides modules were detailed for:

- Gas lifted oil production
- Produced water injection (for disposal)
- Gas production

A pair of "Minnowpod" conductors, completed and suspended, awaiting installation of topsides

Topsides modules have also been developed for both single and dual well configurations.

The Client achieved a rapid realization of satellite production facility from discovery well. The structure and completed wells were invariably ready for production ahead of subsea pipelines and onshore receival facilities.



A typical 2 well "Minnowpod" configured for gaslifted production from one well and water disposal into the other. Self-erecting wireline equipment is also shown.

Key Features of this concept included:

- The substructures can be transported to Site, handled and installed as drill casings;
- The structure topsides can be readily fabricated in locally available manufacturing facilities;
- Transportation and installation can be performed with cost effective locally available plant and vessels; and
- The topsides have been detailed to accommodate self-erecting wireline workover decks and masts to allow rapid well intervention without the need to remobilize a jack-up drilling rig.

Installation

ICON typically provides representation on the drilling rig during conductor setting, to verify integrity of cementing and to capture key dimensional data for use in subsequent detailed design and validation of the complete structure.

Hookup and Commissioning

Hook-up and commissioning of these platforms are minimal due to their simplicity and given that all systems except those directly interfaced with the wells are fully pre-commissioned onshore.

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