

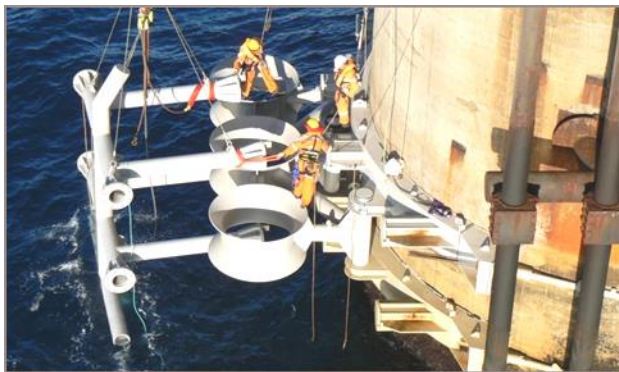
VERMILION ENERGY WANDOO B WELLBAY EXTENSION Design and Installation

ICON Engineering was commissioned by Vermilion Energy to review the feasibility of a platform extension with tensioned conductors to provide another three conductor slots on the Wandoo B platform. The platform is a concrete gravity base structure with all existing conductors located inside one of the main legs.

Analysis of the structure determined the preferred solution was to use rigid conductors supported at water level by a conductor guide which also provided boat impact protection to the conductors. The module extension was designed to be installed in pieces limited by the platform crane capacity of approximately 8 tonnes at the desired radius.



Completed conductor guides and riser protection



Installation of conductor protection frame

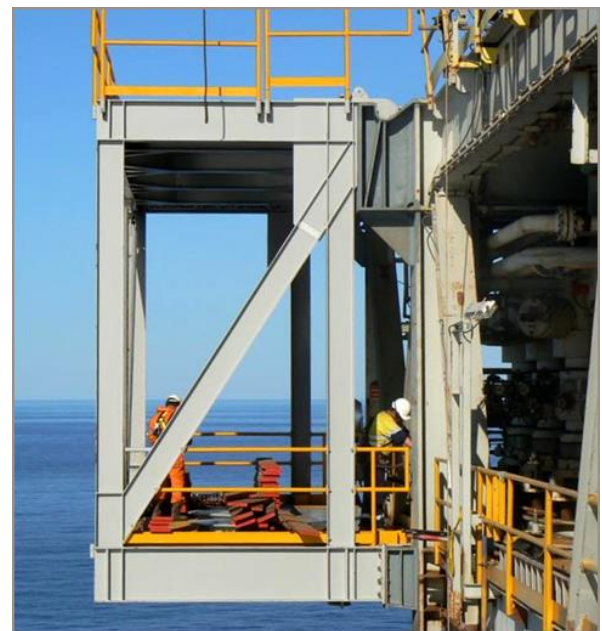
Work Scope

- Conceptual design and option study
- Structural design of module extension, conductors, conductor guides, boat impact protection and seabed template
- Management of fabrication
- Offshore installation

Challenges

- Minimal or no platform shutdown allowed. Requirement for vessel impact protection demanded a heavy structure to be built in the splash zone.
- 8t crane lift limitation and crane availability
- Very short access windows for bumper and conductor guide installation limited by a) low tide b) calm seastate c) daytime work only
- Gravel scour protection on the seabed which had to be removed to allow drilling and template installation
- Utilisation of a shutdown just after project commencement to undertake hot work for module installation
- Survey and positioning of template, conductor guides and topsides modules

The installation of topsides was done by extending the rig cantilever beyond the jacket, picking up the topsides and skidding back under load to set the topsides onto the jacket for weldout.



Installation of the deck extension using module hung off pre-installed brackets

Innovative solutions used

To meet the challenges there were a significant number of innovations applied to this project:

- The use of post tensioned bands to clamp conductor guides and boat bumper to leg
- Sacrificial boat bumper designed to absorb impact energy by progressive collapse
- Boat bumper constructed from components weighing less than 7 tonnes
- The use of topsides supported on hooks which were installed during a planned shutdown just after project commencement and before module design was completed.