

Cliff Head A – HWU Structural Design & Installation

Client: Roc Oil WA Pty Ltd

Overview

AEC was engaged by Roc Oil to perform detailed design, fabrication support and installation engineering of a bi-directional skidding system for a temporary hydraulic work over unit (HWU) and laydown area onto the Cliff Head A platform off the coast of Dongara, Western Australia. A stick build HWU was preferred over the use of a jack-up rig from a cost viewpoint.

The Challenge

The platform’s original topsides installed weight was approximately 500t. The additional HWU structure and equipment had an estimated weight of 315t. Jacking forces of up to 210t and other live loads resulted in a maximum combined topsides weight of 1,426t. The ability of the facility to support the extra loads was not known before the start of the assessment. Also, given the small size of the facility, efficient use of deck space and constructability were key issues. The entire system was to be installed using the platform’s existing 20t WLL crane.

The Solution

A modular structural system was developed to maximise pre-fabrication. Vendor units were placed on the existing main deck. A temporary laydown area was supported on elevated skid rails on the next level. This was connected to the main sub-base which skids east-west on heavy duty rails. The upper tier structure supporting the HWU jack was supported on north-south skid rails on the sub-base. This enabled installation of the heavy system components within reach of the crane before skidding to the required well slot.

AEC updated the existing jacket and topsides models using SACS analysis software and incorporated as-built data. Detailed analysis of the topsides and jackets was carried out for each of 9 well slot locations to determine the critical pull load allowed over each well. AEC’s structural assessment was reviewed and approved by Lloyds Register.

AEC provided full implementation support including detailed installation workpacks, lift plans and attendance during fabrication, trial assembly and offshore installation.

Outcome

The HWU system was installed on the facility over a period of 3 weeks without the need for any site modifications. It operated for approximately 10 weeks until it successfully completed its intended scope and was demobilised to Dongara for storage until it is next required.

