

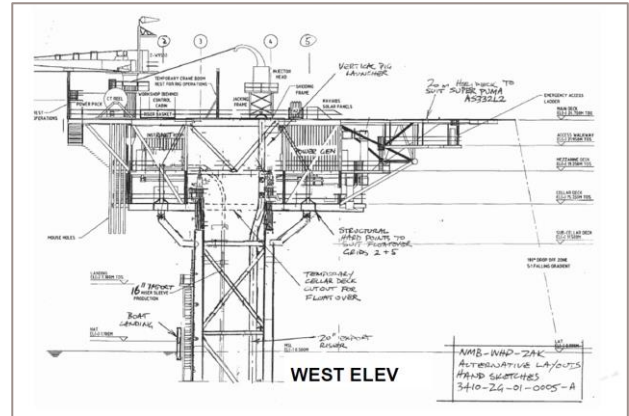
## HESS CORPORATION NMB ZAK WELLHEAD PLATFORMS Value Engineering Study, South China Sea

ICON Engineering was contracted by Hess Corporation via DRL Engineering to review and carry out value engineering on an existing conceptual design of a wellhead platform (WHP) for use in the North Malay Basin field in 57m water depth in the South China Sea.

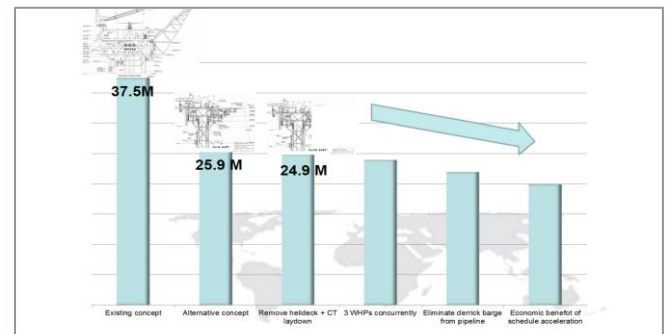
The scope included proposing lighter alternative designs, benchmarking the design against existing WHPs and carrying out a cost study of potential savings.

The design changes for the alternative WHP design included:

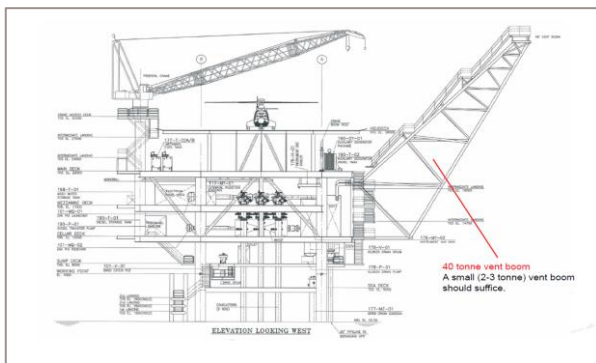
- Weight step change to a minimal platform
- Remove substantial areas of unused deck
- Provision for tender assisted coiled tubing
- Crane to suit CT packages, reach all of main deck
- Helideck to suit Super Puma AS322L2
- Substantial reduction in vent boom size
- Lower helideck to same level as main deck
- Use of a vertical pig launcher to save space
- Minimise jacket structure in wave zone
- Reduced leg spacing from 16mx12m to 6mx6m
- Open up alternatives to derrick barge installation



Elevation of revised design



Cost saving step changes

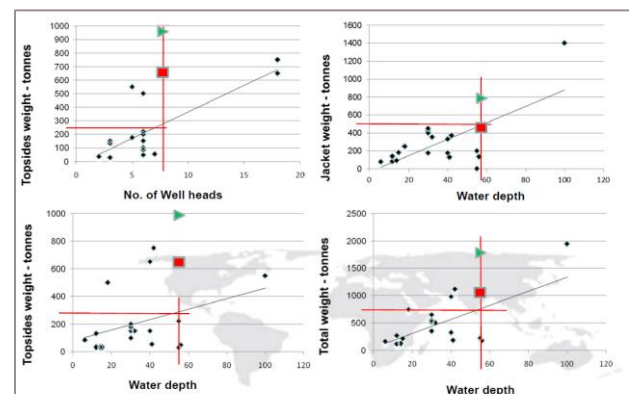


Elevation of existing design

As a result of the redesign measures, the estimated weight of the topside could be reduced from 960 t to 670 t (30%) and the jacket from 795 t to 483 t (39%). This would allow reduction in fabrication, material and transport costs by an estimated 30%.

Another significant benefit of the reduced jacket weights was the option of now being able to install the jacket using a jack-up rig in lieu of a derrick barge. Similarly, the reduced topside weight opened up an option to install the topsides by float over in lieu of a derrick barge. This enables significant cost savings and schedule flexibility by removing the need to enter a schedule queue for a derrick barge as well as substantial weather standby costs.

The original and alternative design were bench-marked against WHPs installed over the past 15 years in the region by considering the number of wellheads, the weight of the jacket and the weight of the topsides. It was found that both the jacket and the topside from the original design were considerably heavier than the other WHPs installed in the same depth of water and with the same number of well heads. The alternative design brought the jacket and topside weights closer to benchmark averages. Opportunities to further refine the design were also identified giving latitude for additional weight reductions.



Bench-marking of topside and jacket weights