

CASE STUDY - Sub Sea Window Machining

- **Requirement:** A 26-1/2" conductor required a 1.3 x 0.45m window machining with 50mm radii 9m from the sea bed for a mud dump vent clamp to be fitted.

Cold cutting was specified due to the 26-1/2" conductor housing 13-3/8" casing and a power line that could not be damaged during cutting.

- **Location:** Apache North Sea – Forties Delta – 115m water depth
- **Equipment:** Mirage gantry GM2000 and milling rail MR1500 were modified for sub sea use and a pipe clamp with chain tensioning produced to allow the diver to clamp the machine onto the conductor.

The four corners were pilot drilled and then the 4 off 100mm diameter holes were trepanned at fixed centres with hydraulic valves acting as datum point stops. The gantry system was then used to mill between the corners to produce the window and the cut out portion of the conductor was retained by cross member clamps with drilled and tapped holes in the conductor.

Drilling and trepanning – 45 minutes per hole, machining top, bottom and sides through conductor thickness – total machining time 2 days.



The gantry system in place at 115m water depth with the two top holes drilled and top slot milled through and right hand slot of the rectangle part milled.

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The gantry system chain clamp and diver operation which we were able to keep to a minimum by using hydraulic stops and auto feeds on the main axis.



The milling rail mounted onto the Gantry system, large hand wheel for the diver to control the in feed. The auto stop hydraulic valves controlled the size of the window and spindle positioning.



The full mock up FAT trials in our UK works including the demonstration of removal of gantry system and machined window and full diver training DVD.

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