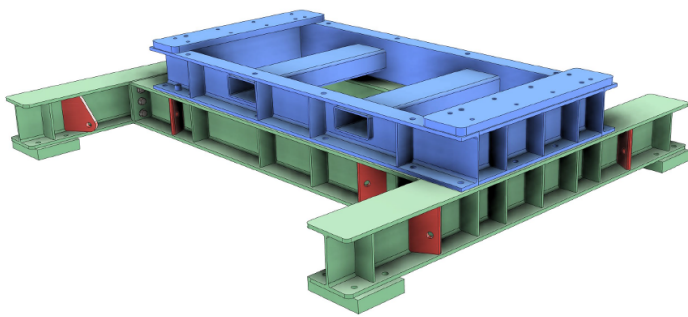
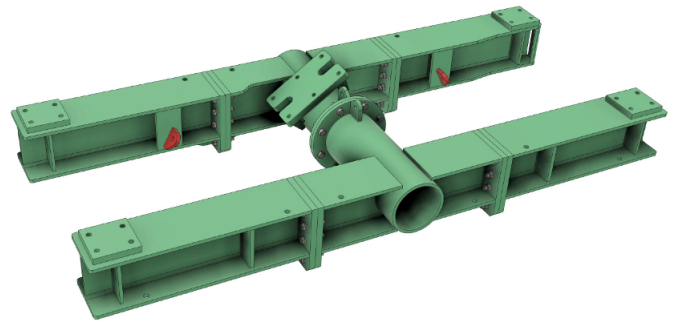


Client: North Sea Operator

Project: Umbilical Installation



Assembled grillage with winch base



Assembled frame

### Background

A new electro-hydraulic umbilical was required to be installed between a north sea platform and nearby manifold. The umbilical was required to be pulled through an existing J-tube, however, due to topside J-tube opening and umbilical hang off location being sited between existing infrastructure, in a heavily congested area with restricted head height, made the pull in operation complex.

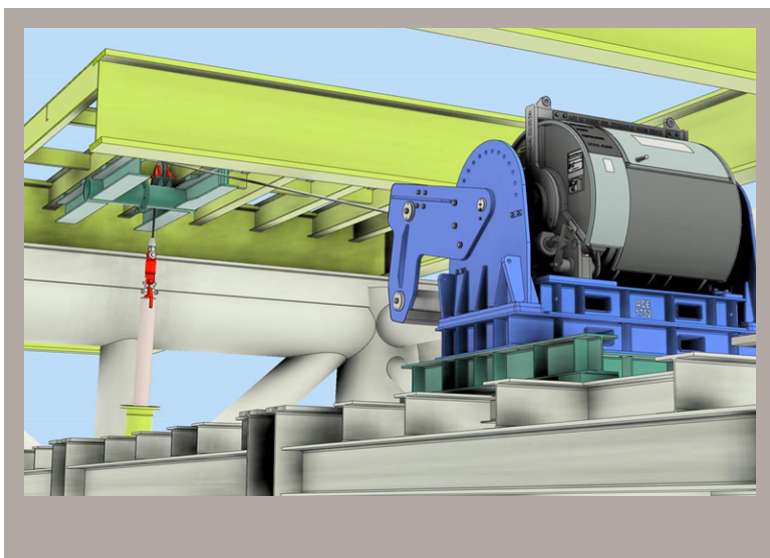
Some of the complexities dealt with during Elgenio's scope were as follows:

- Limited information due to age of asset
- Congested area with sensitive pipework essential for platform production
- Limited head height for overpull during pull in
- Balancing engineering solutions based on minimal platform impact

### Task

Concept proposal phase to screen various pull in options:

- Site visit to determine methodology and gather information on potential options
- Pull in analysis to determine winch loadings to specify topside equipment
- Winch pull In system design, sheave frame design, destruct and installation sequences for installing winch to platform
- Seafastening design for umbilical lay spread. Reel drive system, tensioner, reel, winches etc.
- Installation analysis for umbilical lay
- Project draughting support including integration of point cloud survey
- Technical animation covering all project related activities



### Challenges

Highly complex pull in arrangement that was fundamental to the success of the project and required a unique engineering solution to enable the next stages of the project.

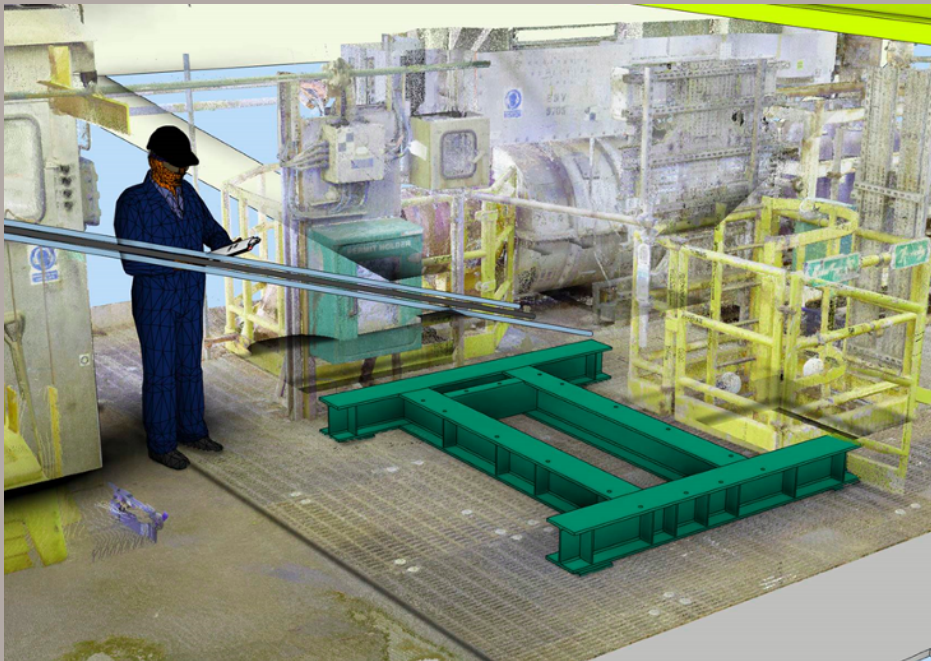
### The Solution

Point Cloud Data was used to identify potential solutions and clashes with proposed modification prior to site visit which allowed for optimum use of time during site visit.

Pull in analysis allowed for optimised winch system and accurate specification of equipment.

Winch and pull in system were made as small as possible to allow transfer offshore and to be built in situ and load tested. Bolted connections were used throughout to aid in reducing individual part size.

Solving the complex pull in provided the basis for a successful project and installation campaign.



*Solving the complex pull in provided the basis for a successful project and installation.*