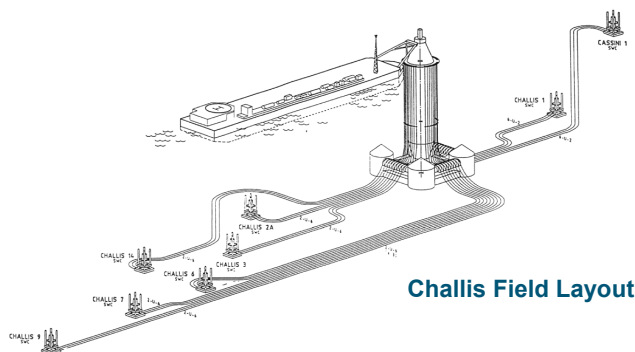


## NEWFIELD PETROLEUM / COOGEE RESOURCES

### Challis Field Abandonment Studies

In February 2003, ICON Engineering was employed by Newfield Petroleum to perform a study of the abandonment of the Challis Field.

The Challis Field is located approximately 650km west of Darwin. The water depth is approximately 106m. The field comprises 17 wells drilled in the Challis and Cassini fields. The product from these wells is fed back to the Challis Riser Turret (RTM) via flowlines.



The FPSO Challis Venture is connected to the 10.5m diameter SALM riser via a yoke. The SALM is secured to the seabed by a gravity base.

#### The scope of the study included:

- investigate the options for removing the Challis Venture (CV) from the SALM riser. These included reverse of installation procedure, explosives, cutting etc
- identify issues associated with leaving the CV riser floating near vertical after CV removed
- investigate methodology for toppling the riser in place after CV has been disconnected.
- assess cost, technical risk and safety risks associated with all options
- investigation and costing for the option of severing the SALM at the universal joint and recovering the SALM for onshore scrapping



**Challis Venture FPSO Connected to RTM**

Key features of the study included:

#### Naval Architect Services

The work utilised ICON's naval architecture capability to review the behaviour of the 450 tonne yoke and SALM during a sudden disconnection sequence (eg if explosives were used). A detailed analysis was undertaken for the sequential ballasting process needed to topple the SALM in a controlled orientation.

Our naval architecture group also analysed the SALM in a free floating condition under tow to a scrapping location.



**Possible Yoke cutting location**

#### Study of explosive cutting techniques

A detailed study of the use of shaped charges to sever the yoke was undertaken. This option was compared to mechanical means of disconnection such as flame cutting or removal of pins from articulation points.

#### Study of cutting methods for severing the universal joint

Cutting options for the universal joint were investigated.

Methods studied included

- abrasive water jet
- diamond wire cutting
- explosives

The above methods were compared and recommendations as to the proposed method and location of cut were made.

#### Transportation of SALM to disposal location

A review of available heavy lift and submersible transportation vessels was undertaken. The option of a wet tow was also considered.

Recommendations were made regarding the technical and commercial merits of the various options.