

An SSIV Location Optimisation Study and updated report [22] was performed to identify the optimal location of the SSIVs relative to the CPF, and hence the distance of the GERB's from the CPF to:

- reduce the inventory available within the riser between the riser SDV and SSIV to reduce fire durations topsides.
- be sufficiently distant from the platform to prevent a dropped object from the platform impacting the un-isolatable section of the line (i.e. downstream of the SSIV).

The GEP riser SSIVs are automatically closed by the CPF Integrated Control & Safety System (ICSS) on confirmation of fire or high gas concentration in the riser balcony area, or on activation of an emergency shutdown level ESD0, as detailed in the CPF cause and effect charts [23].

The GERB module 3 includes provision for connection of a temporary subsea pig launcher, via a 42 inch header, for inspection pigging of the GEP. The subsea pig launcher is intended to be stored onshore and deployed to the GERB's when required.

#### **2.2.4 Pipeline End Termination and Export Tie-in Spool**

A 42 inch export tie-in spool connects the GEP to GERB module 3 piping.

The PLET supports the 42 inch connector between the export tie-in spool and the end of the GEP. The skid that holds the connector is free to slide across a mudmat foundation to allow relief of GEP end expansion forces.

#### **2.2.5 Hot Tap Tees and Removable Spool**

Five hot tap tees are provided along the GEP route to facilitate future midline tie-in of pipelines from other fields.

The hot tap tees are welded inline and comprise:

- A 42" x 20" tee main body with sealed branch (i.e. not pre-drilled) which will be orientated with the branch vertically up, thus preventing dead leg corrosion issues;
- a diverless subsea connector hub welded to the branch with a protection cap; and
- an overtrawlable protection shroud.

No pigging bars are required to be used as the tee geometry does not necessitate their use. Additionally, pigging bars are prone to overstress and potential failure during S-lay installation and fatigue failure during operation.

A removable spool is also installed to allow connection of a future compression platform (if required).

The removable spool consists of a 48m straight pipe section with flange sets at each end. The flanges are provided with shrouds to provide protection during installation and to provide anti-snag protection during the operational life of the pipeline.