TALISMAN ENERGY

PIPER BRAVO

Last Updated: February 2011

The Piper field lies in block 15/17 of the United Kingdom Continental Shelf located 193km north east of Aberdeen in the Central North Sea. Located at co-ordinates 58°27'41"N, 00°15'04" E, the Piper 'B' platform stands in approximately 145m of water. Piper 'B' is an eight-legged fixed steel jacket supported platform. The Piper 'B' was installed in 1992, and commenced production in February 1993.

Piper 'B's process facilities separate production from the Piper, Saltire, Chanter, Iona and Tweedsmuir reservoirs into oil, natural gas liquids (NGLs) and dry gas. The platform receives oil from the MacCulloch field for onward transmission to Flotta. Piper also receives gas from the MacCulloch and Dumbarton fields.

OPERATIONAL INFORMATION

Licence	P.220	
Licensees	Talisman Energy (UK) Limited **(Op)**	20.2770%
	Talisman North Sea Limited	16.6670%
	Transworld Petroleum (U.K.) Limited	23.5000%
	Transworld Energy Alpha Limited	19.5560%
	ENI UK Limited	20.0000%
Platform Type	Eight-legged steel jacket	
Platform Weight	Topside	33,900 tonnes
	Jacket	40,400 tonnes
	TOTAL	74,300 tonnes
Drilling	Platform slots,	24
	Pre-drilled wells	8
Wells	Production	12
	Injection	5
Nearest Installations	Saltire	7.4 km
	Tartan	18 km

Nearest Installations	Claymore	35 km
Associated Fields	Tweedsmuir	Subsea Tieback, 2 producers + 2 injectors
	Chanter	1 producer + 1 injector (drilled from Saltire)
	Iona	1 producer (drilled from Saltire)
	Saltire	Oil and gas processing
	MacCulloch	Oil received for onward transmission, gas received for processing
	Dumbarton	Gas received for processing

CAPACITY PROJECTION

The platform process system is nominally designed for the following quantities. However, peak flow rates may exceed these values based on analysis of the production profiles and the actual equipment capacities at that time.

Description	Unit	Max Capacity	Projected ullage (% of maximum capacity)				
			2011	2012	2013	2014	2015
Piper Separator	BPD	212,000	🟡	🟡	🟡	🟡	🟡
Tweedsmuir Separator	BPD	57,000	🟡	🟡	🟡	🟡	🟡
Oil Export	BPD	140,000	🟢	🟢	🟢	🟢	🟢
Piper Produced Water	BPD	220,000	🟡	🟡	🟡	🟡	🟡
Tweedsmuir Produced Water	BPD	36.500	🟢	🟢	🟢	🟢	🟢
Piper Water Injection	BPD	107,000	🟢	🟢	🟢	🟢	🟢
Piper 1st Compressor	MMscfd	140	🔴	🔴	🔴	🔴	🔴
Piper Sweetening	MMscfd	140	🟢	🟢	🟢	🟢	🟢
Tweedsmuir 1st Compressor	MMscfd	140	🔴	🟢	🟢	🟢	🟢
Tweedsmuir Sweetening	MMscfd	54	🔴	🟢	🟢	🟢	🟢
2nd Stage Compression	MMscfd	140	🟡	🟡	🟡	🟢	🟢
Gas Dehydration	MMscfd	108	🟡	🟡	🟡	🟡	🟡
NGL recovery	MMscfd	108	🟡	🟡	🟡	🟡	🟡
3rd Stage Compression	MMscfd	84	🟡	🟡	🟡	🟡	🟡

Available Capacities:	🟢	> 25%
	🟡	5% to 25%
	🔴	< 5%

PRIMARY SEPARATION PROCESSING FACILITIES

Piper/Saltire

The Piper/Saltire fluids are separated in Piper Separator C-2200 operating at a pressure of circa 9 barg at 70°C. The oil phase is drawn from the separator by Piper Booster Pumps G-2210A/B/C and pumped via Metering Package V-2500 to the MOL suction manifold. MOL Pumps G-2600A/B/C pump the final production through the subsea pipeline to the Flotta Terminal.

Off-gas from the Piper Separator is cooled in Piper Separator Gas Coolers E-2220A/B resulting in some condensate and water drop-out. The condensate is removed in Piper Condensate KO Drum C-2230 and returned by Piper LP Condensate Pumps G-2240A/B to the Piper Separator. The off-gas from the condensate knockout drum passes to the 1st stage gas compression facilities.

The produced water separated in the Piper separator is routed to the produced water clean-up facilities comprising Hydrocyclone Package V-2860 and produced Water Degasser C-2820 prior to discharge overboard.

Tweedsmuir

Tweedsmuir fluid bulk gas / liquid separation occurs in the Slug Suppression System C-2900 which operates at about 11 barg. The gas is routed via the Tweedsmuir Condensate KO drum to the Trim Cooler for further water/condensate removal.

The liquids from the Slug Suppression System are routed via the Tweedsmuir Heater E-2920 to the 3-phase Tweedsmuir Separator C-2300.The gas from the Tweedsmuir Separator flows to the Tweedsmuir KO drum either directly (Separator in HP mode) or via Eductor K-2300 (Separator in LP mode). Eductor K-2301 is used for pipeline depressurisation and Cold Restart.

Oil from the Tweedsmuir Separator is routed to Crude Oil Booster Pumps G-2310A/B and is then metered and exported via the MOL Pumps to Flotta with the Piper oil.

Produced water from the Tweedsmuir Separator is passed through hydrocyclones and a degasser before being discharged overboard.

GAS TREATMENT FACILITIES

Gas originating from the Piper B and Tweedsmuir Oil Separation Systems undergoes compression and treatment processes to make it suitable for use as:

- Lift Gas for Piper B, Chanter, Tweedsmuir and Saltire A fields
- Platform fuel gas
- Export/sales gas

Gas treatment consists of sweetening, dehydration and NGL recovery. In gas sweetening, H2S/CO2 are removed by passing gas against Amine solution (MDEA in Piper B GSP & UCARSOL AP806 in Tweedsmuir GSP) in a contactor tower. The gas from the Piper and Tweedsmuir Oil Separation Systems is treated by dedicated gas sweetening systems. In gas dehydration, water is removed by adsorption onto a molecular sieve bed. Finally, NGLs are removed by cooling of the gas as it expands across Joule Thomson (J-T) valves.

MacCulloch gas ties in downstream of second stage compression system, but upstream of the gas dehydration units since additional drying is required to meet the Piper export gas specification.

Treated gas which is surplus to lift gas and fuel gas requirements is exported to onshore facilities.

PIPELINES

Oil Export	30" * 33.8km Joins main oil line to Flotta Pipeline 4.5km
Gas Export	16" * 1.8km + 18" *53km Joins gas pipeline system to St Fergus Terminal and links in to the Claymore gas import line
Piper 'B' – Saltire	40" * 7.4km Interfield Pipeline Bundle containing: 10" multiphase oil/gas import from Saltire 16" water injection to Saltire 8" gas lift to Saltire
Crude Oil from MacCulloch	10" * 35km
Gas from MacCulloch/Dumbarton	6" * 35km

ENTRY SPECIFICATION

Subject to discussion and negotiation

EXIT SPECIFICATION

Crude Oil Export	Set by Flotta Pipeline System entry requirements
Gas Export	Set by St Fergus entry requirements
Produced Water (Prevention of Oil Pollution Act 1971)	< 30 mg/L oil in water