

## **BUZZARD INSTALLATION**

### **DESCRIPTION OF INFRASTRUCTURE**



The Buzzard complex comprises four separate platforms each supported by steel jackets interconnected by three bridges. The four platforms are the wellhead platform W, the production platform P, the utilities/living quarter platform QU and the production sweetening platform PS.



- The W platform is a four-leg jacket supporting an integrated deck with conductors, wellhead trees, allowance for a potential modular drilling unit, and access to the wells and wellheads for heavy duty jack-up drilling rigs.
- The P platform is a four-leg jacket supporting an integrated deck with well fluid processing to export/import gas and oil export quality standards including acid gas removal. Other facilities include well water injection pumps, HP & LP flares, and lift gas compression. All export and injection risers plus spare risers for future expansion are also located on the P platform.
- The QU platform is a four-leg jacket supporting an integrated deck with living quarters, the main control room, offices and workshops, lifeboats, helideck, main and emergency power generation and utilities including seawater lift pumps and sulphate removal.
- The PS platform carries the oil stripper facilities to remove H<sub>2</sub>S from the oil to meet the Forties entry specification. The PS platform also includes spare risers for future expansion.

### **ENTRY SPECIFICATION**

The entry specification for any third-party tie back to the Buzzard Platform for offshore processing would be assessed on an individual basis. The existing facilities process sour well stream fluids.

## EXIT SPECIFICATION

Crude oil is exported via the Forties Pipelines System (FPS). The export stream meets contractual FPS entry specifications.

Gas is processed on the Buzzard facilities to meet the contractual FRIGG entry specifications and is exported via the FRIGG system to St Fergus where natural gas and natural gas liquids are separated. The natural gas is sent to the National Transmission System (NTS) and the natural gas liquids are either sent on to FPS or to the SEGAL natural gas liquids pipeline for further processing into specification products.

## PRIMARY SEPARATION PROCESSING FACILITIES

The Buzzard process systems are designed to process well stream fluids from the Buzzard reservoirs and export the separated oil and gas to shore. These primary separation facilities include a single, two-stage, three-phase, separation train, water injection and produced water disposal/re-injection.

The Buzzard Phase 2 project will install a new process module on the P platform, to receive fluids from the new wells being developed via a new subsea infrastructure. This process module includes a two-phase slug catcher, produced water treatment facilities, chemical injection, Subsea control systems and a Local Equipment Room. Installation and hook-up of the module has been rescheduled to 2021 to coincide with the delayed major FPS shutdown.

## GAS TREATMENT FACILITIES

The Buzzard gas is compressed and passed through a mercury removal bed before an acid gas removal unit to remove H<sub>2</sub>S and CO<sub>2</sub>. The gas then undergoes further H<sub>2</sub>S polishing, dehydration, hydrocarbon dew-pointing and further compression for gas lift and export. Please note that the Gas Export and Gas Lift maximum capacity values summarised in the following table are not coincident. Please note that the Gas Export and Gas Lift maximum capacity values that are summarised in *Table 2* cannot be achieved coincidentally.

## SUMMARY OF WEIGHT BUDGETS (Including the Buzzard Phase 2 Module)

The current weight position for each of the Buzzard platforms is summarised in below, with the spare tonnage highlighted in yellow.

Topside Weight (te.)	Platform			
	QU	P	PS	W
Dry	10,311	11,873	5,646	3,598
Operating	13,376	15,714	7,647	6,640
Not-To-Exceed (NTE)	15,000	15,750	11,000	8,000
Spare	1,624	36	3,353	1,360

*Table 1: Buzzard Weight Budget Summary*

### INDICATIVE SYSTEM CAPACITIES (Including the Buzzard Phase 2 Module)

Entry Specification	Sour Crude Oil
Exit Specification	Crude Oil exported via FPS. Gas exported via FRIGG.
Oil Export	216,000 bopd
Gas Compression	70 MMscfd
Gas Export	45 MMscfd
Gas Lift	60 MMscfd
Produced Water Handling	372,000 bwpd
Total Liquid Handling	400,000 blpd
H <sub>2</sub> S Removal	500 ppm by wt in the incoming well fluids
Dehydration	75 MMscfd
Treated Seawater	230,000 bwpd
Water Injection	364,000 bwpd

*Table 2: Summary of System Capacities*

ULLAGE	2021	2021	2022	2023	2025
Oil Export	G	G	G	G	G
Gas Compression	R	R	R	R	R
Gas Export	G	G	G	G	G
Gas Lift	R	R	R	R	R
Produced Water Handling	R	R	R	R	A
Total Liquid Handling	R	R	R	R	A
Gas Dehydration	R	R	R	R	R
Water Injection	A	A	A	A	A
Treated Sea Water	G	G	G	G	G

R	<5% Ullage
A	5% to ≤ 25%
G	> 25%

**Table 3: Indicative Summary of Ullage Available**

## RISER AVAILABILITY

The Buzzard development was designed with three pre-installed spare riser clusters on the P platform for future development opportunities. These are located within caissons RC1, RC2 and RC3. Each of these caissons includes a Production, Test, Gas lift, and Water Injection riser. The set of risers inside the RC1 caisson have subsequently been used by the Buzzard phase II development. As such, RC2 and RC3 riser clusters are available for future tie-back opportunities. Table 4 summarises the Buzzard risers. There are a further two spare risers on the PS platform; 10" Production (A-0401) and 8" Test (A-0405).

Ref	Platform	Caisson	Service	OD x thk (mm)	Bottom Elevation	Top Elevation
R1	Process Platform	None	18" Oil Export	466.6 x 17.5	-95.100	+22.728
R2			10" Gas Export	273.1 x 12.7	-95.100	+22.750
R3			16" Water Injection (to SWIM)	406.4 x 15.9 + 3mm CRA 625 cladding	-95.100	+22.622
R4			16" Water Injection (to CWIM)	406.4 x 15.9 + 3mm CRA 625 cladding	-95.100	+22.750
R5	Process Platform	RC1	10" Production (Future - Northern Area)	273.1 x 20.6	-94.900	+22.872
R6			10" Test (Future - Northern Area)	273.1 x 20.6	-94.900	+22.872
R7			4" Gas Lift (Future - Northern Area)	114.3 x 7.9	-95.350	+22.793
R8			10" Water Injection (Future - Northern Area)	273.1 x 20.6	-95.350	+22.872
R9	Process Platform	RC2	8" Production (Future – North Flank 1)	219.1 x 18.3	-94.900	+22.845
R10			8" Test (Future – North Flank 1)	219.1 x 18.3	-95.350	+22.845
R11			4" Gas Lift (Future – North Flank 1)	114.3 x 7.9	-95.350	+22.793
R12			8" Water Injection (Future – North Flank 1)	219.1 x 18.3	-94.900	+22.845
R13	Process Platform	RC3	8" Production (Future – North Flank 2)	219.1 x 18.3	-94.900	+22.845
R14			8" Test (Future – North Flank 2)	219.1 x 18.3	-95.350	+22.845
R15			4" Gas Lift (Future – North Flank 2)	114.3 x 7.9	-95.350	+22.713
R16			8" Water Injection (Future – North Flank 2)	219.1 x 18.3	-94.900	+22.845

**Table 4: Summary Listing of Pipeline Risers (P Platform)**

## **ADDITIONAL INFORMATION**

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