# Fast Facts

## Triton FPSO Bittern/Guillemot W & NW and Clapham Fields

## Overview

- Triton FPSO producing oil and gas from the Bittern, Guillemot West & North West fields Clapham and Pict and Saxon fields
- Location UK Central North Sea, Block 21/30, approximately 193km (120 miles) east of Aberdeen
- Joint project developed by Dana Petroleum and Shell Expro
- Integrated teams are led as follows:
  - FPSO – Dana (duty holder)
  - Bittern – Shell Expro
  - Guillemot W & NW – Dana Petroleum
- Clapham, Pict and Saxon fields developed as subsea tie-backs to the Triton FPSO by operator Dana Petroleum
- Fields tied back to FPSO via subsea facilities comprising a series of pipelines and manifolds:
  - – Bittern 20kms from FPSO
  - – Guillemot West 12kms from FPSO
- Plateau Production: Oil **92,000 b/d** Gas **130 mmcdf**
- Export Oil via shuttle tanker
- Gas via Fulmar gas line to St Fergus
- Drilling carried out by mobile drilling units over the respective fields.

| Triton owners | Bittern | Guillemot | Triton |
|---|---|---|---|
| Dana Petroleum | 32.95% | 90% | 51.96% |
| Shell UK | 39.63% | - | 26.42% |
| ExxonMobil | 25% | 10% | 20% |
| Endeavour | 2.42% | - | 1.61% |

## Technical Data

**Construction**

- New-build double hull tanker, built in Korea
- Modified in the Sembawang shipyard, Singapore
- Turret, cranes and topsides pallets installed and onshore commissioning Tees Offshore Base, UK.

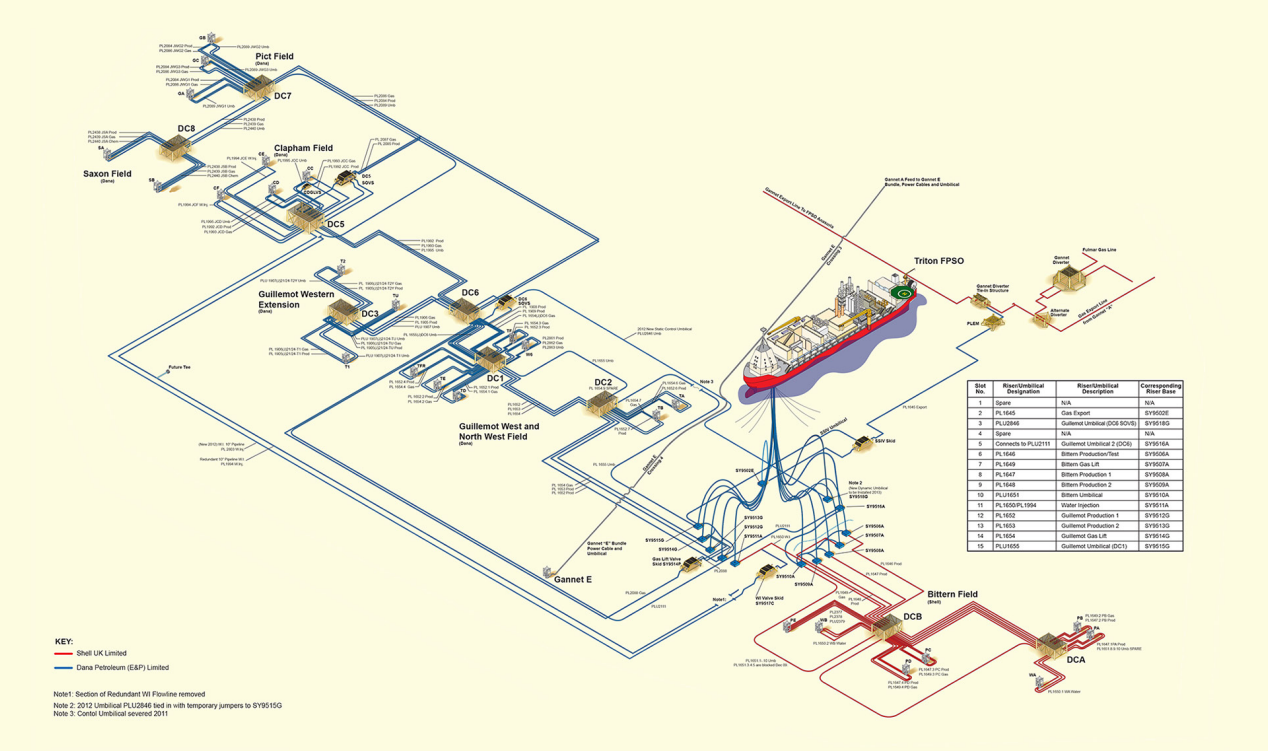
**Mooring/Riser System**

| | |
|---|---|
| Design: | Passive system using an internal bow turret 4.4m dia. Design by Bluewater |
| Mooring Lines: | 3 x 3 lines, each 1,250m long, chain/wire/chain system |
| Riser System: | 9 Flexible risers and 2 umbilicals 15 riser slots installed, allowing additional risers to be added |

**Dimensions**

| | |
|---|---|
| Length overall: | 244m (800ft) |
| Moulded breadth: | 42m (138ft) |
| Moulded depth: | 21.3m (70ft) |
| Deadweight: | 105,000 tonnes |
| Water Depth: | 300ft (90m) |
| Power generation: gas turbines | 42 MW from 2 x LM6000 dual-fuelled |
| Storage capacity: | 630,000 barrels |
| Process capacity: | Oil 105,000 bopd, Gas 140 mmcfd, Water injection 125,000 b/d. |

| Field Data | Bittern | Guillemot West | Guillemot North-West | Clapham | Pict | Saxon |
|---|---|---|---|---|---|---|
| Location | UK Central North Sea, UK Block 29/1a and 29/1b Approx 20km SE of Triton | UK Central North Sea, UK Blocks 21/29a, 21/25, 21/30, 21/29b Approx 14km NW of Triton | UK Central North Sea, UK Block 21/24 Approx 14 km NW of Triton | UK Central North Sea, UK Blocks21/24 Approx 22km NW of Triton | UK Central North Sea, UK Block 21/23b Approx 34km NW of Triton | UK Central North Sea, UK Block 21/23b Approx 35km NW of Triton |
| Water depth | 300ft (90m) | 290ft (87m) | 290ft (87m) | 276ft (85m) | 275ft (84m) | 281ft (85.65m) |
| First Production | March 2000 | March 2000 | March 2000 | October 2003 | June 2005 | November 2007 |
| Recovery | Waterflood | Natural depletion | Natural depletion | Water Injection | Natural depletion | Natural depletion |
| Field Life | 13 years | 10 years | 10 years | 12 years | 15 years | 13 years |
| Wells | 5 production and 2 water injection wells | 4 production wells | 1 production well | 2 production and 2 water injection wells | 3 production wells | 2 production wells |
| Drill Sites | 2 | 2 | | | | |
| Manifolds | 2 x 7 slot manifolds | 2 x 6 slot manifolds | | | | |
| Pipelines | 2 x 10in Production, 1 x 8in Production/Test 1 x 12in Water Injection 1 x 4in Gas Lift Approx. 20km long + 2km long back to FPSO | 2 x 12in Production 1 x 4in Gas Lift Approx 12km + 3km long back to FPSO | Part of Guillemot West Infrastructure | Part of Guillemot West Infrastructure | Part of Guillemot West Infrastructure | Part of Guillemot West Infrastructure |



## Safety Systems

**Safety Case** 14 (2) material change update for Gas Import in 2011.

**Evacuation** preferred option:

1 via helicopter
2 Lifeboat
3 Liferaft or lifebuoy

**Temporary Refuge** Accommodation containing control room, communications

| | |
|---|---|
| Lifeboats: | 2 x TEMPSC<br>1 port (59-man), 1 starboard (62-man) aft |
| Liferafts: | 4 x 15-man aft, 2 x 12 man<br>emergency shelter forward |
| Lifebuoys: | 10 located around vessel |
| Escape Routes: | Walkways protected by firewalls running past process equipment on either side of vessel. |

**Firefighting**

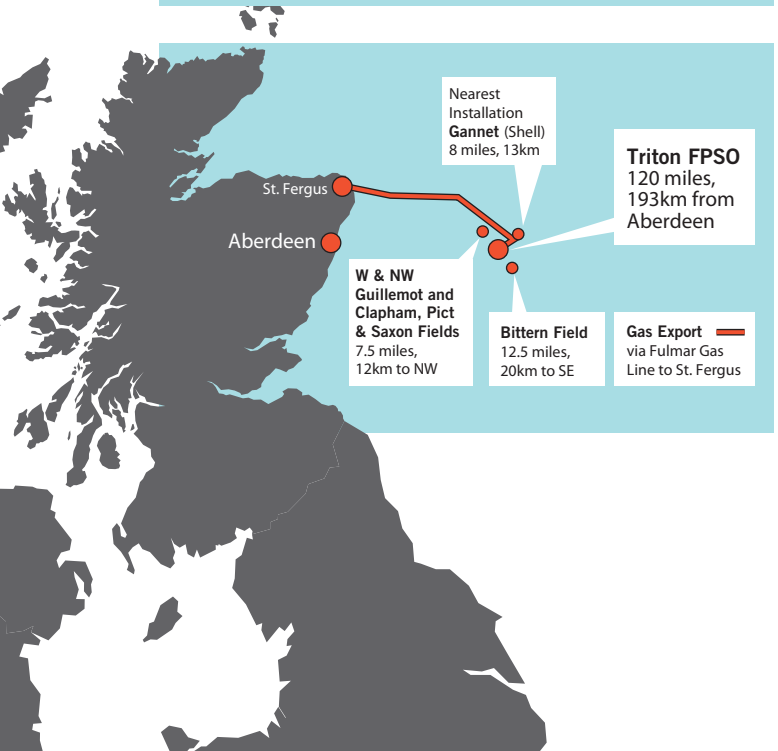
- Firepumps – 2 x 1950m$^3$/hr of firewater
- Extensive water deluge and water curtains throughout facility
- Helideck – foam monitors delivering 6mm coverage of foam.

**Emergency response**

- Fully trained response teams
- Regular exercises/drills.

**Environment**

- FPSO double-hulled
- Process and vessel design plus storage procedures to minimise VOC emissions
- High efficiency turbines and waste heat recovery systems for high energy efficiency and reduced exhaust gas emissions
- Initial response and monitoring of any spill carried out via FPSO management and Dana
- If necessary these would be escalated to respective field operators if additional external resources are required
- Procedures to minimise discharges
- Oil pollution emergency plans to deal with significant incidents
- Key factors to response:
  - Weather
  - Amount of spill
  - Location of spill
  - Local sensitivities
- Member of Oil Spill Response with extensive expertise and equipment and dispersants.




## People

| | |
|---|---|
| **Normal crew**: | Approximately 70. |
| **Accommodation**: | For up to 80. |
| **Shift pattern**: | Generally 2 x 12-hour shifts/14 days on, 21 days off (contractor conditions determined by employer). |

**Management Structure**

- Offshore Installation Manager (akin to ship's captain)
- Supervisors from joint team
- Core operations support personnel from contractor Wood Group.

**Travel offshore**

- Full inventory of people maintained at each stage
- Baggage and body search at heliport
- Full safety briefing before all flights
- Immersion suits/lifejackets/rebreathers worn at all times
- Survival training and full offshore medical examination required
- Minimum Industry Safety Training (MIST) required

**Induction**

New personnel – comprehensive induction on arrival covering safety, welfare, and other familiarisation aspects

**Medical Facilities**

- Qualified Medic (SRN + specialist training)
- Qualified first-aiders
- 2-bed, well-equipped sickbay
- Onshore medical support – CAPITA – Aberdeen-based doctors on 24-hour call-out.

## Standby Vessel

**Ocean Osprey**

Shared with Shell on Gannet and Anasuria

| | |
|---|---|
| Owner/Operator: | Atlantic – Offshore |
| Built/Converted: | Zanakona 2014 |
| Type of vessel: | Emergency Rescue, Recovery and Tanker Assist Vessel |

**Vessel Data**

| | |
|---|---|
| Length/ Breadth: | 66.80/16.00 meters |
| Speed: | 14 knots |
| | 2 x 1935kW MAN engines |
| | 1 x transverse bow thruster |
| | 1x bow azimuth thruster |
| Fast rescue craft: | 1 x WEEDO 800 FRC |
| Daughter craft: | 2 x MP 1000 |
| Launching device: | 3 x heave compensated systems for FRC and DC |
| Rescue basket: | DACON |
| Rescue Zones: | Fitted port and starboard plus Dacon Scoop Recovery System |
| Survivor facilities: | Fully compliant with class A SBV requirements capacity for 400 survivors, with survivor seating, bunks, hospital treatment area, showers and toilets. |

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