SBT Energy

SBT Energy Limited

Technical Presentation

13th February 2020

Why are we different?

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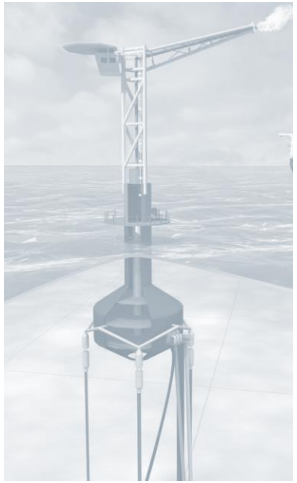
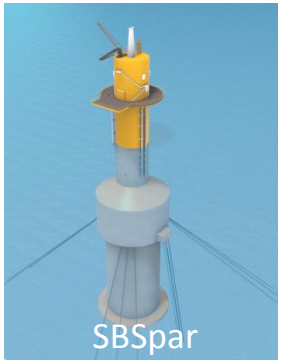
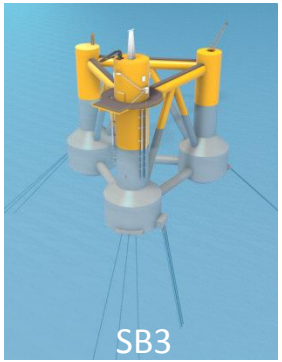
- Previous systems were TLP based.
- TLP's are bespoke designs, tendon connector technology is challenging, difficult to install and vulnerable to high wave heights in shallow water.
- SBT has chosen to move away from TLP and use **<u>catenary moorings.</u>**







Size Comparison

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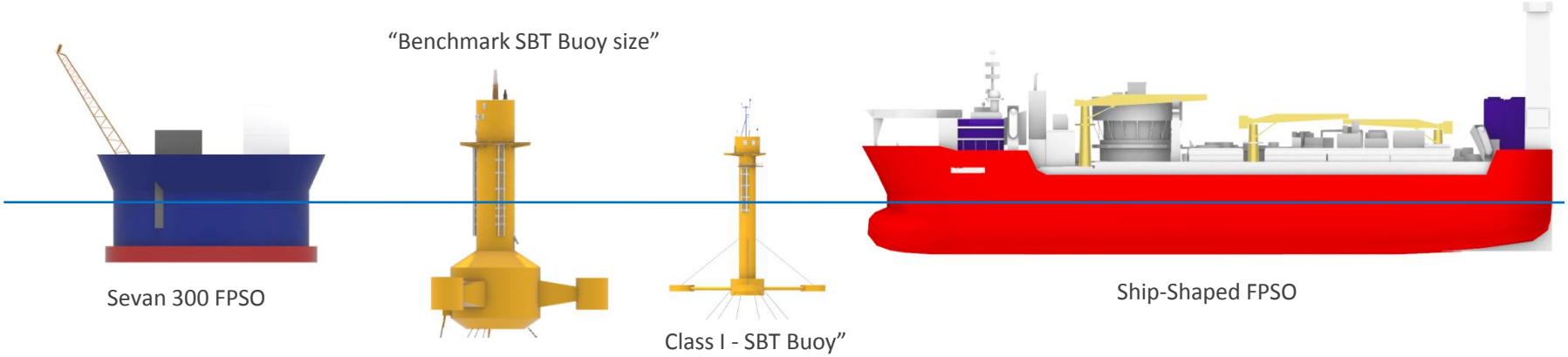
The size of the SBT Buoy is illustrated in this comparison below to a typical 230m long, 42m wide FPSO and a Sevan 300 FPSO (270,000 barrels storage).

Our buoys are scalable in size to suit the application down to < 200t in weight.

Our Buoys and Tanks complement the existing solutions.



Where are we at?

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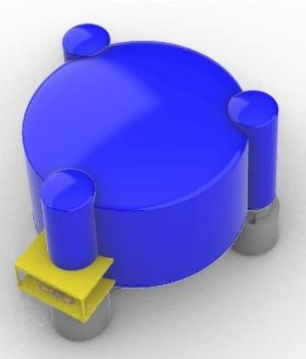
- Buoy designs are high **Stability** and **Low Motions**
- Buoys use simple **Catenary** moorings.
- Internals **Protected** from seawater, salt, sunlight, increasing reliability.
- Internal climate control **Stabilises** temperature and humidity improving equipment **Availability** and **Reliability**.
- NUI automation, robotics and AI need a **Clean and Manageable** environment.
- **Walk to Work** systems plus standardised boat landings using lessons from the offshore wind industry and changing access demands.
- **Low build, Installation and Operational Cost**
- **Model Tests complete, ready to deploy.**


Outrigger Buoy

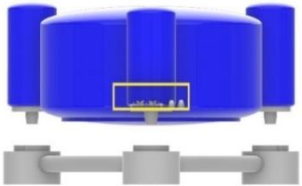
Our Concepts –Tanks and Processes

Our tank concepts differ in their application and operation, many of which can be combined together;

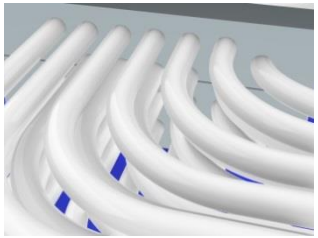
- Subsea Host / Riser Base – Can be used in conjunction with an FPU.
- Subsea Gas Storage (NHx, CO2, H2, CHx)
- Closed Loop Oil Storage, minimising water exchange with the sea.
- Focus on installability, flexibility and innovation.



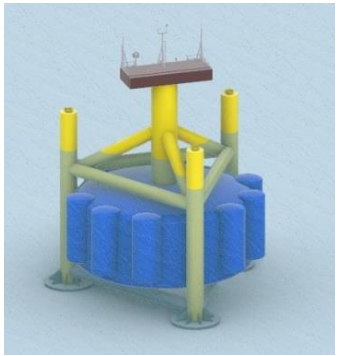
Fixed Tank



Removable Tank



Subsea Gas Tank



Shallow Water Tank

Subsea Gas Storage

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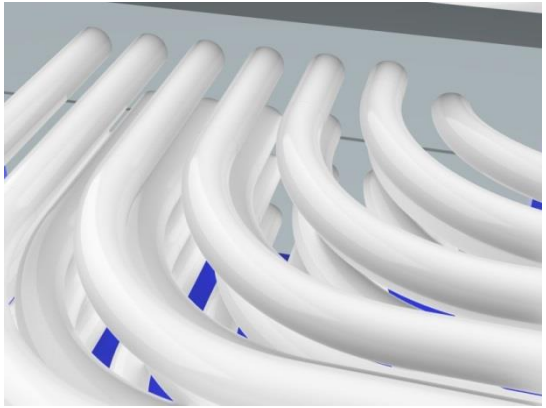
- Storage of gas, hydrogen or CO_2 can be either through lowering the temperature or increasing the pressure.
- Continuously cooling requires energy therefore we use **pressure** in our Subsea Gas Tank.
- Compression of gas generates heat and de-pressurisation cools the gas; therefore subsea storage can help maintain the thermal balance and efficiency using seawater.



- The principles of storage involve maximising the length of onshore welded and coated large diameter line-pipe and stacking onto a re-usable submersible structure.
- As the welding takes place onshore there is no vessel cost, so external and internal coating of field joints can be performed onshore and use more exotic coating as no high installation strains.
- The gas storage arrangement can be incorporated within any of the other tank concepts.

Control & Services Buoy

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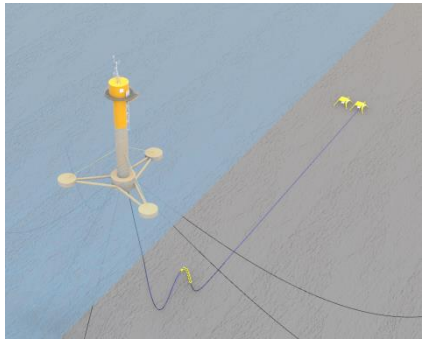
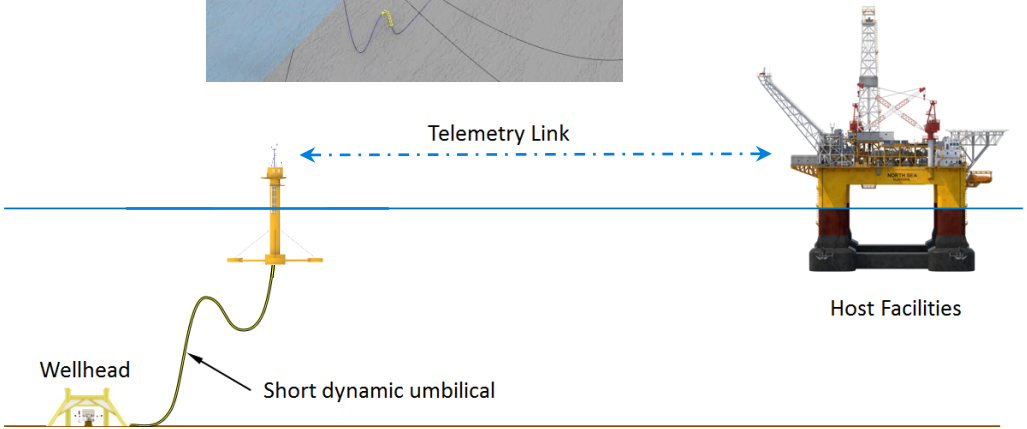
The control and service buoy can be used instead of a subsea umbilical from a facility.

- No complex tethers or concrete base
- Eliminates long static subsea umbilical
- Equipment on the buoy rather than platform
- Eliminates host J-tube requirement
- Allows large chemical storage capacity
- Short umbilical allows for smaller core
- Minimise host's topsides modifications
- Rapid deployment





Production Solutions

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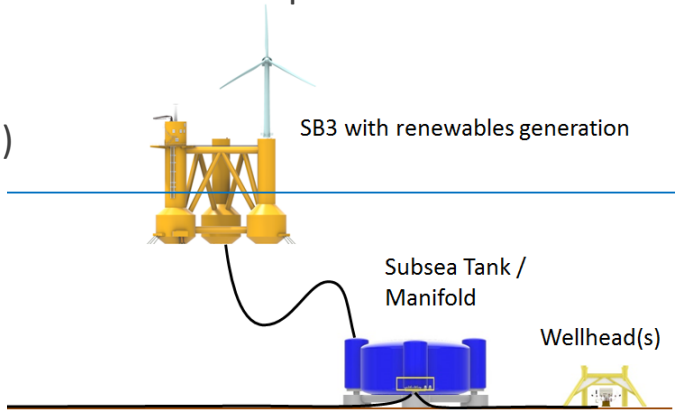
The SBT System can be considered for a range of production scenarios at very low OPEX.

- Maintain mature field production, if current production system is too expensive
- Extend the decommissioning date using above philosophy.
- De-bottlenecking (e.g. reduce water cut from tie-back before on-pass to production facilities).
- Early production system or Extended Well Test system to test reservoir performance.
- A Hub System for several Marginal Fields.
- Make tie-backs economic (service buoy at Drill Centre)
- Minimise brownfield mods for tie-backs.
- Drive ESP's or MPP's from well locations.



Our Market

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