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www.apl.no

Advanced Production and Loading AS (APL™) was established early 1993 to develop and commercialise the Submerged Turret Loading (STL™) and Submerged Turret Production (STP™) technology.

APL is responsible for system development, design and fabrication. Based on system components and experience from the proven STL system, APL has developed the Single Anchor SAL™/SAP™ and the BTL floating buoy systems.

Through acquisition of the business activities in Hitec Marine as in 2002, APL has taken over product ownership for the Bow loading System (BLS), Stern Discharge System (SDS), Volatile Organic Compounds (VOC) Recovery and Return and the Sequential Transfer of Tank Atmosphere (STTA) Systems.

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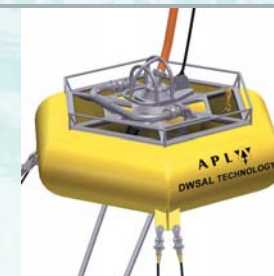
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ADVANCED PRODUCTION AND LOADING AS

DEEPWATER OFFTAKE SYSTEMS



Deepwater SAL
Tandem SAL
Tandem STL
SMT



Deepwater Offtake Systems

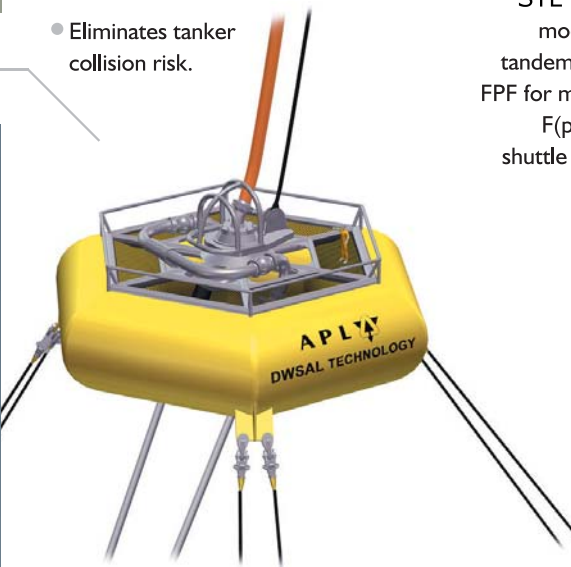
DW-SAL Deepwater SAL



DW/T-SAL Base

Benefits with submerged buoy:

- Wave induced motions significantly reduced both with tanker connected and when idle.
- Reduced wear on connected flowlines and mooring lines.
- Reduced mooring hawser tension and wear of floating hose.
- Eliminates tanker collision risk.



Based on APL's SAL™ system for shallow and moderate waters. Main buoy with riser and mooring line terminations moored 50m (typical) subsurface.

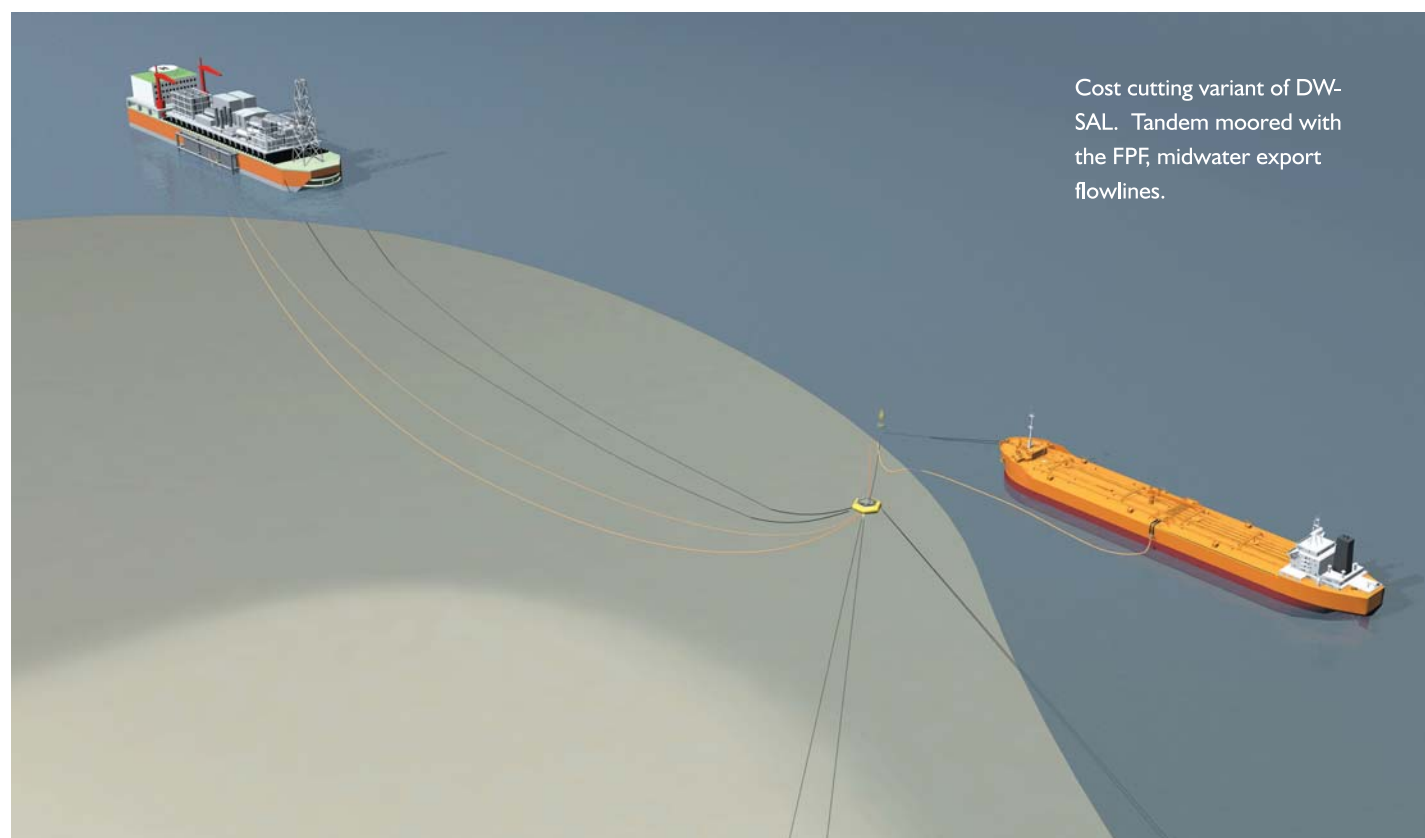
DEEPWATER
OFFTAKE
SYSTEMS

T-STL Tandem STL



STL™ buoy moored in tandem with a FPF for mooring F(p)SO or shuttle tanker.

T-SAL Tandem SAL



SMT Spread Moored Tandem



Export tanker is moored with four lines to buoys attached to two of the FPF mooring lines. Yokohama fender based collision barrier improves safety for connection and departure of tanker.