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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.

MAIN OFFICE:

Advanced Production and Loading AS
Vikaveien 85
N-4816 Kolbjørnsvik, Norway
Tel: +47 45 29 70 00 Fax: +47 37 02 41 28

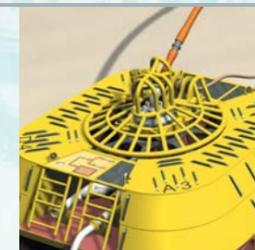
APL FRANCE:

12, Rue de Buffon
76000 Rouen, France
Tel: +33 2 3552 8289 Fax: +33 2 3552 8208

APL Inc.

2000 Dairy Ashford, Suite 530
Houston, Texas 77077, USA
Tel: +1 281 293 7711 Fax: +1 281 293 7707

SAL™



Single Anchor Loading

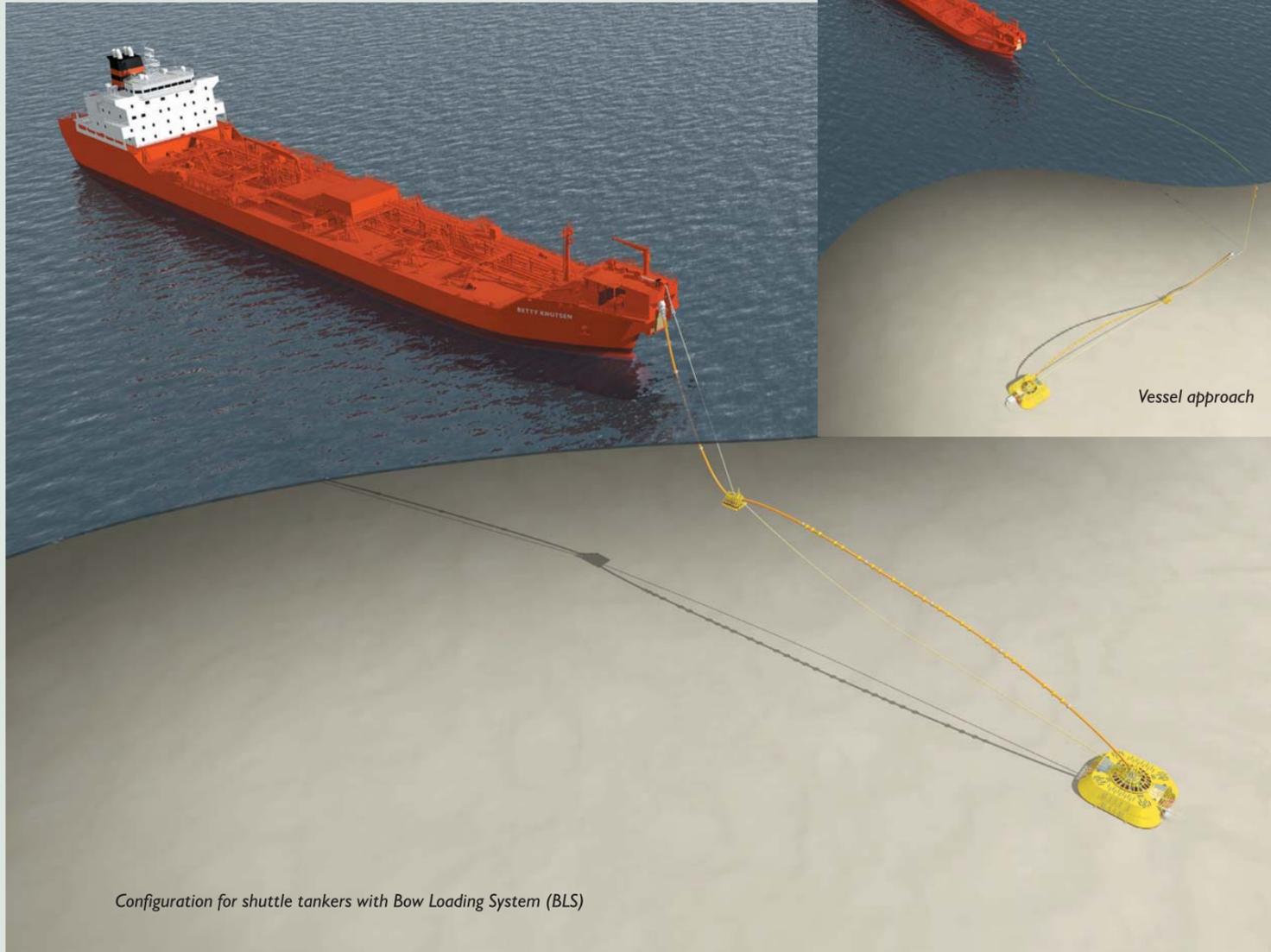
ADVANCED PRODUCTION AND LOADING AS



The system is based on core technology from APL's proven STL™ system

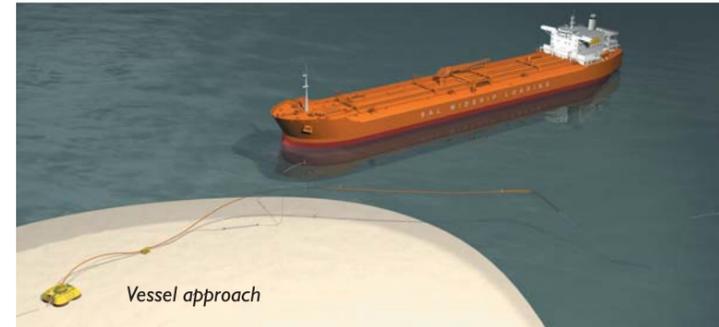
SAL™ - Single Anchor Loading

Cost effective standard/shuttle tanker and FSO mooring



Configuration for shuttle tankers with Bow Loading System (BLS)

The central elements of the SAL system are a mooring and a fluid swivel with a single mooring line and a flexible riser for fluid transfer attached, anchored at the sea bed by the use of a single anchor. This anchor also functions as the PLEM for the seabed export flow line.



Configuration for standard trading tankers with hose connected to midship manifold

The SAL flexible riser can either be designed for connection to a standard shuttle tanker bow loading system or to the midship manifold of a standard trading tanker. A tanker is hooked up to the system by pulling the mooring line and the riser together from the sea bed and up to the bow of the vessel. Here the mooring line is secured and the riser is connected to the vessel. Moored to the SAL system, a tanker can freely weather vane. Disconnection is performed by lowering the mooring line and the riser down to the seabed.

M/T Nordic Savonita moored to the South Arne SAL System



Hanze SAL Anchor under towage to the field



Hanze SAL Anchor ready for installation



Hanze SAL Clumpweight installation



Hanze SAL hose and hawser ends



REFERENCES	Field:	Operator:	Country:	Water depth:	Installed:
November '02	Siri	DONG	Denmark	60 m	1998
	Banff	Conoco	UK	90 m	1998
	South Arne	Hess	Denmark	60 m	1999
	Hanze	Petro-Canada	Netherlands	43 m	2001
	Varandey	MSCO	Russia	12 m	2002
	Ardmore	Tuscan	UK	90 m	2003

SAL

