

FPSO Global Workshop

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Wyndham Greenspoint, Houston



Adaptation of Existing North Sea Shuttle Tankers and Practices to GoM

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TODAY'S DISCUSSION:

Shuttle tankers originated in the North Sea:

How can this experience be used for new developments in GOM and add value to our customers.



How it all started . . .

What started 22 years ago for technical necessity - deep water of Norwegian Trench - is now widespread in the North Sea for all water depths.

It quite changed the way oil was brought ashore.



Today . . .

Navion ASA

- + Owned by Statoil;
- + Operating since 1979 in North Sea;
- + Over 12,000 offloadings;
- + Currently operate a fleet of 27 shuttle tankers.



Navion Operational Experience

(Data used in EIS for FPSOs,
sponsored by Deepstar in 1997-2000)

Total Liftings to Date:-

Total Volume to Date:-

- 12,000+ liftings

- 8 billion bbls transported

- 8 spills (only 3 > 1 bbl,
reported at the offshore
loading facility)

- 283 bbls spilled

- **0.000004%** of total volume
carried

**And sometimes shuttle tankers work in brighter,
calmer conditions than implied here . . .**



Typical Shuttle Tanker Configuration Today

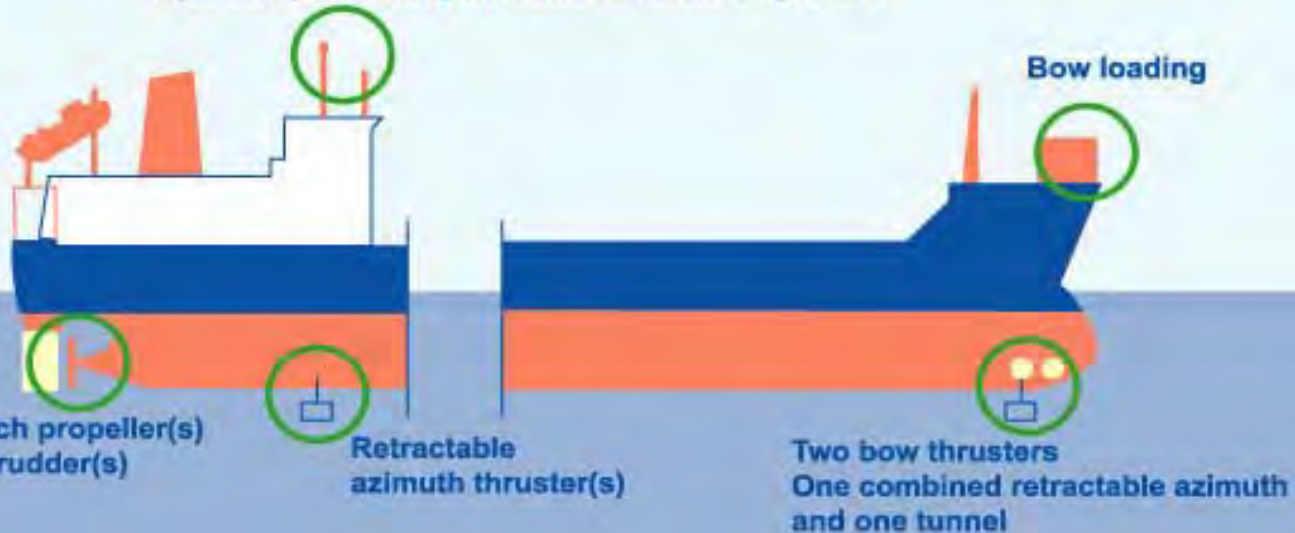
Fail-safe telemetry equipment
Dynamic positioning with three reference systems

Bow loading

Controllable pitch propeller(s)
High efficiency rudder(s)

Retractable
azimuth thruster(s)

Two bow thrusters
One combined retractable azimuth
and one tunnel



Key Features: Dynamic Positioning

Investment required for Dynamic Positioning is about five percent (5%) of total U.S. construction cost;
Allows operation in harsh remote environments with no support vessels.



Key Features: Bow Loading

Standardized well proven interface between shuttle tanker and loading facility.

Investment required for Bow Loading is about one percent (1%) of total U.S. construction cost.



A large red and white oil tanker ship is shown under construction in a shipyard. The ship's hull is painted red, and the upper decks are white. The ship is positioned in a dry dock, with various construction equipment, including yellow cranes and scaffolding, visible around it. The background shows the industrial structure of the shipyard.

Gulf of Mexico: Choice of Shuttle Tanker Design

Adapt to U.S. shipyard construction practices;

Conform to limitations of U.S. ports;

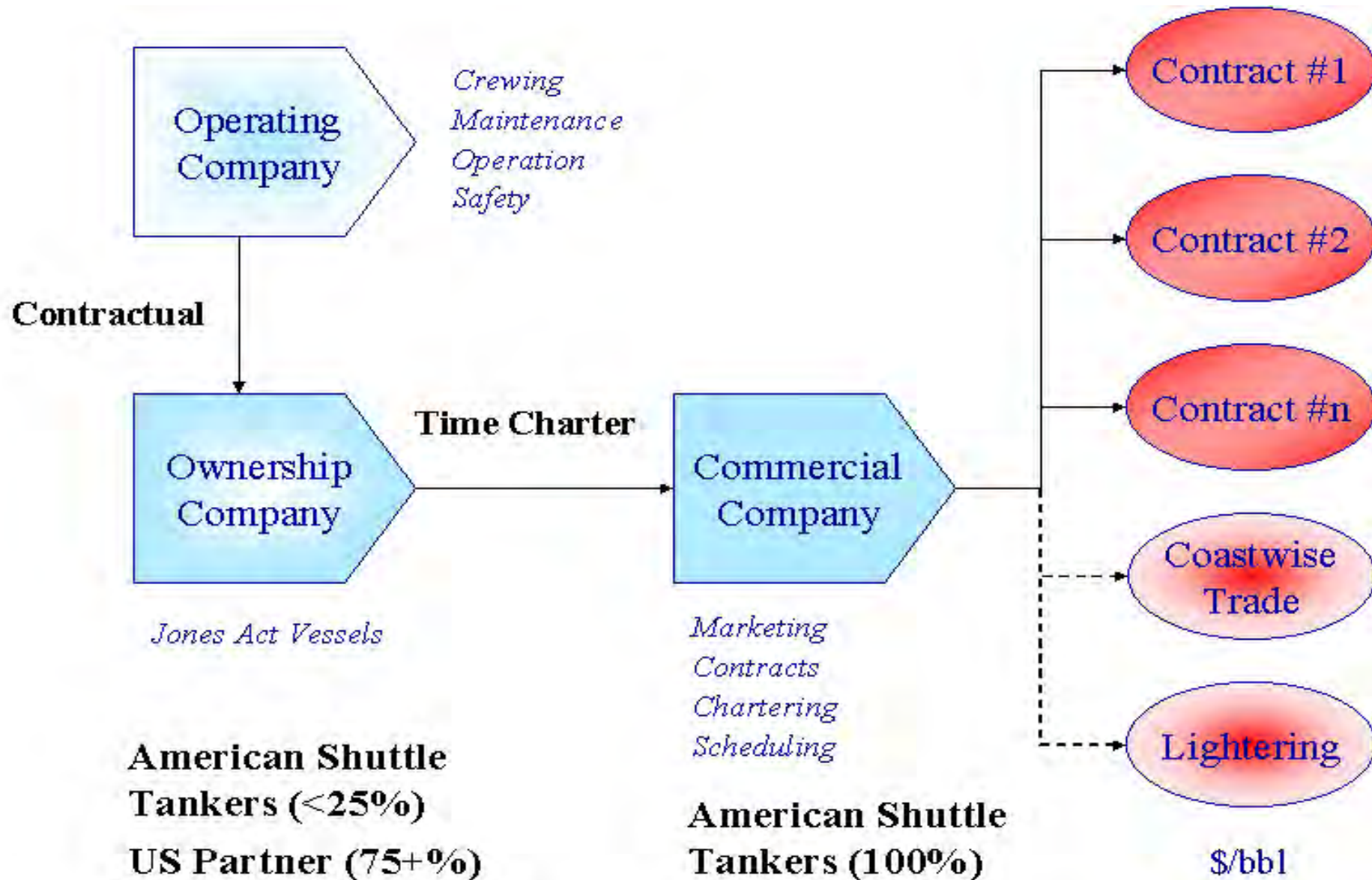
Comply with OPA-90, Jones Act, and our own best practices.

U.S. Gulf of Mexico Shuttle Tanker:

Main Particulars

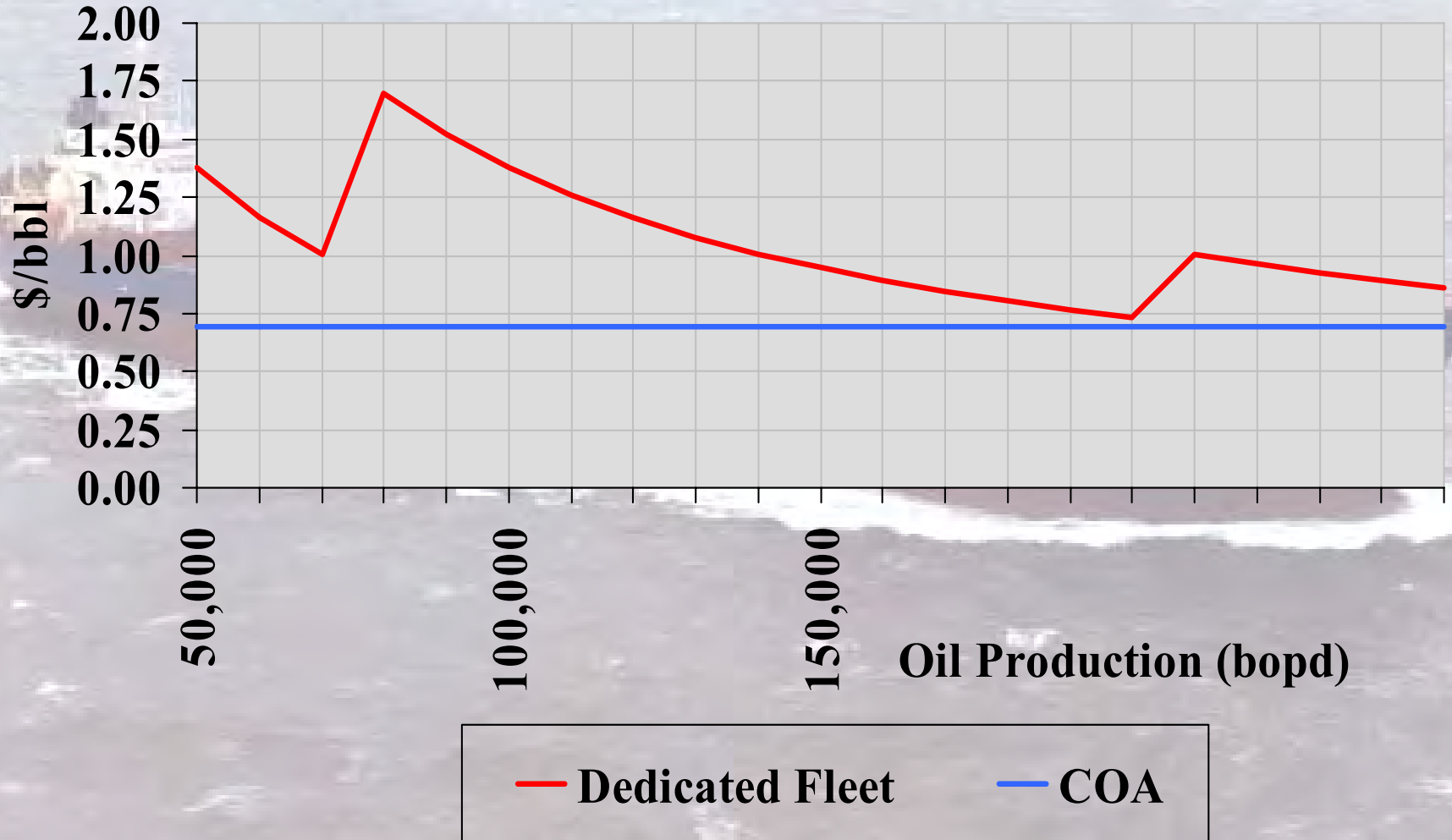
Cargo capacity	565,000 bbls
LOA	800 feet
Moulded breadth	138 feet
Draft (sg 0.88 t/m ³)	40 feet
DWT	80,000mt @ 40 feet
Loading rate:	
Midship manifold	66,000 bph
Bow loading	50,000 bph
Discharge rate	66,000
bph	
(total discharge in 12 hours)	

Commercial Model



The Business Side: Dedicated Tankers or CoA ?

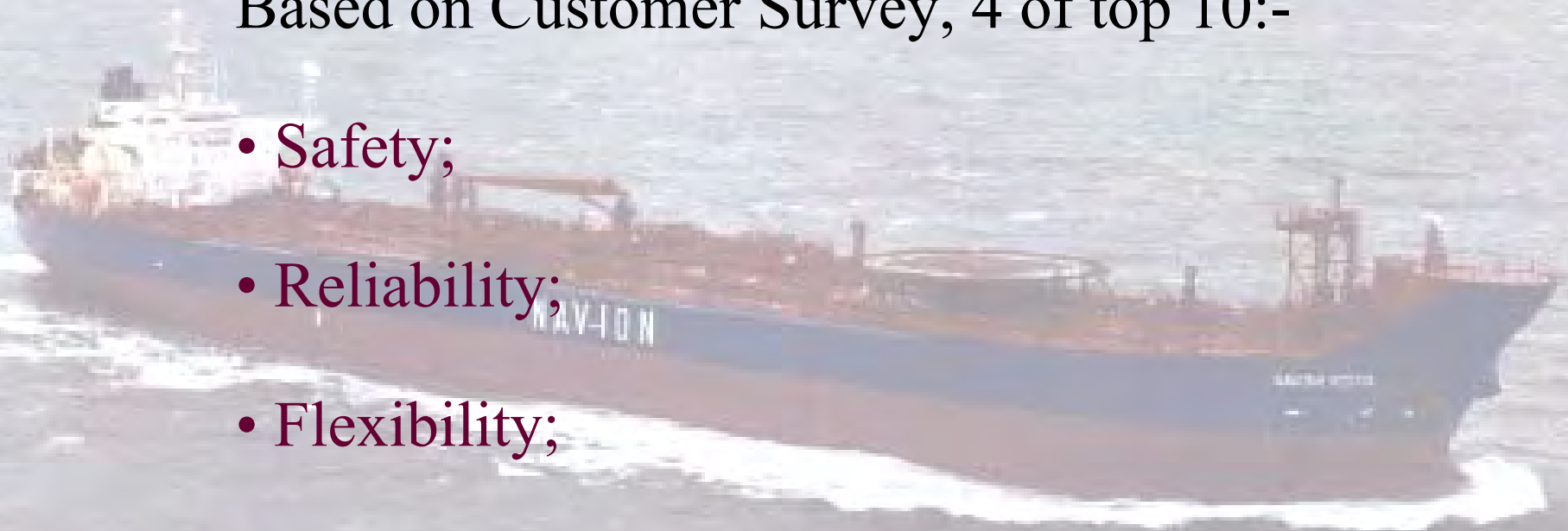
Budgetary Tariff - Dependent on Delivery Distance



The Business Side: Customer Requirements

Based on Customer Survey, 4 of top 10:-

- Safety;
- Reliability;
- Flexibility;
- Competitive prices.



How pipelines compete with shuttle tankers in the North Sea

We find shuttle tankers supplement pipelines.

However,

Shuttle tankers give oil companies a choice of ports, allow traders to view for best prices.

Each partner in a field can take its share of oil and sell separately wherever they like.

Shuttle tankers and the introduction of the Contract of Affreightment have quite changed the business of bringing the oil ashore in the North Sea.

In the North Sea.....

We lift from:

- + Loading Towers (artificial or floating);**
- + Sub Sea Risers (UKOLS);**
- + Submerged Turret Loading (STL,
Single Anchor Loading (SAL),**
- + FPSOs and FSOs.**

While here in the Gulf of Mexico . . .

**We prepare for Shuttle Tankers to
transport oil from any floating
production system:
TLPs, Spars or Semisubmersibles, as
well as FPSOs and FSOs.**



CONCLUSIONS (1)

1. Numerous drilling plans & discoveries in GoM would indicate many projects that may greatly benefit from shuttle tanker service;
2. Shuttle Tankers are very well proven in large sizes (1,000,000+ bbl sizes) and for harsh environments - easily doable today for 565,000 bbl size in GoM;
3. Principle accepted in EIS for FPSOs & FSOs in GoM;

CONCLUSIONS (2)

The background of the slide features a large offshore oil rig on the left and a red-hulled shuttle tanker on the right, both situated in the open ocean. The rig's derrick and various deck structures are visible, while the tanker is positioned to receive or deliver oil. The scene is set against a backdrop of a clear sky and calm sea.

4. Extensive body of safe & reliable experience available to draw on;
5. Shuttle Tankers offer new major benefits in the business of bringing oil ashore in GoM – flexibility in point of sale, enhanced margins for end users;
6. Shuttle Loading feasible from Semis or Spars or TLPs, i.e. this transportation option looks viable today in GoM despite no FPSOs yet.