

An Ocean of Possibility

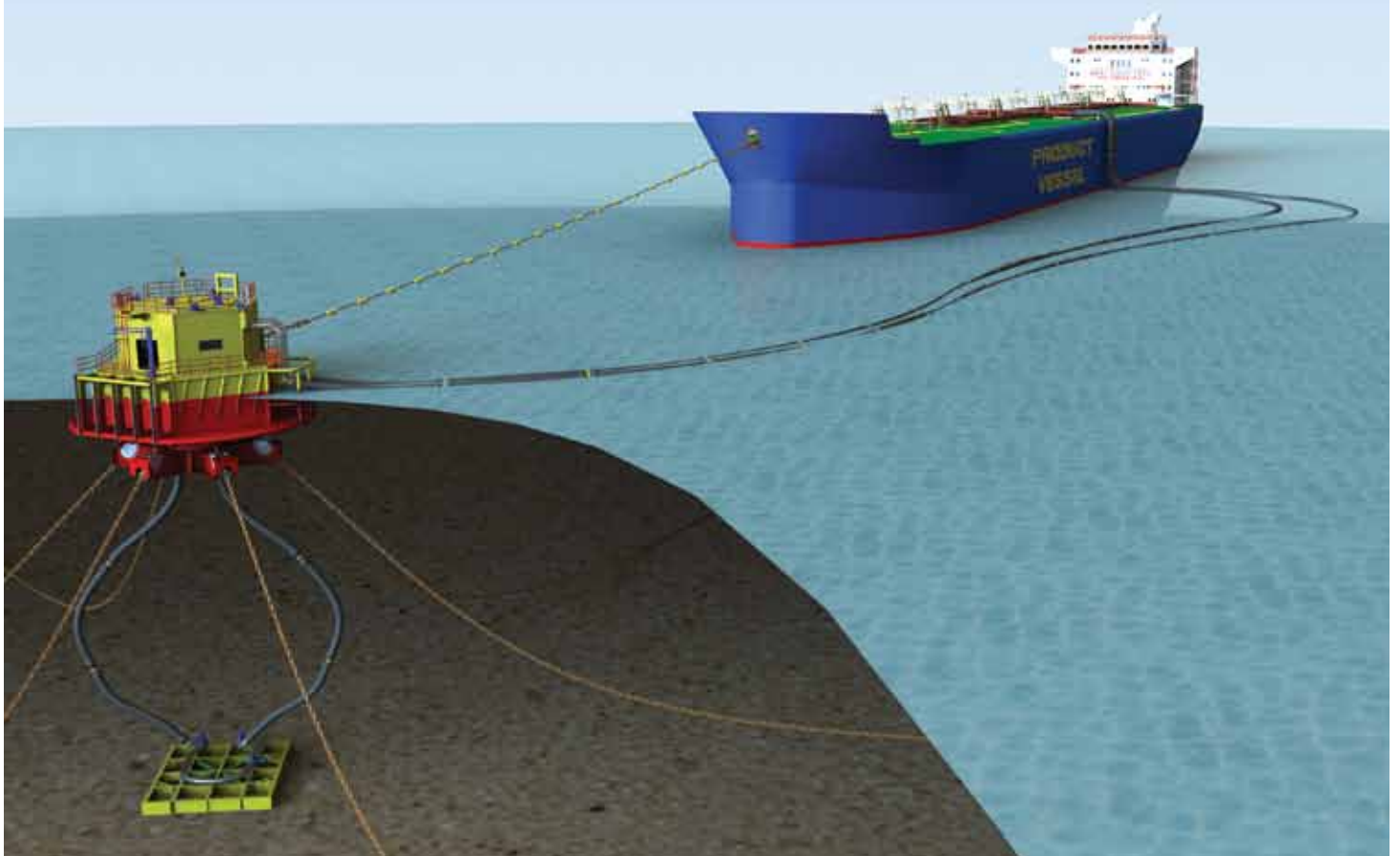
SPM Offloading Buoy

Orwell
OFFSHORE 
Naval Architects and Offshore Engineers

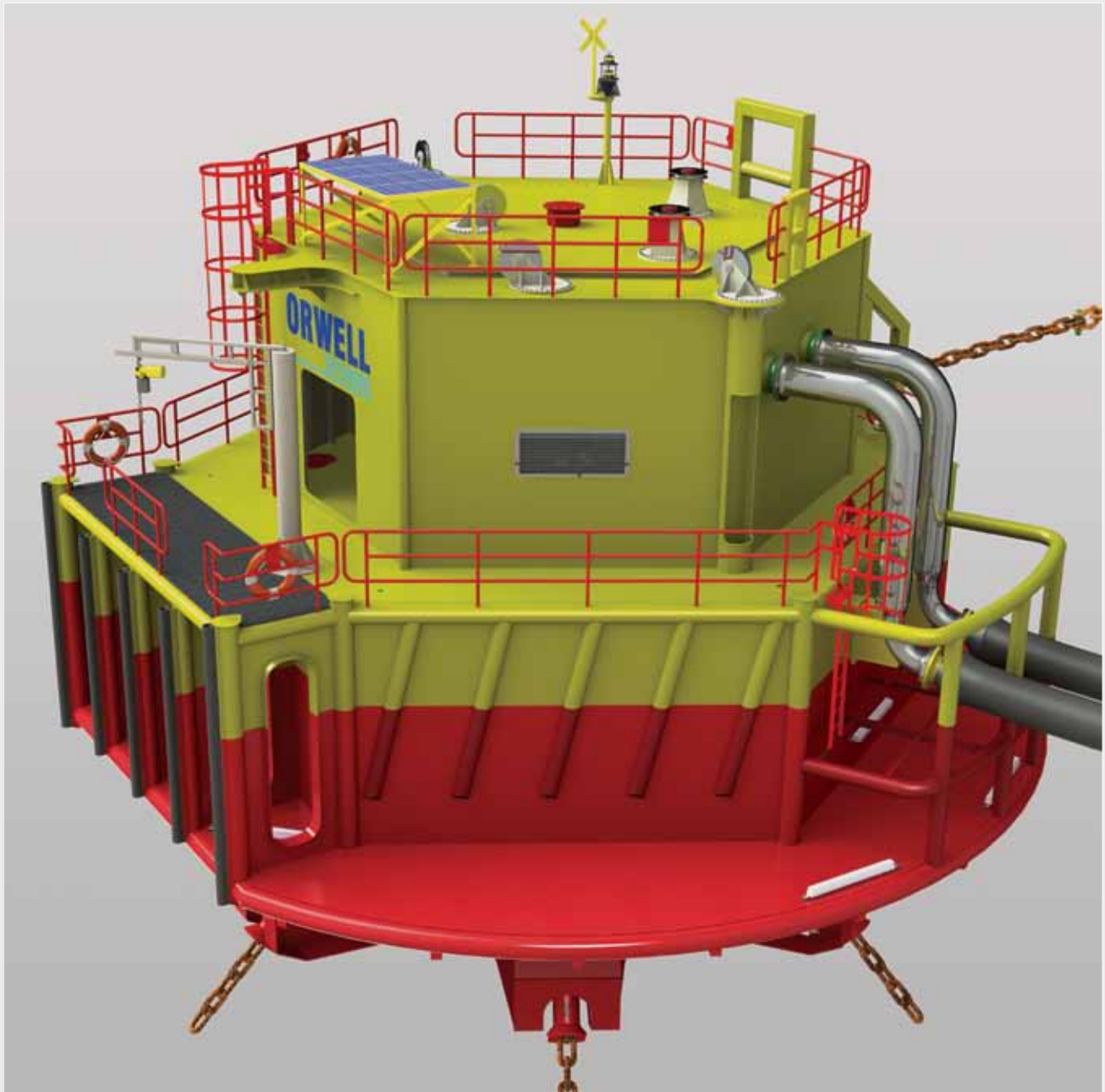
CALM BUOY

Orwell Offshore's Catenary Anchor Leg Mooring (CALM) Buoy offers a reliable state-of-the-art solution for loading and offloading crude oil, refined petroleum products and other fluids while providing for a safe on-board working environment.

The turret buoy design facilitates the provision of a deckhouse structure that allows protection of all mechanical parts and easy access for operation and maintenance.



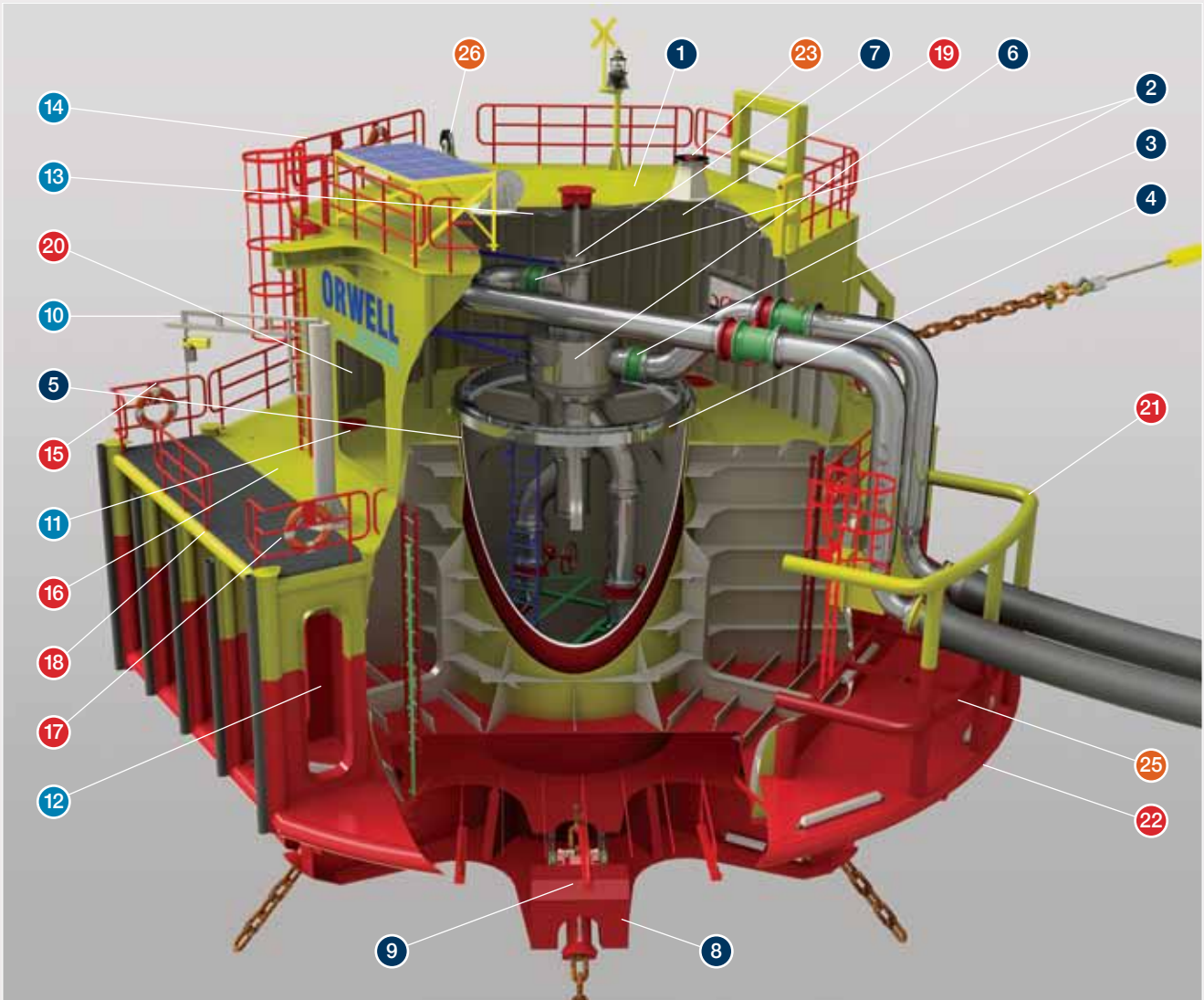
CALM BUOY



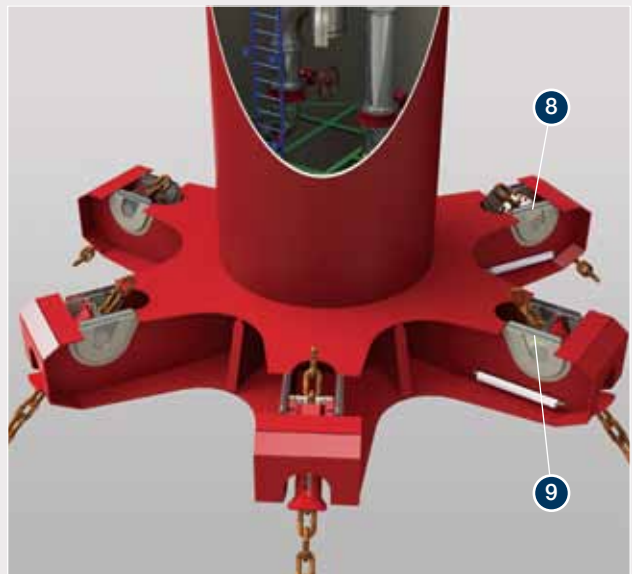
Key features include:

- 25-year design life (based on continuous service) reducing overall cost of ownership
- Hexagonal buoy body approximates a cylinder while providing the advantages of flat-plate construction
- Hexagonal deckhouse structure ties in to the framing of the buoy hull
- Turret-based SPM design allows vessels to weathervane freely
- Deckhouse provides easy and safe maintenance access and protects critical mechanical equipment
- Flat, unobstructed deck surrounded with hand railings for personnel safety
- Single and double product swivels available
- 6 watertight compartments
- Circular skirt protects buoy and deflects vessels in the event of tanker 'kissing'
- Articulated and self-locking chain stoppers prevent chain wear and reduce installation time
- Davit on boat landing platform for material handling
- Meets all Classification Societies requirements and applicable international guidelines such as OCIMF

FEATURES



Swivel with Expansion Joint



Chain Table configuration

FEATURES

Technical Features:

- 1 Deckhouse roof provides ample space for navigation aids such as light, radar reflector, foghorn, as well as solar panels and battery box
- 2 Expansion joints in the product piping compensate for pipe expansion and minor concentric misalignment
- 3 Deckhouse protects all mechanical parts from the environment and provides for a secure, dry and accessible turret interior
- 4 Large-diameter three-race roller bearing connects the turret to the buoy body and allows the tanker to weathervane
- 5 Machined bearing supports enable steel-to-steel fitting of the bearing
- 6 Available with single or double path product swivel
- 7 Double seal arrangement protects the main bearing. A hollow centre can be provided for connections of hydraulic and electrical paths to a subsea control umbilical via slip ring assembly and hydraulic swivel if required
- 8 Chain table configurable for different mooring arrangements
- 9 Articulated self-locking chain stoppers absorb angular motion and protect chain links from wear due to buoy excursion

Operation and

Maintenance Features:

- 10 Davit on the boat landing platform provides for transfer of items to and from support vessels
- 11 Manhole (one per compartment) allows for inspection
- 12 Sounding Pipe (one per compartment)
- 13 Trolley beam in the deckhouse enables easy equipment transfer between deck and deckhouse
- 14 Multiple lugs in the deckhouse facilitate installation and maintenance activities

Safety Features:

- 15 Hand railings provide three points of contact
- 16 Unobstructed deck eliminates hazards
- 17 Life rings (two)
- 18 Long boat landing grants easy and safe access to the buoy and features vertical rubber fenders for protection
- 19 Two louvers in opposite deckhouse walls allow for natural ventilation
- 20 Deck house access doors (2 doors)
- 21 Framing protects overboard product piping in case of collision
- 22 Circular skirt protects buoy from tanker 'kissing'

Installation Features:

- 23 Removable installation sheaves
- 24 Winch in the deckhouse facilitates installation activities including chain pull-in, installation of submarine and floating hose strings and hawser (*winch not shown*)
- 25 Diver platform facilitates installation of the floating hose strings
- 26 Chain pull-in tubes (two) used for chain installation
- 27 Guides inside chain fairlead to prevent twisting of the anchor chain during installation



Articulated and self-locking chain stoppers



Mooring lug and uni-joint with optional load monitoring pin

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