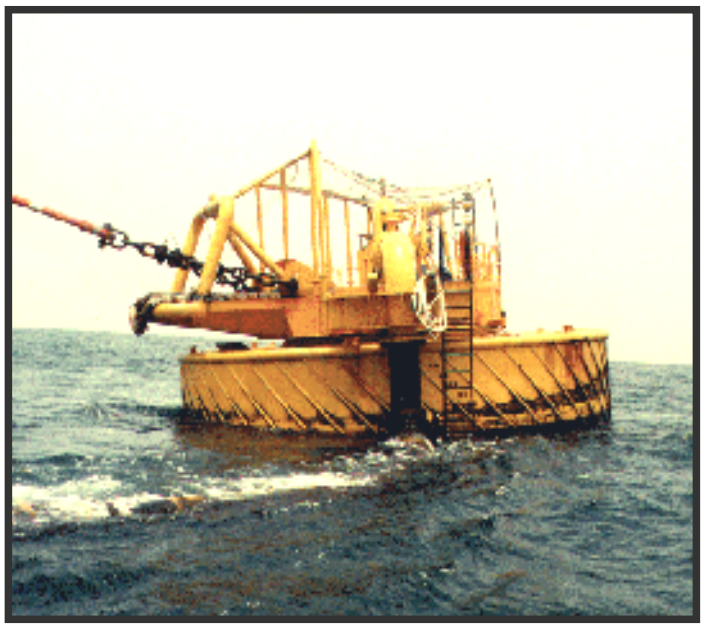
FRASER PUMP
& engineering

LOAD MONITOR SYSTEMS



- **FOR SINGLE POINT MOORINGS AND FPSOs**
- **Ensures the safety of the terminal from damage caused by excessive mooring loads**
- **Prevents damage by drifting tankers with slack hawsers**
- **Predicts high load situations in advance of tide and meteorological changes**
- **Provides a record of events for insurance or claims against tanker operators in the event of accident**

Hawser tension monitoring is essential for the safe and efficient operation of oil import and export terminals.
In addition to hawser load information, the system can optionally measure

- **wind and sea state data** for **predictive analysis**,
- **pipeline pressure** and **temperature** to monitor the pumping operation,
- **gas detection** and **riser leakage** detection for safety.

The **single point mooring systems** offered by Fraser Pump and Engineering are based on proven technology using latest advances in electronics, computing, and radio-telemetry. The result is a series of systems, **easy to use, exceptionally reliable**, and **simple to install**.

All systems are test **witnessed by Lloyd's**, or **ABS** classification societies. Load pins are proof tested, and sensors are calibrated by the UK's **National Physical Laboratory** or other leading calibration laboratories.

Fraser Pump works has supplied major **SPM oil loading and flexible riser** manufacturers with offshore test systems for more than **20 years.** In addition it supplies **process equipment for marine and offshore applications**. All load measuring design and subsystems are supplied by **Dynamic Load Monitoring**, a company with a long history of line and hawser load measurement for terminals and offshore survey markets. An associated company **NM Switchgear** supplies control panels for offshore applications including hazardous area enclosures.

Fraser Pump & Engineering, a trading company of Blue Pennant Ltd.
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Mooring arrangement	Trip-plate load pins or instrumented shackles dependent on the buoy design
Mooring lines	1 or 2 hawsers, measured independently
Mooring loads	Typically 150-400 tonnes maximum tension
Monitoring options	• 0n-board data logger/chart recorder • Radio-telemetry or cell net data links to offshore control station
Alarm/overload options	• On- buoy alarm lantern • Connection to fog horn • Radio telemetry connection to ships bridge
Power options	• Re-chargeable storage batteries • Solar array sized for location • Wind generator
Optional sensors	• Wind speed and direction • Pipeline pressure and temperature • Sea current speed and direction • Gas leak sensors

Fraser Pump can design a suitable system configuration given the buoy's location, manufacturer, and monitoring requirements.
Load pins are IP68 and triple waterproofed. Deck equipment is at least IP66. Hazardous area enclosures are used as required.

200 tonne pin and shackle

Zone 1 area control panel

Met sensors and telemetry mast

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