

**OFFSPRING  
INTERNATIONAL  
LIMITED**



**INTEGRATED TERMINAL MANAGEMENT SYSTEMS**



# Offshore Ops: Next Generation Integrated Terminal Management

Offshore Ops' Terminal Management System allows oil terminals to maximise terminal availability and efficiency, increase safety, reduce operating costs and reduce environmental incidents.

Offshore Ops, working in partnership with Offspring International (OIL), offers industry leading software and technologies for mooring and offloading operations. Offshore Ops' fully OCIMF SMOG 2015 compliant Integrated Terminal Management System has been systematically developed over 12 years to provide 'live' data on a wide range of operational and environmental factors, as well as effective operations management, significantly reducing risk and enhancing mooring and offloading safety and performance.

Part of Offspring International's growing range of equipment for SPM and CBM terminal systems, the compact modular system offers a range of terminal management, environmental and equipment monitoring devices, seamlessly integrated into a single, secure software package.

In addition, the software enables greater efficiency in terminal management by allowing comprehensive monitoring and control over consignment scheduling, asset management and policy and procedural adherence.

## Offshore Ops – Enhanced Terminal Monitoring

Offshore Ops' Integrated Terminal Management System has been developed based on the needs of single and multi-operator terminals. It comprises an array of sensors on the offloading buoy, together with a portable monitoring unit used by the mooring master on the tanker, providing 'live' data on all aspects of offloading operations.



Benefits of the system include the ability to maximise Uptime and minimise Downtime, by monitoring various offloading and weather conditions to ensure it is safe to continue to operate.

### Improved Mooring Operations

Combined GPS and compass heading monitoring of both the buoy turntable and tanker ensures trouble-free moorings. Tanker disorientation can be picked up early, allowing corrective action to be taken. In the event the buoy moves off-station, indicating a possible mooring chain failure, the integrated system will automatically issue an alert.

Offshore Ops' modular Integrated Terminal Management System enhances offloading operations by offering the ability to monitor operations from anywhere, including inspection and maintenance schedules to ensure equipment performance, and real-time data to the tanker, allowing safer mooring. All buoy and tanker data is encrypted during transmission.

### System Benefits

In addition to the mooring and environmental advantages of using the Integrated Terminal Management System, the operational benefits include:

- Consignment scheduling
- Asset register
- Planned maintenance
- Policy and Procedural adherence.

### Consignment Scheduling

Plan and schedule arrival of vessels and their cargoes and maintain a full history of every vessel's movements from arrival into Port, demurrage times, loading / discharge times, and volume of cargo.

### Planned Maintenance

The predetermined inspection and equipment change-out regime embedded in the system ensures that all parts of the SPM are checked and verified as per industry best practice and / or available standards.

### Asset Register

Maintain a stock list of all spares held in store, min / max stock levels, replacement lead times and so on. Record date that the asset is put into service, dates inspected, date retired, amount of work performed by the asset to assist in determining when defined retirement criteria are reached and to future consider whether longer / shorter service life is appropriate.

### Policy and Procedural Adherence

All company policies can be stored and updated on the system with pre-set authorisation levels. New revisions are flagged automatically to specified users when they log onto the system. It records when users have read and accepted the revised procedures or require further guidance.

The same system can be used for training, for issuing permits to work, and for creating work procedures.



Loading / Discharging operations are being undertaken at the time of incident for 40% of spills <7 tonnes and 29% of spills 7-700 tonnes with around 37% of these incidents caused by either equipment failure or fire / explosion.

**Oil Tanker Spill Statistics 2015**  
**- International Tanker Owners**  
**Pollution Federation Limited**

# Offshore Ops: Comprehensive Monitoring & Control

Data can be monitored from multiple locations within the terminal, the tanker and even the world using a secure internet connection. Receiving 'live' data from the SPM / CBM and portable vessel monitoring system ensures informed decisions can be made and implemented immediately, while recorded data can be used to monitor performance over time and lessons learnt.



## Assessment and System Installation

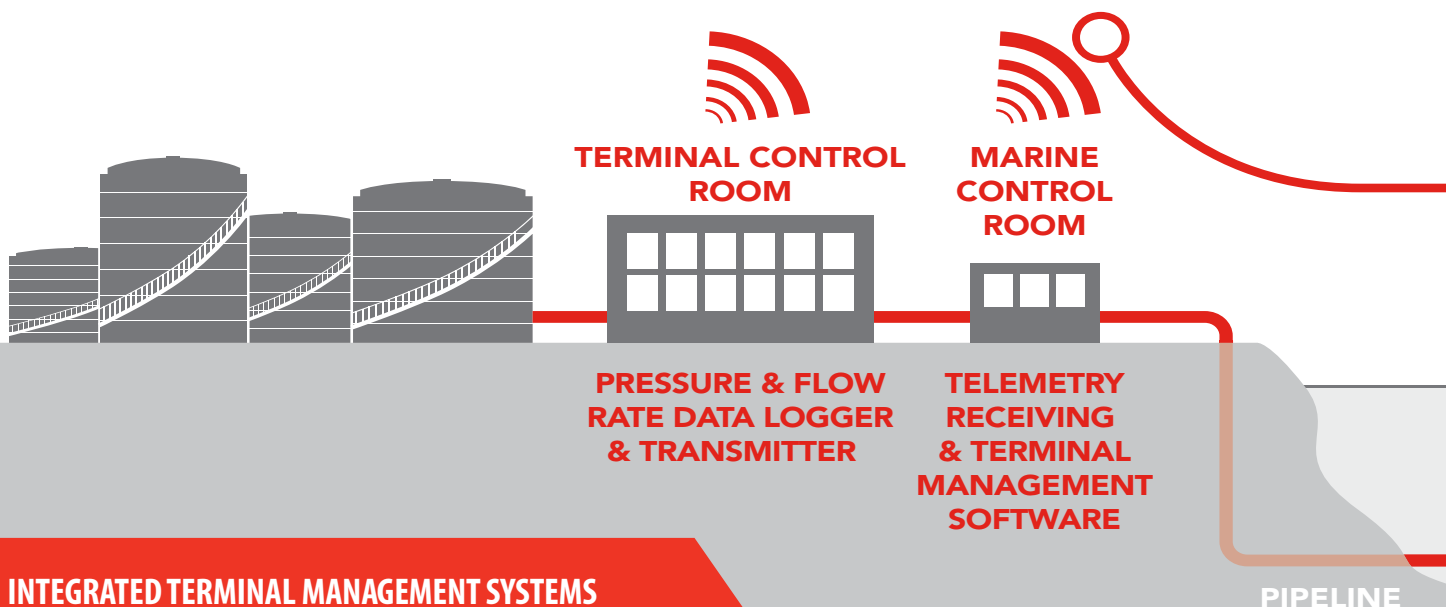
To evaluate the requirements of the terminal and its environment, OIL engineers initially perform a FEED survey. The survey determines the scope of the system, geographic location of aerials, power requirements, redundancy requirements which can be included in the design / added to the existing structure of the SPM / CBM buoy, and a full project plan and schedule. Works to install hardware can either be carried out in a dry dock or in situ in the case of a retrofit without welding.

## System Equipment

Offshore Ops and Offspring International share the philosophy that, for the duration of transfer operations, the entire SPM buoy should be classed as either Zone 1 or Zone 2; as a result all equipment installed on the buoy is either EexD or IS rated. The modular nature of the system allows essential units to be installed initially and further units to be added later as the requirements of the terminal develop or as desired.

## Tanker Mooring Operations

In addition to the monitoring equipment permanently installed on the buoy, the Offshore Ops Vessel Mooring System (VMS) is monitored on portable equipment taken on board the Tanker for final approach. Once moored, SPM excursion limits, Tanker excursion and Tanker manifold pressure, are monitored in real time, together with all SPM and environmental data, as detailed under SPM Buoy.



# SPM Buoy Monitoring



## Hawser Load Cell

Monitoring individual & combined hawser tensions to trend mooring loads in deteriorating weather conditions and issue high and high-high "alarms" in the event of excessive loads. Controlled limits maximise hawser operational life and assist in determining policy on change-out.



## Dome Pressure

Highly accurate calibrated pressure transducers are provided to measure over the range 0-25 bar of buoy dome or pipe pressures.



## Wave & Current

Using ADCP & Acoustic Surface Tracking, the Wave and Current sensor makes high quality wave measurements up to 50 m below the surface. The current speed and direction is measured from the seabed to the surface at 2 m depth intervals giving accurate live information on the entire volume of water under the SPM.

## Surge Tank Level Sensor

For SPMs fitted with surge tanks, if a pressure surge event occurs, a safety valve allows oil into the surge tank. The sensor advises the ullage level in the surge tank.

## SPM Excursion

Multiple GPS units allow the SPM's true position, relative to its plum position to be monitored. Pre-set alarms are activated if the SPM exceeds a set watch keeping circle indicating excessive stressing of subsea hoses, and anchor chains. The GPS units also provide accurate

turntable heading bearing relative to the mooring assembly. No compass calibrations are needed and the GPS units are not affected by the moored Tanker.

## Navigational Aids

To ensure vessels are aware of buoy location Offshore Ops offer navigational lights, foghorn and a Radar reflector, which allows the buoy to be easily identified through radar.

## Ultrasonic Wind Sensor

The Intrinsically Safe ultrasonic wind sensor utilises the latest developments in ultrasonic solid state anemometers technology to detect wind speed as low as 0.01 m/s and offers a low maintenance highly accurate rugged sensor providing wind speed and direction.



# Vessel Mooring System (VMS)



## Tanker Positioning and excursion

Portable Zone 1 certified battery powered wireless GPS units are provided for tanker positioning, speed of approach and heading relative to the SPM. This allows for safer mooring operations. The GPS units are designed to remain on board the tanker for the entire operation providing constant tanker excursion mapped and recorded.

## Manifold Pressure monitoring with Surge Protection

The Zone 1 certified battery powered wireless pressure transducer transmits pressure readings every 2 seconds. Unexpected pressure surges can pose a significant risk to crew, the environment, loading hoses and pipelines. The Offshore Ops Pressure Transducer is designed to protect export terminal hoses, pipeline and buoy from the effects of pressure surges.

ENCRYPTED DATA TRANSMISSION



SPM

PLEM

MANIFOLD WITH SURGE PROTECTION UNIT



LAPTOP CONTROLLER FOR MOORING MASTER



# Maximise offloading systems availability

Offshore Ops' comprehensive system monitoring allows terminal operators to maximise offloading system availability by using predictive wear analysis and planned maintenance to extend service life.

## SMS Alerts

The Telemetry system can be configured to automatically send SMS alarm notifications to the terminal manager and other key personnel on a need to know basis.



## Mooring Hawsers

The real time information resulting from monitoring all loads on hawsers can be used to maximise the life of the hawser and determining policy on change-out. System can also be used to "alarm" in the event of excessive loads.

## Floating and Subsea Hoses

Historical data on floating and subsea hoses can be stored in the system, together with the inspection reports. Any deterioration in condition can therefore be monitored and used to verify change-out / replacement policy.

## SPM Mooring, Hose and Hawser Integrity Management

The data collated by the system is invaluable to Integrity Management engineers for developing site specific extended maintenance management plans. The work scopes for maintenance can be implemented by utilising the Offshore Ops Diver Management software module.

## Solar panel power charging system

A permanent power supply is supplied with redundant battery banks, solar panels and power regulators certified for operation in a hazardous environment. This power system provides continuous power for the complete system. The status of the power systems is monitored by the Data Acquisition unit with status information displayed in real-time on the Remote Receiving units display system.



# Offspring International

Offspring International Limited (OIL) is a leading supplier of high quality mooring and offloading systems for Single Point and Conventional Buoy Mooring applications, integrated terminal management systems, Quay Reel® tanker loading and unloading system, hoses, breakaway couplings and navigational buoy moorings.

Based in Dudley near Birmingham, UK, and with a subsidiary office in Laguna Niguel, California, OIL is a dedicated team of mooring professionals, bringing together over 150 years combined experience in the supply and deployment of offshore mooring systems. We are an active member of the Oil Companies International Marine Forum (OCIMF), contributing our knowledge and experience to Single Point Mooring (SPM) and Conventional Buoy Mooring (CBM) Best Practice.

OIL supplies a range of SPM and tandem offtake mooring systems following the OCIMF 2018 "Guidelines for Offshore Tanker Operations", including single or dual hawser configuration, single leg-type mooring hawser and grommet-type mooring hawser manufactured and supplied in strict accordance with the OCIMF 2000 "Guidelines for the Purchasing and Testing of SPM Hawsers".

## Integrated SPM & CBM supply

OIL offers a comprehensive service for Single Point Mooring and Conventional Buoy Mooring systems, from provision of the entire offtake system, to replacement of mooring hawsers, hoses and associated hardware. Our approach is based on experience of providing offloading systems across the globe; we take a systematic approach to assessing the offshore environment, hawser and hose design, testing, and installation conditions.

All OIL offloading systems and products offer outstanding operational performance, reliability and safety, and include chafe chains, mooring hawsers, pick-up and messenger ropes, support buoys, shackles, associated fittings

and load-monitoring equipment. Additionally, OIL is able to supply single and double carcass floating marine and submarine hoses, dock hoses and long length conduit hoses in accordance with GMPHOM 2009.

OIL is also the exclusive worldwide agent for Lankhorst Euronete Portugal (part of the WireCo WorldGroup) for SPM systems, international agent for Manuli Hydraulics - Oil & Marine division floating marine and submarine offloading hoses, MIB Italiana for MIBreak 'next generation' marine breakaway coupling and primary agent for Techflow Marine's Quay Reel® flexible loading and unloading system. Quay Reel® - Tanker Loading & Unloading System The Quay Reel® system offers significant improvements over conventional port and terminal fluid transfer systems resulting in reduced loading times, reduced demurrage, smaller footprint, and increased safety and reliability.

## Navigational Moorings

Offspring International has supplied navigation buoy moorings for over 20 years. It offers the complete mooring assembly, comprising: sinkers, shackles, swivels, bridles and pendant chain. Mooring Buoys are available in several designs: inflatable, rotationally moulded, PU elastomer coated foam filled, modular and steel.

## Strength and Depth

OIL has a worldwide customer base together with a comprehensive international network of agents. OIL values long-term, customer relationships and so a commitment to excellence in customer service is one of our key strengths. We go beyond the normal pre-sales technical advice and project management expected when delivering mooring and offloading systems on-time and within budget. Our service also includes post-installation reviews and through-life support.





**Offspring International Limited (OIL)** is a leading supplier of high quality mooring and offloading systems for Single Point and Conventional Buoy Mooring applications, integrated terminal management systems, Quay Reel® tanker loading and unloading system, hoses, breakaway couplings and navigational buoy moorings.



For more information on Offspring International Mooring and Offloading Systems  
 call: **+44 (0)1384 453880**  
 email: **mail@offspringinternational.com**  
 or visit **www.offspringinternational.com**



Unit 8, Castle Court 2  
 Castlegate Way  
 Dudley, West Midlands  
 DY1 4RH. UK  
 Switchboard: **+44 (0)1384 453880**  
 Fax: **+44 (0)1384 453888**

28577 Jaeger Drive  
 Laguna Niguel  
 CA 92677  
 USA  
 Tel: **+1 949 215 3268**



**mail@offspringinternational.com**  
**www.offspringinternational.com**



2019/REV5

**INTEGRATED TERMINAL MANAGEMENT SYSTEMS**