NASNet® FPR

NASNet® FPSO ACOUSTIC MONITORING SYSTEM

USING ADS^2 TECHNOLOGY

NASNet® FPR offers an acoustic based monitoring system for use on Floating Production Storage and Offloading (FPSO) installations where the integrity and position of the associated FPSO assets need to be maintained.

Current FPSO design provides production risers to offload and store products to the FPSO commonly via a major component, called a turret. This allows the vessel to rotate and head into the wind to reduce environmental forces on the moorings. These turrets and mooring systems can be an integral part of the vessel, or separate, either floating or submerged and can be disconnected depending on conditions to be expected, e.g. hurricane, typhoon or ice flow.

In such circumstances it is important that the integrity of the system, including moorings, chains, turret and the vessel itself is maintained. NASNet® FPR will provide a subsea monitoring acoustic system for this task based on the proven NASNet® family of applications. Utilising the internal and externally interfaced instrumentation capability of NASNet® receivers, critical parameters are acoustically relayed for logging and analysis.

Should the installation require control of seabed systems such as emergency shutdown valves (ESV) the system can also support acoustic EDS (Emergency Disconnect System) function similar to that offered by the NASeBOP safety critical BOP control EDS sequence.

NASNet® FPR also provides a highly robust position solution of each NASNet® receiver, computed relative to a gird of NASNet® MkII Stations used for monitoring, particularly during disconnect and re-connect operations.

NASNet® OPERATING PRINCIPLE

NASNet® is an advanced subsea acoustic monitoring and positioning system with a concept similar to GPS. Using the advanced Nautronix Acoustic Digital Spread Spectrum (ADS^2) signalling technology NASNet® acoustically relays data packets and employs a broadcast technique to determine accurate range measurements between the calibrated NASNet® array and the passive receivers on tracked targets. The positions of the targets can then be determined with ranges from a minimum of 3 NASNet® Stations.

Due to the one way range measurement techniques and advanced spread spectrum signalling technology utilised, multiple NASNet® systems can be used simultaneously with the same Stations. This provides increased acoustic positioning redundancy and enables multiple vessels to position simultaneously using the same array.

Ranges in excess of 7.5Km can be used for positioning meaning that in an existing NASNet® MkII field large numbers of Stations reside within a usable range. This provides dual benefits of fast update rate (typically 1Hz) and high levels of redundancy ensuring stable and reliable positioning.

Due to the unique Nautronix Acoustic Digital Spread Spectrum (ADS^2) signalling, NASNet® will not interfere or be affected by other commercial acoustic systems maintaining an operational immunity for other ongoing tasks on the vessel or on nearby vessels.

Position solutions derived using NASNet® are completely independent of GPS and therefore ideally placed to provide a highly redundant and safety critical solution, immune from periodic episodes of scintillation caused by solar activity in primarily tropical latitudes or limitations which can occur at high latitudes.

NASNet® FPR

NASNet® FPR acoustically relays real-time feedback on system parameters, positioning quality, command status and warning of any potential issues which empowers operators to make important operational decisions based on the best available information. This monitoring capability extends to include all assets e.g. turret, mooring buoys and chains, production vessel, subsea structures and ROVs, in fact any item which can be fitted with a receiver from the proven NASNet® family.

System monitoring of environmental and structure condition status such as Depth, Temperature, Pressure, and Current etc can be achieved using the NASNet® function of device interfacing normally via NASNet® Mobile Transceiver (MTrx) with the information broadcast to NASNet® receivers for logging and action where necessary.

Control of subsea assets, valves etc can be achieved via acoustic command sequences such as emergency disconnect.

Safety critical data parameters and multiple, rapid simultaneous position updates provides vital and current information to the operators and allows for relative structure positions to be monitored during normal production operations and critically positioning capability during latching operations post disconnection. These positions can be provided for use directly in customers monitoring applications via mutually agreed formats or NASNet® ICIS user interface software can provide operator feedback and QC information.

User interaction with the system is generally limited to the activation and selection of Stations to be used with automated system functions carrying out routine time synchronisation of the seabed Stations.

The system provides real-time feedback on positioning quality, command status and warning of any potential issues which empowers Operators to make important operational decisions based on the best available information.

The deployment of NASNet® DPR infrastructure offers the opportunity to utilise the advanced range of associated Nautronix acoustic solutions and applications including NASNet® DPR, NASCom and NASeBOP to suit operational circumstances.

NASNet® FPR DEPLOYMENT AND SETUP

A grid of NASNet® MkII Stations would be installed in the most effective operational manner. The deployed Station reference position would then be established using a simple and efficient baseline calibration routine which is integrated into the NASNet® control software. After this calibration process the system would be available for use as a position reference.

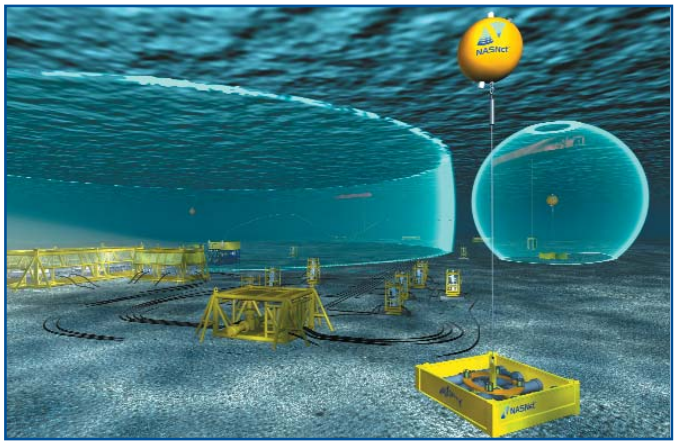
Any additional vessels (e.g. shuttle tankers) which are required to be operational within the FPSO area can also freely use the deployed NASNet® system for activities such as DP reference (NASNet® DPR). In this case no additional subsea Station deployment is necessary with the vessel based NASNet® topsides simply establishing communication to the array. Reliable position solutions can be obtained within minutes, utilising the vessel based NASNet® topsides communicating with the seabed Stations.

KEY BENEFITS OF NASNet® FPR

- Asset and structure monitoring using interfaced data parameters
- Fast and responsive position updates
- Emergency and safety critical acoustic control eg EDS
- True multi-user functionality
- Robust, stable positioning
- High accuracy
- Reliable communications due to advanced digital signalling techniques
- User friendly interface.
- High level of redundancy
- Reduced risk of interference
- Immunity to acoustic pollution from alternative commercial acoustic systems
- Minimal setup time
- Compatible integrated DP reference for locations which has NASNet® pre-deployed
- Easy deployment and calibration for NASNet® free locations

TYPICAL APPLICATIONS OF NASNet® FPR

- Robust and reliable acoustic position reference
- Mitigation of disruption to DP reference availably due to periodic episodes of GPS scintillation
- Monitoring of asset integrity
- Monitoring of environmental and asset conditions via acoustic transmissions



NASNet® Field

Global Leaders in Through Water Communication and Positioning Technology for the Offshore Industry

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