T.EN TECHNIP ENERGIES

Riser Tension Monitoring System (RTMS)

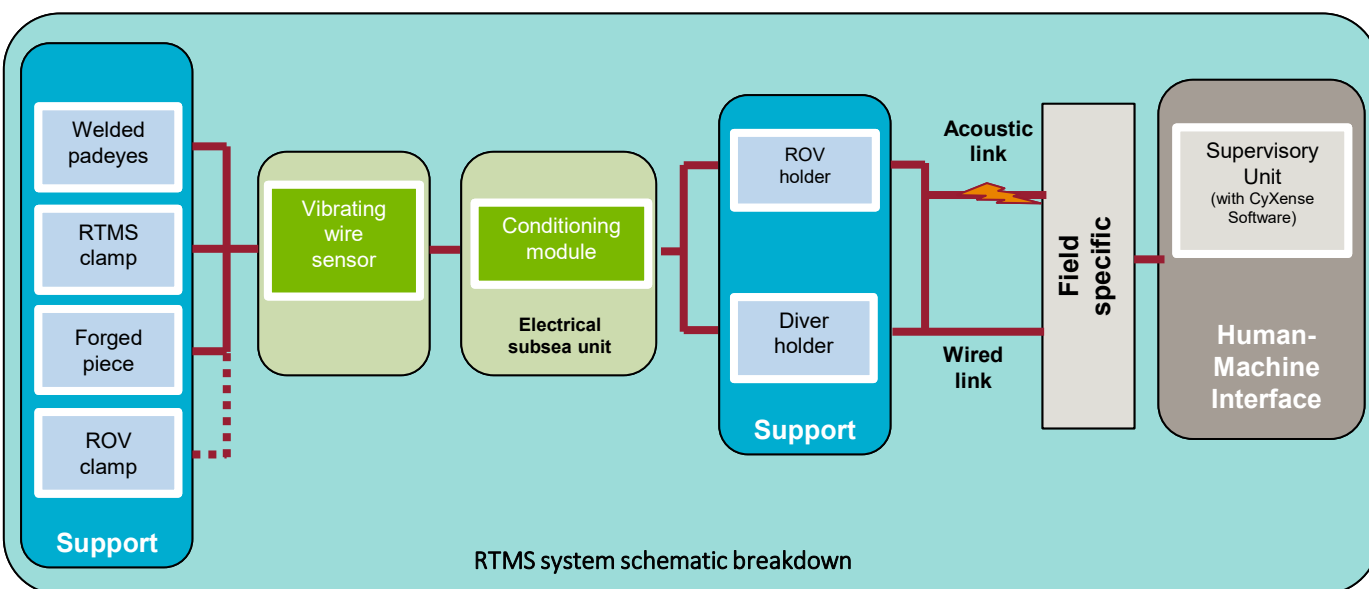A reliable monitoring system for structural integrity

Data cross correlations for residual life assessment

Completed by optional motion, attitude and heading measurements, RTMS allows unique possibilities of data cross correlations and structural history tracking for residual life assessments

Technologies

RTMS monitors the structural integrity of all types of rigid risers

- Free Standing Hybrid Risers (FSHR)
- Buoyancy tanks tendons
- Steel Catenary Risers (SCR)
- Tensioned Leg Platforms (TLP) tendons

The system can be welded or clamped on riser or tendon

RTMS is based on the vibrating wire technology

Continuously measuring extension/compression of the riser. An associated transfer function is used to calculate the corresponding riser or tendon tension and bending.

Data management

Is performed by an in-house developed software CyXense®

Services associated with RTMS include

- Systems installation and setup
- Installation aid
- On-site or in-house operator training
- Hot line assistance
- Data processing
- After sales service
- Maintenance contract

Benefits

- High level of confidence and redundancy
- Sturdiness, high reliability, zero drift and accuracy of vibrating wire technology
- Designed for subsea applications
- Possible deployment by divers
- Part of CyXense® global solution

RTMS system schematic breakdown

Vibrating wires strain sensors

Support axis strain measurement compensated in temperature

- Temperature compensation based on PT1000 internal sensor

Data provided

- Axial tension
- Bending moment
- Direction of bending moment

Sensor supports

- Welded padeyes
- Forged pieces
- Soft clamp support based on aramid strap
- Rigid clamp support for maintainability means and for brownfields (diver retrievable)

Diver or ROV retrievable subsea unit

- Integrates sensors conditioners and data logger
- Options: acoustic modem, batteries…

Topside supervision system (PC-based)

Based on CyXense® in-house software

- Acquire and log the subsea sensor signals
- Apply transfer function on sensors raw values
- Display all sensors values, status of all the equipment alarms
- Log history of events and alarms
- Provide communication interface with the FPSO control system

Optional

- Motion Recording Unit
- Attitude and heading recording system

RTMS - Projects List

Operator / Client Type	Project Location & measurements
IOC / Contractor	Angola • Riser top part tension, bending and motion • Oil Offloading Lines tension and bending
IOC / Contractor	Nigeria • Top part tension, bending and motion
IOC / Contractor	Brazil • Buoyancy support riser tension and motion
IOC / Contractor	Angola • Buoyancy tank tension, bending and motion

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