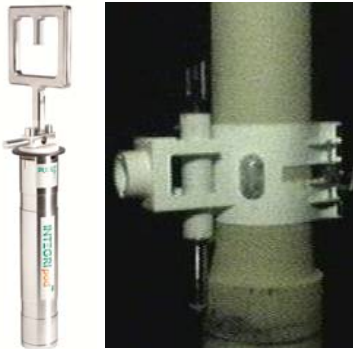


**SCRASSURE™**  
Steel Catenary Riser Monitoring System



**INTEGRistick™** dynamic curvature sensor and motion sensor package



ROV installable holders and **INTEGRipod™** motion data logger



Topside data acquisition system



**SCRASSURE™** Screenshot

The **SCRASSURE™** monitoring system measures key performance parameters of SCRs in support of integrity management, maintenance planning, design validation and improvement of SCR design tools. The measured parameters include:

- Flex joint rotation by measuring angles above and below the joint
- Flex joint bending strain and stiffness by measuring bending strain below the joint
- Riser touchdown zone response by measuring acceleration.

In the touchdown zone, five **INTEGRipod™** motion data loggers (measuring inclination and 3D acceleration) are installed on the riser by ROVs using ROV deployment interfaces.

A topside data acquisition system gathers data from these sensor packages.

The measured parameters are displayed on a screen and compared with preset thresholds. Where these thresholds are exceeded, alarms are raised by the software.

**OPTIONS**

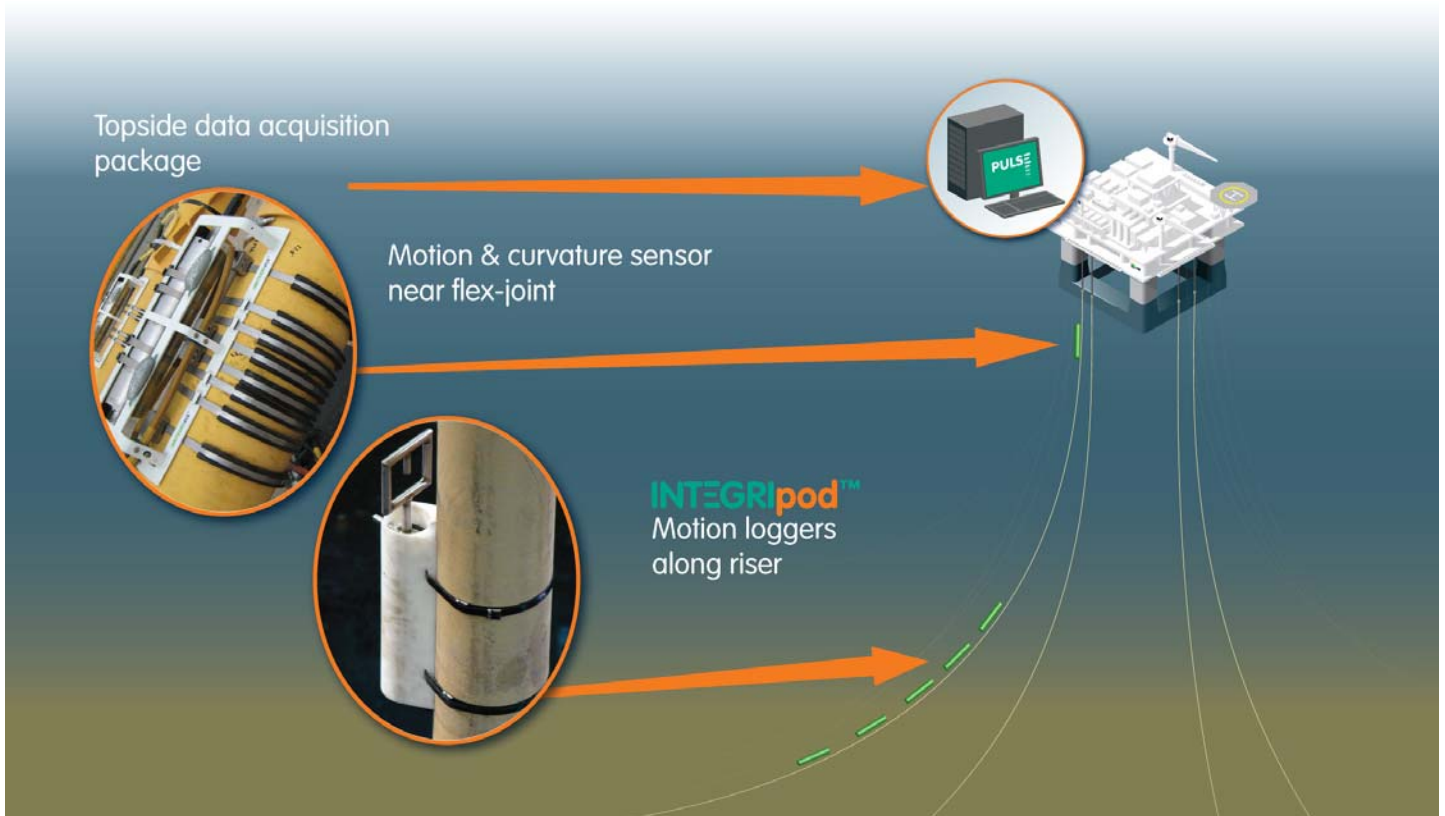
- ROV deployable **INTEGRipods™** motion sensors and **INTEGRistick™** strain sensors at hang-off region for existing SCRs
- Acoustic link for the touchdown zone sensor stations
- Strain sensors such as ROV deployable **INTEGRistick** may be used at the touchdown zone for existing SCRs

**SYSTEM DESCRIPTION**

In the hang-off region, a hardwired **INTEGRipod™** inclinometer sensor is installed above and below the flex joint. A hardwired **INTEGRistick™** dynamic curvature sensor is installed below the flex joint. The installation of these packages will be carried out prior to SCR installation.

**FEATURES**

- Display on-line flex joint rotation and flex joint stiffness
- Detects progressive failure in flex joints
- Raise alarms if discrepancies occur
- Retrofit by divers and ROVs



**SPECIFICATIONS**

Items	Description
Sensor type	INTEGRistick dynamic curvature sensor for dynamic bending strain measurement INTEGRipod on-line motion logger: 3D accelerometer, 2D angular rate and inclinometer INTEGRipod standalone motion logger: 3D accelerometer and inclinometer
Measurement resolution	Dynamic strain: 2 microstrain typical      Acceleration: 2 mg RMS Angular rate: 0.05 deg/s RMS                  Inclination: 0.1 deg RMS Temperature: 0.5 °C
Diver/ROV serviceable	Hang-off region instrumentation package: dry installation Touchdown region instrumentation package: ROV installable holders and pods
Holders for subsea devices	Tailored mechanical interfaces to suit an application
Topside data acquisition system for hang-off region sensor packages	100 m subsea cable and 100 m topside electrical cable, with RS422/RS485 interface Topside data acquisition system based on an industrial PC User specified software running on the PC
INTEGRipod standalone motion data logging programs	Logging period: 10, 20 and 30 min. programmable (20 min. default) Sampling rate: 5 or 10Hz (10Hz default) Logging cycle: 0.5, 1, 2, 4 hrs. programmable (4 hrs. default)
INTEGRipod motion data sensors life	0.5 year with a default logging/data downloading (extendable life)
INTEGRipod dimension	INTEGRipod on-line motion logger: 114mm outside diameter and 1 m length INTEGRipod standalone motion logger: 60 mm outside diameter and 330 mm length
INTEGRipod weight	INTEGRipod on-line motion logger: 15 kg in air with battery, 10 kg in water INTEGRipod standalone motion logger: 3 kg in air, 2 kg in water



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