A unique & cost-effective tool to help you make better decisions regarding your pipelines and structures.
### FIGS® CP SURVEY - BENEFITS

#### REDUCE COST
- Accurate and lean cathodic protection systems
- No excavation and no production stops
- Optimised retrofit and service life extension
- Faster inspections
- Qualified decisions based on accurate predictions

#### INCREASE SAFETY
- Reduced risk of leakage
- Reduced HSE risk by eliminating use of divers

#### PREDICT RISK
- Accurate estimate of current condition and future development
- Improved planning
A FiGS® CP survey maps the electric field (strength and direction), set up by the cathodic protection system.

On both exposed and buried pipelines and structures, it provides an accurate condition assessment and detects even minor coating damages.

Its design allows for accurate measurements with a resolution and detection level beyond any other field gradient sensor available in the market.

Combined with CP modelling, you achieve precise models, enabling significantly improved predictions.

A unique & cost-effective tool to help you make better decisions regarding your pipelines and structures.
Some of the benefits:

- Optimised CP retrofitting, offering substantial cost savings
- Accurate service life estimations
- Eliminates the use of divers - thereby reducing HSE risk
- Kilometers are surveyed accurately and quick
- Eliminates the need for excavation or production stops
- One tool for all your subsea assets - from shallow to ultra-deep water
- From reactive to proactive decisions - predictability
FIGS® CP SURVEY
**FIGS® CP SURVEY - WHEN & WHY**

**Before operation**, a baseline FiGS® CP survey should be conducted to (DNV-RP-F116):

> Look for any damage in the coating and the CP system caused during installation
> Determine the potential along the pipeline and current
> Determine the output of galvanic anodes (baseline for later surveys)

**During operation**, FiGS® CP survey should be conducted to verify:

> CP system failures
> Lack of CP (loss of electrical continuity)
> Excessive anode consumption
> Coating damages

*A well working CP (cathodic protection) system is essential to protect subsea structures and pipelines against corrosion.*
HISTORY OF FIGS®

1979-1981: CPPR, Developed in Trondheim by CorrOcean, Roe Strømmen

2007-2013: FiGS® developed with partners

2015: Statoil approval TRL7 - approved for multi use
APPLICATION AREAS

A FiGS® CP survey can be used on:

> Offshore jacket structures
> Subsea pipelines - baseline survey & retrofit
> In-field structures
> Offshore wind turbines
> Offshore floating platforms - flexible risers/pipelines
OFFSHORE JACKET STRUCTURES

Objective:
> Measure current density to find the actual requirements for cathodic protection

> Check performance of the CP system (anode current and wastage)

Findings/results in case:
> Significant amount of inactive/damaged anodes, which influence the life expectancy of the CP system

> Steel current densities much lower than the values used in the current CP retrofit design

> Extend the life of the current CP system and postpone the retrofit a few years, offering substantial cost savings for our client

> Clients have claimed savings of USD 10 M, nearly 65% of the original estimate using our processed data, combined with CP modelling instead of design code
SUBSEA PIPELINES - BASELINE SURVEY

**Objective:**

- Look for any damage to the coating and the CP system caused by installation
- Verification of a functioning CP system

**Findings/results in case:**

- Surveys revealed sacrificial anode banks not working as expected and corrective measures had to be made
- Surveys DEH pipelines revealed threats to the CP system in the long run
Objective:

> Measure the current density to find the actual requirements for cathodic protection

> Check the performance of the CP system (anode current and wastage)

Findings/results case:

> The survey found buried anodes believed to be depleted still very active

> Coating breakdown was less than the standards expected

> Accurate data for CP retrofit design optimisation

> Clients typically reduce retrofit requirements by 50%
Objective:

> 3D Inspection of CP system
> Establish potential plot of the structure to assess CP protection level
> Quantify drain to connected structures

Findings/results in case:

> We found significant amounts current flowing into the structure (SSIV), indicating that the anodes were depleted and that protection was offered by the anodes of the connected pipeline.
  • Visual inspection confirmed anodes on SSIV were depleted.

> We found significant amounts current flowing out of the X-mas tree down toward the well casing
  • We were able to quantify the current drain to well casing enabling us to calculate remaining life of the CP system on the X-mas Tree
Objective:
> Survey of external CP system
> Determine current distribution, which is often an issue for monopiles

Findings/results in case:
> The monopiles were found to be polarized and well protected, despite the high water resistivity
> We were also able to quantify the current flow to the buried parts of the monopile
> Client got confirmation of a well protected structure and a basis for future inspection plans
Objective:
> Look for damages in outer shield flexibles and risers

Findings/results in case:
> FiGS® easily detected a minor tear in the outer shield

> By combining data with modelling, we were also able to estimate the size of the damage/delamination

> Client got valuable data for monitoring the development of the damage
FORCE TECHNOLOGY NORWAY - AREAS OF EXPERTISE

- Structural monitoring
- Structural engineering
- Integrity management
- Training & courses
- Welding technology
- Inspection & testing
- Corrosion & materials
- Certification of personnel
Thank you for your interest in this fantastic solution!

Please feel free to contact us by using this e-mail

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