

FORCE Technology

We take care of values that create values

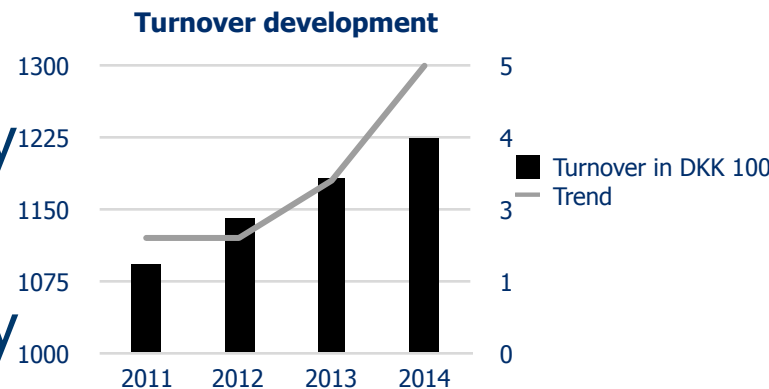
Facts and figures:

✓ Headquarters located in Denmark

✓ 1400 employees – 200 in Norway

✓ 40 years of experience in Norway

✓ Non-profit and independent



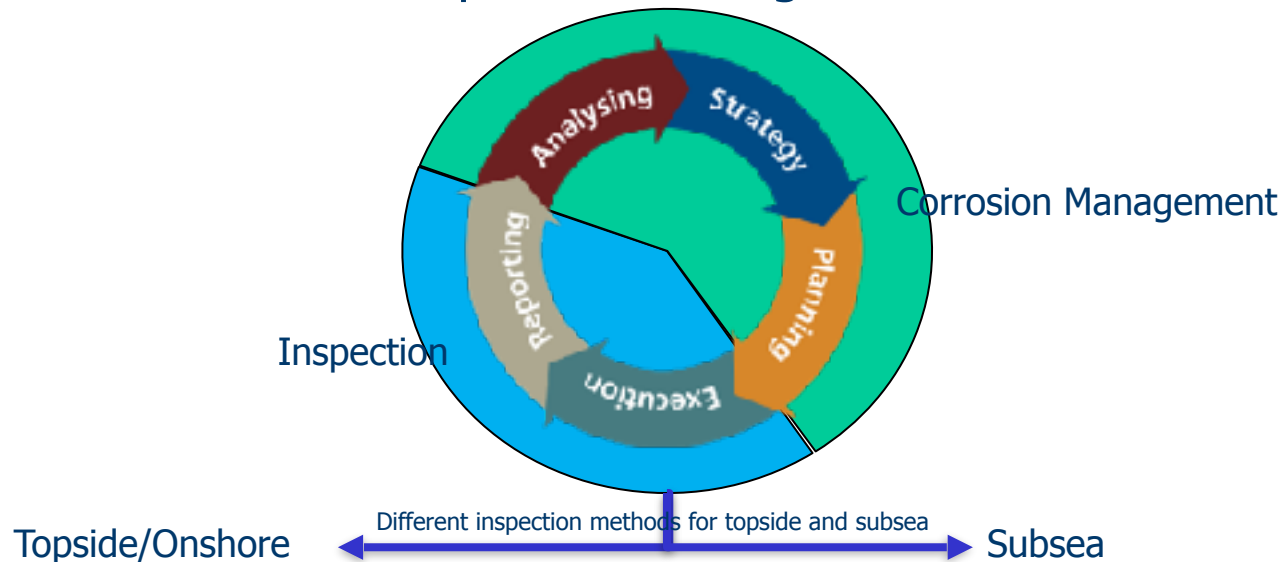
Integrity Management

**“We take care of values
that create values”**

Integrity Management (Products and Services)



Inspection Management



Integrity Management - Competency



- NDT Inspection
- Advanced Inspection
- NDT certification of inspectors and equipment
- Load and Response sensors
- Monitoring systems

- Material selection/ verification
- Cathodic protection (CP)
- Coating and surface protection
- Corrosion Control
- Laboratory services (testing and analysis)
- Failure assessment



- Design
- Reanalysis
- Modification
- Global and local analysis
- Verification

Inspection Management

- Topside Inspection Management
 - Risk Based Analysis & Risk Based Inspection Planning
- Pipeline & Subsea Inspection Management
 - Well Corrosion Management
- Integrity Project Management

Inspection Management - Services



Topside Inspection Management

Planning, execution and follow-up to achieve corrosion control, ensure focus on high-risk items, and thereby reducing HC leaks and a number of unplanned shutdowns due to material degradation.



Risk Based Inspection Planning

Optimise the use of the inspection resources (cost effective), while at the same time ensuring the technical integrity of the asset (safety).

FORCE Technology uses Risk Based Inspection (RBI) planning, which is a method to identify the probability and consequence of component failure.



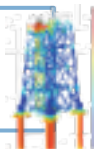
Pipeline and Subsea Inspection Management

Operational support, like inspection planning, data analysis, corrosion modeling and recommendations regarding corrosion and materials.



Cathodic Protection Management

Design, modelling, verification and inspection of CP systems.



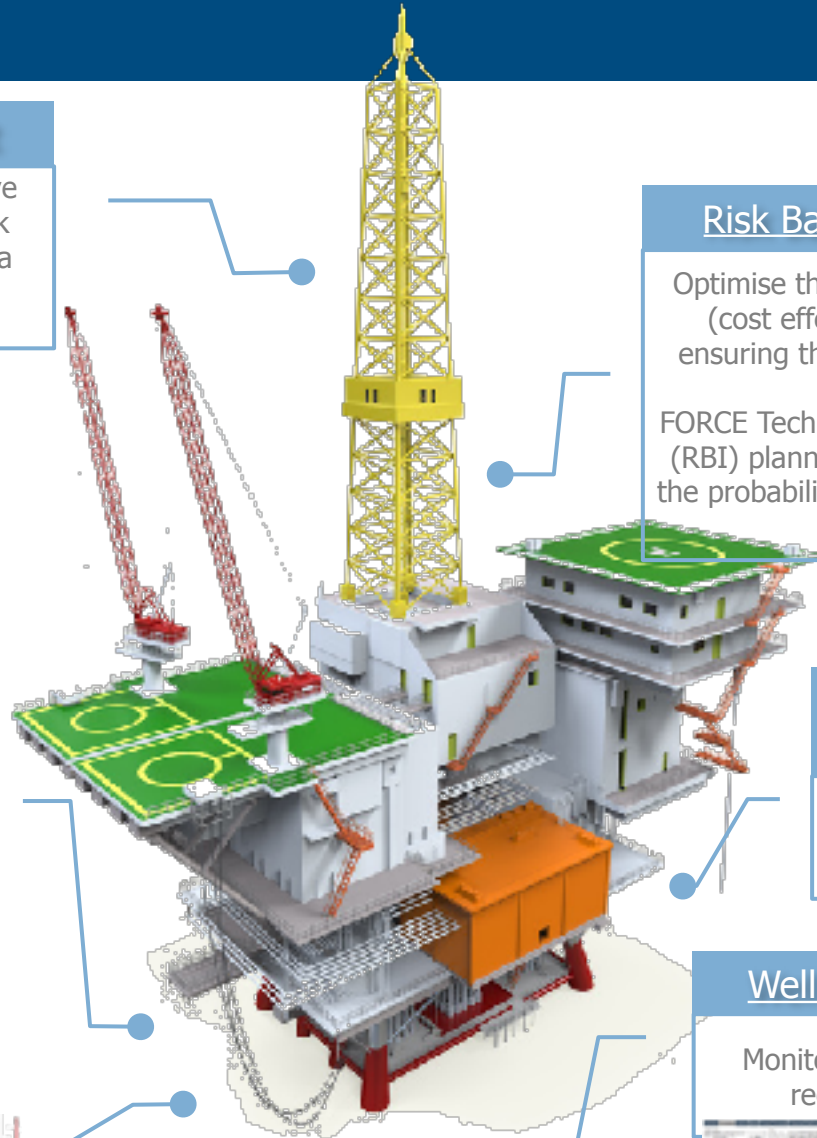
Corrosion and Materials Technology

Materials and corrosion evaluation and analysis.



Well Corrosion Management

Monitoring, analysis and assessment regarding corrosion for wells.



Inspection Management Working Process



Analysing

Follow-up of inspection and findings

- Fitness for Service and special studies (structural, materials, corrosion)
- Failure assessment (laboratory testing and investigation)

Strategy

Integrity strategy

- Risk based analysis/assessments (RBA)
- Define roles and responsibilities
- Define KPI's and procedures

Reporting

Reporting and data gathering

- Use the Integrity Management System (SAP/Workmate) to report KPI's and data from inspection activities
- Establish and follow-up corrective actions and mitigation activities
- Collect, measure and evaluate monitoring/process data and prepare status reports and improvements

Execution

Inspection (visual, NDT and monitoring)

- Implementation and execution of the planned activities for inspection programs

Planning

Risk based inspection planning (RBI)

- Inspection programs (NDT Inspections)
- Corrosion and erosion monitoring programs (Corrosion probes)
- Process monitoring programs (Chemical (MIC, Oxygen))
- Vibration monitoring programs
- Chemical treatment mitigation programs
- Surface protection mitigation programs



- **Risk Based Assessment (ensure identification and focus on high risk systems)**

[e.g. Criticality assessment (CoF & PoF) of potential degradation threats with recommended inspection intervals]

- **Define roles and responsibilities (ensure ownership)**

[e.g. Project Execution Plan, Role Descriptions, Interfaces, Reporting]

- **Define KPI's and procedures**

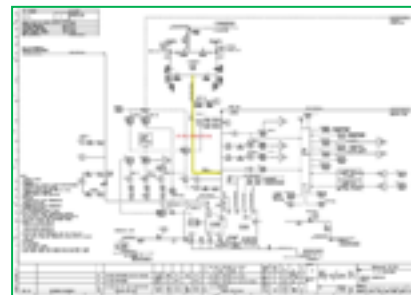
[e.g. Critical monitoring parameters; Process, Corrosion etc, Inspection and mitigation procedures]



- **Risk based inspection planning (RBI)**

[Inspection planning using risk assessment (degradation threats, intervals, criticality), monitoring & process data and inspection history for all TAG's, to establish work packages with location (drawings; ISO, P&ID), inspection methods and reporting requirements]

- Inspection programs (NDT Inspections)
- Corrosion and erosion monitoring programs (Corrosion probes)
- Process monitoring programs (Chemical (MIC, Oxygen))
- Vibration monitoring programs (Structural systems)
- Chemical treatments mitigation programs (Process systems)
- Surface protection mitigation programs (Process and structural)



- **Implementation & execution of the defined and planned activities for the inspection programs**
[e.g. NDT inspection (UT, MT, PT, RT etc.)]

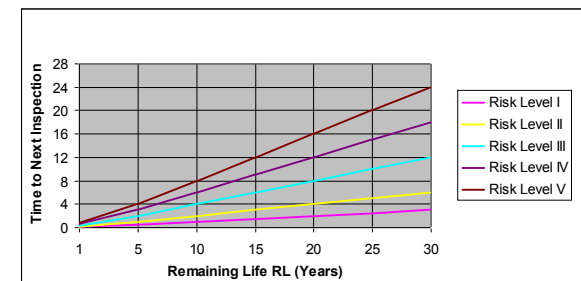
- General Visual Inspection (GVI)
- Close Visual Inspection (CVI)
- Corrosion Under Insulation campaigns (CUI)
- NDT campaigns (UT, MT, PT etc.)
- Radiographic campaigns (RT)
- Non-intrusive campaigns (NII)
- Rope access campaigns (RAT)
- SS316 campaigns (if there is a issue)
- Vibration campaigns
- Thermographic campaigns
- Dropped Object campaigns (DROPS)
- Shutdown's
- Cathodic Protection campaigns (CP)



- **Use the Integrity Management System (CMMS) to report KPI's and data from inspection activities**
[e.g. findings, photos, measurements, monitoring data etc.]
- **Establish and follow-up corrective actions and mitigation activities**
- **Collect, measure and evaluate monitoring/process data and prepare status reports and improvements**



- **Fitness for Service and special studies** (structural, materials, corrosion)
- **Failure assessment** (laboratory testing and investigation)
- **Review the effectiveness of the inspection/corrosion management programs**
- **Improve the corrosion management activities and take necessary actions**
[e.g. Update Risk Based Analysis (longer inspection intervals and/or increase inspection on findings/critical equipment), improve inspection programs, improvement projects etc.]



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Clients

