

Atkins Boreas

Introduction

Atkins Boreas is the centre of pipeline and subsea engineering expertise within the Oil and Gas Division of Atkins. Our engineers are focused on providing solutions to the challenging problems found in the oil and gas industries with particular emphasis on deepwater and high pressure, high temperature (HPHT) developments. We have world class skills in:

- Flow assurance
- Pipeline engineering
- Subsea engineering
- Materials and corrosion engineering
- Integrity management
- Risk and reliability

To provide fully integrated, multi-discipline solutions we work closely with our colleagues in Atkins Oil & Gas who bring expertise in related disciplines such as process, safety, structural design and integrity analysis, conductor design and decommissioning. We provide support over the full life cycle of subsea facilities. This encompasses conceptual subsea facilities design, engineering support and assurance during FEED and detailed design, integrity management during operation and decommissioning planning.

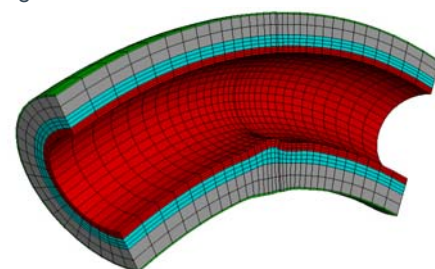
With offices in the UK, USA and Australia, we can deliver our expertise wherever it is required.

Field Development/Concept Studies

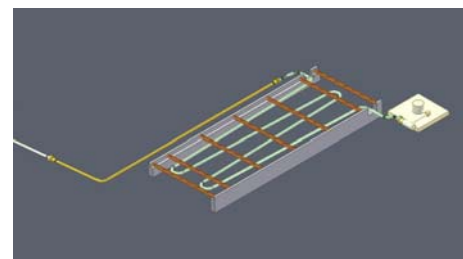
The early stages in a subsea design are critical if the project is to maximise value. An effective field development study will identify, evaluate and screen a range of potential development options. Identification, quantification and management of technical and commercial risks are vitally important at this stage. Project risks are rarely constrained by discipline; a technical challenge arising in one discipline will normally impact a wider number of disciplines.

For example, a key flow assurance decisions might include pipeline thermal management (e.g. cooling/cryogenic spools, insulation, active heating) which will impact chemical management strategies (e.g. continuous or batch inhibition). The flow assurance challenge will then impact key pipeline decisions such as mechanical design and material selection, and key subsea production system decisions such as chemical injection, control and power requirements.

By combining cross-discipline skills and experience within our core areas of flow assurance, pipeline engineering, subsea engineering and project execution, Atkins Boreas ensures that these challenges are solved, not shifted between technical silos. Our technical expertise ensures that any major design issues are identified and addressed at an early stage in the project, where they are most easily solved.



Local Buckling under Thick Coating



Low Profile Self Draining Cooling Spool



Horizontal Tree

Plan Design Enable

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Project Assurance and Support

Engineering continuity from conceptual engineering and FEED to the detailed design, manufacture, system integration testing, installation and commissioning phases is essential to a successful project. We have a proven track record in technical support, assurance and verification during these phases. The key to success is a proactive approach with a close working relationship with the client and contractor. We have developed Design Specifications for a number of projects to ensure that key issues are properly engineered during detailed design.

A cornerstone of Atkins Boreas' activities is specialist studies into problems which cannot be solved by standard methodologies. Extensive use is made of non-linear finite element analysis to model a diverse range of complex engineering problems such as temperature distributions in complex components, pipeline buckling and pipeline installation involving plasticity. We have developed and managed test programmes to address knowledge gaps in many areas of engineering; these include pipe-soil interaction, pipeline local buckling and pipeline bursting.

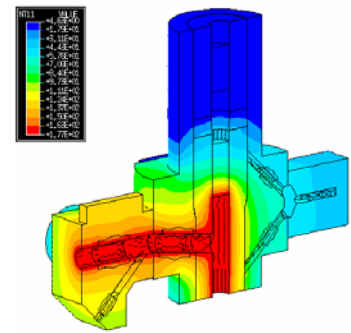
Our engineers look to promote and utilise innovative technologies which can make a real difference to project value. We have supported the development of a number of technologies for example plastic lining for hydrocarbon service, cold flow, deepwater bundles, wax tolerant HIPPS.

Operational Support

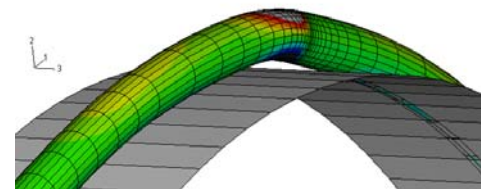
Atkins Boreas has an established capability in supporting integrity management of onshore and offshore pipelines systems during operation. We have compiled pipeline and subsea integrity management schemes (PIMS & SIMS) for a number of operators. We have combined our integrity management, and risk and reliability skills to develop risk-based IRM plans.

We combine our pipeline analysis, material engineering and defect assessment skills to undertake fitness-for-purpose assessments of both local defects (e.g. corrosion, gouges, dents, ovality, local buckles, cracks) and structural defects (e.g. spans, lateral and upheaval buckles), and to undertake failure investigations. Assessment methods range from simple qualitative checks to detailed assessments using advanced elastic-plastic fracture mechanics, FEA and/or testing.

We also apply our integrity management expertise during the design phase to ensure that designs reflect best practice with regard to life cycle management.



Heat Transfer Analysis of Horizontal Tree



Installation Involving Plastic Deformation



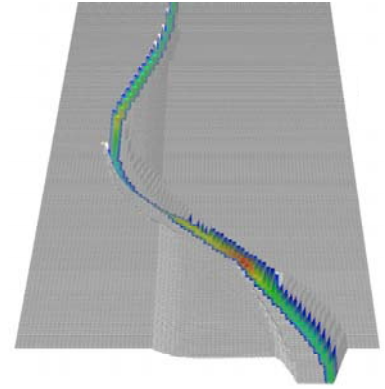
Full Bore Pipeline Failure

HPHT

Atkins Boreas has unrivalled expertise and experience to tackle the pipeline design challenges associated with deepwater HPHT and XHPHT developments. We have created unique analytic models for the conceptual analysis of both upheaval and lateral buckling, and have extensive experience of applying non-linear finite element analyses (FEA) to fully assess more complex loading, geometry, material response and/or pipe-soil interaction.

Atkins Boreas leads the SAFEBUCK JIP which aims to develop methodologies to deliver safe and effective pipeline designs which permit lateral buckling. The JIP scope includes low cycle fatigue and lateral pipe-soil interaction testing.

We combine our subsea engineering, and risk and reliability expertise to assess the technology readiness of and required qualification programmes for subsea systems under HPHT conditions. We combine our skills in subsea and pipeline engineering, risk and reliability, and safety engineering to the use of high integrity pressure protection system (HIPPS).

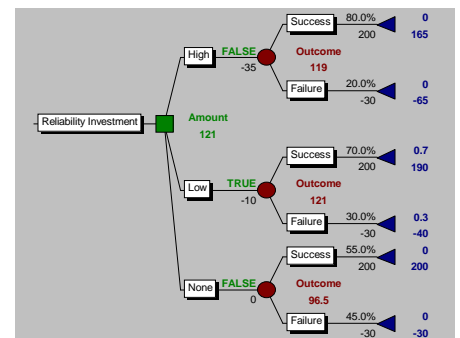


FEA of Lateral Buckle in Soft Seabed

Risk and Reliability

Addressing risk and reliability is critical within the most challenging subsea developments where the cost of intervention can be unacceptably high. These projects throw up a huge range of technical risks and challenges which can be effectively addressed through proper risk and reliability management. Our risk and reliability expertise is applied from field appraisal through concept selection, design and construction, to operation and integrity management

Our risk and reliability expertise is exemplified by our role as drafting author of API RP 17N. We have assisted a number of companies in the development of reliability strategies in line with API RP 17N, including the provision of supporting documentation, training and project implementation assistance



Risk Based Decision Tree Decision Tree

Contacts

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