



ADVANCED ENGINEERING FOR TOP TENSION RISERS

- **Independence**
 - Independent and impartial engineering, without hardware or installation preference
- **Advanced Subsea Engineering**
 - Unique combination of engineering experience, including design, testing, analytical skills and proprietary software solutions
- **Experienced Personnel**
 - Personnel with worldwide experience, all locations, all water depths
 - 25 years in offshore industry
- **Resources**
 - Staff of 150 based in Houston, Galway, Aberdeen, Rio, Perth and Paris
- **Worldwide client base and experience**

SERVICE

- **Overall Concept Design and Configuration Layout**
- **Pipe sizing (API, DNV, CFR)**
- **Selection/Specification of Material and Coating Requirements**
- **Analysis**
 - Extreme (storm conditions)
 - Motion fatigue
 - VIV fatigue
 - Installation
 - Interference with wake effects
- **Specifications**
 - Line pipe
 - Weld test
 - Flex joints/Stress joints
 - Strakes/Fairings
- **Fracture Mechanics**
- **Analysis of Pipe-in-Pipe**
- **Evaluation of Alternative Materials**
- **Operator Project Support**
- **Technology Gap/Bridges**
 - HP/HT
 - Materials
 - Components
 - Concepts
- **Installation Support**
 - Analysis
 - Offshore Supervision

CAPABILITY

- **Experience with Multiple Vessel Types**
 - Spars
 - TLPs
- **Site Locations**
 - Gulf of Mexico
 - West of Africa
 - North Sea
- **Software**
 - Flexcom
 - Freecom
 - Modes
 - Clear
- **Spars**
 - BP - Horn Mountain
 - Murphy - Medusa
 - Murphy Frontrunner
 - ChevronTexaco - Genesis
 - ExxonMobil - Diana/Hoover
 - Kerr McGee - Gunnison
 - Dominion Devils Tower
- **TLPs**
 - BP - Marlin
 - Total - Matterhorn
 - Conoco - Heidrun
 - Anadarko - Marco Polo