

# Cable Risk Management

Risk management for cables in shallow and deep water subsea environments



# Comprehensive Cable Risk Management Through Every Project Phase

## Expert analysis and data-driven solutions

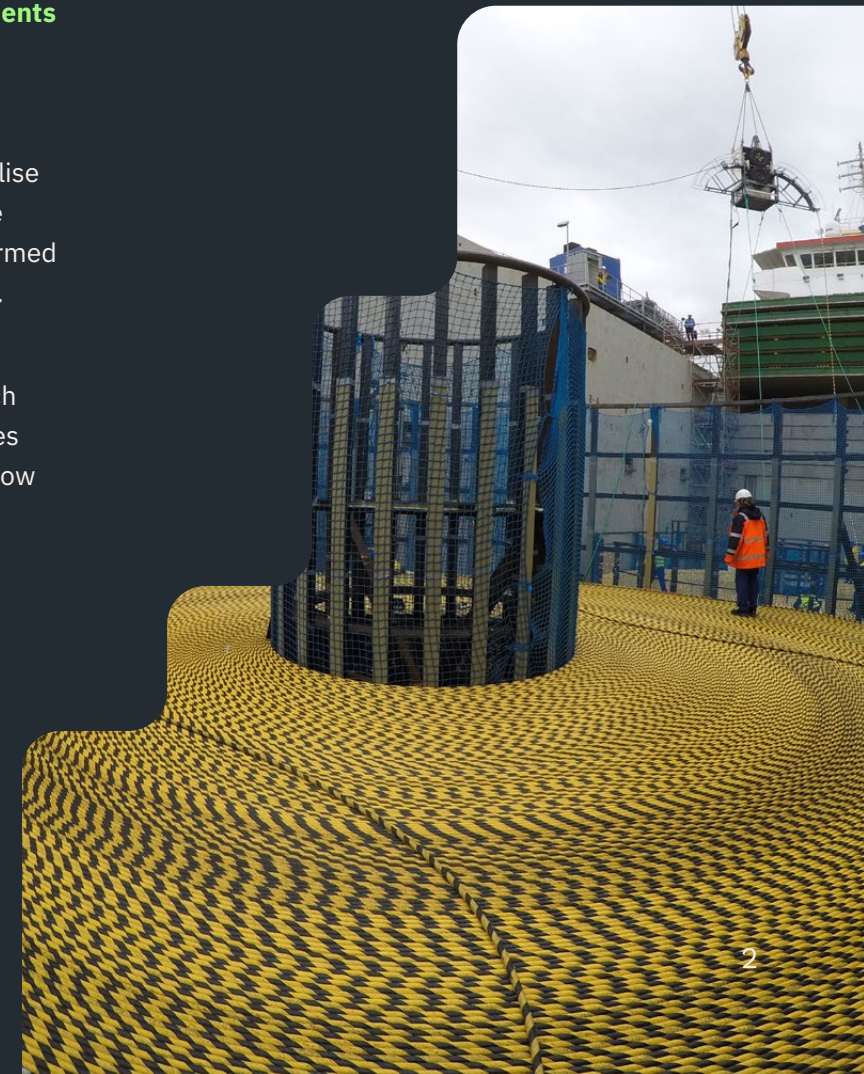
At Ternan, we understand that successful cable installation and long-term integrity depend on thorough risk assessment and mitigation strategies. Our comprehensive approach integrates shallow sub-seabed geophysical ground modelling with advanced route engineering to deliver safe, cost-effective cable installation solutions.

We leverage over two decades of offshore experience to provide clients with accurate risk assessments that inform critical decisions from route selection through to operational maintenance. Our team of marine geologists, geophysicists, and engineers work collaboratively to identify potential hazards and develop tailored solutions that minimise operational risk while optimising project economics.

## Integrated methodology for complex environments

Our integrated methodology combines cutting-edge geophysical interpretation with practical engineering experience to address the unique challenges of subsea cable environments. We utilise both geophysical and geotechnical data to create comprehensive ground models that support informed decision-making throughout the project lifecycle.

From preliminary desktop studies through to as-live assessments during installation, our approach ensures that cable burial and protection strategies are optimised for site-specific conditions. We follow industry best practices including Carbon Trust methodology while adapting our assessments to account for complex and layered geology.



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# Our services



## Shallow sub-seabed Geophysical Ground Modelling

Ternan provide comprehensive shallow sub-seabed ground modelling services, integrating shallow geophysical and geotechnical data to deliver accurate, site-specific ground models. Our expertise supports subsea cable projects by identifying seabed and sub-seabed geohazards, informing route design and reducing operational risk through interpretation and analysis of geoscience data.



## Preliminary CBRA

Ternan offers preliminary Cable Burial Risk Assessment (CBRA) to identify key cable risks at a site, typically before cable routes are finalised. Using a zonal approach, the area is divided into zones rather than specific route sections. If routes are not yet defined, the study can guide route selection by identifying major hazards, such as impractical burial depths, that can be avoided.

The assessment provides recommended Depths of Lowering (DoL), risk profiles for each zone, and advice on handling mobile sediments and other site hazards. As a preliminary study, it can be conducted with limited or lower-quality data and can inform future survey campaigns. Ternan also offers site investigation specification, scoping, and package management services.



## Route Engineering

We deliver expert route engineering services for subsea cable and pipeline projects, including deepwater hazard analysis such as sediment mobility, turbidity currents, and slope stability. Our solutions ensure safe and efficient routing by avoiding features like subsea canyons, unstable slopes, and subsea volcanic risk. Ternan also provide thermal resistivity analysis specifically for power cables, enabling fully integrated and optimised route design.

## **Burial Assessment Study (BAS)**

Ternan conducts Burial Assessment Studies aka Cable Protection Assessments (CPA) for pipelines and cables. Using the required burial depth from the CBRA, the study determines how to achieve it by assessing mobile sediment thickness, site ground conditions, and the proposed trenching method (if known). Its goal is to define the trenching methodology, identify high-risk areas, and outline remedial actions where the required depth of lowering (DoL) cannot be achieved. We can also review and comment on contractor supplied BAS or CPA reports to ensure they are fit for purpose.

## **Advice on data collection strategy**

Based on the information gathered in the preliminary work (ground model/desktop study, preliminary CBRA, preliminary routing), Ternan can provide clients with optimised strategies on data collection, advising on specs, the location and appropriate methodology.

## **Detailed CBRA**

Ternan provide detailed cable burial risk assessments to ensure safe, reliable and cost-effective cable installation. Our assessments evaluate both natural and anthropogenic hazards. Ternan's integrated approach utilises both geophysical and geotechnical data, we determine optimal burial depths and protection measures. The detailed CBRA differs from the preliminary CBRA in that it will require cable routes to be finalised and include route-specific data.

Ternan define appropriate DoL based on risks associated with anthropogenic and natural hazards and provide a probabilistic assessment. Ternan's approach is to present results in a format which allows the client to see the change in risk as DoL changes – which in turn allows refinement of the DoL based on the risk level acceptable to the client.

Ternan follow the Carbon Trust methodology for the probabilistic assessment with adaptations to allow for complex and layered geology to be accounted for.

## **As-Live CBRA**

Ternan's As-Live CBRA service is completed whilst the trenching vessel is on site. The aim is to reduce the vessel's time on site and eliminate the potential need for a re-mobilisation, whilst improving the efficiency of the trenching or cable protection operations without increasing the risk to the cable. This may lead to substantial cost savings.

## **Contribution to O&M**

Ternan's robust cable risk management and site investigation management processes, consisting of ground modelling, risk analysis, CBRAs and route engineering directly support the operations and maintenance of cables and pipelines by reducing the risk of failure and informing proactive asset management. It enables risk-based inspection planning, targeted monitoring in high-risk areas, and efficient response to faults by providing detailed burial and hazard data. This enhances long term cable integrity, minimises downtime, and optimises maintenance resources throughout the asset's lifecycle.

# Our services in cable risk management

Ternan's in-house Geotechnical and Geophysical experts work alongside clients to advise and provide bespoke expertise on each step of the cable risk management life cycle.

## Legend

- → Next step
- + ● Simultaneous process





# Project experience

## Proven Expertise in Complex Subsea Environments

Ternan's cable risk management team combines decades of hands-on offshore experience with cutting-edge analytical capabilities. Our specialists have worked across diverse geological settings, from shallow coastal waters to deep ocean environments, providing practical knowledge to address unique project challenges.

Our multidisciplinary approach ensures seamless integration across all project phases. By combining marine geophysics, geotechnical engineering, and route engineering capabilities, we provide clients with a single point of contact for comprehensive cable risk management services. This integrated approach eliminates coordination challenges while ensuring consistency in data interpretation and risk assessment methodologies.





## Talk to the Ternan Team

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