CONTROL & OPTIMIZATION

MOBYDIC

MOnitored BouYgues DIsc Cutter

The smart technology that optimizes TBM performance in real time

MOBYDIC is an innovative real-time **disc cutter monitoring system** designed for tunnel boring machines (TBMs). Developed by Bouygues Travaux Publics, it provides **instant insight into cutter-ground interaction**, enabling operators to optimize TBM progress, reduce downtime, and prevent hazardous events—particularly in heterogeneous geological conditions.

Key benefits

- **Optimized TBM excavation performance**
  Continuous **real-time geological face mapping** provides operators with clear guidance to anticipate ground changes and immediately adjust excavation parameters.
- **Reduced hyperbaric interventions**
  MOBYDIC detects cutter wear, blocked discs, overheating, radial overload, and other anomalies before failures occur.
- **Enhanced operational safety**
  MOBYDIC automatically generates **alerts** for unacceptable conditions. This enables proactive decision-making and reduces the risk of damage.
- **Full traceability and data analytics**
  Automatic ring-by-ring reports provide temperature, radial force, adhesion and cutter wear assessment.

INNOVATIVE SOLUTIONS FOR TUNNEL CONSTRUCTION

Differentiating Features

Real-time geological face mapping
Clear circular visual displays immediately highlight:

› rock zones
› boulders and core stones,
› alluvium layers,
› marine deposits,
› concrete piles and obstructions

This real-time visualization provides valuable guidance for excavation strategy and penetration control.

Individual cutter monitoring
For each disc cutter, MOBYDIC provides:

› temperature
› rotation speed / blockage detection,
› radial force
› wear estimation
› predicted replacement time.

The follow-up table enables **true predictive maintenance**.

Smart anomaly detection
Typical detected events include:

› Locked disc cutter
› Early signs of cutterhead clogging
› Excessive radial force due to rock in the invert

MOBYDIC acts as an **intelligent assistant** for TBM operators.

System Architecture

The system consists of:

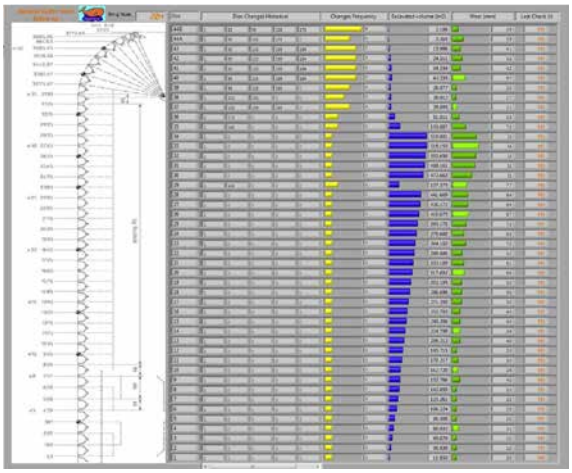
› Wireless Sensors installed directly on the disc cutters
› A data acquisition module
› A dedicated MOBYDIC PC in the TBM control cabin
› Surface-level monitoring capability
› Secured access via password protection

Added value for projects

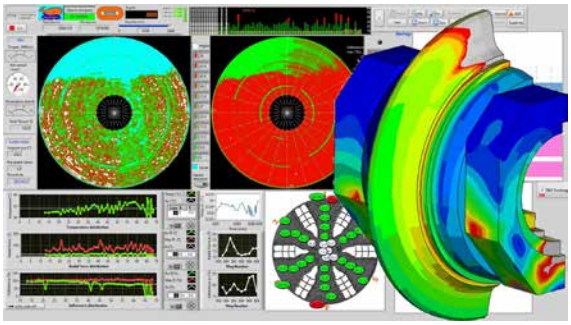
MOBYDIC is ideally suited for tunnelling projects involving **heterogeneous, abrasive, or unpredictable ground conditions**, where minimizing risky or costly interventions is critical.

Project-level benefits include:

› Reduced cutterhead maintenance costs
› Optimized planning of disc replacement sequences
› Fewer excavation incidents (caves, obstructions, overload situations)
› Improved geological documentation and traceability
› Increased productivity, control and operational confidence



Real time discs cutters analysis



BOUYGUES TRAVAUX PUBLICS

Adresse
Contact