Thales Smart Maintenance Platform

SHIFT TO A SMART MAINTENANCE STRATEGY

Discover • Predict • Advise
Impact of Unplanned shutdowns

The main causes of unreliability are external problems, signalling and trains.

- External: 23.8%
- Signalling: 16.2%
- Train: 14.9%
- TOC Operations: 11.4%
- Others: 8.9%
- Track: 7.4%
- Unknown Operations: 5.2%
- Electrification & Plant: 4.4%
- National Rail Operations: 4.2%
- Rules & Processes: 3.0%
- Telecommunication: 0.4%

Research shows that companies worldwide could be saving as much as €149M per year if they could avoid unplanned failures.

How to sustainably reduce unplanned shutdowns?
Maintenance regimes in the rail industry

Is your current Maintenance regime matching your ambition?

Fault repair only

Inspect and service

Scheduling
- Preventive maintenance

Condition Monitoring
- Proactive maintenance
- Health Assessment plus "diagnosis"

Forecasting
- Predictive Maintenance
- Prognostics plus "diagnosis"

Intelligence
Assets
- Optimisation of Operations and Maintenance

What does the schedule say?

What is happening now?

What are the trends in the system?

What should I do?

Is your current Maintenance regime matching your ambition?
Welcome to your new Maintenance strategy
Get full control over your Maintenance operations

**Early Awareness**
Identify anomalous behavior, through a holistic view of your asset network health

**Increased Automation**
Accelerate root cause analysis and support identification of underlying faults.

**Real-time Assistance**
Share data and synchronise views real-time with Thales experts to resolve complex faults

**Right Fix, First Time**
Fix issues the first time, without need for additional expertise, information, or parts

**Protected Staff**
Reduce need for track working by making data accessible from anywhere

Improved passenger experience through better efficiency and enhanced quality of service.
On-board your Smart Maintenance journey

Achieve your transition to Smart Maintenance with TIRIS capability levels.

- **Discover**
  - Available
  - Supporting Operational Decisions.

- **Predict**
  - from Q1 2021
  - Anticipating future events.

- **Advise**
  - from 2022
  - Providing actionable recommendations.

Powered by TIRIS
<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Axle Counters</th>
<th>Point Machines</th>
<th>Track Circuits</th>
<th>Interlocking</th>
<th>CBTC</th>
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**Equipment Type**

- Direct Current
- Single phase Alternating Current**
- Three Phase AC
- Direct Current
- Alternating Current
- High Voltage Impulse
- Audio frequency

**Available TIRIS capabilities**

- Discover
- Predict Q3 2021
- Discover
- Predict Q1 2021
- Discover
- Predict Q4 2021
- Discover

*For older AzLM version, possibility to explore alternative technical options.**

**Single phase AC support is currently suitable for Proof of Concept only.**

Introduction of new assets to be discussed in line with the strategic TIRIS product roadmap.
"This has been a very exciting journey and the first of its kind in the UK, we now have multiple routes following our footsteps and trialling this game changing advancement. [...] Analysis completed this year has led to the 250% return on investment " - Tony Osborne, Network Rail
Customer challenge

- Reduce failures on the network and improve safety
- Manage a variety of assets from numerous vendors

Thales’ answer

A condition monitoring system for over 40,000 equipment
- Data analytics to detect abnormal behavior
- First predictive systems to detect failures before they occur
- Equipment- and vendor-agnostic open architecture

Customer benefits

- Saving of over £12 million in delays
- Increased maintenance efficiency
- Gradual move from preventive to predictive maintenance
Customer challenge
- Inability to identify trends in the data to proactively maintain the system
- Loop inspection is a cumbersome and time-consuming activity

Thales’ answer
Deploying maintenance data analytics (TIRIS) in an as-a-service model
- Access to typically unused diagnostic data
- Big Data Platform which allows users to quickly ingest, process and visualise data
- Service support to advance the customer’s knowledge

Customer benefits
- Ability to easily identify issues related to signalling communication for the entire network
- Remove the need for physical loop inspection
- Benefiting from Thales extensive experience to advance teams’ knowledge
SNCF – Centralised Data Analytics

Customer challenge
- Extensive network with diverse range of types for the same asset
- Inability to predict failures which led to penalties and reduced passenger experience
- Old infrastructure

Thales’ answer
- A centralised approach to data analytics
- Centralised data lake allow fast processing of large amounts of data
- Fully integrated solution – sensor, big data platform and cloud deployment –
- Cybersecurity embedded by design
- Extensive knowledge from other project incorporated to the solution

Customer benefits
- Ability to communicate better via dashboards
- Creating value from data through Thales Data Science capability
Customer challenge
- Looking for optimisation of maintenance tasks to reduce cost
- Supporting obsolescence of the system
- Several systems to support the diagnostic of the signally system

Thales’ answer
- A centralised approach to all your data
- Centralised data lake allow fast processing of large amounts of data
- Flexible Reporting to design and share dashboards with existing data
- Access to data scientist as a service

Customer benefits
- Quickly access to data in a high-performance
- Ability to better communicate with other stakeholders via dashboards
- Creating value from data through Thales Data Science capability
Thank You

Contact us:

Nathan MARLOR
Digital Services Product Line Manager
nathan.marlor@uk.thalesgroup.com

Lorraine DURIEUX
Business Development Manager
lorraine.durieux@uk.thalesgroup.com