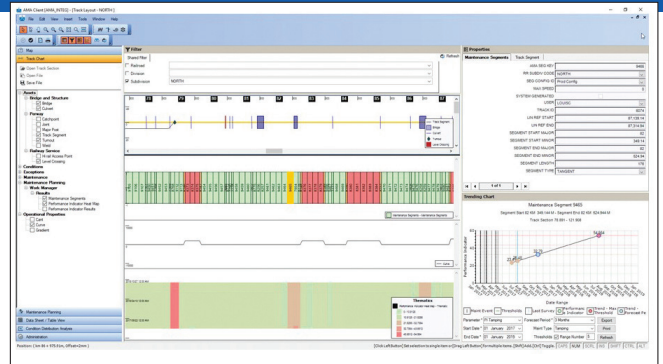
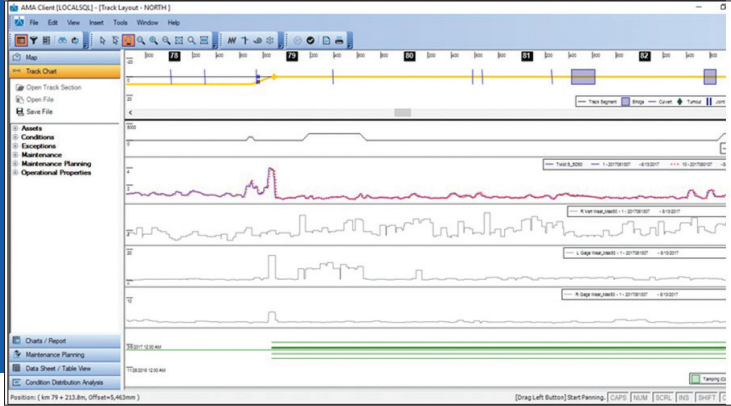


Automated Maintenance Advisor (AMA)



The ENSCO Automated Maintenance Advisor (AMA) is key to transforming track measurement data into actionable maintenance tasks. Using ENSCO's key knowledge of track condition monitoring and deterioration, the AMA was built to trend deteriorating conditions and recommend remedial maintenance tasks to proactively and scientifically conduct track maintenance.

Automated and Integrated

The AMA is a client server solution that is fully integrated with ENSCO's Digital Track Notebook® (DTN) and TrackIT® web products. It accepts measurement data from all ENSCO manned and autonomous track measurement systems and can be configured to accept non-ENSCO data. The AMA recommends maintenance tasks based on the measured track condition. The AMA can also be integrated with Enterprise Resource Planning (ERP) systems, such as SAP or Maximo to execute those maintenance tasks as work orders. The AMA is intended to operate automatically, routinely assessing condition data and then recommending maintenance tasks when applicable.

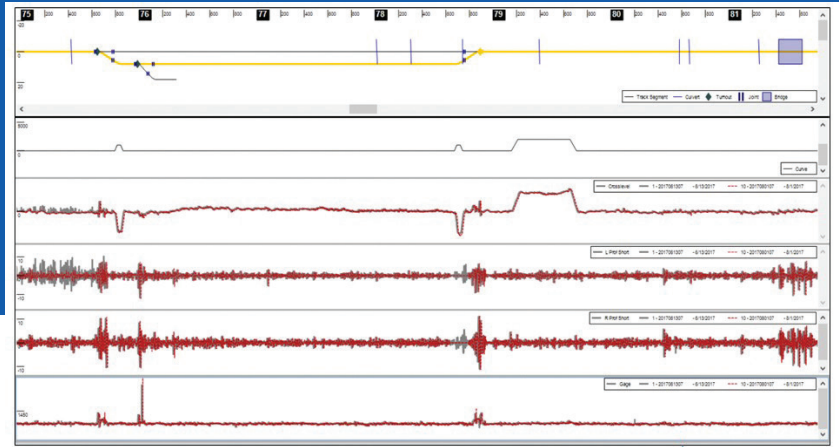
Deterioration Trending

The AMA is designed to be fully flexible and configurable by the end user to define deterioration trending settings. The AMA can handle both linear and point assets. For linear assets, the AMA performs dynamic segmentation based on asset characteristics. The user can create user-defined trending parameters such as custom Track Quality Indices (TQI) or Track Condition Indices (TCI). The AMA can also be integrated with VAMPIRE® to create vehicle/track interaction data to be used in the track deterioration trending.

Maintenance Identification

Users can define custom rules logic to determine when and where maintenance tasks need to be completed. Alternately, users can use ENSCO's recommended settings defined by our track experts. The AMA can also recommend both repair maintenance, e.g. tamping, and replacement maintenance, e.g. undercutting. Rules logic can include cumulative tonnage and component information, such as manufacturer or component type. The final output is recommended maintenance tasks with earliest/latest dates and start/stop mileposts (kilometer posts). If the AMA is integrated with an ERP, the AMA includes a human approval process of maintenance tasks before they are sent to the ERP.

Automated Maintenance Advisor (AMA)



Track Charts (Geometry)

Data Viewing

The AMA can be configured to operate automatically on the server. The resulting data is viewed in ENSCO's web based TrackIT map and track chart. Additionally, the user can select specific segments, or point assets to see trend lines over time.

Examples of AMA Recommended Maintenance Tasks

- Rail grinding
- Rail replacement
- Tie replacement
- Tie pad replacement
- Tamping
- Ballast renewal (undercutting)
- Turnout maintenance
- Diamond maintenance

Benefits

- Increase maintenance efficiency
- Decreases un-needed maintenance work
- Condition-based maintenance
- Uses actual measured data to recommend maintenance
- Reduces manual data analysis

Key Features

- Cloud-based
- Fully automated operation
- Separate "sand-box" instance used for settings optimization
- Recommends maintenance tasks with earliest/latest dates and start/stop mileposts (kilometer posts)
- User customized settings and rules logic
- Flexible to various asset and measurement types
- Integrates with VAMPIRE®
- Optional application hosting as a service by ENSCO



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