OSCAR CONDITION MONITORING SYSTEMS

BENEFITS INCLUDE

- ■ Combination alerts based on data from multiple device types

- ■ Retention of tribal knowledge

- ■ Reduced training costs through provision of a single system interface

- ■ Automation of alerts and maintenance orders

- ■ Automated and on-demand reporting system

- ■ Integration with other business systems to allow operational information to be incorporated

- ■ Standards-based reporting, including AAR conventional layouts

- ■ Flexible and easy to configure and customize to each railway's operation.

OSCAR is the latest predictive condition monitoring system from Inspired Systems. It provides an automated maintenance reporting tool to predict problems with rolling stock and any other critical asset components. OSCAR acts as a repository for Asset Protection data.

OVERVIEW
Railway operators are continually looking for ways to prevent catastrophic incidents, including derailments and collisions. They have invested extensively in asset protection devices that help with the early identification or prediction of failures. The result has been an astonishing array of instruments fitted to railways around the world, using anything from a simple brittle bar derailment detector, to highly technical video and laser measurement devices, calculating anything from heat, wear patterns, angle of attack, and much more.

These devices produce a staggering amount of information and with some railways operating hundreds of devices across a huge expanse of territory, the data produced can be massive. Users will spend large amounts of time cross referencing data in spread sheets and looking up information in various systems. When such volumes of data are available, problems can be missed and errors can occur.

The OSCAR system developed by Inspired Systems has been designed to integrate data from all asset protection systems and provide an automated predictive maintenance system.

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OSCAR IN THE RAIL ENVIRONMENT
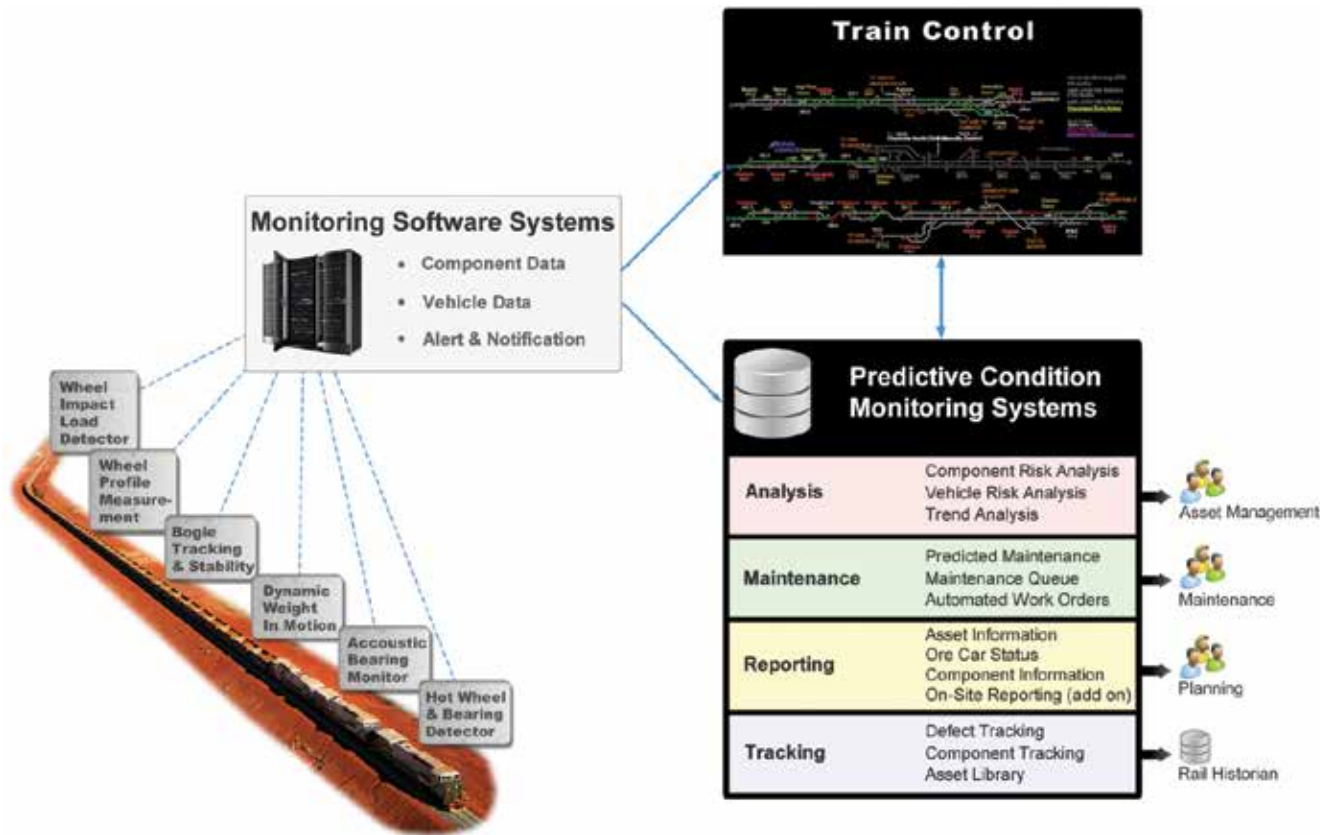
OSCAR collects, compiles and analyses the data from various types of vehicle performance monitoring devices (both wayside and on-board), to create a composite view of railway vehicle performance.

It provides a single interface to obtain all information about the health of the assets being monitored. The system allows users to drill down to existing interfaces from each of the asset protection systems. OSCAR is a large warehouse of vehicle performance data that is surrounded by application layers that allow users full access to performance data at the most beneficial and useful levels. The database is structured to allow the addition of new monitoring devices or new sources of data.

OSCAR utilises "business rules" that can be made flexible so users can modify the parameters around which rules are based and execute reports against data sets by using the configured Reporting Services tools.

This data has proven valuable in testing through the comparative relationship between differing loads, speeds and braking events prior to arrival at a Hot Bearing and Wheel Detector (HBWD). OSCAR also includes data from the Wheel Impact Load Detector (WILD), Bearing Acoustic Monitor (BAM), Dragging Equipment Detectors and Stream Flow Detector systems, to provide further information about the condition of railway vehicles. This information is used to score against readings and generate independent reports based on their alarm thresholds and values.

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# OSCAR CONDITION MONITORING SYSTEMS

OSCAR ARCHITECTURE

OSCAR has been designed with an architecture focused around flexibility. OSCAR must integrate with third-party data sources, and as such, the layered architecture allows for multiple data sources to be connected via a series of industry standard interfaces, including SMB, ODBC, web services etc.

OSCAR FEATURES

- Asset Protection data repository system
- Web based application accessible anywhere
- Collects information from Argus, LIS, WILD, BAM, Weighbridge, DED, SFD and other reporting systems
- Provides history for each component of each asset
- Tracks bearings, wheel or other components by serial
- Automatically calculates maintenance alerts
- Advanced search function
- Interfaces to clients maintenance database

OSCAR BENEFITS

- Predictive maintenance
- Wear and utilisation trending
- Lifespan performance reporting
- Tracking on individual components
- Configurable alerts, with filtering to users, groups or departments
- Save frequent queries
- Interactive data views with drill-down, and data expansion
- Automatic alerts and periodic reports
- Allows comparisons against fleet averages
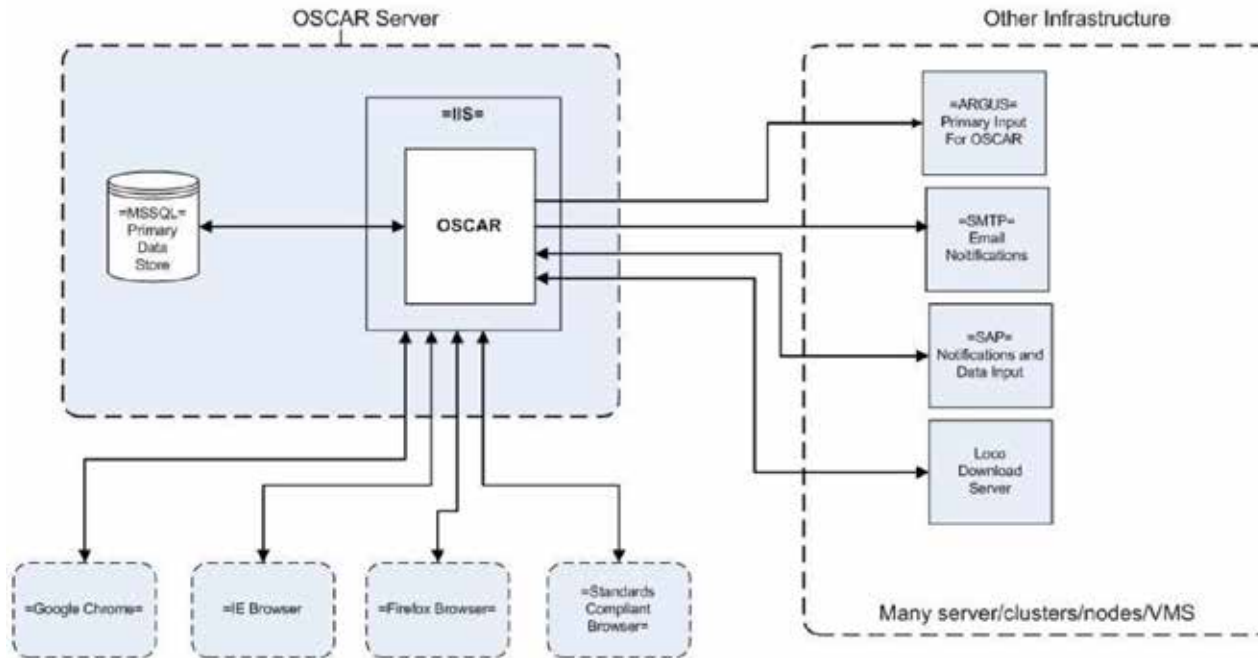
Benefits are derived through the delivery of the processed information as quickly as possible. Within the limits imposed by available telecommunications systems, OSCAR provides near real-time notification of important events on monitored vehicles to its users. This is particularly useful for maintenance crews to cull rail vehicles in need of immediate repair.

OSCAR reduces maintenance costs by lowering the incidence of unnecessary service on vehicles. It also enables higher utilisation and lower costs through scheduled maintenance at facilities when railcars are empty. In addition, OSCAR can monitor post maintenance performance to provide a quality control check on the maintenance performed.

When used in conjunction with software such as Inspired Systems' "Locomotive Information System" (LIS), OSCAR can also provide valuable information on locomotive and driver performance.

DASHBOARDS

OSCAR provides a simple to use dashboard system that allows management to create graphical reports detailing:

- ■ Fleet health
- ■ Fleet availability/utilisation
- ■ Maintenance lists

Dashboards can also be created to identify trends, provide hit lists (i.e. top ten faulty vehicles) or analyse bearing and wheel group performance. Essentially, any query can be turned into a customised, simple to read graph that draws on multiple data sources and aggregates. These can be saved and reloaded at any point.
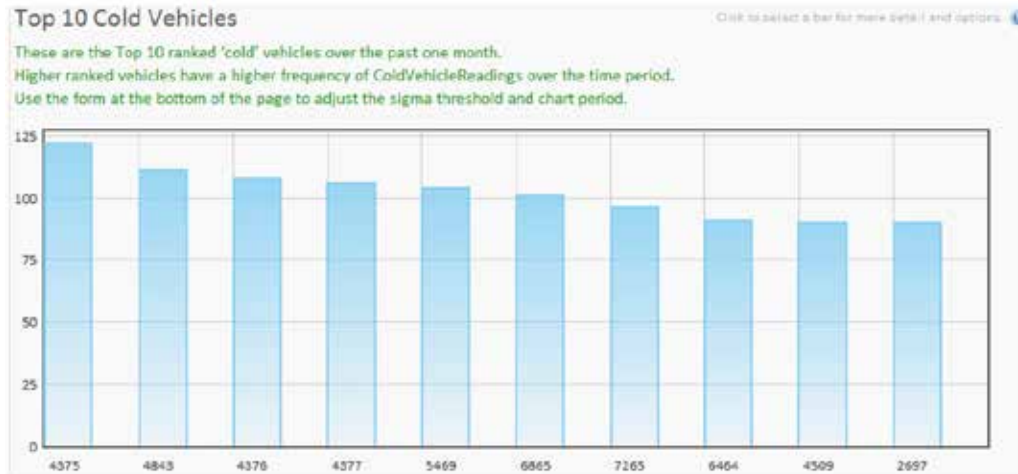
PLAIN LANGUAGE SEARCH FACILITY
OSCAR utilises a simple to use search facility. Plain language text and point-and-click help systems allow users to form complicated queries in seconds. The same search parameters are used when building a dashboard as searching data - simplifying the promotion of users to management quickly and with no additional training.

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OSCAR CONDITION MONITORING SYSTEMS

WEB-BASED USER INTERFACE

By using industry standard web interface technology, OSCAR has been developed to minimize effort to access the system. Benefits to this include:

- Function through firewalls – as web-based technology is rarely blocked, access from clients is normally allowed by IT administrators without further changes to firewalls, ports, or application verifications

- Functions on most devices – the basic technology used by OSCAR means that a client can access it from almost any device, including smart phones, tablets and PCs.

- OSCAR has also been programmed to minimize the number and type of plug-ins that are used. This means that IT departments don't need to install additional software for users to be able to unlock the benefits of OSCAR.

- Remote maintenance can be performed through web portals, by either Inspired Systems' staff, or local administrators.

- Remote deployment – data can be hosted almost anywhere, including on Inspired Systems' own Cloud servers (subject to device data availability).

BUSINESS SYSTEM INTEGRATION

OSCAR has been designed to integrate into other business systems; examples include:

- Rail Historians
  + Access train name information
  + Raise alert notifications

- Maximo
  + Retrieve serial numbers, and vehicle configuration
  + Generate work orders

- SAP
  + Access train name information
  + Raise alert notifications
  + Retrieve serial number and vehicle configuration

- Web Services
  + Access train name information
  + Raise alert notifications
  + Retrieve serial number and vehicle configuration
  + Retrieve current location (track and node) information

- OEM sockets
  + Access train name information

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OSCAR CONDITION MONITORING SYSTEMS

AUTOMATED ALERTS

OSCAR is designed around the principle of augmenting the human factor when analysing asset protection data. As such, it is necessary for interfaces to be utilised to pass the results of this analysis to down-stream systems. The alerts are capable of being sent to multiple systems and currently include:

- ■ Email to users and/or maintainers, with hyperlinks to OSCAR with the data causing the alert
- ■ SMS to out-of-office personnel
- ■ SAP integration to raise notifications and work orders

- ■ Maximo integration to raise notifications and work orders
- ■ Generic ODBC to raise notifications and work orders

Additional interfaces are readily defined and implemented within the OSCAR architecture, allowing alerts to be passed via different mechanisms to other systems.

Alert Details

Criteria	Hot Bearing (> 65 degrees)
Temperature	66
Trip Returned	Not Returned
Detected	23-Jun-2012 02:11AM @ N027W
Detected Direction	Loaded
Vehicle Type	Car
Vehicle AEI	3161
Component Type	Bearing
Component Serial	N/A
Installed Position	1R

HISTORIC RECORDS

OSCAR is designed to store a lifetime's worth of data for the railway. OSCAR'S data extends to over 10 years for bearings and wheels at some installations, providing whole-of-life performance reporting, including tracking reconditioning and refitting history.

OSCAR'S carefully crafted database provides maximum performance for all searches and alerts, resulting in fast searching and near-real-time reporting.
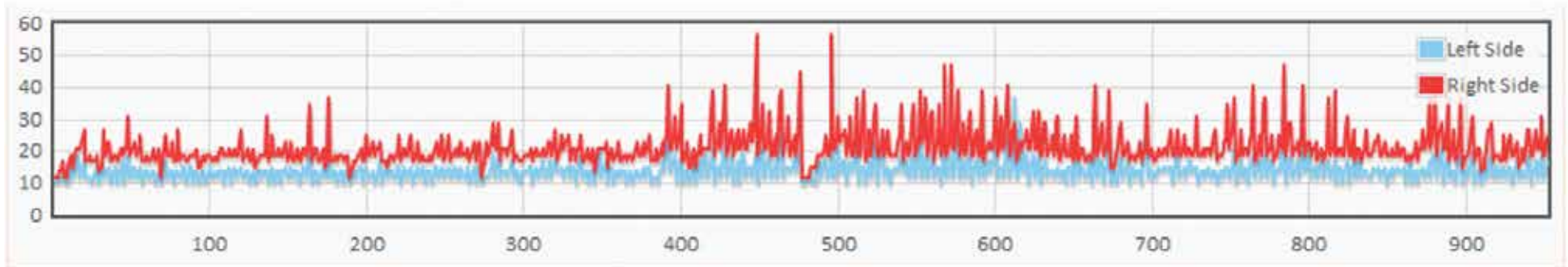
AUTHENTICATION

User Authentication levels allow individual users or groups of users to receive alerts, notifications and administrative privileges. This allows Condition Monitoring teams to work on identifying trends and potential performance issues, without affecting on-going operations and alerts. Users can be segmented into those who are allowed to create and modify alert criteria, and those who can view and action the alerts created. Finally, all activities each user performs that affect the database are logged for later auditing, should it be required.

INDUSTRY STANDARD TECHNOLOGY AND PLATFORM

As OSCAR operates on standard Microsoft Server platforms, it is Virtual-Machine ready, and easy to deploy. This minimizes deployment costs through use of client-supplied virtualisation, or Inspired Systems' can provide a high-availability deployment platform to host the operation.

The benefits extend beyond cost, which includes:

- Greater application availability – less down-time even during maintenance periods, and hardware failures
- Remote deployment – can be hosted almost anywhere, including virtual environments
- Updates and maintenance are provided for third-party applications, servicing the wider community
- Long-term development and support by Inspired Systems staff
- Readily available replacement staff from the wider development community.

DATA PROVISION

- Asset utilisation
- Predictive maintenance
- Wear/utilisation tracking and planning
- Track component lifespan
    + Compare batches and models
- Track performance

OSCAR USERS

- Maintenance crews
    + Automatic alerts and cut out notifications
- Maintenance supervisors
    + Component performance and lifespan
    + Maintenance cycles
- Planning
    + Fleet availability
    + Just-in-time spares stocking

OSCAR INTERFACES

- Client Application for Maintenance Crews
    + Popup reporting
    + Audible alerts
    + Printouts
    + Automatic links to history reporting
- Web-based Interface
    + User authentication & customized information
    + Reports
        - Cut-out reports, Warnings, "Lost" vehicles
    + Graphs
        - View historic data
        - Compare different components, batches, etc
        - Scrolling, zooming, add and remove data series
    + Configure alerts and search criteria
    + Vehicle Display
        - Histogram
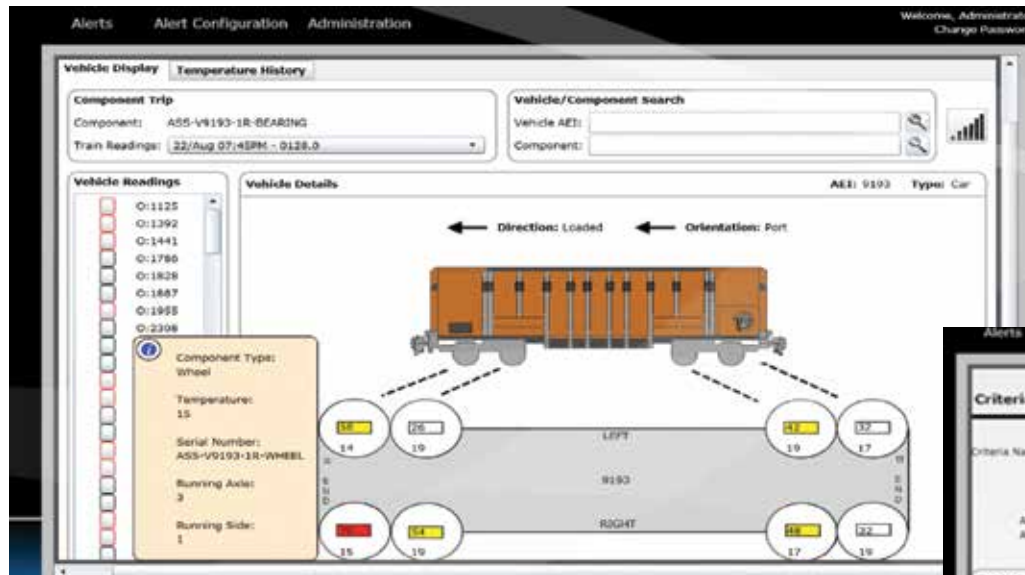   - Position In Train
        - Wheel and bearing

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SCREENSHOT OF TRAIN DISPLAY

SCREENSHOT OF CONFIGURATION TOOLS

OSCAR CONDITION MONITORING SYSTEMS

SCREENSHOT OF SAMPLE DATA

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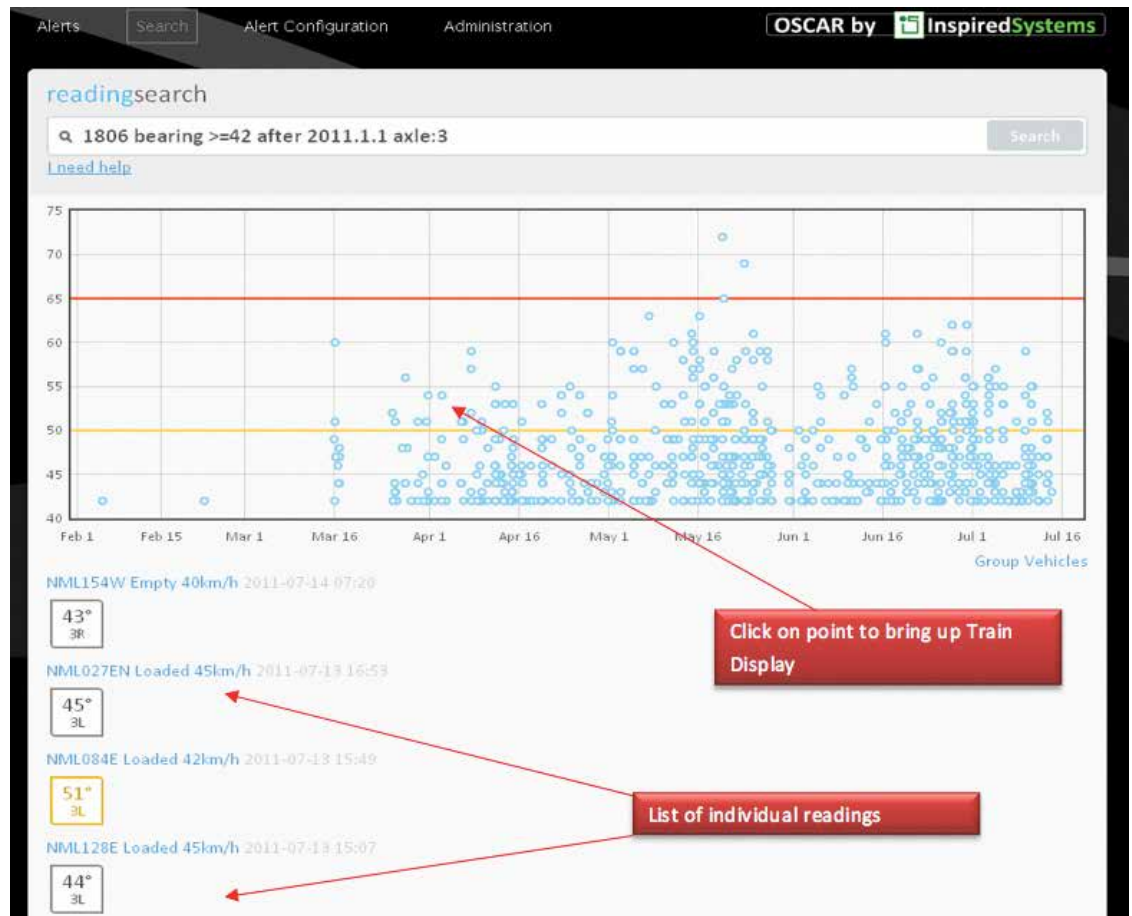+61 8 9456 5666 | progressrail.com | ✈ @Progress_Rail

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SCREENSHOT OF SEARCH RESULTS

SCREENSHOT OF SEARCH RESULTS WITH CHARTING