Equipment Health Management System Overview

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Agenda

- **What is EHMS?**
- How does EHMS work?
- What are the different alert types and alert levels?
- Walkthrough of EHMS
  - Permissions & Accessing EHMS
  - Querying Cars
  - Closing Alerts
  - Reporting ABT
- EHMS Notifications Portal Overview
- Related Tools
- Helpful Tips
- Reference Links

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What is EHMS?

Detector Network

EHMS receives and processes over 36 million train passes per year from a network of roughly 10,000 wayside detectors across North America.

Equipment Repairs

EHMS allows car owners, railroads, and equipment maintenance providers to report equipment repairs and view repair histories.

Data Security

As a trusted steward of industry data, Railinc secures all applications, including EHMS, to allow access to only authorized users.

Safety & Efficiency

EHMS enhances safety and asset utilization by enabling proactive repairs, damage prevention, and data-driven trend analysis.

Why use EHMS?

- Alert and repair information is contained for all equipment types (excluding containers and trailers).
- A repository for WILD calibration records (per AAR Field Manual Appendix F).
- EHMS was developed to support the Equipment Health Management Committee (EHMC) and is helpful to ensure:
  - Safety
  - Damage Prevention
  - Maintenance Opportunities
  - Repair History
  - Reduce costly repairs

What AAR Rules apply to EHMS?

RAILINC

EHMS Alerts by Component Type

Field Manual of the AAR Interchange Rules

	ABT	AEI	Bearing	Truck	Wheel	Wheelset
Rule 3	LORFAHS, LORFNCF					
Rule 36			ABD, HBD, HBD_WILD, HBD_ABD			
Rule 41					*WILD*, *WILD_WPD*, *WPDWHEEL*, *WTDC*	
Rule 44						*WILD*
Rule 46				THD		
Rule 63		AEIMISMATCH, AEITAG, *AEIUMLER*				
Rule 90			HBD_TRND			

Mandatory
AAR A1
AAR A2
Window Open

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Essential EHMS Workflows

Detector Reads

Information from wayside detectors are sent to Railinc's EHMS platform for evaluation and validation.

Data Summaries

Detector Reads within set thresholds create or update Data Summaries, providing a longer-term view of measurements.

EHMS Events

Detector read(s) that meet alert thresholds as defined by AAR Committees are recorded in EHMS as Events.

EHMS Alerts

EHMS opens a new alert only when thresholds are met for a unique alert type, car, and component location combination.

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EHMS Alert Levels

W Window Open (W)

This lowest-level alert advises that some degradation has started. An alert at this level is primarily a notice to the car owner/operator that a potential problem exists on the car and to allow the car owner to get the car into the shop of their choice.

A2 AAR A2 (O)

This mid-level alert offers the equipment owner a chance to schedule repairs before damage starts. Units with an AAR A2 level fall under AAR rules and may be repaired if they are in the shop for any other reason.

A1 AAR A1 (C)

This high-level alert notifies shops that wheels need to be replaced. Units with alerts at this level may be pulled into the shop specifically for this repair.

M Mandatory (M)

This severe-level alert advises railroads and car owners that high stresses are being placed on rails requiring immediate action. A unit with a Mandatory Alert should be immediately reviewed by a shop and repaired.

Acoustic Bearing Detector (ABD)

- **ABD alerts** (A1) are opened from detectors that measure defects by using microphones to listen to the wheel bearing noise levels. The readings must be from validated detectors to ensure that the alerts accurately reflect the condition of the bearing in question and identify cup, cone, roller, or a large area spall defects.
- ABD Alerts can only be closed by reporting a repair.
- Data from validated and non-validated detectors are used to create the **Acoustic Bearing Combined Data Summary**. In the combined ABD data summary, a level 1 severity is always the most severe, regardless of the vendor.

Automatic Equipment Identification (AEI)

- AEI readers are equipped with RFI (radio frequency) technology to wirelessly identify tags on railroad equipment while enroute. EHMS uses AEI data to identify various issues with the tag and creates the AEI data summary. Identifying tag issues aids in improving AEI accuracy and wayside detector component identification.
  - **AEIMISMATCH** (A2) – Mismatched equipment information between left and right tags
  - **AEITAG** (A2) – The tag on left or right side of equipment was unable to be read and is presumed to be missing or no longer functional.
  - **AEIUMLER** (W) – Inconsistencies between AEI Train Pass and Umler registry

Hot Bearing Detector (HBD)

- HBD identify bearing issues by capturing the bearing temperature above ambient, using the variation of the temperature on the side of the train (Kt) and both sides of the equipment (Ke).
- There are no data summaries for HBDs.
- There are four HBD Alert Types defined by the MSRP F S-6001, Why Made (WM) Codes 51 and 52. All are opened at an AAR A1 level.
  - **HBD** (WM51)
  - **HBD_TRND** (WM51)
  - **HBD_ABD** (WM52)
  - **HBD_WILD** (WM52)

Line of Road Failure Air Hose Separation (LORFAHS)

- A LORF Air Hose Separation event occurs when a train unexpectedly goes into emergency braking due to an air hose separating between two cars. In these cases, railroads report the cars involved in the separation.

- **LORFAHS** (W or A1) – An uncoupling of two air hoses at the gladhand not attributable to other causes (such as a train separation), 3 or more events within 12 months.

Line of Road Failure No Cause Found (LORFNCF)

- A LORF No Cause Found (NCF) event occurs when a train goes into emergency braking for an unknown reason not triggered by the operator. In these cases, the full train consist is sent to Railinc's E-Train system, where an algorithm calculates an index based on the car's history in similar events. A higher index suggests a greater likelihood the car has brake-related issues.

- **LORFNCF** (A1) – 3 or more counts of LORF NCF events within 90 days.

Truck Hunting Detector (THD)

- Truck Hunting is condition where the freight car's trucks exhibit a dynamic instability. This is measured through the lateral strain gages on the wheel impact load detectors. The lateral forces and their frequency of occurrence are combined into a unitless measure called Truck Hunting Index (HI).

- **THD** (W) – The hunting index is greater than or equal to 0.2
- **THD** (A1) – 1 reading at ≥ .5 or 2 readings ≥ .35 (in twelve months)

Wheel Impact Load Detector (WILD)

- WILD detectors measure vertical forces imparted by wheels on the rails. Vertical forces above nominal are typically due to wheel out-of-round (OOR) conditions. As the OOR section of the wheel rolls over the rail, it produces a higher impact force. WILD detectors report the forces in kips units – 1 Kip is 1,000 pounds of force.

- **WILD** (W) – >65 kips
- **WILD** (A2) – >80 kips
- **WILD** (A1) – >90 kips
- **WILD** (M) – >140 kips

Wheel Profile (WILD_WPD & WPDWHEEL)

- Wheel Profile Detectors are wayside systems that measure wheel profiles of moving trains using laser and optical scanning devices to take images of the flange, tread, etc.
- The goal of the WPD data summary is to get an aggregate view of these measurements. The data summary can be used to perform wheel trend analysis and determine wheel wear and condition. When worn beyond limits, the wheels can be scheduled for replacement.
- **WPDWHEEL** (W) – any Flange Height, Flange Thickness, Rim Thickness, or Hollow Tread measurement is out of the optimal range.
- **WILD_WPD** (W) – the Rim Thickness is very low and Max Dynamic is ≥ 50 kips

Wheel Temperature Detector – Cold (WTDC)

- HBDs are also utilized to measure the wheel temperature by pointing the detector in the direction of the wheel. Temperature readings are analyzed and evaluated to determine if a data summary should be opened. Currently, Brake Health data summaries do not close with a repair, inspection, or autoclose process.

- **WTDC** (W) - The Cold Wheel alert identifies wheels that are cold on a braking train more than 6 times. Brake Health Indicators (BHI) are tracked in the Brake Health data summaries (Car or Truck).

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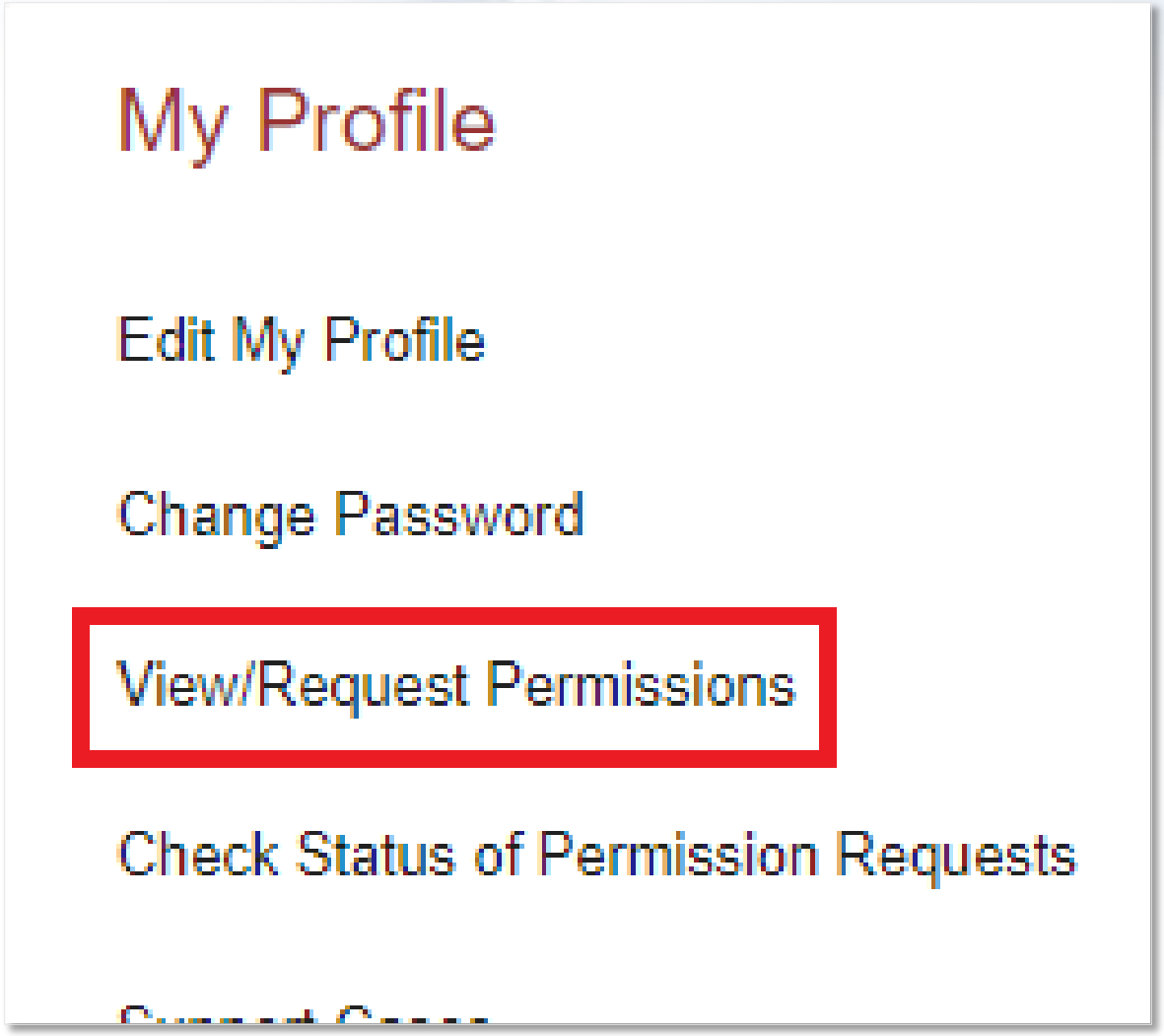
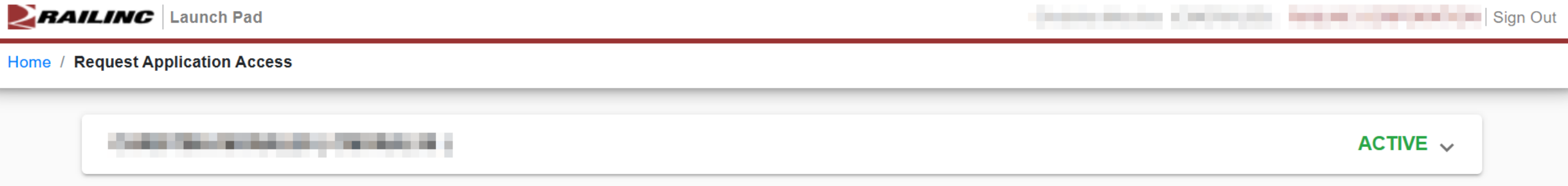
Request Permissions

- The User Services menu can be found on the right side of the Launch Pad.
- Click “View/Request Permissions.”



Request Application Access



You can search for EHMS using the filter at the top of the screen or scroll down and find it in the alphabetical list of applications.

Available EHMS Roles

EHMS

The Equipment Health Management System (EHMS) supports the Advanced Technology Safety Initiative (ATSI). The purpose of EHMS is to proactively detect, report, and alert carriers, car owners and equipment maintenance providers of potential safety problems.

1 Select Roles — 2 Confirm — 3 Done

☐ EHMS Car Repair History (MARK required)

Allows user to view/report inspections or repairs in EHMS and EHV. This will also allow user to view historical information for your respective equipment.

☐ EHMS Generic Access (MARK required)

Allows users to view alert and data summary information to EHMS and EHV. This must be granted to view to view EHMS and EHV information.

☐ EHMS Road Admin (MARK required)

Company Administrator who will manage the assignment of EHMS related roles for their company. This user will receive emails for requested permissions for their respective company and must grant permission as determined by their respective company.

Which Roles to Request

EHMS

Request

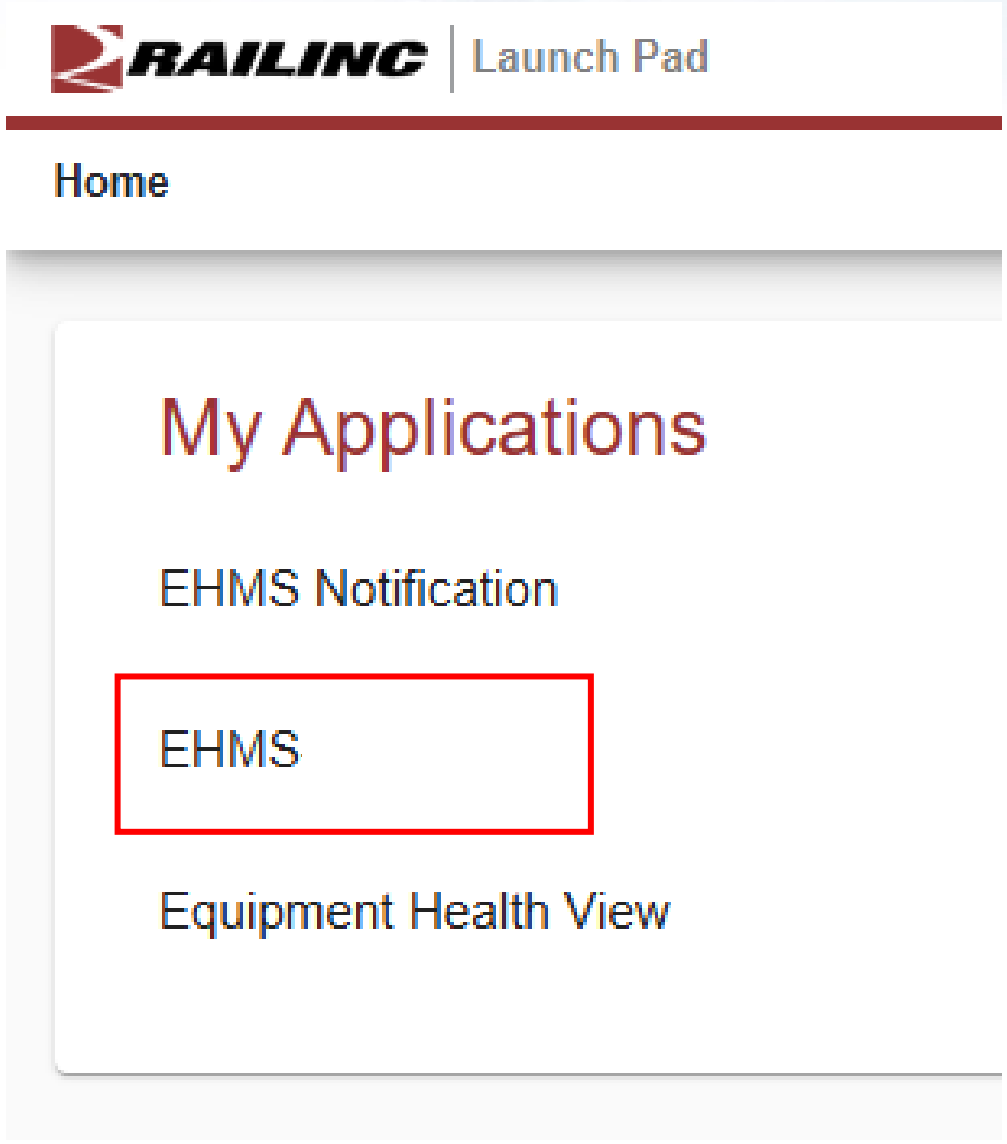
The Equipment Health Management System (EHMS) supports the Advanced Technology Safety Initiative (ATSI). The purpose of EHMS is to proactively detect, report, and alert carriers, car owners and equipment maintenance providers of potential safety problems.

EHMS Car Repair History	RAIL - RAILINC CORPORATION	07/09/2019
EHMS Generic Access	RAIL - RAILINC CORPORATION	07/09/2019

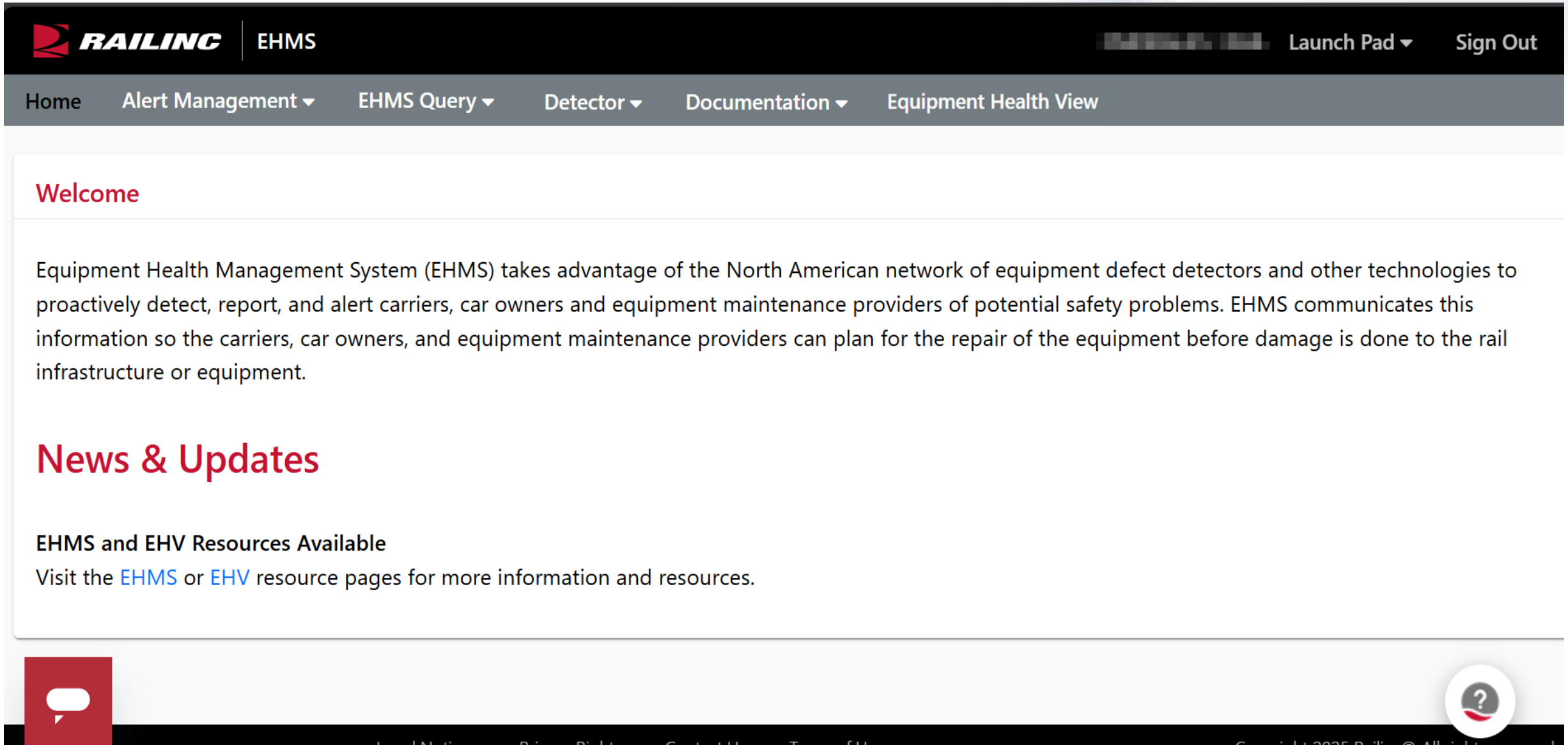
Make sure to request these roles with your MARK!

After Approval – EHMS on Launch Pad

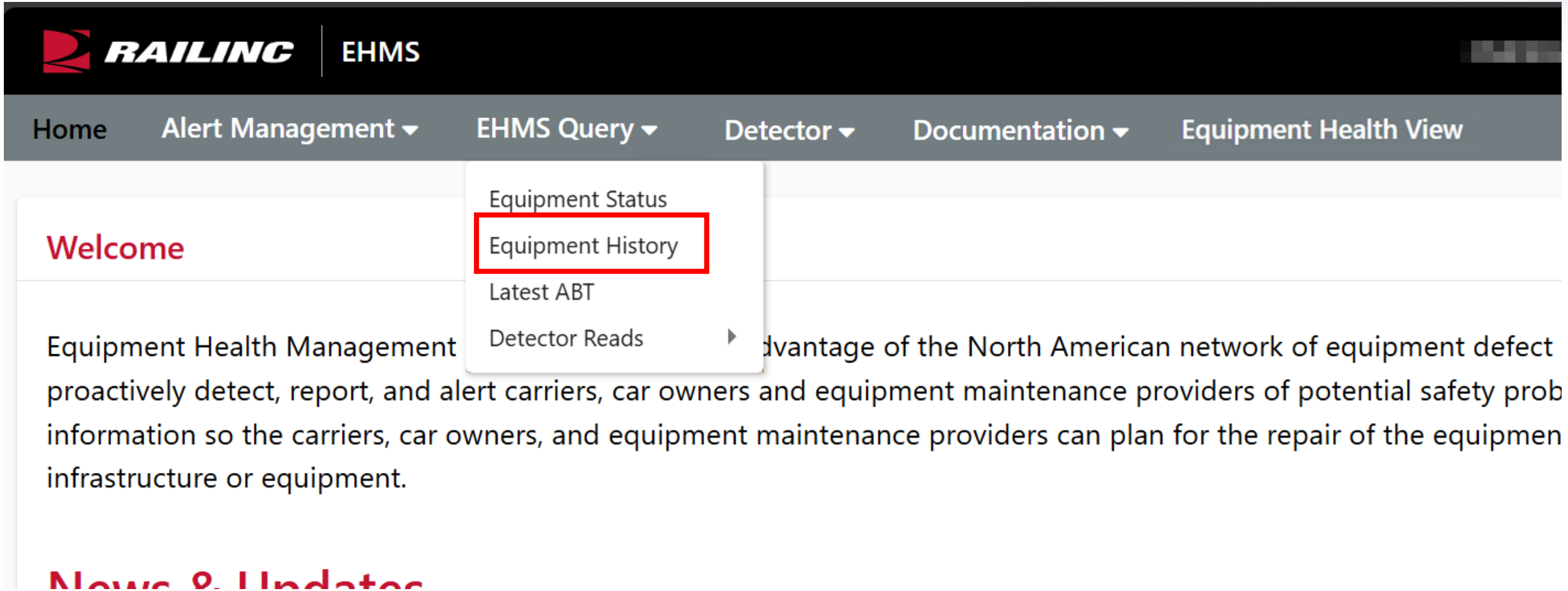
- Once your permission request has been approved, you can access the application through the Launchpad under ‘My Applications.’



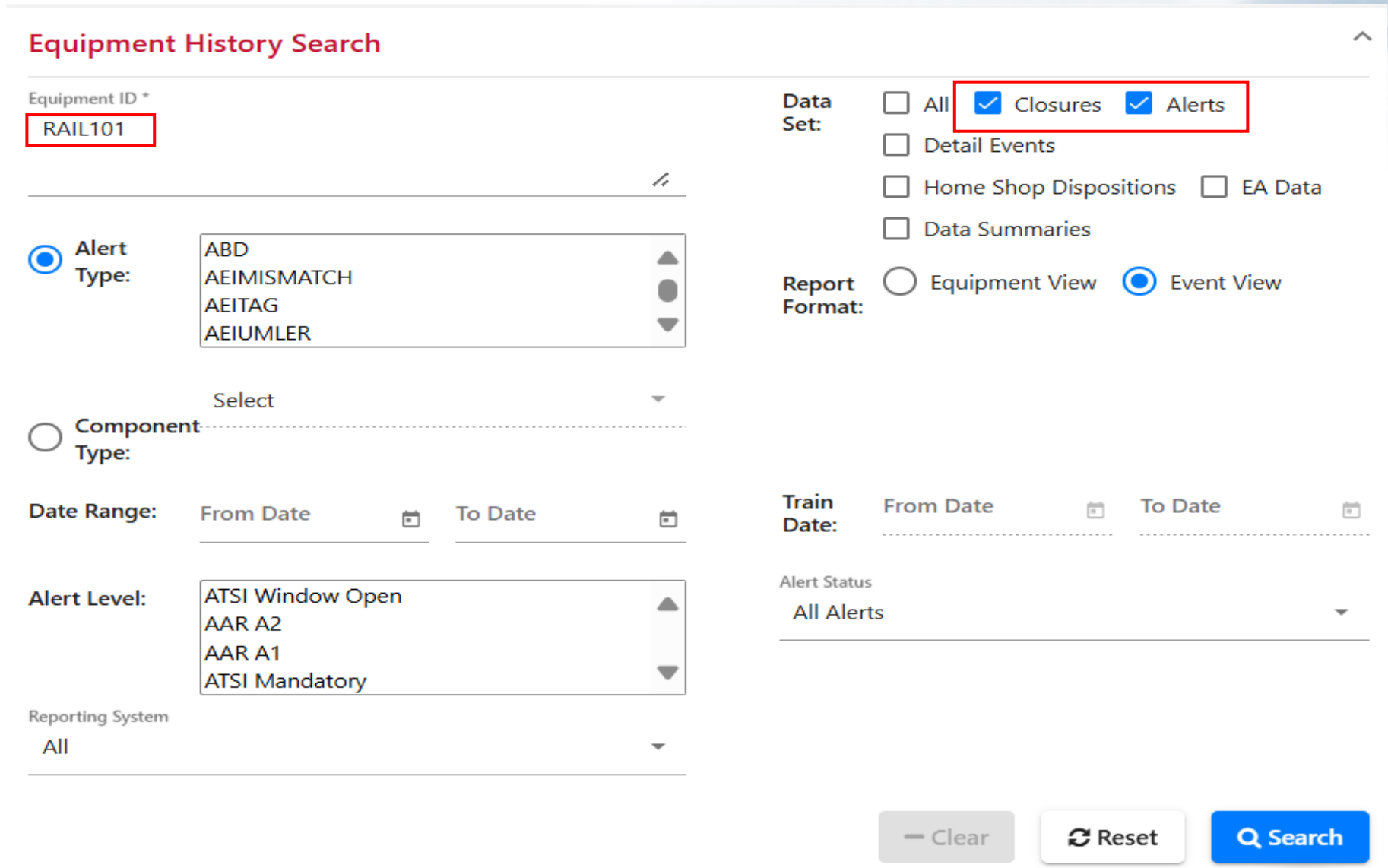
EHMS Homepage



EHMS Query



Equipment History Query



Equipment History Search Results

Alerts

Export

Total items: 33 Clear Filters

Equipment ID	Alert Type	Open Date	Location	Alert Date	Alert Status	Closed Date	Alert Level	Opening Reason	Closing Reason	Reported Clos...	Reported Clos...	Close Alert
RAIL-0000000101	WILD	03-26-2025	AXLE=01; SIDE=L	03-26-2025	OPEN		M	ALERT_EVENT				
RAIL-0000000101	THD	09-11-2023	TRUCK=A	09-11-2023	OPEN		C	ALERT_EVENT				
RAIL-0000000101	WILD	03-08-2023	AXLE=01; SIDE=L	03-08-2023	CLOSE	03-08-2023	M	ALERT_EVENT	INSPECTION	RAIL	03-08-2023 10:46	

Closures

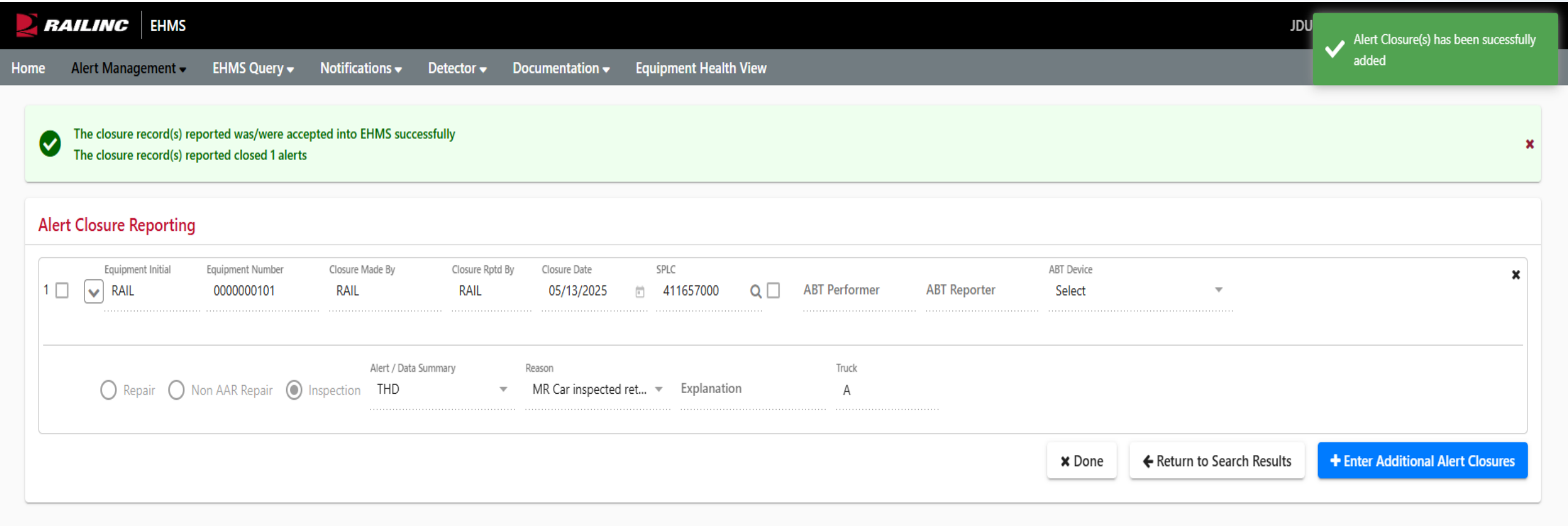
Export

Total items: 45 Clear Filters

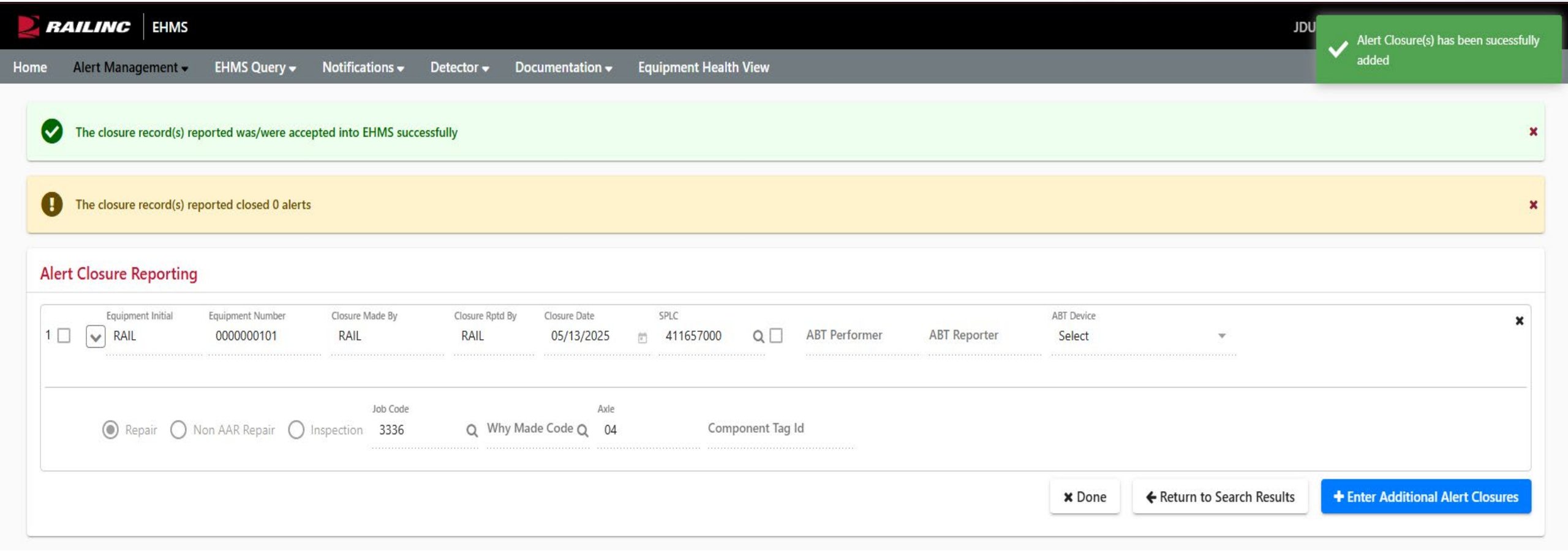
Equipm...	Event Date	Location	Performer	Reporter	SPLC	Closure Type	Job Code	Why Made Code	Insp. Reason	Insp. Type	Reported Tim...	Report System	Delete Closure
RAIL-0000000101	03-08-2023	AXLE=01; SIDE=L	RAIL	BSHXV01-RAIL	411700000	Inspection			MR	WILD	03-08-2023 10:46	CRH	
RAIL-0000000101	12-14-2022	AXLE=03	RAIL	JRSYSTEM-RAIL	411700000	Repair	3360	09			12-14-2022 09:16	WSR	
RAIL-0000000101	12-14-2022	AXLE=04	RAIL	JRSYSTEM-RAIL	411700000	Repair	3360	09			12-14-2022 09:17	WSR	

Alert Closure Reporting

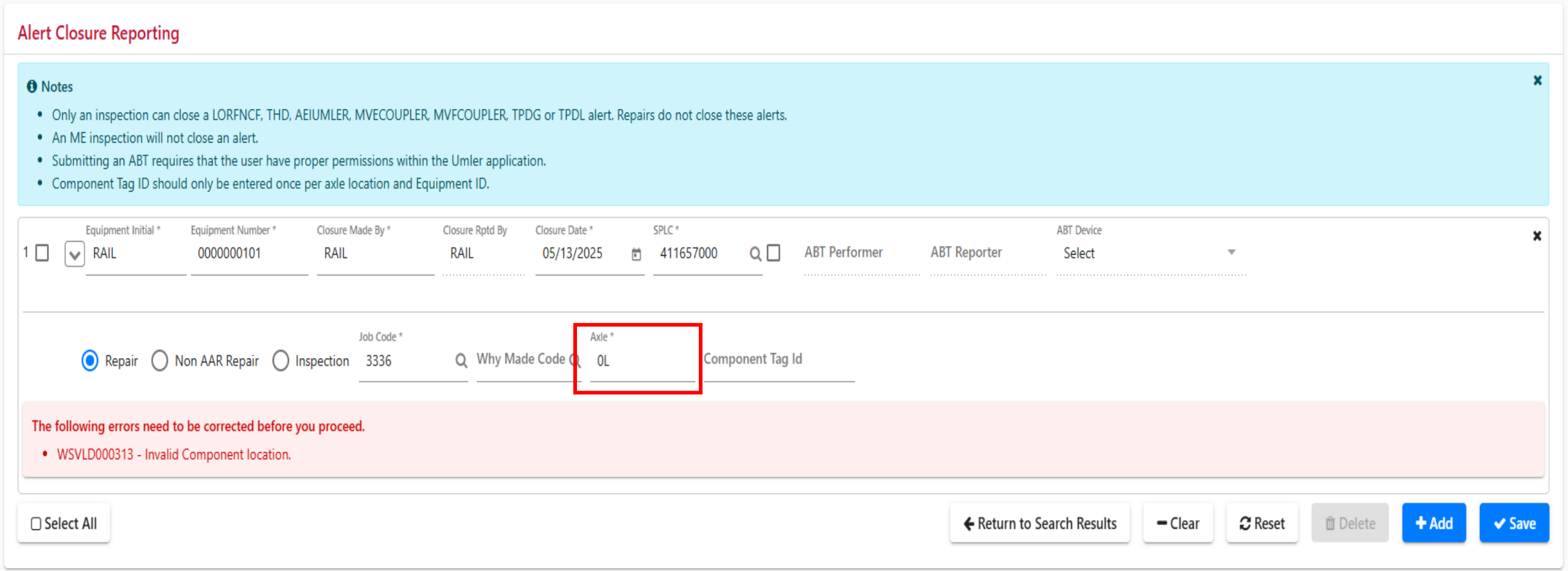
Alert Closure Successful



Closure Reporting Successful, No Alert Closed



Alert Closure Reporting Error



Return to Equipment History Search Results

Alerts

Export

Total items: 33 | Clear Filters

Equipment ID	Alert Type	Open Date	Location	Alert Date	Alert Status	Closed Date	Alert Level	Opening Reason	Closing Reason	Reported Clos...	Reported Clos...	Close Alert
RAIL-0000000101	WILD	03-26-2025	AXLE=01; SIDE=L	03-26-2025	CLOSE	05-13-2025	M	ALERT_EVENT	REPAIR	RAIL	05-13-2025 17:46	
RAIL-0000000101	THD	09-11-2023	TRUCK=A	09-11-2023	CLOSE	05-13-2025	C	ALERT_EVENT	INSPECTION	RAIL	05-13-2025 17:38	

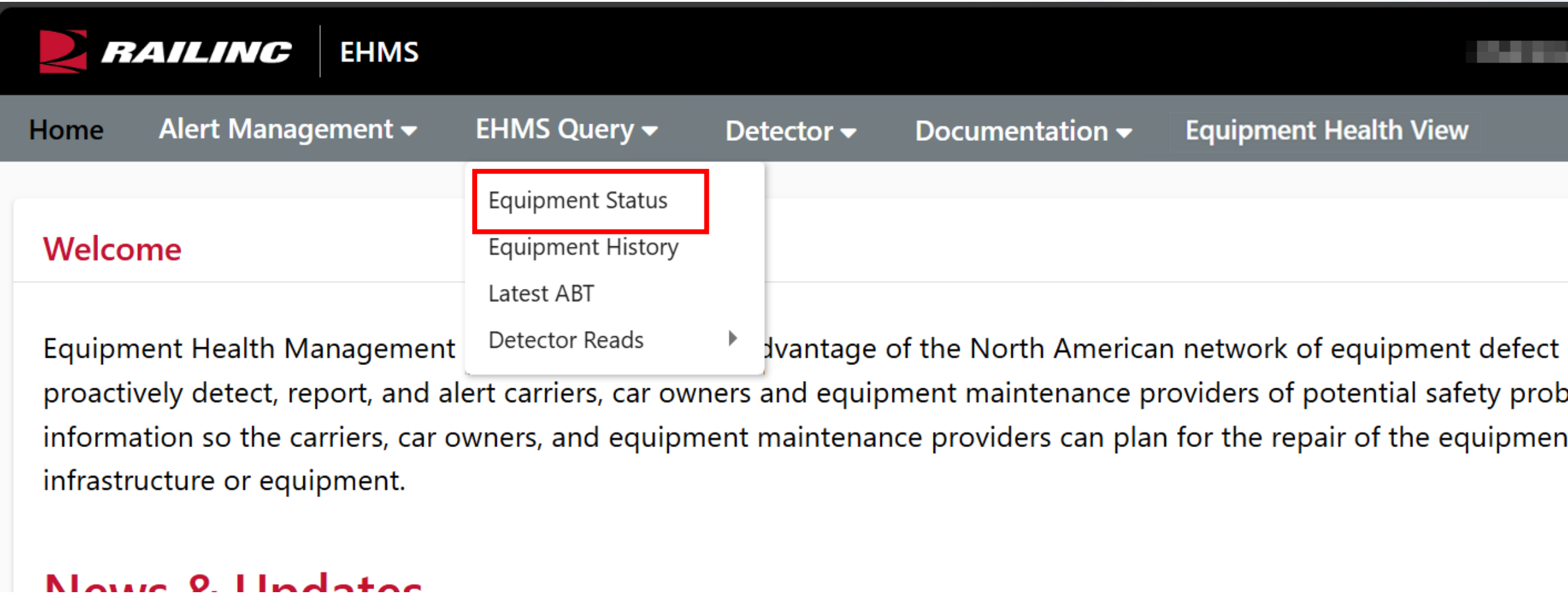
Closures

Export

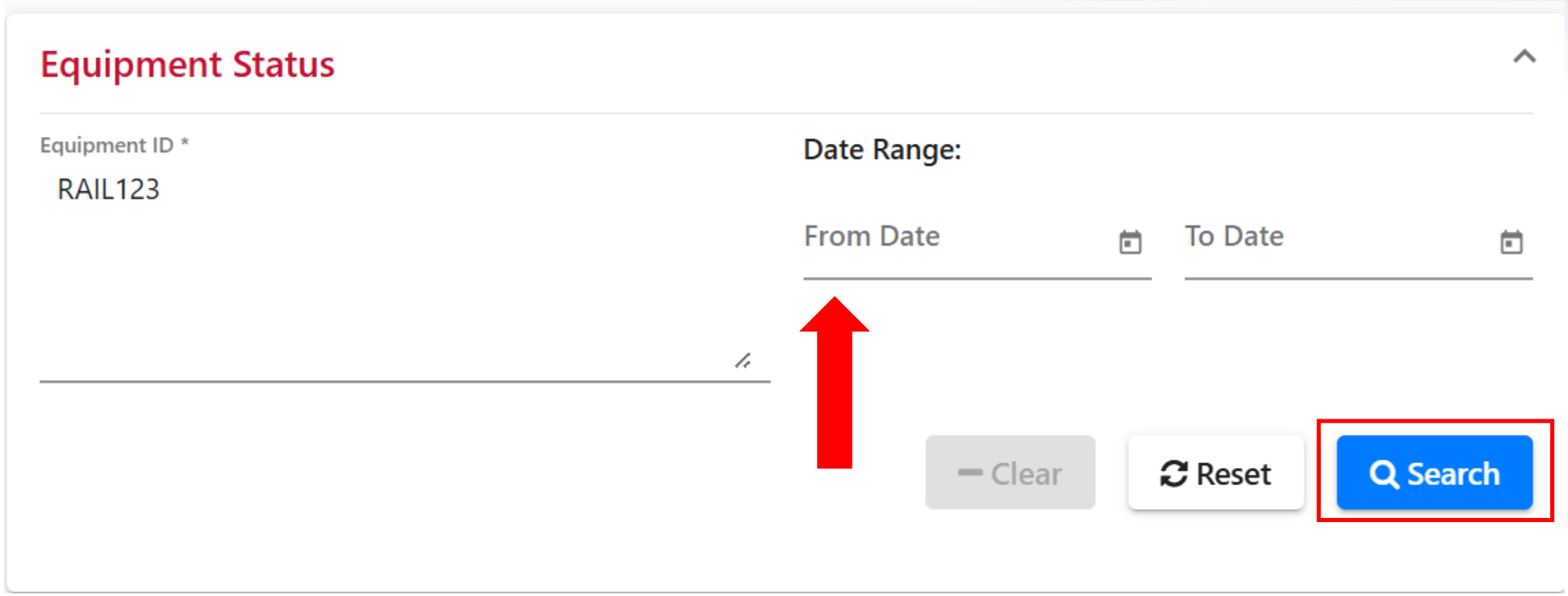
Total items: 48 | Clear Filters

Equipm...	Event Date	Location	Performer	Reporter	SPLC	Closure Type	Job Code	Why Made Code	Insp. Reason	Insp. Type	Reported Tim...	Report System	Delete Closure
RAIL-0000000101	05-13-2025	TRUCK=A	RAIL	[redacted]-RAIL	411657000	Inspection			MR	THD	05-13-2025 17:38	CRH	

EHMS Status Query



Equipment Status Query



Equipment Status Search Results

Alerts

Print | Export

Total items: 1 | Clear Filters

Equipment ID	Alert Type	Event Name	Event Name	Location	Home Shop	Date	Alert Level	Close Alert
RAIL-0000000123	MVFCOUPLER	GT_TWO_MIS_FAS4	GT_TWO_MIS_FAS4	COUPLER A	No	04-21-2020 13:54	ATSI Window Open	

30 | 100 | 500 | 1000 | 5000

Data Summaries

Print | Export

Total items: 0 | Clear Filters

Equipment ID	Data Summary Type	Owner	Location	Report View	Earliest Open Date	Latest Event Date	Report Repair / Inspection	Opened In Error

No Results Found

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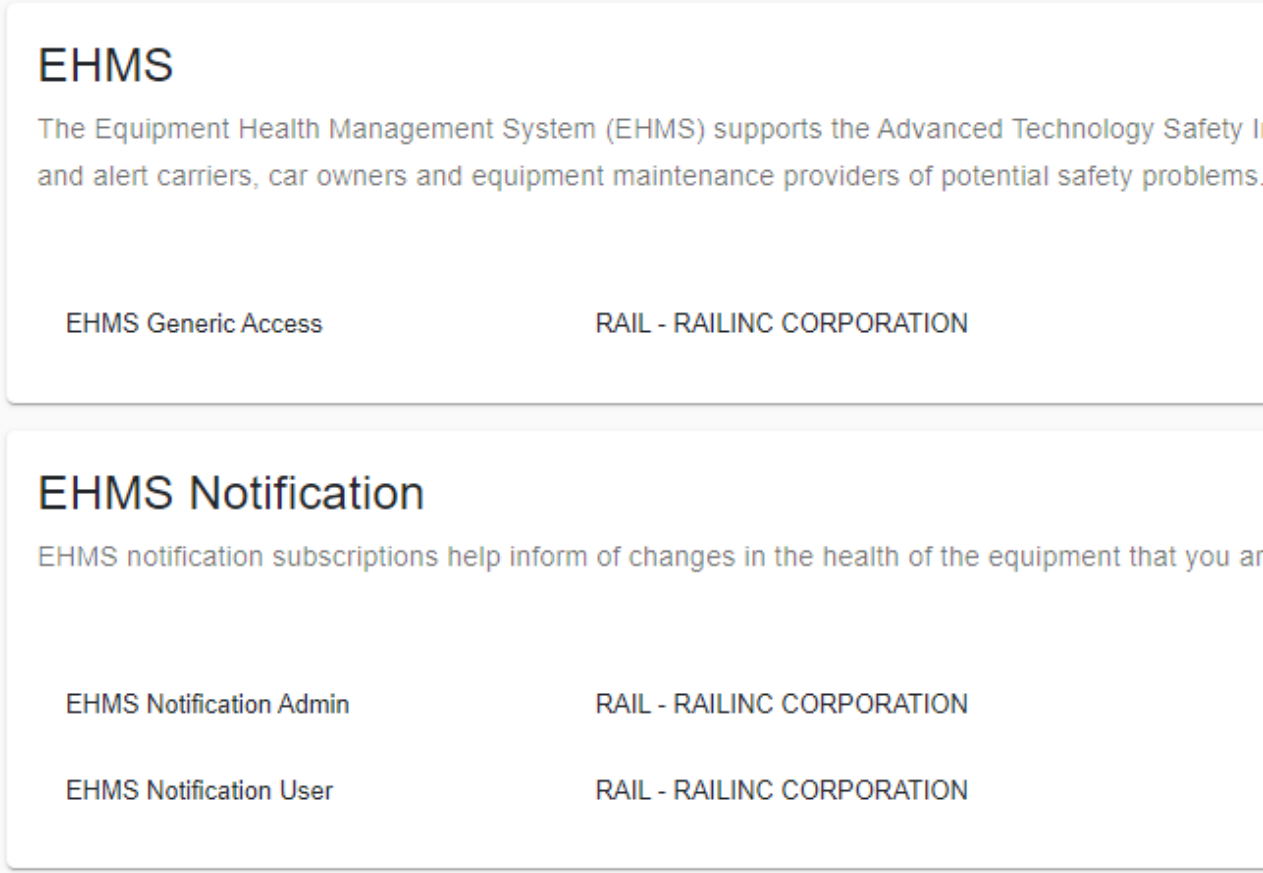
EHMS Notifications Overview

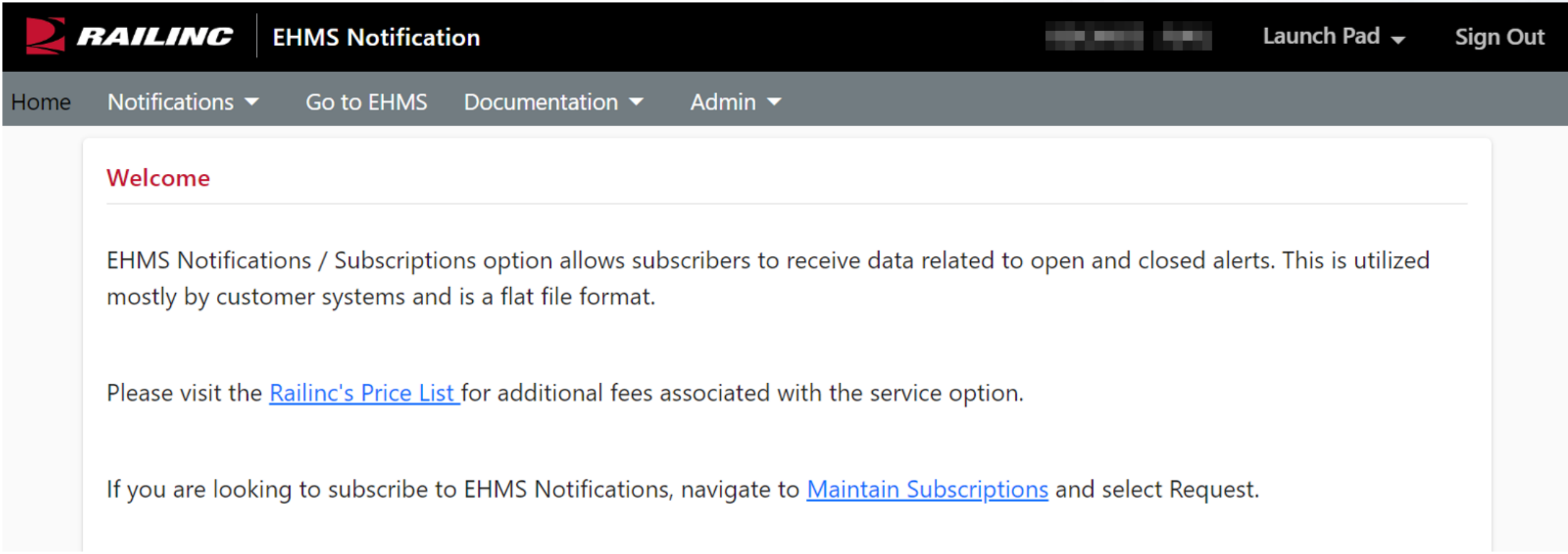
- EHMS Notifications inform subscribers of changes in the health of equipment on a schedule that you select. This message process provides alert and data summary information on equipment.
- Available EHMS Notification delivery methods:
  - IBM MQ (IBM Message Queue)
  - FTP (File Transfer Protocol)
  - Email

How To Access

- To access the EHMS Notification application, you will need these permissions:
  - EHMS Generic Access (MARK required)
  - EHMS Notification User (MARK required)

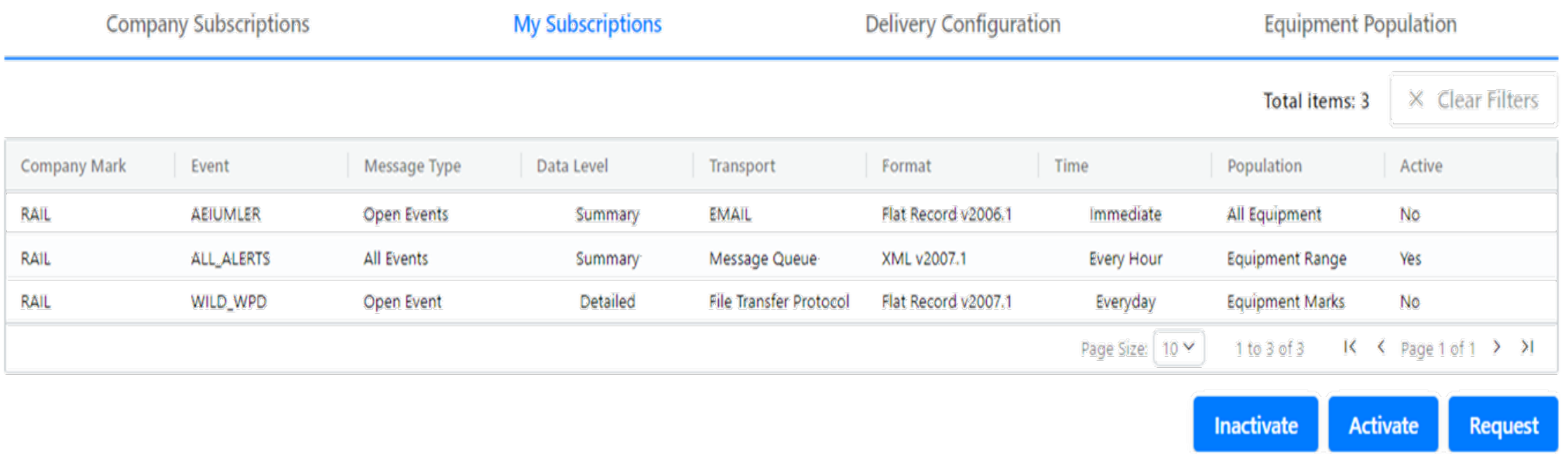


EHMS Notifications Portlet



My Subscriptions

- Request personal subscription by Email delivery method only
- Activate or inactivate personal subscription
- User Subscription Requests are reviewed by Notification Admin



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EHMS Services and System Integrations

EHMS Web and Repair Services

Utilizes a standard format for querying or reporting to EHMS and connects systems to Umler, EA, CRB, LMIS, EHMS, and CarLogix.

Equipment Advisory (EA)

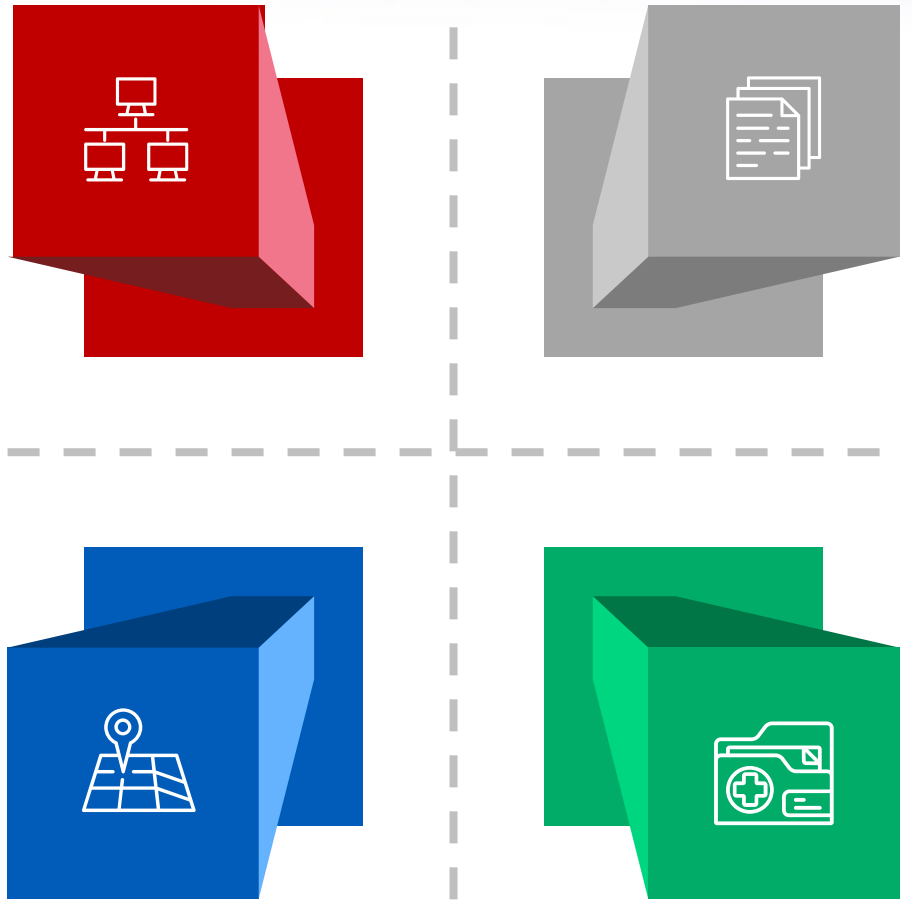
Allows authorized users to create and assign equipment to industry advisories, as well as report inspections, reports and query active advisories.

Damaged and Defective Car Tracking (DDCT)

Enables car owners and railroads to exchange information about damaged and defective freight cars for efficient disposition.

Equipment Health View (EHV)

A consolidated view of equipment health information from EHMS, Umler, DDCT and Equipment Advisory systems.



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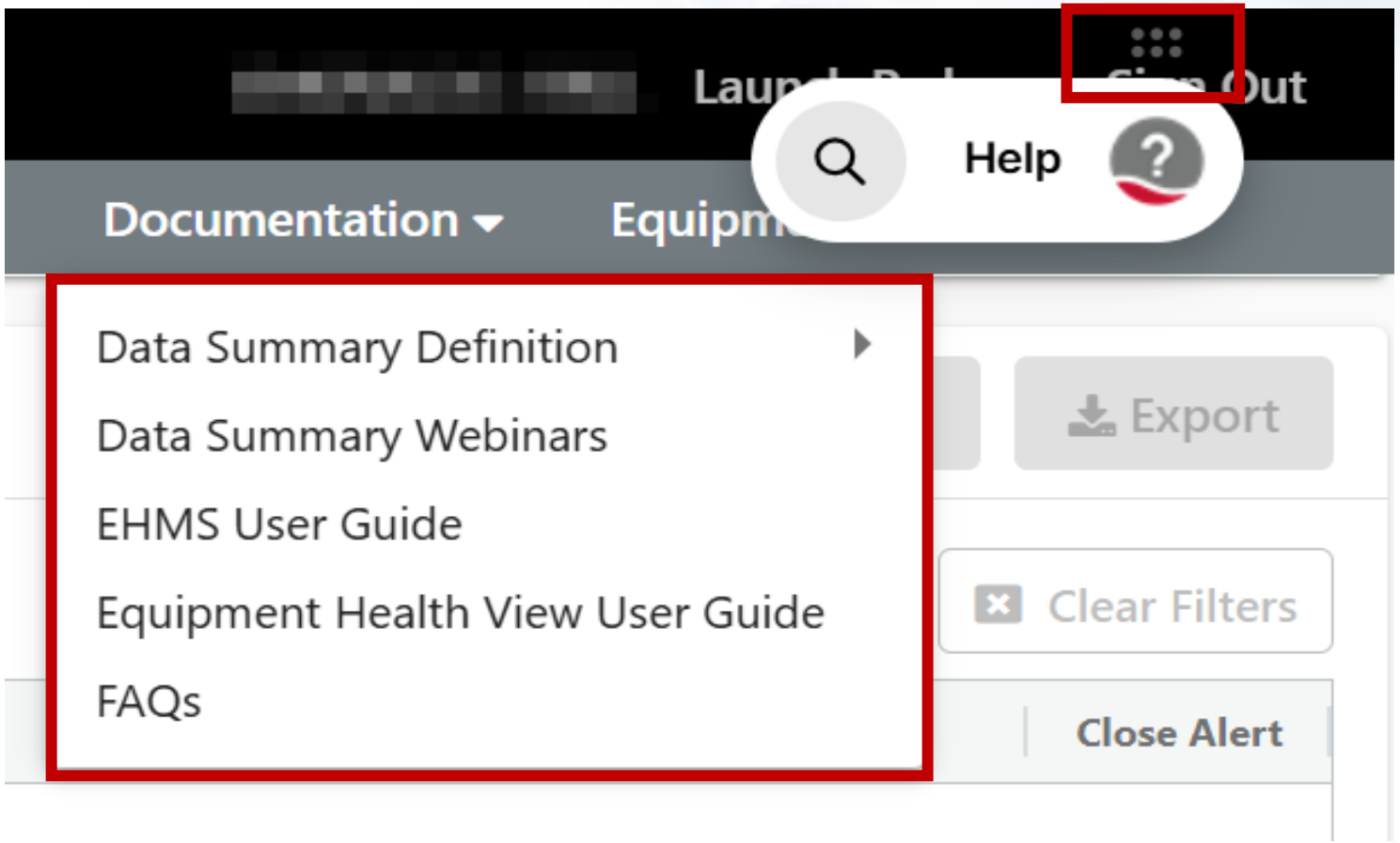
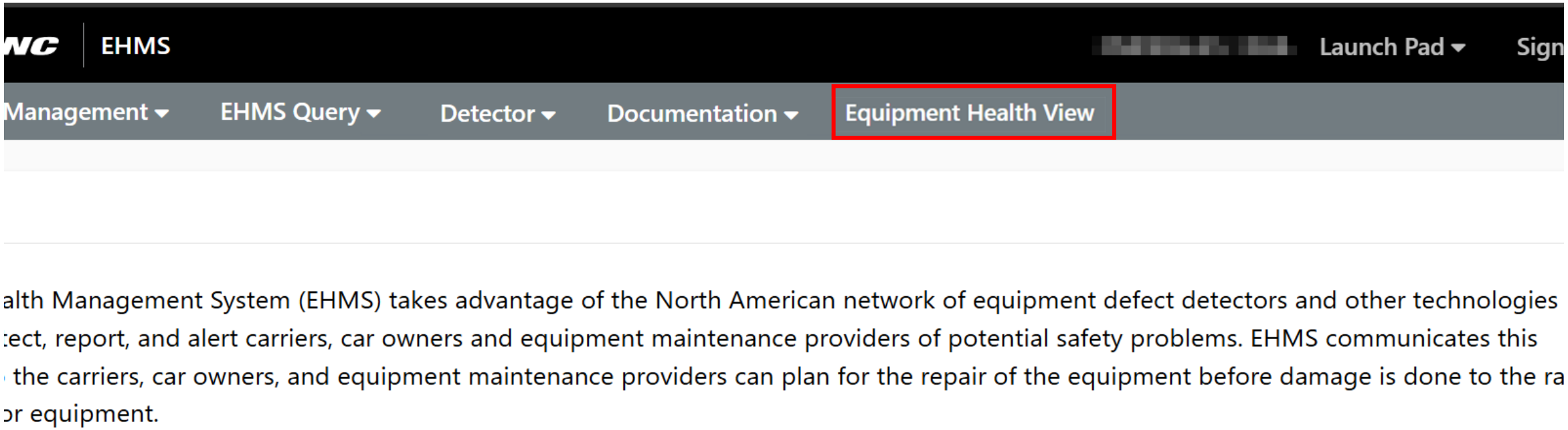
Helpful Tips

- Helpful documents are in the “Documentation” tab on the EHMS Menu.
- The Help widget can be moved anywhere on screen.
- You’re able to export your searched cars into Excel via the export button in Equipment History.



Helpful Tips

- You’re able to query 500 cars at a time.
- You can access Equipment Health View (EHV) through the EHMS application menu.



Guides and References

- **Equipment Health Management System Product Page**

https://public.railinc.com/products-services/equipment-health-management-system

- **EHMS User Guide**

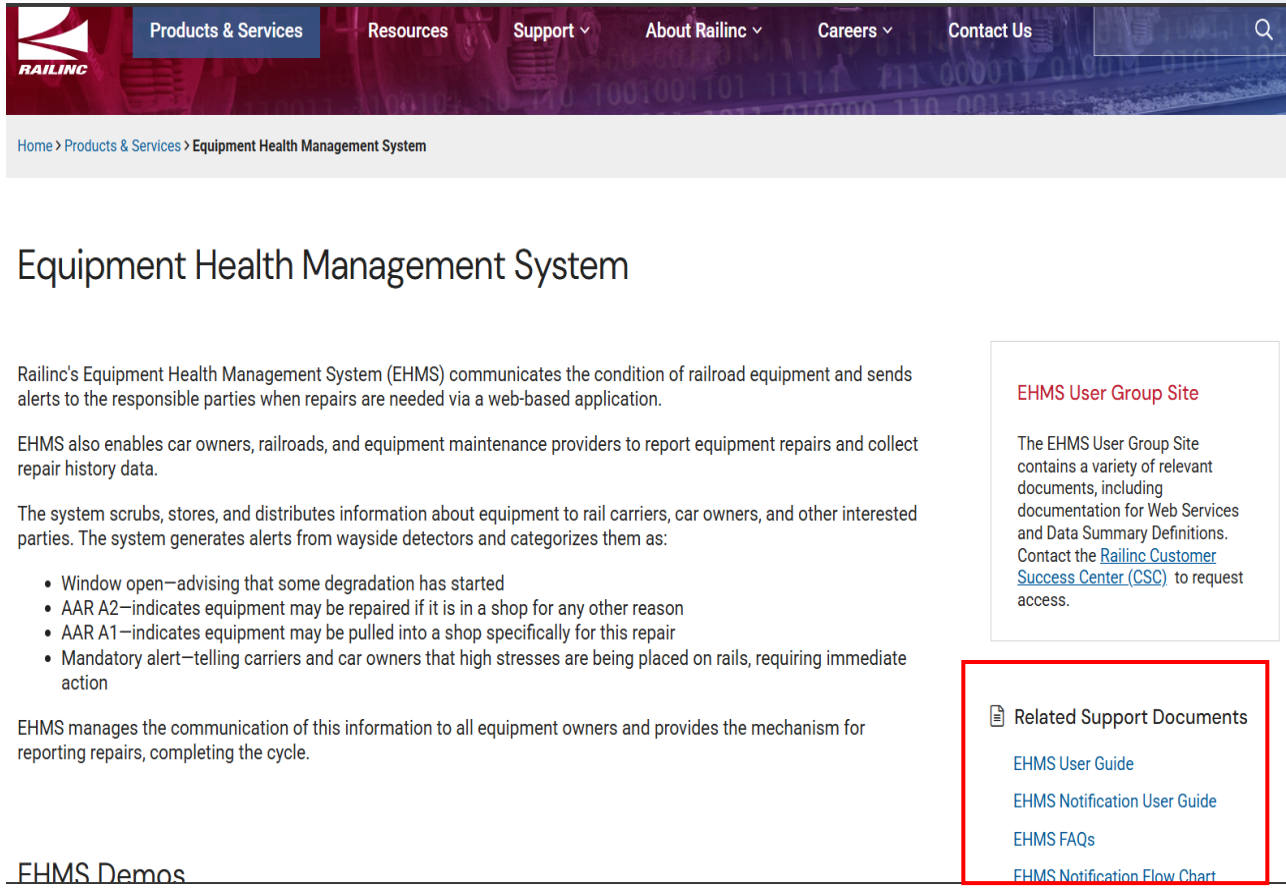
https://public.railinc.com/sites/default/files/documents/EHMS_UG.pdf

- **EHMS Notification Message Format**

https://public.railinc.com/products-services/equipment-health-management-system

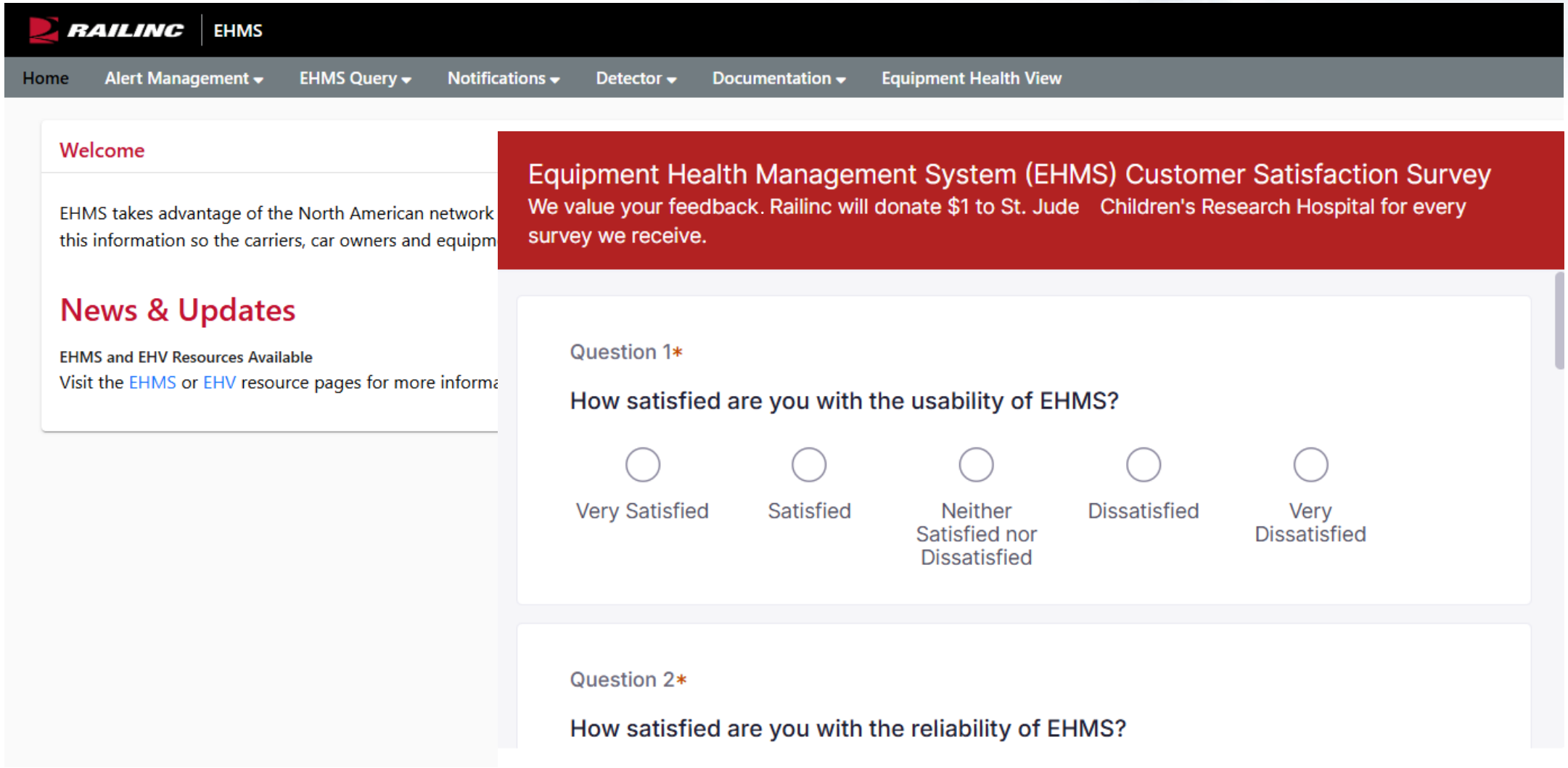
- **Notification Flow Chart**

https://public.railinc.com/sites/default/files/documents/EHMS_NotificationFlowChart.pdf



Upcoming Survey

- June 16th – June 30th



Questions?

Railinc Keeps You Moving.

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