

# *Electrolyte Locomotive Idle Reduction System*



**Award Winning**



*Our Innovation Keeps  
Your Trains Rolling™*

**ACS Railroad Solutions Introduces  
The Next Generation in Idle Reduction Technology**

**All the Functions of a Traditional  
AESS, Supplemented by a 33 kWh  
Lithium-Ion Energy Module for  
Increased Idle Reduction Efficacy**



2025 NORFOLK SOUTHERN  
**THOROUGHbred  
 SUSTAINABILITY  
 PARTNER AWARDS**



**ACS Railroad Solutions Electrolyte Locomotive Idle Reduction System Named Winner of Norfolk Southern Thoroughbred Partner Award for Innovation**

In search of an Automated Engine Start/Stop (AESS) system that truly delivered reduced fuel usage and GHG emissions, Norfolk Southern engaged ACS Railroad Solutions in a Pilot Program for their next generation Electrolyte Idle Reduction system, which uses a 33 kWh Energy Module to keep key locomotive systems operational when the engine is not engaged and to facilitate reliable engine restarts



**Tangible Results Achieved\***

- Locomotive systems, including HVAC run off of Energy Module for 3.5 consecutive hours with engine off
- Locomotive systems run off of Energy Module for 8 consecutive hours, without HVAC engaged
- Depleted Energy Module able to recharge in 2.5 hours
- Estimated typical fuel savings = \$87,000 per year

\* Results based on Norfolk Southern Pilot program and may vary based on locomotive model and individual circumstances

Norfolk Southern annually awards a select set of its partners in recognition of innovations that significantly contribute to a more sustainable future. ACS Railroad Solutions is proud to announce we are a 2024 Award Recipient for our Electrolyte Idle Reduction System which offers significant potential reduction in fuel consumption and GHG emissions through the mitigation of unnecessary locomotive idling.

**What Norfolk Southern Had to Say**

*"Railroads are an essential part of the low-carbon supply chain. Our Thoroughbred Partner Awards recognize their incredible achievements and underscore our shared commitment to lowering our nation's overall carbon footprint"* - Ed Elkins, Norfolk Southern Chief Marketing Officer

*"This year honorees stand out as trailblazers in environmental leadership. Recognizing their accomplishments is pivotal as we collectively work towards building a better, more sustainable planet."* - Josh Raglin, Norfolk Southern Chief Sustainability Officer

*"The ACSRS Electrolyte system looks to be a real game changer and will be a key element in Norfolk Southern leading the transition to a sustainable, low carbon economy. The design of this system effectively addresses many of the challenges we've experienced with legacy AESS systems, and we're confident the additional reduction in fuel consumption and GHG emission will have a large impact on our efforts"* - Ryan Stege, Norfolk Southern Senior Director of Locomotive Operations

**A Practical Solution to Significantly Reducing Locomotive Idle Time in Train Yards**



**What Makes the *Electrolyte* Idle Reduction System Innovative**

Traditional Automated Engine Start/Stop (AESS) Systems are typically deployed to meet EPA requirements for a locomotive to be rated anything above Tier 0. These systems offer the potential to reduce fuel consumption and reduce emissions, but those benefits are not always realized due to the binary nature of an AESS fully shutting down the locomotive, and the inability to address key factors that necessitate the engine to reengage.

The ACS Railroad Solutions Electrolyte Idle Reduction System performs all the functions of a traditional AESS, and leverages a 33 kWh Lithium-Ion based Energy module to improve Idle Reduction efficacy in the following ways:

**Minimize the Motivation for System Override**

- HVAC System remains operational, keeping crew comfortable
- Lighting, Safety and Analytic Systems kept operational

**Drastically Reduce Air Brake Pressure Drop as a Cause of Engine Restarts**

- Make-up Air Compressor is provided and fully integrated into control system
- Compressor is powered via the Electrolyte Energy Module

**Maximize Engine Off Time While Facilitating Reliable Engine Restarts**

- Energy module maintains charge of Lead-Acid batteries when engine is off
- The L-I Batteries will automatically engage to assist in a restart if required

**System Components**



- 33 kWh Lithium-Ion based Energy Module
- Comprised of 18 individual battery cards connected in series



- Locomotive Logic Control:
  - Multiple Sensor Inputs
  - Relay Control
  - CAN Bus integration to Energy Module



- Energy Module is fully enclosed and mounts in Sandbox
- Internally wired to external industrial-grade quick disconnects
- Enclosure has heating and cooling capabilities to ensure optimal operating temperature
- Fully integrated make-up air compressor



- In Cab Display



- Remote Monitoring and Data Collection Software

Technology from ACS Railroad Solutions can help you navigate complexity and give you a competitive edge. Our offerings can directly impact many of the key value drivers for your railroad such as **Operational Efficiency, Sustainability, Regulatory Compliance and Enhanced Safety & Employee Well Being**. Our unique solutions are customer inspired as we work closely with Railroad Mechanical, Transportation and Comms & Signals teams to understand the challenges of today's Railroading environment. We specialize in identifying technology successfully deployed in other transportation segments and adapting it for Railway applications, as well as creating bespoke solutions for individual Railroads to keep your trains rolling.



### Railyard Devices

Innovative products your maintenance crew can leverage to increase repair velocity, decrease repeat defect rate and ensure you get Power when and where you need it

- Multi-Unit (MU) Test Kit
- Fiber Optic Test Light
- Electrician Test Light
- CPM Service Kit
- Download Cable Kit



### Locomotive Enhancements

Add-ons to your existing fleet to automate and modernize locomotive operation and maximize the value of your PTC systems

- Electric Wiper Kits
- Anti-Glare Film
- In-Cab & external camera systems
- Battery Cranking Monitor



### Connectivity

A range of cables, antennas, converters and specialty products that facilitate both in-cab and remote data acquisition

- Cab Signal Monitor
- Ethernet Cables
- 50 Ohm Radiating Cable
- RF Filter Kits
- Wiring Harnesses
- Locomotive Antennas



### Idle Reduction

Lithium Ion Battery Technology that can reduce fuel usage and GHG emissions by maximizing time between Locomotive restarts, while keeping key systems continually operational and Lead Acid batteries fully charged

- *Electrolyte* Power System for Locomotives



### Railway Sensors

A variety of devices which provide essential information related to speed and temperature to your train control systems or maintenance teams. Our sensor solutions are specifically designed for Railway use and built to sustain the rigors of the operating environment.

- OEM replacement Speed/Motion sensors for multiple locomotive applications including traction motors, blowers and compressors
- Temperature sensors for Air, Water and Lubricant
- Self-Adhesive Indicators Strips that can provide an irreversible indication of wheel bearing temperature



### Our Innovation

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