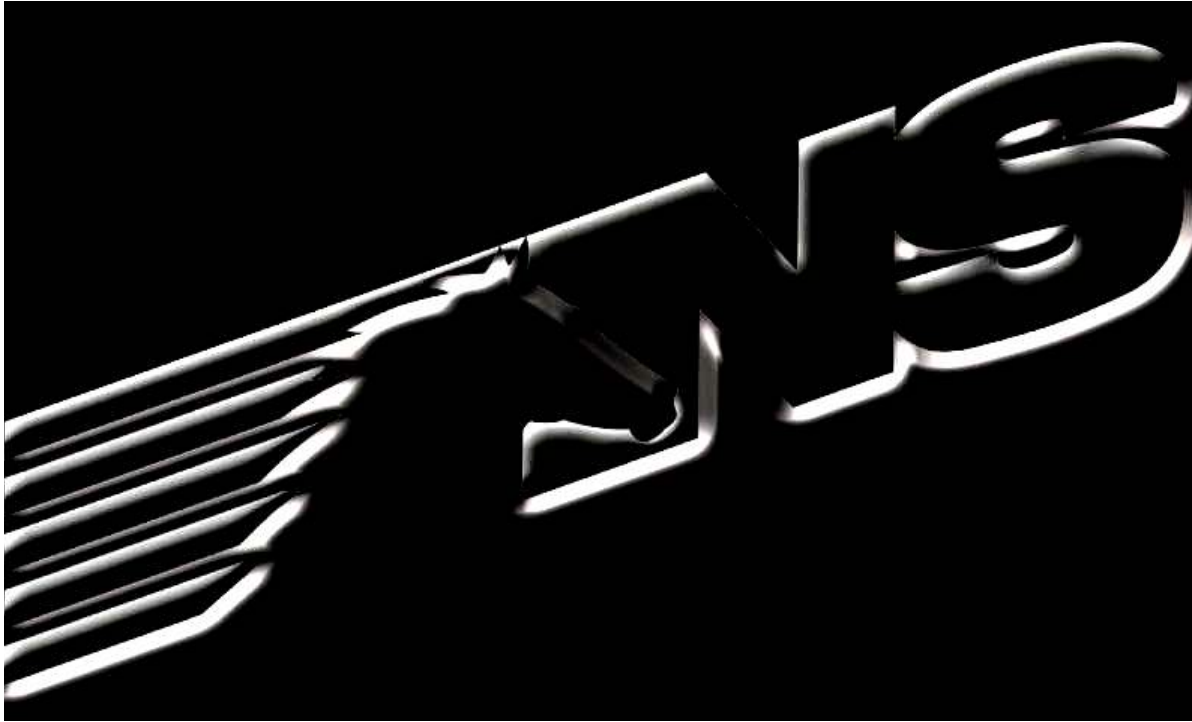




**General Chairmen's Meeting
Norfolk 03/04/08**

Wireless
Event
Recorder
Information
System



TERMS

- WiLIS – Wireless Locomotive Information System.
- WERIS – Wireless Event Recorder Information System.
- LEADER – Locomotive Engineer Assist Display Event Recorder.
- Dashboard – Interface for WERIS/LEADER
- CMU – Communications Management Unit

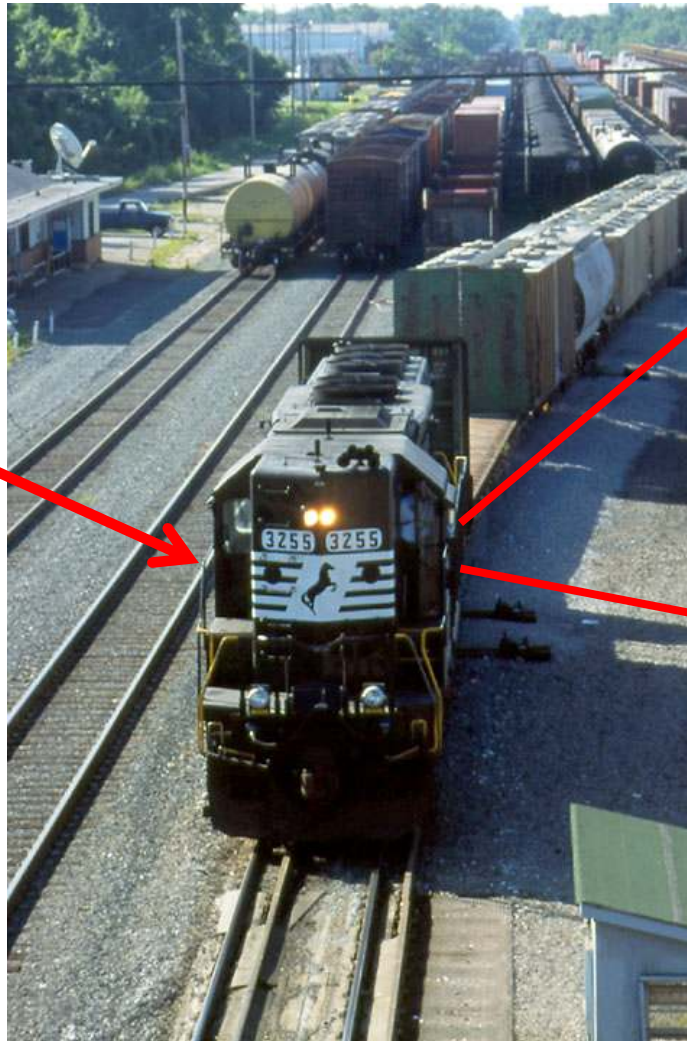


Equipment

- 1077 active locomotives WERIS ready – 96.5% Reporting. (Quantum CMU)
- Asset Tracking Devices (Quantum switch engine locomotives) are WLIS only.
- 1616 Total Devices both WERIS/WiLIS

WERIS

Wireless Event Recorder Information System



**Wireless
Access
Point**



Onboard Computer



Event Recorder



WERIS

- Access Points
 - Industrial Version of Home Wireless – 802.11
 - One or More at Most Terminals.
 - 62 Planned AP's
 - Range (500 ft – 2500 ft)



WERIS

WERIS Access Points Usually at Fuel Racks



WERIS

Typical 802.11 Access Point Hardware





WERIS

- How Often Does the Quantum CMU Upload Event Recorder Data?
 - Every 100 Hours
 - Any Time a File Equals 512 K
 - Dependent on How Often CMU “Sees” an Access Point



WERIS

- How Much Data Can the Quantum CMU Retain?
 - 255 Files of 512 K
 - 512 K $\sim$ 110 Hours
 - 1168 Days or 3.2 Years



WERIS

- Core IT Functionality
 - Automatically Downloads Data
 - Moves Data to Central Servers
 - Associates Data with Specific Trains by District
 - Enhances with Crew Data.



WERIS Applications

- Auto Query Function
 - Software by Quantum
 - Scans Recorder Data
 - Looks at Pre-defined Exception Lists
 - Generates “Operational Alerts”



WERIS Applications

- Examples of “Operational Alerts”
 - Excessive Speed
 - Power Braking
 - Independent Brake Use
 - Short Time Ratings, etc.

WERIS Applications



- Yard & Local Fleet Sizing Tool
 - Playback Software Creates Notch Duty Cycle Information- Horse Power Sizing
 - Event Recorder Data Captures Traction Motor Current Levels - GP or SD?



WERIS Applications

- Fuel Consumption Data for Costing
 - Train ID Specific Costing Possible
 - Sums Notch Duty Time
 - Each Loco Type has Published Fuel Consumption for per Notch
 - GPS Stamp Anchors Start and Finish



WERIS Applications

WERIS Includes a Railview “Health Check”





WERIS

- Wireless Event Recorder Down Load:
 - Promotes Competition
 - Drives Professionalism
 - Improves Train Handling
 - Promises to Reduces Costs...



WERIS-Reduced Costs

- Reduced Traction Motor Failures
 - Traction Motor Over Current
 - Traction Motor Plugging
- Reduced Flat Spots
- Reduced Rail Burn
- Reduced Train Separations
- Reduced Derailments



WERIS-Reduced Costs

- Reduced Fuel Consumption
- Enhanced Locomotive Troubleshooting
- Back Up Data for Grade Crossing Accidents
- Streamlined Engineer Qualification Process/Training



In Summary

- The Major Advantages of Wireless E.R. Download and WERIS
 - Methodical, Automatic Data Retrieval
 - “Auto Query” Quickly Scans Reams of Data and Spotlights Exceptional Events
 - Data Associated with specific trains by district.
 - Data has “GPS Stamp” Anchoring Location



Where Are We Now?

- AP's Accepting Locomotive Data Now.
- Raw Functionality By End Of - 1st Quarter (Brio Type Queries)
- WERIS Desk Being Established – 1st Quarter
- Dashboard Functionality – 4th Quarter
- Overall 75% complete with infrastructure with testing phase to begin in October



WERIS

Questions?