

A photograph of a train in motion, blurred to convey speed. The train is dark, and the background shows a hillside with trees in autumn colors. The image is positioned on the left side of the slide.

# ***AAR ECP BRAKES STANDARDS & SUPPLIER CERTIFICATION STATUS***

**Railroad Safety Advisory Committee  
February 20, 2008**

**Patrick T. Ameen  
Asst. Vice President Technical Services  
AAR Safety & Operations**



**TOMORROW. ARRIVING BY TRAIN.**



# *AAR Interchange Rules & Standards*

- ◆ **Manual of Standards & Recommended Practices:  
7 Technical ECP Standards in Section E-II (plus 1 under  
development)**
- ✓ **Brake Systems Committee**
- ✓ **Equipment Engineering**
- **Interchange Rules: Field Manual Rule 88**
- ✓ **Arbitration & Rules Committee**
- ❖ **Technical Services Working Committee**



# *ECP Brake Systems Standards*

- ❖ **AAR S-4210: ECP CABLE-BASED BRAKE SYSTEM CABLE, CONNECTORS, AND JUNCTION BOXES---PERFORMANCE SPECIFICATION:**
- ✓ **The ECP “Hardware Standards”**
- ✓ **November 1999: Adopted**
- ✓ **2002: Revised**
- ✓ **9/26/07: Revisions Submitted to Industry Comment**
- ✓ ***12/6/07: Adopted***



# *ECP Brake Systems Standards*

- ❖ **AAR S-4240 ECP BRAKE EQUIPMENT APPROVAL PROCESS:**
- ✓ **12/1/06: Industry Comments Solicited**
- ✓ **1/16/07: Adopted (new Standard)**
- ✓ **Acceptance Procedure (150 Car Test Rack, 100 car sets + 2 locomotives in service within 24 months, semi-annual service reports, 4 year in-service test )**
- ✓ **Conditional Approval Allotments: 1000, 5000, 10000, 50,000, unlimited**
- ✓ **May be Withdrawn for: Safety, Reliability, or Incompatibility**



# *ECP Brake Systems Standards*

- ❖ **AAR S-4260 ECP BRAKE & WIRE DISTRIBUTED POWER INTEROPERABILITY TEST PROCEDURES**
- ✓ *Establishes Baseline for Compliance with Balance of AAR S-4200 Suite of Standards*
- ✓ **12/5/06: Industry Comments Solicited**
- ✓ **1/26/07: Adopted (new Standard)**
- ✓ **NYAB & Wabtec Testing in Process**



# *ECP Brake Systems Standards*

- ❖ **AAR S-4200 ECP BRAKE CABLE-BASED BRAKE SYSTEMS --- PERFORMANCE REQUIREMENTS**
- ✓ **Ensure Safety, Reliability, Functionality, & Interoperability**
- ✓ **Set-up/Initialization, Cab Displays & Controls, Communication Network Test, Train Net Braking Ratio, Train Brake Commands, System Diagnostics, Cab Displays & Controls, Environmental Requirements (shock, temperature, humidity)**
- ✓ **November 1999: Adopted**
- ✓ **2002: Revised**
- ✓ **12/12/07: Revisions Submitted to Industry Comment**
- ✓ ***2/16/08: Revisions Adopted***



# *ECP Brake Systems Standards*

- ❖ **AAR S-4220: ECP BRAKE CABLE-BASED BRAKE DC POWER SUPPLY---PERFORMANCE SPECIFICATION**
- ✓ **November 1999: Adopted**
- ✓ **2002: Revised**



# *ECP Brake Systems Standards*

- ❖ **AAR S-4230: INTRATRAN COMMUNICATION SPECIFICATION for CABLE-BASED FREIGHT TRAIN CONTROL SYSTEMS**
- ✓ **November 1999: Adopted**
- ✓ **2002: Revised**



# *ECP Brake Systems Standards*

- ❖ **AAR S-4250: PERFORMANCE REQUIREMENTS for ITC-CONTROLLED CABLE-BASED DISTRIBUTED POWER SYSTEMS**
- ✓ **2003: Adopted**



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# *ECP Brake Systems Standards*

- ❖ **AAR S-4270: ECP SOFTWARE CONFIGURATION STANDARD**
- ✓ **2/18/08: 1<sup>st</sup> Draft in front of Brake Systems Committee Technical Advisory Group**



# Dynamic Brake Status Reporting

- ❖ **July 1, 2005: AAR Standard S-5509 Adopted**
- ✓ ***Utilized the “C” Band for Communications Frequency***
- ✓ ***2006: Locomotive OEM Asked Locomotive Committee to Change Standard to “A” Band; Locomotive Committee Upheld Standard S-5509***
- ❖ ***2007: ECP OEM Raised Issue of Potential Interference or “Cross-Talk”***
- ✓ ***June 2007: TTCI Expert Analysis Concluded Ample Band Width Capacity & Extremely Remote Potential for Interference***
- ✓ ***October 2007: Issue Raised @ FRA ECP Hearings & Technical Conference***
- ✓ ***February 14, 2008: AAR Standard S-5509 Changed to “A” Band (70kHz to 95 kHz).***



# *ECP Brake Systems: Interchange Rules*

- ❖ **Interchange Rule 88: MECHANICAL REQUIREMENTS FOR ACCEPTANCE**
  - A. **At Any Time**
    - 2. **Air Brake Equipment**
      - s. **Cars equipped with ECP brake equipment must comply with AAR Standards S-4200, S-4210, S-4220, S-4230, and S-4260 when shipped from car builder (latest revision when built)**
  
- ❖ **DOES NOT MANDATE ECP BRAKES, BUT IT SETS THE STAGE**



# *ECP Brake Systems: Supplier Certification Status*

- ◆ **New York Air Brake Company:**
  - ✓ **12/15/04: Conditionally Approved for 1,000 Units**
  - ✓ **12/1/05: Unconditionally Approved for Cable-Based Distributed Power Systems**
- ✓ **Wabtec Railway Electronics:**
  - ✓ **9/11/07: Conditionally Approved for 1,000 Units**
- ❖ ***Both Engaged in Interoperability Testing per AAR Standard S-4260***

