



# Brotherhood of Locomotive Engineers and Trainmen

*A Division of the Rail Conference — International Brotherhood of Teamsters*

## **NATIONAL LEGISLATIVE OFFICE**

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**JOHN P. TOLMAN**

*Vice President and*

*National Legislative Representative*

November 7, 2007

Docket Clerk  
DOT Central Docket Management Facility  
West Building Ground Floor, Room W12-140  
1200 New Jersey Avenue, Southeast  
Washington, DC 20590

Re: Docket No. FRA-2006-26175

Dear Docket Clerk:

On September 4, 2007, the Federal Railroad Administration (“FRA”) published a Notice of Proposed Rulemaking (“NPRM”) concerning Electronically Controlled Pneumatic (“ECP”) brake systems. *See* 72 FR 50820–50853. These comments are submitted by the Brotherhood of Locomotive Engineers and Trainmen, a Division of the Rail Conference of the International Brotherhood of Teamsters (“BLET”), and supplement our October 4, 2007 testimony (FRA-2006-26175-21), our October 19, 2007 testimony (FRA-2006-26175-26), and our written post-hearing comments (FRA-2006-26175-19), all of which are incorporated by reference herein. These supplemental comments will address two specific subjects.

First, our written testimony at the October 19, 2007 Public Hearing / Technical Conference posed more than a dozen questions concerning three of the Association of American Railroads (“AAR”) standards FRA proposes to incorporate by reference into the Final Rule. *See* FRA-2006-26175-26 at pp. 15–18. In our written post-hearing comments, we had noted that responses to those questions had not been received at the time said comments were filed and, therefore, we reserved the right to comment further upon receipt of AAR’s responses. *See* FRA-2006-26175-19 at p. 2.

We have since received and reviewed AAR’s responses, as set forth in its written post-hearing comments. *See* FRA-2006-26175-35 at pp. 17–22. The responses were prompt and detailed, which we appreciate. Moreover, the information provided clarifies a number of questions and concerns we had, and we can state that no new issues arise from the information AAR has provided.

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Secondly, on November 7, 2007, we were notified for the first time of the existence of a document titled “Recommended Minimum FRA Requirements for ECP Locomotive Event Recorder Data,” which was submitted by Robert Kull, Director of Business Development for Wabtec Railway Electronics, and was dated October 22, 2007. *See* FRA-2006-26175-31. We also were notified at that time of the publication in the docket of an e-mail message from Donald S. Usak of Norfolk Southern Railway (“NS”) to FRA Motive Power & Equipment Specialist James Wilson. *See* FRA-2006-26175-32.

Because we were unaware of the existence of these documents until after the close of the comment period, we were unable to address them in our written post-hearing comments. Nonetheless, the issues raised in those documents are of such vital concern to our membership that we respectfully request that FRA consider these supplemental comments despite the fact that they are being filed after the end of the comment period.

The subject matter of both documents is the relationship between ECP brake system data and locomotive event recorders. Mr. Kull proposes that the following five ECP parameters be recorded: (1) ECP brake command, as sent by the locomotive; (2) ECP trainline power status; (3) ECP percent operable brakes; (4) ECP mode; and (5) EOT brake pipe pressure. *See* FRA-2006-26175-31. Mr. Kull further proposes that the source of the data “be either ... from the ECP Head End Unit (HEU), the Integrated Locomotive Computer (ILC), or by a separate interface to the ECP train line.” *Id.*

Mr. Usak notes that NS locomotive event recorders will capture data for the following eight parameters: (1) ECP brake call (*i.e.*, position of the automatic brake valve handle); (2) ECP brake command, as received by the train; (3) ECP brake source;<sup>1</sup> (4) ECP trainline power status; (5) ECP percent operable brakes; (6) ECP mode; (7) EOT brake pipe pressure; and (8) ECP empty/load status. *See* FRA-2006-26175-32. Mr. Usak does not indicate the source of the data that is recorded.

For purposes of this rulemaking (*i.e.*, recording data pertinent to brake systems in freight operations), current FRA regulations governing event recorders classify locomotives into two categories. One is a “lead locomotive originally ordered before October 1, 2006, and placed in service before October 1, 2009, including a controlling remote distributed power locomotive, [and] a lead manned helper locomotive.” 49 CFR § 229.135(b)(1). Event recorders on this category of locomotive must record: applications and operations of the train automatic air brake; applications and operations of the independent brake; and applications and operations of the dynamic brake, if so equipped. 49 CFR §§ 229.135(b)(1)(vi)–(viii).

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<sup>1</sup> This parameter records which of a dozen non-engineer initiated braking events — such as various penalty brake applications — has occurred.

The other category is governed by Section 229.135(b)(3), and includes a “lead locomotive, a lead manned helper locomotive, and a controlling remotely distributed power locomotive ... originally ordered on or after October 1, 2006 or placed in service on or after October 1, 2009.” Event recorders on this category of locomotive must record, and the certified crashworthy event recorder memory module must retain, the following brake and/or ECP-related data elements:

- Applications and operations of the train automatic air brake, including emergency applications. The system shall record, or provide a means of determining, that a brake application or release resulted from manipulation of brake controls at the position normally occupied by the locomotive engineer. In the case of a brake application or release that is responsive to a command originating from or executed by an on-board computer (e.g., electronic braking system controller, locomotive electronic control system, or train control computer), the system shall record, or provide a means of determining, the involvement of any such computer. 49 CFR § 229.135(b)(3)(vi).
- Applications and operations of the independent brake. 49 CFR § 229.135(b)(3)(vii).
- Applications and operations of the dynamic brake, if so equipped. 49 CFR § 229.135(b)(3)(viii).
- Electronic controlled pneumatic braking (ECP) message (and loss of such message), if so equipped. 49 CFR § 229.135(b)(3)(xi).
- EOT brake pipe pressure (EOT and ECP devices). 49 CFR § 229.135(b)(3)(xiv).
- Locomotive automatic brake valve cut in. 49 CFR § 229.135(b)(3)(xxi).
- Locomotive position in consist (lead or trail). 49 CFR § 229.135(b)(3)(xxii).
- Safety-critical train control data routed to the locomotive engineer’s display with which the engineer is required to comply, specifically including text messages conveying mandatory directives, and maximum authorized speed. 49 CFR § 229.135(b)(3)(xxv).

The Section-by-Section Analysis of FRA’s 2005 Final Rule concerning event recorders extensively discussed the rationale behind Section 229.135(b)(3)(vi):

The data element contained in subparagraph[] (b)(3)(vi) ... of the final rule requires that the system record, or provide a means of determining, that a brake application or release resulted from manipulation of brake controls at the position normally occupied by the locomotive engineer. In the case of a brake application or release that is responsive to a

command originating from or executed by an on-board computer (*e.g.*, electronic braking system controller, locomotive electronic control system, or train control computer), the system must record, or provide a means of determining, the involvement of any such computer.

These additional requirements concerning the operation of the automatic braking system are necessary in order to take into account the proliferation of processor-based technology that is now extensively used to control the functions of locomotives, including on-board computers constituting subsystems of train control systems. When the original event recorder rule was being prepared, the automatic brake on most locomotives functioned by mechanical and pneumatic means, responding directly to manipulations of the controls by the locomotive engineer; and train control (where provided) addressed braking and power “knock down” functions very directly as well. Since that time, braking functions are becoming increasingly controlled electronically based on requests from the control stand, and the electronic commands themselves may pass through a second locomotive computer before being executed. Major manufacturers of locomotives have plans to run braking software on their own host processors. Further, some developing train control projects contemplate routing commands through other on-board computers.

In general, new electronic systems have functioned well, but there have been notable failures. It is obviously a dangerous situation when service braking is not available (requiring the engineer to employ the emergency braking feature). The unintended application of train brakes can also constitute a safety hazard, particularly in freight operations where management of in-train forces is a significant challenge. In the event of an accident, it is critical that data be logged in the event recorder memory module that is sufficient to determine the source of brake applications and releases. It should be known whether or not they were requested, and whether or not they occurred as requested, from the control stand. In the event no action was taken at the control stand that can explain the brake application, it is important to know (insofar as is feasible) the source of the application. While not every source of an unintended brake application can be determined in real time and monitored electronically, on-board computers capable of issuing a command for application or release of the brakes or executing such commands should be monitored to determine their role.

70 FR 37929 (June 30, 2005).

There are three significant differences between the Kull and the Usak documents pertaining to data elements to be recorded. First, with regard to brake commands, Mr. Kull proposes that the event recorder contain data on the “[b]rake command *sent on the ECP train line from the locomotive.*” See FRA-2006-26175-31 (emphasis added). Mr. Usak, on the other hand, advises that NS records (1) “the position of the automatic brake valve handle,” and (2) “the actual braking command received through the train.” See FRA-2006-26175-32.

Given FRA's 2005 Preamble discussion concerning Section 229.135(b)(3)(vi), it is clear that the method employed by NS complies with the rule, while Mr. Kull's proposal, if adopted, would not. We, therefore, strongly urge FRA to require that both the position of the automatic brake valve handle and the ECP brake command received by the train be recorded on the locomotive event recorder.

Second, Mr. Usak advises that NS records "whether the brake system is set for an empty train or a loaded train." *Id.* Mr. Kull's proposal lacks a similar parameter. In response to our question concerning Section 4.4.14 of AAR's S-4200 Standard, AAR noted that "[i]n empty status, the brake shoe force is reduced, as compared to loaded status, to protect the wheels," and that "[w]hen there is a mismatch, the braking force is the highest available since the default is to loaded status." *See* FRA-2006-26175-35 at p. 20. AAR's standard prescribes that this default must occur automatically by system design. *See* FRA-2006-26175-7 at p. E-II-54.

As FRA well knows, among the many uses of event recorder data is as evidence in a certification revocation or disciplinary proceeding. AAR's ECP standard requires the system to default to a loaded status setting in the event of a mismatch and that this default must occur automatically, independent of any action taken by the locomotive engineer. This corrective action — which we acknowledge is necessary in the interest of safety — will, however, significantly and suddenly change the braking characteristics of a train.

Section 4.4.14 of the S-4200 Standard also states that if "a [car control device] detects a train empty/load command mismatch, it shall report an invalid empty/load command status to the [head-end unit] when polled." *Id.* The report from the CCD to the HEU clearly constitutes "safety-critical train control data routed to the locomotive engineer's display with which the engineer is required to comply," and, therefore, is subject to recordation pursuant to 49 CFR Section 229.135(b)(3)(xxv). Once again, the parameters recorded by NS comply with FRA's event recorder regulation, and Mr. Kull's omission of the ECP empty/load status parameter leaves his proposal lacking.

Lastly, there is the question of data source, which is reflected in the third difference in parameters between the two documents. Mr. Kull proposes that data from one of three sources — the head-end unit, the integrated locomotive computer, or a separate interface to the ECP train line — be used. While Mr. Usak did not specify the source of the ECP data recorded by NS, he notes that a dozen non-engineer initiated braking sources are tracked. We disagree with Mr. Kull's assessment that, in FRA's event recorder regulation, "[t]he detailed source of the data is not defined."

To the contrary, the Preamble to the 2005 Final Rule notes that when a brake application or release that is responsive to a command originating from or executed by an on-board computer, the

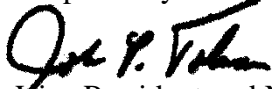
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system must record, or provide a means of determining, the involvement of any such computer. *See* 70 FR 37929. Furthermore, it also should be known whether or not the brake applications were requested, and whether or not they occurred as requested, from the control stand. Id.

We submit that the “ECP train brake source” parameter described by Mr. Usak is necessary to comply with both Section 229.135(b)(3)(vi) and Section 229.135(b)(3)(xxv), and that Mr. Kull’s proposal cannot serve as a basis for FRA requirements pertaining to event recording of ECP data because of this omission. Additionally, we believe that the control stand, the head-end unit and its display, and the ECP computer — as necessary — all must serve as data sources in order to ensure the appropriate recordation of data in compliance with FRA’s rule.

We, again, appreciate the opportunity to participate in this matter.

Respectfully submitted,



Vice President and National Legislative Representative

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