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Before the
Federal Communications Commission
Washington, D.C. 20554

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Federal Communications Commission
Office of the Secretary

In the Matter of)
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Association of American Railroads)
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Petition for Rule Making to Amend Section)
90.238(e) of the Commission's Rules)
)
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RM- _____

To: The Commission

**PETITION FOR RULEMAKING OF THE
ASSOCIATION OF AMERICAN RAILROADS**

The Association of American Railroads ("AAR"), by its undersigned counsel, pursuant to Section 1.401(a) of the Commission's rules, hereby petitions the Commission to initiate a rulemaking proceeding to amend its rules so as to allow Railroad Licensees, as defined in Section 90.7 of the rules, to operate certain on-board telemetry devices at a transmitter power of eight watts. To enable such operation, AAR requests that the Commission modify Section 90.238(e) of the rules (which currently contains a power limit of two watts for all "telemetry" operations using particular frequencies), by raising the power limit to eight watts for "end-of-train" ("EOT") devices used by the railroad industry, as more fully described herein.

I. Statement of Interest

AAR is a voluntary non-profit organization composed of railroad companies operating in the U.S, Canada and Mexico. One of AAR's roles is to represent its

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members in connection with federal regulatory matters of concern to the railroad industry, including matters relating to communications and access to radio frequency spectrum. Also, AAR has been certified by the Commission as the designated frequency advisory committee that coordinates licensing in the Private Land Mobile Radio (PLMR) bands for railroad use.¹ In this regard, AAR serves as the frequency coordinator not only for its own members, but for all entities that meet the definition of "Railroad Licensee" in Section 90.7 of the Commission's rules,² whether or not they are members of AAR.

II. Discussion

Radio communications systems are a vital component of the railroad industry's operations, and the safe and efficient operation of rail freight transportation is increasingly dependent on reliable communications links. One very important type of radio communication is the telemetry link between the rear of a train and the lead locomotive. These onboard communications systems are governed by regulations promulgated by the Federal Railroad Administration,³ and are deployed in two different

¹ See *Frequency Coordination in the Private Land Mobile Radio Services, Report & Order*, 103 FCC 2d 1093, ¶ 94 (1986); *Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Services and Modify the Policies Governing Them and Examination of Exclusivity and Frequency Assignment Policies of the Private Land Mobile Services, Second Report and Order*, 12 FCC Rcd 14307, 14324, 14330 (1997) ("*Second Report & Order*"), and *Second Memorandum Opinion and Order*, 14 FCC Rcd 8642, 8650-52 (1999).

² According to Section 90.7 of the rules, "Railroad Licensees" are "Railroad common carriers which are regularly engaged in the transportation of passengers or property when such passengers or property are transported over all or part of their route by rail." Although all major freight railroads are members of AAR (as are numerous larger regional and short-line railroads), there are many entities which meet the definition of "Railroad Licensee" but which are not members of AAR (such as many of the smaller short-line freight railroads as well as local and regional transit authorities).

configurations: (1) one-way end-of-train devices (described at 49 C.F.R. §232.403), and (2) two-way end-of-train devices (described at 49 C.F.R. §232.405).

A one-way EOT device consists of two units, a “rear unit” affixed to the rear coupling on the last car of the train, and a “front unit” installed in the cab of the locomotive.⁴ According to FRA regulations, the rear unit of a one-way EOT device “shall be capable of determining the brake pipe pressure on the rear car and transmitting that information to the front unit for display to the locomotive engineer.”⁵ This function falls within the FCC’s definition of “telemetry” in Section 90.7 of the Commission’s rules, *i.e.*, the “transmission of non-voice signals for the purpose of automatically indicating or recording measurements at a distance from the measuring instrument.”⁶ The front unit of a one-way EOT device consists of a radio receiver which, according to FRA regulations, “shall be designed to receive data messages from the rear unit and shall be capable of displaying the rear car brake pipe pressure” in the cab of the locomotive.⁷

A two-way EOT device is similar in functionality to a one-way EOT device except that each of the two components operates both as a transmitter and a receiver. In this regard, FRA regulations require that the front unit of a two-way EOT device be capable of transmitting “an emergency brake application command” to the rear unit, and

³ 49 C.F.R. §§ 232.401-232.409

⁴ 49 C.F.R. §232.403(a).

⁵ 49 C.F.R. §232.403(b). In addition to brake pressure information, the rear unit also measures and transmits information regarding state of motion of the rear car, the condition of the rear marker light, and the condition of battery on the rear unit.

⁶ 47 C.F.R. §90.7.

⁷ 49 C.F.R. §232.403(f).

that the rear unit be capable of receiving that command and activating the train's braking system from the rear of the train.⁸

Throughout the railroad industry in the United States, the rear unit transmitters on one-way EOT devices operate on 457.9375 MHz, and two-way EOT devices transmit on the frequency pair 452.9375 MHz (front-to-rear) and 457.9375 MHz (rear-to-front).⁹ Operation on these frequencies is authorized under Section 90.35(c)(30) and Section 90.238(e) of the Commission's rules, the latter of which allows telemetry operations with a transmitter output power not to exceed two watts. It is this two watt power limit that the railroad industry, through this Petition for Rulemaking, seeks to increase to eight watts.

Although the railroad industry's standardized protocols for channel access, message integrity checks and retry mechanisms provide a relatively robust communications link, the operational environment in which EOT devices must work is difficult and challenging. For example, the only practical place to mount the rear unit is on the coupling knuckle behind the last car of the train. This is a highly disadvantageous location for purposes of radiofrequency propagation because the direct path from the rear

⁸ 49 C.F.R. §232.405. Applying the brakes from both the front and the rear of the train dramatically increases braking effectiveness and reduces stopping distance. Two-way EOT devices are deemed sufficiently important for safety reasons that FRA regulations mandate their use in certain types of train operations (49 C.F.R. §232.407); furthermore, trains required to use them are not permitted to leave terminal areas without a proven link (49 C.F.R. §§232.407(f) and 232.409(b)), and trains *en route* that lose the link for more than a specified period of time are required by FRA regulations to either limit their speed or stop, depending on the circumstances (49 C.F.R. §232.407(g)).

⁹ In the past, one railroad in the U.S. used another frequency (161.115 MHz) for its EOT links. At the present time, however, *all* railroads use 452/457.9375 MHz, which is the industry standard specified for "End-of-Train Communications" in the AAR Manual of Standards and Recommended Practices (AAR Standard S-5701).

unit transmitter to the front unit receiving antenna on the locomotive is virtually always blocked by the intervening train cars, and even the indirect path to the front unit can be adversely affected by certain kinds of terrain. Furthermore, the rear unit device must be portable (because it must be affixed by a rail yard worker to the last car of the train after the train has been assembled), which renders large or sophisticated antennas on the rear unit problematic because of their additional bulk and weight.

In spite of these negative operational factors, EOT devices generally have worked well, and remain a vital component of ongoing efforts to sustain safe and efficient rail operations. However, because of the two-watt power limit for telemetry operations in Section 90.238(e), there is very little margin for degradation of the link, especially on longer trains (*i.e.*, trains that are between 7,000 and 8,000 feet (approximately 1.5 miles) in length). Accordingly, to minimize the possibility of link failure for EOT communications, AAR is proposing a power increase to eight watts.

The text of AAR's proposed rule amendment is set forth in the Appendix to this petition, as required by Section 1.401 (c) of the Commission's rules. As shown in the Appendix, the amendment proposed herein is very narrow in scope: AAR is proposing an increase in the two-watt power limit in Section 90.238(e) of the rules, to eight watts transmitter output power, solely for telemetry transmissions from the rear unit to the front unit of an EOT device,¹⁰ when operated by a "Railroad Licensee" using 452/457.9375 MHz for communications between the end of a train and the lead locomotive.

¹⁰ The two-watt limit of Section 90.232(e) is not applicable to the front-to-rear transmission in a two-way EOT device. As required by FRA regulations (49 C.F.R. §232.405(a)), the transmission from the front unit to the rear unit in a two-way EOT device is a "command," which falls outside the Commission's definition of "telemetry" in 47 C.F.R §90.7, and which is instead a "telecommand" as defined in the same rule, *i.e.*, the "transmission of non-voice signals for the purpose of remotely controlling a device."

The proposed increase translates to a 6 dB increase in available power, and would enable a slightly higher link margin so that everyday propagation anomalies would be less detrimental to link integrity, especially for use on longer trains.

The proposed amendment poses little (if any) risk of interference to parties outside the rail industry because the 452/457.935 MHz channel pair is coordinated and used exclusively by the railroad industry for EOT links throughout the U.S.¹¹ In addition, the adjacent frequencies on both sides of the EOT channel pair are used exclusively by the rail industry for a different (but similar) purpose, namely, the remote control of “distributed power” (*i.e.*, mid-train locomotives) pursuant to Section 90.35(c)(59) of the Commission’s rules . The prospect of interference within the railroad community as a result of the proposed rule change is minimal. In this regard, it is likely that the increased power limit will be utilized only when necessary to maintain the link integrity because conservation of battery life on the rear unit is an important consideration for operational purposes. Thus, AAR anticipates that the railroads will specify in their industry-wide standard for EOT devices that the higher power levels be used only when necessary (for example, only on retry transmissions).

III. Conclusion

For the reasons described above, AAR respectfully requests the Commission to issue a Notice of Proposed Rulemaking to implement a modification of Section 90.238(e)

¹¹ 47CFR 90.35(b)(3). AAR has found five licenses in the Commission’s ULS database for the channel pair 452/457.9375 MHz which are held by four entities that are not “Railroad Licensees.” A search of the files and records of AAR’s frequency coordination staff revealed that none of these four licensees had ever obtained the “prior written consent” of AAR as required by Section 90.35(b)(2)(ii) of the Commission’s rules. AAR has contacted these four licensees, requesting that they cease using these frequencies and offering to cooperate with them in finding alternative frequencies.

of the Commission's rules as set forth in the attached Appendix, and to adopt the proposed rule modification after an opportunity for public comment.

Respectfully submitted,

ASSOCIATION OF AMERICAN RAILROADS

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Attachment: Appendix

Appendix

Part 90 of Chapter I of Title 47 of the Code of Federal Regulations is amended as follows:

PART 90 – PRIVATE LAND MOBILE RADIO SERVICES

* * *

Subpart J – Non-Voice and Other Specialized Operations

* * *

§ 90.238 Telemetry Operations

* * *

(e) In the 450-470 MHz band, telemetry operations will be authorized on a secondary basis with a transmitter output power not to exceed 2 watts on frequencies subject to §90.20(d) or §90.35(c)(30), except that telemetry operations may be authorized with a transmitter output power not to exceed 8 watts on the frequency pair 452/457.9375 MHz when used by a Railroad Licensee for providing communications between the end of a train and the lead locomotive of the same train.