



Federal Communications Commission
Washington, D.C. 20554

April 5, 2019

Jonathan V. Cohen, Esq.
Wilkinson Barker Knauer, LLP
1800 M Street, NW, Suite 800N
Washington, DC 20036

DA 19-261

RE: **National Railroad Passenger Corporation (Amtrak), Call Sign WRAP937**

Dear Mr. Cohen:

The Mobility Division (Division) of the Wireless Telecommunications Bureau (Bureau) hereby grants Amtrak's modification application seeking permanent authority to operate 52 positive train control (PTC) wireless radio base stations under Automated Maritime Telecommunications System (AMTS) license WRAP937.¹ Today's action enables Amtrak to deploy a Congressionally-mandated PTC safety system on its Michigan Line, between Porter, Indiana, and Dearborn, Michigan.² This grant of permanent operating authority is subject to certain conditions adopted below.

BACKGROUND

Positive Train Control. The Rail Safety Improvement Act of 2008, as amended by the Positive Train Control Enforcement and Implementation Act of 2015 (together, the Rail Safety Act), required Amtrak and most U.S. freight and commuter railroads to install and operate interoperable PTC systems by December 31, 2018.³ As the Rail Safety Act permits, 37 of the 41 railroads required to implement PTC have requested that the Federal Railroad Administration (FRA)⁴ grant them up to a 2-year extension, until December 31, 2020, to implement PTC.⁵ Four railroads report that they have implemented an FRA-certified and interoperable PTC system on all of their required main lines.⁶ Once implemented, PTC systems are designed to reduce the risk of human-error rail accidents, by "prevent[ing] train-to-train collisions, over-speed derailments, incursions into established work zone limits, and the movement of a

¹ ULS File No. 0008206132 (filed May 10, 2018, and amended June 22, Sept. 12, Sept 27, Oct. 17, and Nov. 6, 2018) (License Modification Application).

² Exhibit 1 to License Modification Application at 1 (hereafter Exhibit 1).

³ Rail Safety Improvement Act of 2008, Pub. L. No. 110-432, § 104, 122 Stat. 4848, 4857 (2008), amended by the Positive Train Control Enforcement and Implementation Act of 2015, Pub. L. No. 114-73, § 1302, 129 Stat. 568, 576 (2015).

⁴ The FRA is responsible for approving each railroad's PTC system, including design, testing, and implementation and for ensuring compliance with the Rail Safety Act and FRA regulations implementing that statute. *See* Positive Train Control (PTC) Information (R&D), Federal Railroad Administration, <https://www.fra.dot.gov/Page/P0152> (last visited April 5, 2019) (information regarding FRA's oversight of PTC implementation).

⁵ *See* Statement on Positive Train Control Implementation, U.S. Department of Transportation (Dec. 31, 2018), available at <https://www.transportation.gov/briefing-room/statement-positive-train-control-implementation> (last visited April 5, 2019).

⁶ The four rails are: Port Authority Trans-Hudson (PATH), North County Transit District, Portland & Western Railroad, and the Southern California Regional Rail Authority (Metrolink). *Id.*

train through a switch left in the wrong position.”⁷ The U.S. rail industry has chosen to implement PTC using radio spectrum that creates wireless networks with the capacity to enable real-time information sharing between trains, rail wayside devices, and “back office” applications, regarding train movement authorities, speed restrictions, train position and speed, and the state of signal and switch devices.

Spectrum Authorizations. Amtrak contracted with Alstom Signaling Operation, LLC (Alstom), a PTC systems integrator, to construct Amtrak’s Michigan Line PTC system and to acquire necessary spectrum for assignment to Amtrak.⁸ On September 6, 2017, Alstom filed an application to acquire 32.5 kilohertz (217.4675-217.5000 MHz) of AMTS spectrum partitioned from call sign WQCP810 to implement PTC on the Michigan Line, stating that it would then assign the spectrum to Amtrak for its PTC deployment.⁹ On December 4, 2017, the Division consented to Alstom’s application.¹⁰ On January 23, 2018, Alstom consummated acquisition of the AMTS spectrum, call sign WRAP937.¹¹ On April 16, 2018, Alstom filed an application to assign WRAP937 to Amtrak,¹² and on May 15, 2018, the Division consented to the application.¹³ On October 26, 2018, Amtrak consummated its acquisition of WRAP937 from Alstom.¹⁴

License Modification Application. Although AMTS geographic licensees generally are authorized to place base stations anywhere within their licensed geographic service areas, Section 80.215(h)(2) of the Commission’s rules requires individual licensing of AMTS base stations located less than 169 kilometers (105 miles) from a channel 13 TV station, or less than 129 kilometers (80 miles) from a channel 10 TV station.¹⁵ On May 10, 2018, Alstom filed the License Modification Application to support Amtrak’s PTC deployment, requesting permanent authority to operate each of the 52 PTC base stations because of their proximity to certain channel 10 and 13 TV stations.¹⁶ We note that after acquiring WRAP937 from Alstom,¹⁷ Amtrak amended the License Modification Application to substitute

⁷ 49 U.S.C. § 20157(i)(5).

⁸ See Exhibit 1 at 1 n.2.

⁹ *Wireless Telecommunications Bureau Assignment of License Authorization Applications, Transfer of Control of Licensee Applications, and De Facto Transfer Lease Applications, and Designated Entity Reportable Eligibility Event Applications Accepted for Filing*, Public Notice (WTB Sept. 13, 2017), 2017 WL 4054436; ULS File No. 0007892280 (filed Sept. 6, 2017 and amended Nov. 16, 2017). The AMTS band includes two megahertz of spectrum (217-218 MHz paired with 219-220 MHz).

¹⁰ *Wireless Telecommunications Bureau Assignment of License Authorization Applications, Transfer of Control of Licensee Applications, De Facto Transfer Lease Applications and Spectrum Manager Lease Notifications, Designated Entity Reportable Eligibility Event Applications, and Designated Entity Annual Reports Action*, Public Notice (WTB Dec. 13, 2017), 2017 WL 6404505; ULS File No. 0007892280 (consent to the partition, disaggregation, and assignment of spectrum authorized under call sign WQCP810 to WRAP937).

¹¹ *Wireless Telecommunications Bureau Assignment of License Authorization Applications, Transfer of Control of Licensee Applications, De Facto Transfer Lease Applications and Spectrum Manager Lease Notifications, Designated Entity Reportable Eligibility Event Applications, and Designated Entity Annual Reports Action*, Public Notice (WTB Jan. 31, 2018), 2018 WL 654888; ULS File No. 0008074799 (filed Jan. 24, 2018) (notice of consummation).

¹² *Wireless Telecommunications Bureau Assignment of License Authorization Applications, Transfer of Control of Licensee Applications, and De Facto Transfer Lease Applications, and Designated Entity Reportable Eligibility Event Applications Accepted for Filing*, Public Notice (WTB Apr. 25, 2018), 2018 WL 1959851; ULS File No. 0008160112 (filed Apr. 16, 2018).

¹³ *Wireless Telecommunications Bureau Assignment of License Authorization Applications, Transfer of Control of Licensee Applications, De Facto Transfer Lease Applications and Spectrum Manager Lease Notifications,*

itself for Alstom as the applicant.¹⁸ On August 31, 2018, Amtrak requested special temporary authority (STA) to test and operate 52 PTC base stations on the Michigan Line using the same frequencies licensed under WRAP937.¹⁹ On September 13, 2018, the Division granted Amtrak's STA request, call sign WRCE940.²⁰

Engineering Report. Lockard & White Inc. (L&W), an engineering firm, performed an interference study for Amtrak titled "AMTS Engineering Report" (Engineering Report) dated May 1, 2018 and initially filed with the Commission on May 10, 2018.²¹ Amtrak subsequently filed amended engineering reports dated June 21, September 8, and September 26, 2018.²² Further references to the Engineering Report in this Letter Order are to the amended report dated September 26, 2018. The Engineering Report addresses the potential number of channel 10 and 13 over-the-air (OTA) TV households that could be affected by operation of the 52 PTC base stations.²³

Interference Mitigation Plan. As required by Section 80.215(h)(2), Amtrak filed a plan to limit potential interference from operation of the 52 PTC base stations to OTA television reception (Interference Mitigation Plan).²⁴ Amtrak also provided a certification of then Senior Director, Dr. Atousa Vali Sichani, certifying that Amtrak will adhere to the Interference Mitigation Plan (Amtrak Certification).²⁵

Broadcaster Notification. Amtrak provided written notice of the filing of the License Modification Application to four potentially affected broadcast stations on May 10, 2018, and, as subsequently amended, on June 22, September 12, and September 27.²⁶ Amtrak provided written notice of the filing of the amended License Modification Application to one additional potentially affected

Designated Entity Reportable Eligibility Event Applications, and Designated Entity Annual Reports Action, Public Notice (WTB May 23, 2018), 2018 WL 2393166; ULS File No. 0008160112.

¹⁴ *Wireless Telecommunications Bureau Assignment of License Authorization Applications, Transfer of Control of Licensee Applications, De Facto Transfer Lease Applications and Spectrum Manager Lease Notifications, Designated Entity Reportable Eligibility Event Applications, and Designated Entity Annual Reports Action*, Public Notice (WTB Nov. 14, 2018), 2018 WL 5994107; ULS File No. 0008416334 (filed Oct. 26, 2018) (notice of consummation).

¹⁵ See 47 CFR § 80.215(h)(2); see also 47 CFR § 80.475(a)(1). Further, under the Commission's rules, AMTS base stations are authorized "subject to the condition that no harmful interference will be caused to television reception except that TV services authorized subsequent to the filing of the AMTS station application will not be protected." 47 CFR § 80.215(h).

¹⁶ ULS File No. 0008206132; see also 47 CFR § 80.215(h)(2); 47 CFR § 80.475(a)(1).

¹⁷ See *supra* note 14 and accompanying text.

¹⁸ See Section 1.65 Amendment, ULS File No. 0008206132 (filed Nov. 6, 2018); Wireless Telecommunications Bureau Market-Based Applications Accepted for Filing, Public Notice (WTB Nov. 14, 2018), 2018 WL 5994099. Given the approved substitution, in this Letter Order we refer to Amtrak as the applicant, including for pleadings originally filed by Alstom,

¹⁹ ULS File No. 0008361481, Exhibit 1, Request for Special Temporary Authority at 1.

²⁰ ULS File No. 0008361481. The Division renewed WRCE940 on March 5, 2019, ULS File No. 0008547164.

²¹ Lockard & White Inc., AMTS Engineering Report, for Alstom Signaling, dated May 1, 2018, ULS File No. 0008206132 (filed May 10, 2018).

broadcast station (WZZM-DT) on October 17, 2018.²⁷ No broadcast station or other party has filed a comment on, or opposed, the License Modification Application.

DISCUSSION

We have carefully reviewed the License Modification Application, the Engineering Report, the Interference Mitigation Plan, the Amtrak Certification, and all other filings in the record before us and find that the public interest in rail safety will be served by granting Amtrak permanent authority to operate the 52 proposed PTC base stations at transmitter output power levels ranging from 2 to 25 watts.²⁸

Interference Analysis. The Engineering Report addresses the potential for interference from operation of the 52 proposed PTC base stations to OTA channel 10 and 13 receivers as required by Section 80.215(h)(2).²⁹ This report identifies two channel 10 TV stations located less than 129 kilometers (80 miles) from one or more of the 52 base stations: WYGN-LD, Berrien Springs, Michigan, and WILX-DT, Onondaga, Michigan.³⁰ This report also identifies three channel 13 TV stations located less than 169 kilometers (105 miles) from one or more of the 52 base stations: WODN-LP, Portage, Indiana; WZZM-DT, Grand Rapids, Michigan; and WTVG-DT, Toledo, Ohio.³¹

Channel 10 Broadcast Stations. In its Engineering Report, L&W states that consistent with OET-74 Supplement A,³² channel 10 stations WILX-DT and WYGN-LD have not been included in its “analysis as the transition to digital TV results in a lack of criteria to assess potential interference to channel 10.”³³ Likewise, consistent with OET-74 Supplement A, L&W states that “harmful interference to TV Channel 10 is unlikely.”³⁴ Further, L&W confirms Amtrak’s responsibility for avoiding interference to viewers of these stations and states that if interference is caused by Amtrak operations,

²² See Lockard & White Inc., AMTS Engineering Report, for Alstom Signaling, dated June 21, 2018, ULS File No. 0008206132 (filed June 22, 2018); Lockard & White Inc., AMTS Engineering Report, for Alstom Signaling, dated Sept. 8, 2018, ULS File No. 0008206132 (filed Sept 12, 2018); Lockard & White Inc., AMTS Engineering Report, for Alstom Signaling, dated Sept 26, 2018, ULS File No. 0008206132 (filed Sept. 27, 2018) (Engineering Report).

²³ Engineering Report at 16-22.

²⁴ Interference Mitigation Plan Exhibit 3, ULS File No. 0008206132 (filed May 10, 2018) (Interference Mitigation Plan).

²⁵ See Amtrak Certification Exhibit 3 Attachment A, ULS File No. 0008206132 (filed May 10, 2018) (Amtrak Certification).

²⁶ See 47 CFR § 80.475(a)(2); Certificates of Service, ULS File No. 0008206132 (filed May 10, June 22, Sept. 12, and Sept. 27, 2018).

²⁷ See 47 CFR § 80.475(a)(2); Certificates of Service, ULS File No. 0008206132 (filed Oct. 17, 2018).

²⁸ See Engineering Report at 7-9 (Tables 1-3). The peak effective radiated power (ERP) levels of 51 of the stations will range from 3.9 to 58.1 watts. *Id.* One station (CP 10) will transmit at a peak ERP of 128.7 watts. *Id.* at 8 (Table 2).

²⁹ See, e.g., *id.* at 4.

³⁰ See 47 CFR § 80.475(a)(1); Engineering Report at 11-12 (Tables 5-6).

³¹ See *supra* note 30.

³² Longley-Rice Methodology for Predicting Inter-Service Interference to Broadcast Television from Mobile Wireless Broadband Services in the UHF Band, Supplement A – Guidance for Predicting Inter-Service Interference to Broadcast Television in the VHF Band from Positive Train Control (PTC) Systems, OET Bulletin No. 74,

Amtrak will cure it at its own expense.³⁵ We agree that L&W properly excluded channel 10 stations WILX-DT and WYGN-LD from its interference analysis for the reasons it states. However, we emphasize that if PTC operations were to interfere with OTA reception of either channel 10 station, Amtrak must remediate such interference as required by Section 80.215(h)(4) and the interference mitigation conditions we adopt below.³⁶

Channel 13 Broadcast Stations. Using proprietary software, L&W applied the Longley-Rice radio propagation model³⁷ to predict the number of television households that potentially could be affected by operation of the 52 PTC base stations.³⁸ Consistent with OET-74 and OET-74 Supplement A, L&W calculated the number of potentially affected channel 13 households using a threshold desired/undesired (D/U) signal ratio of -33 dB.³⁹

The report utilizes a matrix of square tiles (two kilometers per side) for full power stations WZZM-DT and WTVG-DT and square tiles (one kilometer per side) for low power station WODN-LP to identify the tiles with insufficient D/U ratio inside each television station's service area and the number of potential households within those tiles that potentially could be affected by the proposed PTC operations.⁴⁰ L&W predicts that the proposed PTC operations would affect no WZZM-DT or WODN-LP TV households.⁴¹ Additionally, L&W predicts that operations from four proposed base stations (Denton, Felters, Haggerty, and Portage Road) have the potential to affect a total of 206 WTVG-DT households before interference mitigation measures.⁴²

Section 80.215(h)(3) provides different criteria for licensing of AMTS base stations potentially affecting fewer than 100 households each and those potentially affecting more than 100 households each.⁴³ We apply these criteria below.

Authorization of 50 Base Stations (potentially affecting fewer than 100 households each). L&W predicts that Amtrak's proposed PTC operations have the potential to affect viewers of one channel 13

Supplement A at 5 (2017), <https://transition.fcc.gov/oet/info/documents/bulletins/oet74/OET74a-PTC.pdf> (OET-74 Supplement A).

³³ Engineering Report at 17.

³⁴ *Id.* See also OET-74 Supplement A at 5.

³⁵ See Engineering Report at 17; Interference Mitigation Plan at 1; Amtrak Certification.

³⁶ 47 CFR § 80.215(h)(4).

³⁷ See Longley-Rice Methodology for Evaluating TV Service Coverage and Interference, OET Bulletin No. 69 (2004), <https://transition.fcc.gov/oet/info/documents/bulletins/oet69/oet69.pdf> (OET-69); Longley-Rice Methodology for Predicting Inter-Service Interference to Broadcast Television from Mobile Wireless Broadband Services in the UHF Band, OET Bulletin No. 74 (2015), <https://www.fcc.gov/bureaus/oet/info/documents/bulletins/oet74/OET74.pdf> (OET-74).

³⁸ Engineering Report at 6 and 16-17.

³⁹ *Id.* at 16.

⁴⁰ *Id.*

⁴¹ See *id.* at 16 and 22.

⁴² *Id.* at 20.

⁴³ 47 CFR § 80.215(h)(3).

TV station, WTVG-DT.⁴⁴ Section 80.215(h)(3) provides for approval of an AMTS base station where fewer than 100 households are within the interference contour of the base station and a station's analog Grade B contour (here, L&W used WTVG-DT's noise-limited service contour).⁴⁵

L&W predicts that operation of 48 proposed base stations would affect no WTVG-DT household,⁴⁶ and that the aggregate transmissions of two base stations (Denton and Haggerty Road) have the potential to affect 67 WTVG-DT households in one tile (four square kilometers).⁴⁷ Because none of these 50 base stations has the potential to impact more than 100 households, we hereby grant Amtrak permanent authority to operate these stations for PTC deployment under WRAP937, subject to the interference mitigation conditions adopted below.

Authorization of Two Base Stations (potentially affecting more than 100 households each). L&W predicts that the aggregate transmissions of two base stations (Felters and Portage Road) have the potential to affect 139 WTVG-DT households in four tiles (16 square kilometers).⁴⁸ Under Section 80.215(h)(3)(i)-(iii), we may approve an AMTS base station where 100 or more households could be affected provided that the applicant: (1) shows that the proposed site is the only suitable location (at the application stage, it is sufficient to establish that the site is especially well-suited to provide the proposed service); (2) develops a plan to control any interference caused to TV reception from its operations; and (3) agrees to make adjustments to TV receivers to eliminate interference caused by its operations.⁴⁹

After review of the record, we find that Amtrak has satisfied the three requirements of Section 80.215(h)(3)(i)-(iii) for the Felters and Portage Road base stations. First, Amtrak certifies that each base station location is especially well-suited to provide the proposed PTC service.⁵⁰ Amtrak explains that "to provide continuous and reliable coverage, PTC base stations must be located at regular intervals along the rail line, as close to the tracks as possible."⁵¹ Amtrak states that its ability to relocate these base stations to reduce potential interference is constrained "by necessary system design requirements, as well as by

⁴⁴ See Engineering Report at 16 and 20.

⁴⁵ 47 CFR § 80.215(h)(3). Historically, the Commission analyzed the potential for interference according to a TV station's analog Grade B predicted contour. To account for the conversion to digital television, the Commission developed the noise-limited service contour (NLSC) to approximate the same probability of service as the analog Grade B contour. The NLSC is defined using the F(50,90) field strength contour, the area in which at least fifty percent of the locations can be expected to receive a signal that exceeds a specified field strength value at least ninety percent of the time. See *Establishment of a Model for Predicting Digital Broadcast Television Field Strength Received at Individual Locations*, Notice of Proposed Rule Making and Further Notice of Proposed Rule Making, 25 FCC Rcd 10474, 10485, para. 25 (2010). See also *Avista Corporation*, Order, 27 FCC Rcd 263, 266-67, paras. 6-7 (WTB MD 2012) (Longley-Rice propagation model and noise-limited service contour (NLSC) used to predict potential interference to DTV station by AMTS licensee), *subsequent history omitted*.

⁴⁶ Engineering Report at 20.

⁴⁷ *Id.*

⁴⁸ *Id.* L&W states "that the calculation of interference into any given household consists of an RSS [Root Sum Square] of multiple [PTC] AMTS stations." *Id.* at 17. Therefore, the potential interference from each station is not stated. To analyze the maximum potential impact on WTVG-DT households, we will assume, for the sake of our analysis here only, that each station has the potential to impact up to 139 TV households.

⁴⁹ 47 CFR § 80.215(h)(3)(i)-(iii).

⁵⁰ See Interference Mitigation Plan at 2; Engineering Report at 16.

⁵¹ See *supra* note 50.

topography and the proximate location of residences.”⁵² Regarding the second and third requirements, Amtrak commits to implementing the Interference Mitigation Plan (including free installation of notch filters)⁵³ to any household experiencing interference to their OTA reception of channels 10 or 13, which L&W predicts will eliminate potential interference to all households.⁵⁴ Accordingly, we find that Amtrak has satisfied the requirements of Section 80.215(h)(3)(i)-(iii) and hereby grant it permanent authority to operate the Felters and Portage Road PTC base stations under WRAP937, subject to the interference mitigation conditions adopted below.

Interference Mitigation Plan and Conditions. Section 80.215(h)(4) requires AMTS licensees to eliminate interference from their base station operations to viewers’ OTA reception of channels 10 and 13.⁵⁵ The Interference Mitigation Plan describes and establishes a process for Amtrak to comply with Section 80.215(h)(4).⁵⁶

The plan states that potentially affected broadcast stations have been provided a 24-hour hotline phone number to receive and investigate reports of interference complaints.⁵⁷ Under the plan, if further interference mitigation is required, Amtrak will provide free of charge, -20 dB notch filters to affected viewers, which Amtrak asserts could eliminate potential interference caused to any affected TV receiver.⁵⁸ If Amtrak cannot abate the interference with a -20 dB notch filter, or the provision of “either a better . . . notch filter or a more directional receive antenna,” it will take appropriate steps to review and modify the source of the interference to resolve the problem.⁵⁹

Although Section 80.214(h)(4) provides AMTS licensees up to 90 days to resolve interference issues, Amtrak commits to investigating complaints of interference received from consumers or broadcasters within 30 days, and expects to have any interference complaints resolved by providing the necessary filtering to the affected consumer or modifying the communication parameters of the offending base station(s) within 60 days from receipt of an initial complaint.⁶⁰ Consistent with that commitment, as a condition of today’s grant of permanent authority to operate the 52 PTC base stations, we require Amtrak to:

1. Provide each potentially affected broadcaster contact information to report possible interference;⁶¹

⁵² *See id.*

⁵³ A notch (band reject) filter attenuates one frequency band and passes both a lower and a higher frequency band.

⁵⁴ *See* Interference Mitigation Plan at 1. Amtrak has committed to taking additional measures to remedy interference if the installation of notch filters is inadequate. Amtrak Certification.

⁵⁵ 47 CFR § 80.215(h)(4).

⁵⁶ L&W states that Amtrak will deploy a radio with approximately 70 dB of attenuation below the main carrier at 216 MHz (the upper band edge of channel 13) and that it expects no TV households will be affected by potential interference from any base station. *See* Engineering Report at 23.

⁵⁷ Interference Mitigation Plan at 2.

⁵⁸ *See id.* at 2; Amtrak Certification. *See also* Engineering Report at 23.

⁵⁹ *See* Amtrak Certification.

⁶⁰ *Id.* *See also* 47 CFR § 80.215(h)(4).

⁶¹ *See supra* notes 30 and 31 and supporting text (potentially affected broadcasters).

2. Provide a party reporting interference a unique tracking number for each interference report;
3. Investigate any reported interference within 30 calendar days of receiving a report; and
4. Resolve any interference caused by base station operations at its own expense within 60 calendar days of receiving an interference report.⁶²

For the reasons stated above, we hereby conditionally grant the License Modification Application, ULS File No. 0008206132 (WRAP937).

Action taken pursuant to Sections 1, 4(i), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), and 303(r), and Sections 0.331 and 80.215(h) of the Commission's rules, 47 CFR. §§ 0.331 and 80.215(h).

Sincerely,

Roger S. Noel
Chief, Mobility Division
Wireless Telecommunications Bureau

⁶² If Amtrak were unable to remedy interference, Commission rules would require it to discontinue use of an offending base station. 47 CFR § 80.215(h)(4).