



Federal Communications Commission
Washington, D.C. 20554

June 30, 2016

DA No. 16-742

Brian W. Higgins
Lawrence J. Movshin
Wilkinson Barker Knauer, LLP
2300 N Street, NW
Washington, DC 20037-1128

RE: **National Railroad Passenger Corporation (Amtrak), Call Signs WQVQ770-WQVQ773**

Dear Mr. Higgins and Mr. Movshin:

The Mobility Division (Division) of the Wireless Telecommunications Bureau hereby grants Amtrak's request for permanent authority to operate 66 wireless radio base stations to implement a Congressionally-mandated positive train control (PTC) rail safety system.¹ Amtrak is currently operating the PTC base stations, under a grant of special temporary authority,² on the southern portion of Amtrak's Northeast Corridor (NEC) rail line (extending from New York City to Washington, D.C.) and on Amtrak's branch line extending from Philadelphia to Harrisburg, Pennsylvania.³ Today's grant of permanent operating authority is subject to the conditions enumerated below.

BACKGROUND

Positive Train Control. Pursuant to 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"), Amtrak and most freight and commuter railroads are required to install and operate interoperable PTC systems by December 31, 2018.⁴ 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 train through a switch left in the wrong position."⁵ 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. The Federal Railroad Administration (FRA) is responsible for approving each railroad's PTC system, including design, testing, and

¹ FCC File Nos. 0006812391, WQVQ770 (Lead License Modification Application); 0006812432, WQVQ771; 0006812452, WQVQ772; and 0006812459, WQVQ773 (collectively, License Modification Applications, and all filed May 22, 2015).

² See call signs WQVY242, WQVY245, WQVY246, and WQVY247.

³ Request for License Modification at note 3 (attached as Exhibit 1 to the Lead License Modification Application).

⁴ 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).

⁵ 49 U.S.C. § 20157(i)(5).

implementation and for ensuring compliance with the Rail Safety Act and FRA regulations implementing that statute.⁶

Amtrak Spectrum. On March 4, 2015, the Division granted Amtrak's request to obtain certain Automated Maritime Telecommunications System (AMTS) spectrum to deploy PTC on the southern portion of the NEC and two related branch lines.⁷ Although AMTS geographic licensees generally are authorized to place base stations anywhere within their licensed service areas, the Commission requires individual licensing of AMTS base stations in proximity to certain channel 10 and 13 television stations.⁸ Further, under Commission 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."⁹

License Modification Applications. On May 22, 2015, Amtrak filed four License Modification Applications requesting permanent authority to operate 66 PTC base stations using 75 kHz of spectrum (217.0125-217.0875 MHz) in the AMTS spectrum band.¹⁰ Because all 66 proposed base stations are located less than 169 kilometers (105 miles) from one or more channel 13 TV stations, or less than 129 kilometers (80 miles) from one or more channel 10 TV stations, Amtrak submitted a plan to limit interference from its base station operations to viewers' reception of these stations as required by Commission rules (Interference Mitigation Plan).¹¹ Amtrak's plan was based on the results of a May 31, 2015 interference study prepared by Pericle Communications Company (Pericle) regarding the potential number of households that could be impacted by Amtrak's operation of the 66 base stations (Pericle Study) at transmitter output powers ranging from 5 to 20 watts.¹²

⁶ See Positive Train Control (PTC) Information (R&D), Federal Railroad Administration, <https://www.fra.dot.gov/Page/P0152> (last visited June 15, 2016) (information regarding FRA's oversight of PTC implementation).

⁷ *National Railroad Passenger Corporation (d/b/a Amtrak)*, Order, 30 FCC Rcd 2038 (WTB Mobility Div. 2015). As a result, Amtrak now holds directly or by spectrum lease 100 kHz of AMTS spectrum (217-217.100 MHz), covering an 18-mile wide corridor that runs nine miles on each side of Amtrak's rail lines from New York City to Washington, D.C., from New York City to Albany, New York, and from Philadelphia to Harrisburg, Pennsylvania. See Lead License Modification Application, Exhibit 1 at n.3.

⁸ 47 CFR §§ 80.475(a), 80.215(h).

⁹ 47 CFR § 80.215(h).

¹⁰ See *supra* note 1. The AMTS band includes two megahertz of spectrum (217-218 MHz paired with 219-220 MHz).

¹¹ See 47 CFR §§ 80.475(a)(1), 80.215(h)(2). Amtrak's Interference Mitigation Plan is attached as Exhibit 3 to the Lead License Modification Application.

¹² AMTS Channels 10 and 13 Television Interference Study, dated May 31, 2015 (attached as Exhibit 2 to Lead License Modification Application, filed June 3, 2015). Pericle states that five full-power television stations meet the distance criteria in Section 80.215(h): Channel 10, WHTM-DT, Harrisburg, Pennsylvania; Channel 10, WTNH-DT, New Haven, Connecticut; Channel 13, WJZ-DT, Baltimore, Maryland; Channel 13, WNET-DT, Newark, New Jersey; and Channel 13, WYOU-DT, Scranton, Pennsylvania. *Id.* at 2. Although seven low power television stations (including translators) also meet the distance criteria, Pericle states that only three were close enough to an Amtrak base station for viewers to be subject to interference. *Id.* at 2-3. These three stations are: Channel 10, W10CY-D, Port Jervis, New York; Channel 10, WNXV-LD, New York, New York; and Channel 10, WMGM-LD, Atlantic City, New Jersey. *Id.* at 3.

Special Temporary Authority. On May 28, 2015, Amtrak requested 180-day special temporary authority (STA) to test the 66 proposed base stations at transmitter output powers ranging from 5 to 20 watts, pending Commission review of Amtrak's License Modification Applications, Interference Mitigation Plan, and the Pericle Study. On May 29, 2015, the Division granted Amtrak's request subject to strict conditions designed to protect television broadcast operations.¹³ On November 24, 2015, the Division granted Amtrak's request to renew its special temporary authority to continue testing the 66 base stations.¹⁴

On December 22, 2015, Amtrak filed applications to modify its special temporary authority (STA Modification Request).¹⁵ Amtrak stated that as it moved to implement PTC over the southern NEC rail line and its rail line extending from Philadelphia to Harrisburg, Pennsylvania, testing indicated that operation at power levels ranging from 5 to 20 watts was insufficient to provide fully effective coverage of its PTC network.¹⁶ Amtrak stated that it determined that it must operate all 66 of its PTC base stations at, or very close to, 25 watts output power to assure the safety of life and property for which PTC service is designed.¹⁷ On December 23, 2015, the Division granted Amtrak's request for special temporary authority to operate at transmitter output powers up to 25 watts at each of the 66 base stations.¹⁸

Amended License Modification Applications. On February 25, 2016, Amtrak amended its License Modification Applications to request permanent authority to operate at transmitter output power levels up to 25 watts at each of the 66 base stations.¹⁹ In support of its request, Amtrak filed an Amended Interference Mitigation Plan also on February 25, 2016, which it further amended on June 21, 2016.²⁰ Amtrak's plan is based on the results of a February 1, 2016 interference study prepared by Pericle regarding the potential number of households that could be impacted by operation of the 66 base stations at 25 watts, rather than at transmitter output powers ranging from 5 to 20 watts as Amtrak initially requested (Revised Pericle Study).²¹

¹³ Letter from Roger S. Noel, Chief, Mobility Division, Wireless Telecommunications Bureau, to Brian W. Higgins, Esq., counsel to Amtrak, (May 29, 2015) (on file in FCC File Nos. 0006835525 (WQVY242), 0006835526 (WQVY245), 0006835527 (WQVY246), and 0006835528 (WQVY247)).

¹⁴ Letter from Roger S. Noel, Chief, Mobility Division, Wireless Telecommunications Bureau, to Brian W. Higgins, Esq., counsel to Amtrak, dated November 24, 2015 (on file in FCC File Nos. 0007026828 (WQVY242), 0007026831 (WQVY245), 0007026836 (WQVY246), and 0007026838 (WQVY247)).

¹⁵ ULS File Nos. 0007072459 (WQVY242), 0007072461 (WQVY245), 0007072464 (WQVY246), and 0007072466 (WQVY247) (all filed Dec. 22, 2015).

¹⁶ STA Modification Request, Exhibit 1, at 2.

¹⁷ *Id.*

¹⁸ On May 13, 2016, Amtrak filed applications to renew its STA, which the Division granted on May 16, 2016. FCC File Nos. 0007265780 (WQVY242), 0007265786 (WQVY245), 0007265799 (WQVY246), and 0007265854 (WQVY247).

¹⁹ *See supra* note 1.

²⁰ Further Amended Interference Mitigation Plan, attached as Exhibit 3 to the Lead License Modification Application (filed June 21, 2016).

²¹ AMTS Channels 10 and 13 Television Interference Study (2016), attached as Exhibit 2 to the Lead License Modification Application (filed Feb. 25, 2016).

Public Notice and Comment. As required by the Commission's rules, Amtrak provided written notice of the filing of its License Modification Applications to affected broadcasters.²² The applications appeared on public notice twice.²³ Two parties filed comments regarding the applications.

On June 11, 2015, Media General, Inc. (Media General)—licensee of Channel 10, WHTM-TV in Harrisburg, Pennsylvania, and Channel 10, WTNH-DT in New Haven, Connecticut—filed comments regarding the potential for interference from Amtrak's base station operations to viewers' reception of its stations.²⁴ Subsequently, on November 10, 2015, Media General filed a request to withdraw its comments stating that (1) "no consumer complaints had been received by either station," and (2) field tests did not detect any interference from Amtrak's PTC base station operations.²⁵ Pursuant to Section 1.935 of the Commission's rules,²⁶ we hereby approve Media General's withdrawal of its comments.

On March 30, 2016, Mission Broadcasting, Inc. (Mission)—licensee of digital television station Channel 13, WYOU(DT), in Scranton, Pennsylvania—filed comments regarding the amended License Modification Applications.²⁷ Mission states that it "does not question the benefits of Amtrak's PTC network."²⁸ Mission further states it does not oppose Amtrak's applications to operate its base stations at up to 25 watts transmitter output power, noting "Amtrak's continued commitment to a mitigation plan to resolve actual complaints of interference to viewers' reception of WYOU."²⁹

Amtrak Interference Report. On June 16, 2016, Amtrak reported that since it began testing its PTC base stations—initially in July 2015 at transmitter output power levels ranging from 5 to 20 watts, and beginning in December 2015 at power levels up to 25 watts—it has not received a single report of interference from either television viewers or broadcasters.³⁰

²² See 47 CFR § 80.475(a)(2).

²³ See *Wireless Telecommunications Bureau Market-Based Applications Accepted for Filing*, Public Notice, 2015 WL 3645223 (2015) (original License Modification Applications); *Wireless Telecommunications Bureau Market-Based Applications Accepted for Filing*, Public Notice, 2016 WL 902989 (2016) (amended License Modification Applications).

²⁴ See Response of Media General, FCC File Nos. 0006812391, 0006812452, and 0006812459 (filed June 11, 2015). Amtrak replied to Media General's comments on June 22, 2015. Media General did not file comments regarding Amtrak's amended License Modification Applications.

²⁵ See Withdrawal of Response of Media General at 1-2, attached to Call Sign WQVQ770 (filed Nov. 11, 2015), dated November 10, 2015; see also Affidavit of Andrew C. Carington, Vice President, General Counsel, and Secretary, Media General, Inc., attached to Call Sign WQVQ770 (filed Nov. 18, 2015), dated November 18, 2015.

²⁶ 47 CFR § 1.935.

²⁷ Mission Comments, FCC File No. 0006812391 (filed Mar. 30, 2016).

²⁸ *Id.* at 2.

²⁹ *Id.* at 3.

³⁰ See Certification of Atousa Vali, PhD, PEng, Senior Director – Amtrak Engineering, dated June 15, 2016 (filed June 16, 2016, FCC File No. 0006812391) (Atousa Vali Certification).

DISCUSSION

We have carefully reviewed Amtrak's amended License Modification Applications, its Further Amended Interference Mitigation Plan, the Revised Pericle Study, and all other filings in the record before us and find that the public interest in rail safety will be served by grant of Amtrak's request for permanent authority to operate the 66 base stations at transmitter output power levels up to 25 watts.

Revised Pericle Study. Amtrak submitted the Revised Pericle Study to quantify potential interference from its proposed base station operations to over-the-air channel 10 and channel 13 receivers. Pericle states that it calculated the number of potentially impacted households using threshold desired/undesired (D/U) signal values of -31 dB for channel 10 and -33 dB for channel 13 and a Longley-Rice propagation model.³¹ Pericle identified tiles (75 meter squares) with insufficient D/U signal inside each television station's service area and the number of potential households that could be adversely affected using 2010 U.S. census data.³² Pericle predicts that Amtrak's operation of 23 base stations (including four that are underground) would impact no households.³³ It further predicts that operation of the remaining 43 base stations could impact a combined total of 106,568 households in Delaware, the District of Columbia, Maryland, New Jersey, New York, and Pennsylvania, before interference mitigation.³⁴

Authorization to Operate 30 Base Stations (potentially impacting fewer than 100 households each). Section 80.215(h)(3) of the Commission's rules provides that the Commission will approve an AMTS base station where fewer than 100 households are within the interference contour of the base station and the analog Grade B contour of the impacted TV station.³⁵ As noted above, Pericle predicts that 23 base stations will create no potential interference to any households, and it predicts that seven base stations could create potential interference to less than 100 households each.³⁶ Consistent with Section

³¹ Revised Pericle Study at 3. Section 80.215(h)(2) requires applicants to calculate the number of households within the overlap of a proposed AMTS base station interference contour and the grade B contour of an affected TV station. 47 CFR § 80.215(h)(2). Amtrak states that this method is outdated because it relies on an analog rather than a digital contour coverage model. *See* Amended Interference Mitigation Plan at 3. We agree that Pericle's use of the Longley-Rice model more accurately predicts the number of potentially impacted households and find good cause to grant Amtrak a waiver of the requirement to calculate AMTS station overlap using the grade B contour of an affected TV station. *See* 47 CFR § 1.3 (the Commission may grant a waiver for good cause). With 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. *See, e.g., Review of the Commission's Part 95 Personal Radio Services Rules*, Notice of Proposed Rule Making and Memorandum Opinion and Order on Reconsideration, 25 FCC Rcd 7651, 7676, para. 65 (2010); *Study of Digital Television Field Strength Standards and Testing Procedures, Report to Congress: The Satellite Home Viewer Extension and Reauthorization Act of 2004*, 20 FCC Rcd 19504, 19507, para. 3 (2005). 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).

³² Revised Pericle Study at 3 and 10.

³³ *Id.* at 3, Table 1, and Appendix A Table A.2.

³⁴ *Id.*

³⁵ 47 CFR § 80.215(h)(3).

³⁶ Revised Pericle Study, Appendix A Table A.2.

80.215(h)(3), we hereby grant Amtrak permanent authority to operate these 30 base stations, subject to the conditions specified below that Amtrak remedy interference from its operations to viewers' reception of over-the-air television.

Authorization to Operate 36 Base Stations (potentially impacting more than 100 households each). Having authorized 30 of the 66 base stations above, we now address the remaining 36 base stations, which Pericle predicts could create interference to more than 100 households each.³⁷ Under Section 80.215(h)(3)(i)-(iii) of the Commission's rules, we may approve an AMTS base station where 100 or more households could be impacted 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.³⁸

For the 36 proposed base stations that could create potential interference to more than 100 households each,³⁹ we find that Amtrak has satisfied the requirements of Section 80.215(h)(3)(i)-(iii). First, "Amtrak certifies that each of its PTC base station locations is especially well-suited to provide the proposed PTC service."⁴⁰ Amtrak explains that its ability to relocate these base stations to reduce potential interference is limited "due to topography, the proximate location of residences to rail lines, and the need to provide continuous, uninterrupted PTC signal coverage."⁴¹ Regarding the second and third requirements, Amtrak has committed to implementing its Further Amended Interference Mitigation Plan (free installation of notch filters)⁴² to any households experiencing interference to over-the-air reception of channels 10 or 13 caused by its PTC operations, which Pericle predicts will eliminate potential interference to all but 1,887 households.⁴³ Amtrak has committed to taking additional measures to remedy interference if the installation of notch filters is inadequate.⁴⁴ We agree with Amtrak that it has satisfied the requirements of Section 80.215(h)(3)(i)-(iii) and consistent with that rule, we hereby grant Amtrak permanent authority to operate these 36 base stations, subject to the conditions specified below that Amtrak remedy interference from its operations to viewers' reception of over-the-air television.

Further Amended Interference Mitigation Plan. As noted above, Pericle predicts that 23 base stations will create no potential interference to any households, and that Amtrak's operation of the remaining 43 base stations could potentially impact a combined total of 106,568 households in Delaware, the District of Columbia, Maryland, New Jersey, New York, and Pennsylvania.⁴⁵ Pericle predicts that the use of television receiver 25 dB notch filters could completely eliminate potential interference caused by 33 base stations and reduce the number of potentially impacted households from ten base stations to

³⁷ *Id.*

³⁸ 47 CFR § 80.215(h)(3)(i)-(iii).

³⁹ Revised Pericle Study, Appendix A Table A.2.

⁴⁰ Further Amended Interference Mitigation Plan at 3.

⁴¹ *Id.*

⁴² A notch (band reject) filter attenuates one frequency band and passes both a lower and a higher frequency band.

⁴³ Revised Pericle Study at 3.

⁴⁴ Further Amended Interference Mitigation Plan at 3.

⁴⁵ Revised Pericle Study, Appendix A Table A.2.

between 21 and 589.⁴⁶ In sum, Pericle predicts that assuming an over-the-air viewership rate of 100 percent, installation of free notch filters should eliminate potential interference to all but 1,887 households.

Pericle asserts a more accurate over-the-air television viewership rate would be 8.7% in the areas that could be impacted by Amtrak's PTC base station operations because many households subscribe to cable or satellite television services and do not view over-the-air television.⁴⁷ Applying an assumed viewership rate of 8.7%, Pericle predicts 9,271 households could be impacted by Amtrak's base station operations, and that with the installation of notch filters, only 164 households would be impacted.⁴⁸ Pericle's use of an assumed over-the-air viewership rate of 8.7% may or may not reflect the percentage of impacted households, and the actual number of households could be higher or lower than 9,271.

We note that the Commission's AMTS rules generally predate the rise of cable and satellite television and do not provide a basis to discount the number of potentially affected households by an assumed over-the-air viewership rate. Pericle's prediction that 9,271 households could be impacted goes to whether Amtrak's proposed notch filter solution is feasible because the number of filters needed would be materially less than 106,568. Significantly, as noted above, Amtrak reports that since commencing operation of the PTC base stations—initially in July 2015 at 5 to 20 watts, and then at up to 25 watts starting in December 2015—it has received no complaints of interference from either broadcasters or their viewers.⁴⁹

Section 80.215(h)(4) of the Commission's rules requires Amtrak to eliminate interference from its base station operations to viewers' over-the-air reception of channels 10 and 13.⁵⁰ Under its Amended Interference Mitigation Plan, Amtrak has agreed to provide notch filters "free of charge, to any households that may, in the future, experience interference to over-the-air reception of channels 10 and 13 from its PTC operations."⁵¹ Amtrak has identified a vendor to investigate interference complaints, which will provide viewers notch filters and, if necessary, assist with their installation.⁵² Amtrak states that in those limited cases where installation of notch filters may not completely address potential interference, it will provide consumers "a more directional receive antenna."⁵³ If those measures do not resolve interference, Amtrak will "modify the source of the interference [*i.e.*, base station antennas/operations] to resolve the problem."⁵⁴

⁴⁶ *Id.*

⁴⁷ *Id.* at 3-4, Table 1. Pericle states that according to Arbitron, the over-the-air penetration rate in the five affected television markets included in its study varies from 3.5% in New Haven, Connecticut to 8.7% in Baltimore, Maryland. *Id.* at 4.

⁴⁸ *Id.* at 3-4, Table 1.

⁴⁹ *See supra* note 29, Atousa Vali Certification.

⁵⁰ 47 CFR § 80.215(h)(4).

⁵¹ Further Amended Interference Mitigation Plan at 1-2.

⁵² *Id.* at 2.

⁵³ *Id.*

⁵⁴ *Id.*

Although Section 80.215(h)(4) provides AMTS licensees up to 90 days to resolve interference issues, Amtrak has “committed 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 Amtrak’s receipt of the initial complaint.”⁵⁵ Consistent with Amtrak’s commitment we will, as a condition of today’s grant of permanent authority to operate the 66 base stations, require Amtrak to:

1. Provide each affected broadcaster contact information to report possible interference;⁵⁶
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;⁵⁷ and
4. Resolve any interference caused by Amtrak’s base station operations at its own expense within 60 calendar days of receiving an interference report.⁵⁸

CONCLUSION AND ORDERING CLAUSES

For the reasons stated above and specifically to support Amtrak’s implementation of a positive train control rail safety system as required by Congress, we hereby grant Amtrak’s four License Modification Applications: FCC File Nos. 0006812391 (WQVQ770); 0006812432 (WQVQ771); 0006812452 (WQVQ772); and 0006812459 (WQVQ773).⁵⁹

⁵⁵ *Id.* at 3.

⁵⁶ *See supra* note 12 (affected broadcasters). Amtrak states that it has provided each affected broadcast station the phone number of Amtrak’s “consumer complaint line,” which is manned 24 hours each day. Further Amended Interference Mitigation Plan at 3.

⁵⁷ Amtrak states that reports of interference to Amtrak will be forwarded within Amtrak to members of the Engineering group for consideration and resolution. Further Amended Interference Mitigation Plan at 3.

⁵⁸ We note that if Amtrak were unable to remedy interference, Commission rules would require it to discontinue use of an AMTS base station. 47 CFR § 80.215(h)(4).

⁵⁹ Today’s grant of authority to operate the 66 base stations reflects the power levels specified in Table A.4 (Amtrak Base Station Site Data) of the Revised Pericle Study. If Amtrak intends to operate a base station at a power level higher than specified in Table A.4, it must comply with the requirements of Sections 80.215(h) and 80.475(a) of the Commission’s rules. 47 CFR §§ 80.215(h), 80.475(a).

Brian W. Higgins
Lawrence J. Movshin
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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, 1.3, 1.935, and 80.215(h) of the Commission's rules, 47 C.F.R. §§ 0.331, 1.3, 1.935, and 80.215(h).

Sincerely,

Roger S. Noel
Chief, Mobility Division
Wireless Telecommunications Bureau