



Federal Communications Commission
Washington, D.C. 20554

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DA 20-1259

RE: **Southern California Regional Rail Authority, Call Sign WQYR421**

Dear Mr. Feldman:

The Mobility Division (Division) of the Wireless Telecommunications Bureau (Bureau) hereby grants the License Modification Application¹ of the Southern California Regional Rail Authority (SCRRA) for permanent authority to operate 17 positive train control (PTC) wireless radio base stations, 546 PTC wireless radio wayside stations, and related mobile (locomotive) stations under Automated Maritime Telecommunications System (AMTS) Call Sign WQYR421.² For the reasons discussed below, we also grant SCRRA's request for waiver of certain rules to facilitate its PTC deployment.³

Today's action authorizes SCRRA, operator of the Metrolink commuter railroad (Metrolink), to deploy a Congressionally-mandated, interoperable PTC system on its rail lines serving Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties, California.⁴ Our action today also will benefit three railroads that operate as tenants on portions of the SCRRA rail network—Amtrak, the BNSF Railway (BNSF), and the Union Pacific Railroad (UP).⁵ This grant of permanent operating authority is subject to the conditions we adopt below.

¹ ULS File No. 0007974978 (filed Oct. 27, 2017, amended Nov. 9 and 21, 2017, Nov. 19, 2018, May 28 and Oct. 15, 2019, and Mar. 13, 2020) (License Modification Application).

² The AMTS rules define two station classes: coast stations and ship stations. 47 CFR § 80.5 (defining a coast station as a "land station in the maritime mobile service" and a ship station as a "mobile station in the maritime mobile service located on-board a vessel which is not permanently moored"). The Commission amended the AMTS rules in 1997 to permit AMTS stations to serve fixed, mobile, and handheld units on land, in addition to marine vessels. *See Amendment of the Commission's Rules Concerning Maritime Communications*, PR Docket No. 92-257, Second Report and Order and Second Further Notice of Proposed Rule Making, 12 FCC Rcd 16949, 16964-65 paras. 24-25 (1997). Because they are both fixed stations, we regulate PTC base and wayside stations as AMTS coast stations for licensing purposes. And because they are mobile, we regulate locomotive stations as AMTS ship stations for licensing purposes.

³ ULS File No. 0007974978, Further Amended Request for Waivers (filed Mar. 13, 2020) (SCRRA Waiver Request).

⁴ Metrolink System Map, https://www.metrolinktrains.com/train-status/train_tracker/wheres-my-train-map-view/ (last visited Oct. 13, 2020).

⁵ SCRRA Waiver Request at 4.

I. BACKGROUND

Rail Safety Improvement Act of 2008. Congress established the PTC mandate in the *Rail Safety Improvement Act of 2008* (the Rail Safety Act)⁶ following a catastrophic rail accident in Chatsworth, California, where, on September 12, 2008, a Metrolink commuter train collided head-on with a Union Pacific freight train, killing 25 passengers and injuring more than 100 other passengers.⁷ The National Transportation Safety Board (NTSB) found that a Metrolink engineer failed to appropriately respond to a red signal, and that a PTC system would have stopped the Metrolink train short of the red signal preventing the fatal collision.⁸

The Rail Safety Act, as amended by *the Positive Train Control Enforcement and Implementation Act of 2015*, required most U.S. freight, passenger, and commuter railroads to install and operate interoperable PTC systems by December 31, 2018.⁹ Four railroads timely implemented a Federal Railroad Administration (FRA)¹⁰ certified, interoperable PTC system on all of their required main lines.¹¹ As the Rail Safety Act permits, the remaining railroads subject to the PTC mandate requested up to a 2-year extension, until December 31, 2020, to implement PTC.¹² The FRA found that these railroads met the statutory criteria necessary to qualify for an extended implementation schedule.¹³

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.”¹⁴ The U.S. rail industry has chosen to implement PTC through wireless networks that use radio spectrum. These networks have the capacity to enable real-time information sharing between trains, rail wayside devices, and “back office” applications,

⁶ See Pub. L. No. 110-432, § 104, 122 Stat. 4848, 4857 (2008).

⁷ NTSB, Collision of Metrolink Train 111 with Union Pacific Train LOF65-12 Chatsworth, California, Accident Report No. RAR-10/01 at vii (2010), <http://www.nts.gov/investigations/AccidentReports/Reports/RAR1001.pdf> (last visited Oct. 13, 2020).

⁸ *Id.*

⁹ 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).

¹⁰ 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 (last updated Nov. 13, 2019), <https://www.fra.dot.gov/Page/P0152> (last visited Oct. 13, 2020).

¹¹ SCRRA is among the four railroads that met the December 31, 2018, PTC implementation deadline. See Statement on Positive Train Control Implementation, U.S. Department of Transportation (last updated Dec. 31, 2018), <https://www.transportation.gov/briefing-room/statement-positive-train-control-implementation> (last visited Oct. 13, 2020) (DOT PTC Implementation Statement). SCRRA seeks authorization to use additional spectrum to implement PTC in this proceeding.

¹² DOT PTC Implementation Statement.

¹³ Positive Train Control (PTC), U.S. Department of Transportation (last updated July 26, 2020), <https://railroads.dot.gov/train-control/ptc/positive-train-control-ptc> (last visited Oct. 13, 2020)

¹⁴ 49 U.S.C. § 20157(i)(5).

regarding train movement authorities, speed restrictions, train position and speed, and the state of signal and switch devices.

SCRRA/Metrolink. SCRRA is a joint powers authority of the transportation commissions representing Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties.¹⁵ Metrolink commenced service in October 1992.¹⁶ Metrolink operates seven train lines serving 61 stations, with over 409 route miles of track.¹⁷ On an average weekday, Metrolink serves nearly 40,000 riders.¹⁸ Metrolink serves as a host railroad on portions of its track for tenant rails Amtrak, BNSF, and UP.¹⁹ Metrolink also operates within its territory as a tenant railroad on track hosted (*i.e.*, owned and operated) by BNSF and UP.²⁰ SCRRA has invested more than \$220 million to deploy PTC.²¹

Spectrum Acquisition and Authorization. SCRRA first applied to the Commission to acquire spectrum in 2010, by requesting to partition an area comprising Metrolink's five-county service territory and neighboring San Diego County from AMTS License WQGF318,²² licensed to Maritime Communications/Land Mobile, LLC (MCLM).²³ SCRRA's Assignment Application included a request for waiver of several technical rules to facilitate Metrolink's use of the spectrum for PTC. SCRRA narrowed the scope of its waiver request on October 20, 2015 and June 8, 2016.²⁴ On September 14, 2016, the Mobility Division consented to the spectrum Assignment Application and granted SCRRA's amended waiver request.²⁵ On December 16, 2016, SCRRA consummated the spectrum acquisition, resulting in the grant of Call Sign WQYR421 (217.500-218.000 MHz, 218.500-219.000 MHz).²⁶

¹⁵ Metrolink, <https://www.metrolinktrains.com/about/agency/member-agencies/> (last visited Oct. 13, 2020).

¹⁶ Metrolink, History, <https://metrolinktrains.com/about/agency/history-of-metrolink/> (last visited Oct. 13, 2020).

¹⁷ SCRRA Waiver Request at 2.

¹⁸ *Id.*

¹⁹ *Id.* at 4.

²⁰ *Id.*

²¹ *Id.* at 3.

²² The AMTS spectrum band includes two spectrum blocks in 10 geographic license areas: Block A (217.5-218/219.5-220 MHz) and Block B (217-217.5/219-219.5 MHz). 47 CFR § 80.385(a)(2) and (3). Station WQGF318 is the Southern Pacific (AMT006) A Block license.

²³ ULS File No. 0004144435 (filed Mar. 8, 2010) (Assignment Application). On August 1, 2011, MCLM filed a voluntary petition for relief under Chapter 11 of the Bankruptcy Code. *In re Maritime Communications/Land Mobile, LLC*, No. 11-13463-DWH (Bankr. N.D. Miss.). FCC File No. 0004851459 (filed Aug. 26, 2011). In April 2012, the Bureau accepted MCLM's application for the involuntary assignment of its licenses to MCLM as a debtor-in-possession. *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 April 25, 2012), 2012 WL 1435969; ULS File No. 0004851459 (filed Aug. 26, 2011).

²⁴ ULS File No. 0004144435, Minor Amendment (filed Oct. 20, 2015), and Second Minor Amendment (filed June 8, 2016).

²⁵ *Maritime Communications/Land Mobile, LLC and Southern California Regional Rail Authority File Applications to Modify License and Assign Spectrum for Positive Train Control Use, and Request Part 80 Waivers*, Order, 31 FCC Rcd 9826, 9833-40 paras. 22-40 (WTB MD 2016) (*SCRRA Order*).

²⁶ *Wireless Telecommunications Bureau Assignment of License Authorization Applications, Transfer of Control of Licensee Applications, De Facto Transfer Lease Applications and Spectrum Manager Lease Notifications*,

SCRRA is currently leasing 220-222 MHz Band spectrum from PTC-220, LLC (PTC-220), a consortium of the nation's seven class I freight railroads, for Metrolink's PTC deployments in its service territory.²⁷ SCRRA, Amtrak, BNSF, and UP have developed a joint plan to deploy interoperable PTC systems in Southern California using shared infrastructure, SCRRA's AMTS spectrum, and 220-222 MHz Band spectrum leased from PTC-220.²⁸

Special Temporary Authorization. Metrolink is currently deploying PTC for testing purposes under Special Temporary Authorization (STA) Call Sign WRJD571, using the same spectrum and in the same geographic area for which we grant permanent operating authority today.²⁹ SCRRA states that has received no reports of interference related to these PTC operations under STA.³⁰

License Modification Application. Although AMTS geographic licensees generally are authorized to deploy base stations anywhere within their licensed geographic service areas, section 80.215(h)(2) of the Commission's rules requires individual licensing of 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.³¹ SCRRA seeks to modify its geographic area license under Call Sign WQYR421 to individually authorize, on a permanent (non-STA basis) and subject to its license term, operation of 17 base stations and 546 wayside stations, stating they meet section 80.215(h)(2)'s individual station licensing criteria.³²

SCRRA Engineering Report. On behalf of SCRRA and pursuant to section 80.215(h)(2) of the Commission's rules,³³ RF Networks Inc. (RF Networks), an engineering firm, performed an interference study.³⁴ The study addresses the potential number of channel 10 and channel 13 over-the-air (OTA) TV households³⁵ that could be impacted by Metrolink's operation of PTC-equipped base, wayside, and mobile (locomotive) stations. We discuss the report's findings below.

Designated Entity Reportable Eligibility Event Applications, and Designated Entity Annual Reports Action, Public Notice (WTB Dec. 28, 2016), 2016 WL 7475683; ULS File No. 0004144435 (filed Dec. 16, 2016) (notice of consummation).

²⁷ SCRRA commenced leasing spectrum from PTC-220 in September 2012. Lease Identifiers L000010091 (expiring Sep. 19, 2029) and L000010092 (expiring Sep. 23, 2029).

²⁸ SCRRA Waiver Request at 6.

²⁹ ULS File No. 0009176150 (STA granted Aug. 11, 2020).

³⁰ STA Call Sign WRJD571, Operational Update, dated Oct. 20, 2020.

³¹ 47 CFR § 80.215(h)(2); *see also id.* § 80.475(a)(1). 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." *Id.* § 80.215(h).

³² SCRRA Waiver Request at 7-8, and n.9.

³³ 47 CFR § 80.215(h)(2).

³⁴ ULS File No. 0007974978, "Interference Analysis for BEA 160 & 161 AMTS-A Block with Over-the Air TV Channels 13 and 10 Broadcasts" at 3, prepared by RF Networks Inc., dated March 20, 2019 (filed May 28, 2019) (SCRRA Engineering Report).

³⁵ The study considered one Channel 13 station KCOP-TV, Los Angeles, CA. SCRRA Engineering Report at 38 (Fig. 7). The study considered six Channel 10 stations: KERO-TV, Bakersfield; KGTV, San Diego; DKTAV-LD, Altadena; KIIO-LD, Los Angeles; KZSW-LD, Riverside; and K10PV-D, Santa Barbara. *Id.* at 39-44 (Figs. 8a to 8f).

Interference Mitigation Plan. As required by section 80.215(h)(2), SCRRA has provided a plan to limit potential interference from operation of Metrolink's PTC base and wayside stations to OTA television reception,³⁶ and SCRRA certifies it will adhere to the Interference Mitigation Plan.³⁷

SCRRA Waiver Request. SCRRA requests a waiver of section 80.215(i) of the Commission's rules, so that it and its tenant railroad partners (pursuant to spectrum leasing arrangements) may operate locomotive radios at up to 50 watts transmitter power output (TPO) with an effective radiated power (ERP) up to 39 watts.³⁸ SCRRA also requests a waiver of section 1.913(a)(1) of the Commission's rules to the extent the rule requires SCRRA to file a separate FCC Form 601, Schedule D for authorization of each of its 546 wayside radio stations.³⁹ For the reasons stated below, we grant the requested rule waivers.

Broadcaster Notification. SCRRA served copies of the License Modification Application (including the Engineering Report, Interference Mitigation Plan, and Waiver Request) to potentially affected broadcast stations on October 27, 2017, and as subsequently amended, on May 28 and October 11, 2019, and on March 13, 2020.⁴⁰ No broadcast station or other party has filed a comment on, or opposed, the SCRRA License Modification Application.

II. DISCUSSION

We have reviewed the License Modification Application, Engineering Report, Interference Mitigation Plan, Waiver Request, and all other filings in the record before us, and we find that the public interest in facilitating rail safety will be served by granting SCRRA permanent authority to operate 17 PTC wireless radio base stations,⁴¹ 546 PTC wireless radio wayside stations,⁴² and related PTC wireless radio mobile (locomotive) stations.⁴³

³⁶ "Interference Mitigation Measures," SCRRA Engineering Report at 6-7 (Interference Mitigation Plan).

³⁷ ULS File No. 0007974978, Certification of Darrell Maxey, SCRRA Chief Officer Mobilization, Transition and Special Projects, dated March 13, 2020 (attached as Exhibit 4 to SCRRA Waiver Request) (Maxey Certification).

³⁸ SCRRA Waiver Request at 4-7, citing 47 CFR § 80.215(i) (AMTS mobile radio stations must have a TPO "not exceeding 25 watts and an ERP not exceeding 18 watts" unless certain conditions are met).

³⁹ SCRRA Waiver Request at 7-8 and 12-13, citing 47 CFR § 1.913(a)(1).

⁴⁰ ULS File No. 0007974978, Certificates of Service (filed Nov. 9, 2017, May 28, 2019 and Oct. 11, 2019, and Mar. 13, 2020).

⁴¹ SCRRA Engineering Report at 27 (base station parameters).

⁴² SCRRA Waiver Request, Ex. 2 (wayside station parameters). Wayside radio stations are collocated with intermediate or control point railroad signals and communicate with both approaching trains and nearby base stations. SCRRA Engineering Report at 3. They are usually located within 30 feet of the rail edge, with antenna heights typically between 30 and 60 feet. *Id.* The wayside radio stations are owned by SCRRA, BNSF, and UP. SCRRA Waiver Request, Ex. 2. SCRRA base stations will control the assignment and use of its AMTS spectrum by all wayside radio stations in SCRRA territory, including stations owned by BNSF and UP. SCRRA Waiver Request at n.10.

⁴³ SCRRA Engineering Report at 24, Tbl. 5.3 (locomotive radio parameters).

A. Authorization of Wireless Mobile (Locomotive) Radio Stations

We first address SCRRA's request for authorization to operate locomotive radios at up to 50 watts transmitter power output (TPO)⁴⁴ with an ERP up to 39 watts under Call Sign WQYR421.⁴⁵

Section 80.215(i) of the Commission's rules provides that AMTS mobile radio stations must have a TPO "not exceeding 25 watts and an ERP not exceeding 18 watts."⁴⁶ The rule permits increased power output, up to 50 watts, provided two conditions are met: (1) "[i]ncreases exceeding 25 watts are made only by radio command from the controlling [base] stations,"⁴⁷ and (2) TPO "is 25 watts or less when external radio commands are not present."⁴⁸ Section 80.215(j) provides that mobile radio stations that meet both conditions are "exempted from the limitation of 18 watts ERP when operating in specific geographical areas identified in a plan for the use of higher power."⁴⁹ SCRRA seeks a waiver of the two conditions in sections 80.215(i)(1) and (2) (which it cannot meet for technical reasons described below) so that it and its tenant railroad partners may operate locomotive radios at up to 50 watts TPO with an ERP up to 39 watts.⁵⁰ We grant SCRRA's request for the reasons that follow.⁵¹

Mobile Radio Transmitter Power Output Limit. The Rail Safety Act requires U.S. railroads to deploy interoperable PTC systems so that when a railroad enters another's territory as a tenant, it can safely use the host rail's PTC system where required.⁵² To comply with this statutory interoperability requirement, SCRRA and its tenant railroad partners have deployed an integrated PTC system in Southern California, which uses a combination of their base and wayside radio stations operating on 220-222 MHz band spectrum leased from PTC-220.⁵³ Due to a shortage of available 220-222 MHz band spectrum for PTC deployment in Southern California, however, SCRRA and its tenant railroad partners intend to create a common pool of PTC spectrum channels drawn from 220-222 MHz Band spectrum leased from PTC-220 and from adjacent band AMTS spectrum licensed to SCRRA.⁵⁴ SCRRA explains that to

⁴⁴ TPO is the power level at the output terminals of a radio transmitter.

⁴⁵ SCRRA Waiver Request at 4-7. ERP is defined as "[t]he product of the power supplied to the antenna multiplied by the gain of the antenna referenced to a half-wave dipole." 47 CFR § 1.907.

⁴⁶ 47 CFR § 80.215(i).

⁴⁷ *Id.* § 80.215(i)(1).

⁴⁸ *Id.* § 80.215(i)(2).

⁴⁹ *Id.* § 80.215(j).

⁵⁰ SCRRA Waiver Request at 4-7.

⁵¹ This waiver extends to all PTC locomotive radio operations under Call Sign WQYR421. SCRRA Waiver Request at n.7 (stating that the "waiver request should cover freight railroad mobile radios that will utilize the Station License [WQYR421] in Southern California pursuant to a forthcoming leasing arrangement").

⁵² 49 U.S.C. § 20157(a)(2)(A)(i)(1) (a railroad "must provide for interoperability of the system with the movements of trains of other railroad carriers over its lines"). The Rail Safety Act defines "interoperability" as "the ability to control locomotives of the host railroad and tenant railroad to communicate with and respond to the positive train control system, including uninterrupted movements over property boundaries." *Id.* § 20157(i)(3).

⁵³ SCRRA Waiver Request at 7.

⁵⁴ *Id.*

implement interoperable PTC systems that can use channels drawn from the common spectrum pool, it requires a limited waiver of section 80.215's power limits.⁵⁵

SCRRA and its tenant railroad partners are deploying Meteorcomm PTC locomotive radios.⁵⁶ Consistent with applicable Part 90 rules,⁵⁷ they have configured their mobile radios to operate at 50 watts TPO in the 220-222 MHz band.⁵⁸ BNSF and UP locomotives (as well as Amtrak locomotives) operate at 50 watts TPO outside SCRRA territory.⁵⁹ When these locomotives enter SCRRA territory, "their radios do not have a function through which they can turn their [50-watt TPO] down."⁶⁰ The radio's TPO "is configurable only when a trained technician connects to the specific radio via computer terminal, successfully authenticates to the radio, issues a series of configuration commands, and reboots the radio."⁶¹

We evaluate SCRRA's request for waiver under section 1.925(b)(3) of the Commission's rules. Under section 1.925(b)(3), the Commission may grant a request for waiver if it is shown either that (i) the underlying purpose of the rule(s) would not be served or would be frustrated by application to the instant case, and that a grant of the requested waiver would be in the public interest, or (ii) in view of unique or unusual factual circumstances, application of the rule(s) would be inequitable, unduly burdensome or contrary to the public interest, or the applicant has no reasonable alternative.⁶² We grant SCRRA's waiver request under the second prong of the Commission's waiver standard.⁶³

We find that in view of the unique and unusual circumstances here, including Congress' mandate that PTC rail safety systems be interoperable,⁶⁴ application of the two conditions required to operate mobile radio transmitters at 50 watts TPO in the AMTS band—(1) that TPO increases exceeding 25 watts are made only by base station radio command;⁶⁵ and (2) that TPO must be 25 watts or less when external radio commands are not present⁶⁶— would be contrary to the public interest in the safety of life and property and in efficient spectrum use. We also find that SCRRA has no reasonable alternative.

Amtrak, BNSF, and UP have programmed thousands of Meteorcomm locomotive radios to operate at 50 watts TPO in the 220-222 MHz band, and the record shows that these radios cannot be controlled by external radio commands to use a lower TPO when they enter SCRRA territory and use

⁵⁵ *Id.*

⁵⁶ *Id.* at 6-7. The Meteorcomm Radio's specifications are attached as Exhibit 1 to the SCRRA Waiver Request.

⁵⁷ 47 CFR § 90.729(b).

⁵⁸ SCRRA Waiver Request at 6-7.

⁵⁹ *Id.* at 6.

⁶⁰ *Id.* at 7.

⁶¹ *Id.*

⁶² 47 CFR § 1.925(b)(3). The Commission also may waive its rules for good cause shown. *Id.* § 1.3.

⁶³ 47 CFR § 1.925(b)(3)(ii).

⁶⁴ *SCRRA Order*, 31 FCC Red at 9838-39 (finding that SCRRA faces unique factual circumstances in complying with the federal PTC mandate).

⁶⁵ 47 CFR § 80.215(i)(1).

⁶⁶ *Id.* § 80.215(i)(2).

SCRRA's AMTS spectrum. Like its railroad partners, SCRRA has configured its mobile radios to operate at 50 watts TPO and they too cannot be controlled by external radio commands to use a lower TPO.⁶⁷ Further, it is not possible to program the radios to operate at 50 watts TPO and satisfy the condition that TPO be 25 watts or less when external radio commands are not present.⁶⁸ In sum, SCRRA and its tenant railroads are required by statute to deploy interoperable PTC systems and have no reasonable alternative to the requested rule waivers because the mobile radio power levels are preset at 50 watts TPO and cannot be controlled by base station radio commands. We also find that not permitting SCRRA to operate mobile radios at 50 watts TPO would be contrary to the public interest because it would preclude sharing of scarce spectrum resources, which are needed for robust interoperable deployment of PTC in Southern California.

Given the totality of the circumstances in the record before us and for the reasons stated above, we hereby waive section 80.215(i)(1) and (2) of the Commission's rules to the extent necessary, and authorize SCRRA and its tenant railroads to operate PTC locomotive radios at 50 watts transmitter power output under Call Sign WQYR421.

Mobile Radio Effective Radiated Power Limits. SCRRA also requests waiver of section 80.215(i)'s 18-watt mobile radio ERP limit, to the extent necessary, so that it (and its tenant railroad partners operating pursuant to spectrum leasing arrangements)⁶⁹ can operate PTC locomotive radios at up to 39 watts ERP.⁷⁰ As explained above, although section 80.215(i) generally limits mobile radio ERP to 18 watts,⁷¹ section 80.215(j) exempts mobile radio operations from this ERP limit provided the two conditions for exceeding section 80.215(i)'s 25-watt TPO limit are met "when operating in specific geographical areas identified in a plan for the use of higher power."⁷²

Pursuant to section 80.215(j), SCRRA has submitted a plan to deploy mobile radios with an ERP of up to 39 watts in specific geographical areas.⁷³ The plan includes: (1) a map of the specific rail lines and stations where PTC mobile radios will operate;⁷⁴ and (2) showings regarding the number of mobile radios expected to operate in SCRRA territory and their peak ERP levels.⁷⁵ SCRRA explains that mobile

⁶⁷ SCRRA Waiver Request at 9 (stating that "[b]ase and wayside stations in the SCRRA network are not capable of controlling the power output of mobile/locomotive transmitters"). As noted above, changes in TPO can only be implemented "when a trained technician connects to the specific radio via computer terminal, successfully authenticates to the radio, issues a series of configuration commands, and reboots the radio." SCRRA Waiver Request at 7.

⁶⁸ 47 CFR § 80.215(i)(2).

⁶⁹ SCRRA Waiver Request at 6 n.7.

⁷⁰ Depending on their configuration, SCRRA radios operate at up to 26.22 watts ERP, BNSF radios at up to 26.93 watts ERP, and UP radios at up to 38.74 watts ERP. SCRRA Engineering Report at 24, Tbl. 5.3 (LA Basin Locomotive radio TPO and ERP data).

⁷¹ 47 CFR § 80.215(i).

⁷² *Id.* § 80.215(j).

⁷³ SCRRA Waiver Request, Ex. 3 (Section 80.215(j) Plan).

⁷⁴ SCRRA Engineering Report at 25, Fig. 5.1 (PTC-equipped track routes for SCRRA, BNSF and UP in the LA Basin).

⁷⁵ *Id.* at 24, Tbl. 5.3 (LA Basin Locomotive radio TPO and ERP data), and at 26, Fig. 5.2 (LA Basin PTC Train Runs by Metrolink as Host and Tenant).

radio transmissions are itinerant (unless stopping at a station, locomotive radios generally are in constant motion) and operate at much lower power and antenna height (approximately 19 feet) than base stations (up to 150 feet) and wayside stations (up to 60 feet) in the SCRRA radio network.⁷⁶ Mobile radios use a 30% duty cycle while base station radios use a 50% duty cycle.⁷⁷ SCRRA explains that no appreciable additional interference would result from operation of the mobile radios at up to 39 watts ERP, as such operations are at substantially lower power levels than base stations (up to 762 watts ERP)⁷⁸ and wayside stations (up to 285.5 watts ERP).⁷⁹

Above we waive the two conditions of section 80.215(i) required to use mobile radios with TPO exceeding 25 watts ERP. Once these two conditions are met (or waived, as here), a licensee is exempt from the rule's 18-watt ERP limit, provided it has submitted an appropriate plan for use of higher mobile power under section 80.215(j). We have closely reviewed each element of SCRRA's section 80.215(j) plan and find that the plan meets the requirements for exemption of mobile radio operations from section 80.215(i)'s 18-watt ERP limit. Accordingly, we hereby authorize SCRRA and its tenant railroad partners to operate mobile radios at up to 39 watts ERP.

B. Authorization of Wireless Radio Base and Wayside Radio Stations

We now address SCRRA's request for authorization to operate 17 PTC wireless base stations with ERP levels from 20 to 762 watts,⁸⁰ and 546 PTC wireless radio wayside stations at ERP levels from 15.6 to 285.5 watts.⁸¹

Request for Waiver of 47 CFR § 1.913(a)(1). We first address SCRRA's request to provide relevant PTC wayside radio station data in a consolidated format. Pursuant to section 1.3 and 1.925(b)(3)(ii) of the Commission's rule,⁸² SCRRA requests that we waive section 1.913(a)(1) to the extent the rule requires SCRRA to file a separate FCC Form 601, Schedule D for authorization of each wayside radio station.⁸³ SCRRA states that the PTC mandate and the sheer number of required PTC wayside radio stations included in its License Modification Application present unique factual

⁷⁶ *Id.* at 24-26.

⁷⁷ *Id.* at 26.

⁷⁸ *Id.* at 27 (base station parameters).

⁷⁹ SCRRA Engineering Report at 24 (noting that "even assuming trains and Wayside antennas both operate at the highest elevations of the railroad ROW, then with respect to Base Station ERP and antenna height, which are the parameters most responsible for adjacent channel interference, the Base stations and Waysides always present the worst case scenario").

⁸⁰ SCRRA Engineering Report at 27 (base station parameters).

⁸¹ SCRRA Waiver Request, Ex. 2 (wayside station parameters).

⁸² 47 CFR § 1.3 (the Commission can waive any provision of its rules "for good cause shown"); *id.* § 1.925(b)(3)(ii).

⁸³ SCRRA Waiver Request at 7-8 and 12-13, citing 47 CFR § 1.913(a)(1). Schedule D is titled "Wireless Telecommunications Bureau and/or Public Safety and Homeland Security Bureau Schedule for Station Locations and Antenna Structures." The Schedule D instructions state "[t]his schedule must be completed when any station location is to be added, modified, or deleted." FCC Form 601, Schedule D – Instructions, at 1 (Mar. 2018). And that an applicant must "[u]se as many copies of Schedule D as necessary to provide information for all stations." *Id.*

circumstances that would render the requirement to complete a Schedule D for each wayside radio station unduly burdensome and contrary to the public interest within the meaning of section 1.925(b)(3)(ii).⁸⁴

SCRRA requests permission to present the information required by Schedule D for each wayside radio station in a spreadsheet (attached as Exhibit 2 to its Waiver Request).⁸⁵ The 14-page spreadsheet provides the location and technical parameters required by Schedule D for each wayside radio station in a user-friendly format that can be analyzed by interested parties and FCC staff, rather than having to parse 546 separate Schedule D filings. We find that Congress' PTC mandate and the application of section 1.913(a)(1)—to the extent it would require SCRRA to file 546 individual Schedule Ds to comply with that statutory mandate—present unique factual circumstances⁸⁶ and that it would be contrary to the public interest to require strict adherence to the rule.⁸⁷ For these reasons, we grant SCRRA's waiver request.

Interference Analysis. As required by section 80.215(h)(2),⁸⁸ SCRRA's Engineering Report addresses the potential for interference from the proposed operation of PTC base and wayside radio stations to over-the-air (OTA) channel 10 and 13 receivers.⁸⁹ The report identifies six channel 10 TV stations, which are located less than 129 kilometers (80 miles) from one or more base or wayside radio station: KERO-TV, Bakersfield; KGTV, San Diego; DKTAV-LD, Altadena; KIIO-LD, Los Angeles; KZSW-LD, Riverside; and K10PV-D, Santa Barbara.⁹⁰ It also identifies one channel 13 TV station, KCOP-TV, Los Angeles, which is located less than 169 kilometers (105 miles) from the identified base and wayside radio stations.⁹¹

Channel 10 Broadcast Stations. As noted above, there are six channel 10 stations located less than 129 kilometers (80 miles) from one or more SCRRA PTC base or wayside radio station sites.⁹² OET-74 Supplement A states that “to assert compliance with the protection and mitigation requirements in [section 80.215(h)] regarding potential interference to channel 10, PTC applicants intending to operate in the AMTS band should briefly explain [1] that the transition to digital TV results in a lack of criteria to assess potential interference to channel 10, [2] that harmful interference to TV Channel 10 is unlikely, and [3] that if such interference is caused by PTC operations, it will be cured at the applicant's expense.”⁹³

⁸⁴ SCRRA Waiver Request at 7; 47 CFR § 1.925(b)(3)(ii)

⁸⁵ SCRRA Waiver Request at 7.

⁸⁶ *SCRRA Order*, 31 FCC Rcd at 9838-39 (finding that SCRRA faces unique factual circumstances in complying with the federal PTC mandate).

⁸⁷ 47 CFR § 1.925(b)(3)(ii).

⁸⁸ *Id.* § 80.215(h)(2).

⁸⁹ SCRRA Engineering Report at 10. The wayside radio stations are owned by BNSF, SCRRA, and UP. *Id.*, Ex. 2. SCRRA base stations will control the assignment and use of its AMTS spectrum by all wayside radio stations in SCRRA territory, including stations owned by BNSF and UP. SCRRA Waiver Request at n.10.

⁹⁰ SCRRA Engineering Report at 39-44 (Figs. 8a to 8f).

⁹¹ *Id.* at 38 (Fig. 7).

⁹² *Id.* at 39-44 (Figs. 8a to 8f).

⁹³ 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,

Consistent with the requirements of OET-74 Supplement A, RF Networks states that “[t]he transition from analog to digital TV resulted in a lack of criteria to assess potential interference to channel 10,”⁹⁴ and that in any event harmful interference to TV Channel 10 is not likely.⁹⁵ Further, SCRRA acknowledges that it is responsible for avoiding interference to viewers of OTA television stations at its own expense.⁹⁶ We agree that RF Networks properly excluded channel 10 stations from the interference analysis. We emphasize, however, that if SCRRA’s PTC operations were to interfere with OTA reception of any channel 10 station, SCRRA must remediate such interference at its own expense as required by section 80.215(h)(4)⁹⁷ and the interference mitigation conditions we adopt below.

Channel 13 Broadcast Stations. RF Networks applied the Longley-Rice radio propagation model⁹⁸ to predict the number of television households that potentially could be affected by the proposed operation of PTC base and wayside radio stations.⁹⁹ RF Networks states that, consistent with OET-74 and OET-74 Supplement A, it calculated the number of potentially affected channel 13 households using a threshold desired/undesired (D/U) signal ratio of -33 dB.¹⁰⁰

RF Networks used a matrix of square tiles (two kilometers per side) for full power channel 13 station KCOP-TV, Los Angeles, California, to identify the tiles with insufficient D/U ratio inside the television station’s service area and the number of potential households within those tiles that potentially could be affected by the proposed PTC operations.¹⁰¹ RF Networks predicts that of the approximately 5,813,939 households in the study area, the proposed operation of 17 base and 546 wayside radio stations would, in the aggregate, have the potential to impact up to 101,038 households (1.73 percent of all households), before undertaking interference mitigation measures.¹⁰²

Section 80.215(h)(3) provides for authorization of an AMTS station where a licensee shows that fewer than 100 households would be impacted by its operation.¹⁰³ As explained below, a license must satisfy three requirements to obtain authorization of a station that potentially would impact more than 100

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

⁹⁴ SCRRA Engineering Report at 33. *See also* OET-74 Supplement A at 5.

⁹⁵ SCRRA Engineering Report at 34. *See also* OET-74 Supplement A at 5.

⁹⁶ SCRRA Engineering Report at 6.

⁹⁷ 47 CFR § 80.215(h)(4).

⁹⁸ 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).

⁹⁹ RF Networks’ study methodology included six steps. SCRRA Engineering Report at 10.

¹⁰⁰ SCRRA Engineering Report at 10.

¹⁰¹ *Id.*

¹⁰² *Id.* at 5.

¹⁰³ 47 CFR § 80.215(h)(3).

households.¹⁰⁴ Rather than providing data for each station, SCRRA has chosen to aggregate the data for all stations.¹⁰⁵ Given this aggregation, to analyze the potential impact on KCOP-TV households, we will assume for this specific analysis that each station has the potential to impact more than 100 TV households.

RF Networks predicts that the aggregate transmissions of 17 base and 546 wayside radio stations have the potential to affect 101,038 KCOP-TV households.¹⁰⁶ Under section 80.215(h)(3)(i)-(iii), the Commission may approve an AMTS base station where 100 or more households are within the interference contour of that station and a television station's analog Grade B contour (here, RF Networks used station KCOP-TV's noise-limited service contour),¹⁰⁷ provided 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.¹⁰⁸ We find that SCRRA has satisfied the three requirements of section 80.215(h)(3)(i)-(iii) for licensing of the referenced base and wayside radio stations.

First, SCRRA certifies that each of its "proposed base and wayside station locations . . . is especially well-suited to provide the proposed PTC service."¹⁰⁹ SCRRA explains that "to provide continuous and reliable coverage, PTC wayside stations must be located at regular intervals along the rail line, and the base stations must be in locations that provide constant and reliable coverage of the wayside stations."¹¹⁰ SCRRA states that its "ability to relocate PTC base and wayside stations to reduce potential interference is thus limited by necessary system design requirements, as well as by the challenging topography of Southern California and the proximate location of residences."¹¹¹

Regarding the second and third requirements under section 80.215(h)(3), SCRRA has developed a plan to mitigate potential interference (including free installation of notch filters if necessary)¹¹² for any

¹⁰⁴ *Id.*

¹⁰⁵ SCRRA Engineering Report at 10.

¹⁰⁶ *Id.* at 5.

¹⁰⁷ 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*, ET Docket No. 10-152, 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).

¹⁰⁸ 47 CFR § 80.215(h)(3)(i)-(iii).

¹⁰⁹ Maxey Certification at para. 3.

¹¹⁰ *Id.*

¹¹¹ *Id.*

¹¹² A notch (band reject) filter attenuates one frequency band and passes both a lower and a higher frequency band.

household experiencing interference to their OTA reception of a channel 10 or 13 station, which RF Networks predicts would eliminate potential interference to all households.¹¹³ Accordingly, we find that SCRRA has satisfied the three requirements of section 80.215(h)(3)(i)-(iii) and hereby grant its Modification Application seeking permanent authority to operate the 17 base stations identified in the Engineering Study and the 546 wayside stations identified in Exhibit 2 to its Waiver Request,¹¹⁴ subject to the interference mitigation conditions we adopt 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 13.¹¹⁵ SCRRA's Interference Mitigation Plan describes and establishes a process for SCRRA to comply with section 80.215(h)(4), including a 24-hour hotline to receive reports of interference from affected TV stations.¹¹⁶

SCRRA personnel will investigate whether a transmitter owned or controlled by SCRRA is the source of any reported interference.¹¹⁷ If interference mitigation is required, SCRRA has committed to resolve the interference by one of three possible measures.¹¹⁸ First, SCRRA could reduce the ERP of the interfering transmitter, provided link performance would be unaffected at the reduced ERP.¹¹⁹

Second, if an ERP reduction is not feasible, SCRRA could change the frequency of the interfering transmitter either to another licensed AMTS frequency or to a frequency in the 220-222 MHz band on spectrum leased from PTC-220.¹²⁰ SCRRA states that it has received no reports of interference to OTA television from its systemwide PTC deployment on leased 220-222 MHz band spectrum.¹²¹ We expect that a frequency change to the 220-222 MHz band would remediate any interference. We also note that since commencing PTC operations under special temporary authority using the same AMTS spectrum and in the same area for which it seeks permanent authorization here, SCRRA states it has received no reports of interference to OTA television.¹²²

¹¹³ SCRRA Engineering Report at 6-7 (Interference Mitigation Measures) and Maxey Certification at para 2, committing SCRRA to implement those measures.

¹¹⁴ Appendix C to the Engineering Study identifies 588 radio transmitters. There are 546 wayside stations located less than 169 kilometers from Channel 13 Station KCOP-TV, and thus subject to individual licensing. These same sites are enumerated in Exhibit 2 to the SCRRA Waiver Request. There are 20 wayside stations subject to command by SCRRA base stations but more than 169 kilometers from Channel 13 Station KCOP-TV, and thus not subject to the individual licensing requirement. And there are 17 base stations, five with two transmitters. SCRRA Waiver Request at 8, n.9; 47 CFR § 80.5 (defining a station as “[o]ne or more transmitters or a combination of transmitters and receivers, including the accessory equipment, necessary at one location for carrying on radiocommunication services”).

¹¹⁵ 47 CFR § 80.215(h)(4).

¹¹⁶ SCRRA Engineering Report at 6-7.

¹¹⁷ *Id.* at 6.

¹¹⁸ *Id.*

¹¹⁹ *Id.*

¹²⁰ *Id.*

¹²¹ *Id.*

¹²² STA Call Sign WRJD571, Operational Update, dated Oct. 20, 2020.

Third, if interference were to persist despite the foregoing measures, then SCRRA would provide free of charge, TV notch filters to affected viewers, which we anticipate would eliminate interference caused to any affected TV receiver.¹²³ The filters have a minimum notch depth of 40 (+/-1) dB.¹²⁴ After application of a notch filter, the interference-free signal margin will be increased by 40 dB “reducing the net population of OTA receivers for which interference to channels 10 or 13 is possible, to zero” according to the SCRRA Engineering Report.¹²⁵

Although section 80.214(h)(4) provides AMTS licensees up to 90 days to resolve interference issues,¹²⁶ SCRRA has committed to being more responsive and resolve reports of interference within 60 days of receiving an interference report.¹²⁷ Consistent with the foregoing, as a condition of today’s grant of permanent authority to operate the 17 PTC base and 546 wayside radio stations, we require SCRRA to:

1. Establish and maintain a 24-hour helpdesk to receive reports of potential interference.
2. Provide each potentially affected broadcaster contact information to report possible interference to the helpdesk;¹²⁸
3. Provide a party reporting interference a unique tracking number for each interference report;
4. Investigate any reported interference within 30 calendar days of receiving a report; and
5. Resolve any interference caused by its operations at its own expense within 60 calendar days of receiving an interference report.¹²⁹

¹²³ SCRRA Engineering Report at 6.

¹²⁴ *Id.*

¹²⁵ *Id.*

¹²⁶ 47 CFR § 80.215(h)(4).

¹²⁷ SCRRA Engineering Report at 6.

¹²⁸ The potentially affected broadcasters include: (1) one Channel 13 station, KCOP-TV, Los Angeles, CA; and (2) six Channel 10 stations: KERO-TV, Bakersfield; KGTV, San Diego; DKTAV-LD, Altadena; KIIO-LD, Los Angeles; KZSW-LD, Riverside; and K10PV-D, Santa Barbara. SCRRA Engineering Report at 38-44 (Figs. 7 to 8f).

¹²⁹ If SCRRA were unable to remedy interference, Commission rules would require it to discontinue use of an offending base or wayside radio station. 47 CFR § 80.215(h)(4).

III. CONCLUSION

For the reasons stated above, we hereby conditionally grant the License Modification Application and SCRRRA's Waiver Request, ULS File No. 0007974978 (WQYR421).

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, 1.913(a)(1), 1.925(b)(3), and 80.215(h)-(j) of the Commission's rules, 47 CFR §§ 0.331, 1.913(a)(1), 1.925(b)(3), and 80.215(h)-(j).

Sincerely,

Roger S. Noel
Chief, Mobility Division
Wireless Telecommunications Bureau