



PUBLIC NOTICE

Federal Communications Commission
45 L Street NE
Washington, DC 20554

News Media Information 202-418-0500
Internet: www.fcc.gov
TTY: 888-835-5322

DA 24-703

Released: July 18, 2024

WIRELESS TELECOMMUNICATIONS BUREAU AND OFFICE OF ENGINEERING AND TECHNOLOGY APPROVE NOKIA INNOVATIONS LLC TO BEGIN INITIAL COMMERCIAL DEPLOYMENT IN THE 3.5 GHZ BAND

GN Docket No. 15-319

I. INTRODUCTION

1. With this *Public Notice*, the Wireless Telecommunications Bureau (WTB) and the Office of Engineering and Technology (OET) (collectively, WTB/OET) of the Federal Communications Commission (Commission or FCC) certify that the Spectrum Access System (SAS) operated by Nokia Innovations LLC (Nokia) has satisfied the Commission's SAS laboratory testing requirements¹ and is approved to begin initial commercial deployments (Initial Commercial Deployment or ICD) as described in its ICD proposal and consistent with the obligations and conditions detailed in this *Public Notice* and contained in the ICD Proposals Public Notice.² WTB/OET, in consultation with the Department of Defense (DoD) and the National Telecommunications and Information Administration (NTIA), have reviewed Nokia's SAS laboratory testing report, ICD proposal, and all supplemental materials.³

II. BACKGROUND

2. In the *2015 Report and Order*, the Commission directed WTB/OET—in consultation

¹ Conditionally approved SAS administrators were permitted to file their laboratory testing reports in GN Docket No. 15-319. *Wireless Telecommunications Bureau and Office of Engineering and Technology Establish Procedure and Deadline for Filing Spectrum Access System Initial Commercial Deployment Proposals*, Public Notice, 33 FCC Rcd 7390, 7392, para. 5 (WTB/OET 2018) (*ICD Proposals Public Notice*). Nokia filed its laboratory testing report with the Commission and requested confidential treatment. See Letter from Meredith Singer, Counsel to Nokia, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 15-319 (filed Jan. 17, 2023) (ICD Test Report).

² Nokia's ICD proposal and the supplement to its ICD proposal were filed in GN Docket No. 15-319 consistent with the Commission's instructions. *ICD Proposals Public Notice*, 33 FCC Rcd at 7394-95, para. 11. Nokia requested confidential treatment for its ICD filings. See Letter from Letter from Meredith Singer, Counsel to Nokia, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 15-319 (filed May 8, 2024) (Supplement to ICD proposal); Letter from Meredith Singer, Counsel to Nokia, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 15-319 (filed Jul. 21, 2023) (ICD Proposal).

³ Nokia also submitted documentation—including reports on system testing in a non-operational environment—demonstrating its ability to successfully implement the modified aggregate interference model described by WTB, OET, and NTIA. See Letter from Dr. Milind Buddhikot, Head of Nokia Spectrum Controller, Nokia and David Bartlett, Vice President—Federal Regulatory and Government Affairs North America, Nokia to Marlene H. Dortch, Secretary, FCC, GN Docket No. 15-319 (July 2, 2024); *Wireless Telecommunications Bureau and Office of Engineering and Technology Announce Modified Aggregate Interference Model Used by Spectrum Access System Administrators*, GN Docket Nos 15-319 and 17-258, Public Notice, DA 24-553 (WTB/OET 2024) (*Aggregate Interference Model Public Notice*); Letter from Charles Cooper, Associate Administrator, Office of Spectrum Management, NTIA, to Ronald T. Repasi, Chief, OET, FCC, and Joel Taubenblatt, Chief, Wireless Telecommunications Bureau, FCC (June 11, 2024) (NTIA June 11, 2024 Letter).

with DoD and NTIA—to oversee the review, certification, and approval of SASs in the 3.5 GHz band.⁴ As required in the *2015 Report and Order*, and as further described in the *SAS/ESC Proposal Public Notice*, all prospective SAS administrators must complete a two-stage review process prior to final certification.⁵ In the first stage, a prospective SAS administrator must submit a proposal describing how its system will comply with all Commission rules governing the construction, operation, and approval of SASs and perform all core functions described in the *2015 Report and Order*.⁶ The second stage involves SAS testing both in a controlled lab environment and in a real-world setting.⁷ On September 22, 2023, WTB/OET conditionally approved Nokia’s SAS.⁸

3. As part of the second stage testing process, Nokia elected to collaborate with the Institute for Telecommunication Sciences (ITS), NTIA’s research and development arm, in order to complete the laboratory testing requirement.⁹ ITS completed its laboratory testing in December 2022, and subsequently provided Nokia with a SAS laboratory test report, which Nokia submitted for the Commission’s review in January 2023.¹⁰

4. In order to comply with the field testing requirement, in July 2018, WTB/OET sought proposals for short-term, limited geographic commercial deployment.¹¹ Consistent with the requirements set forth in the *ICD Proposals Public Notice*, Nokia submitted its ICD proposal with the Commission in July 2023¹² and later supplemented its proposal in May 2024.¹³ Nokia also submitted documentation—including reports on system testing in a non-operational environment—demonstrating its ability to

⁴ See generally *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959, 4067, paras. 369-373 (2015) (*2015 Report and Order* and *2015 FNPRM*, respectively); see also 47 CFR §§ 0.241(j), 0.331(f).

⁵ See *Wireless Telecommunications Bureau and Office of Engineering and Technology Establish Procedure and Deadline for Filing Spectrum Access System (SAS) Administrators(s) and Environmental Sensing Capability (ESC) Operator(s) Applications*, GN Docket No. 15-319, Public Notice, 30 FCC Rcd 14170, 14174-77 (WTB/OET 2015) (*SAS/ESC Proposal Public Notice*).

⁶ See *2015 Report and Order*, 30 FCC Rcd at 4054-55, para. 320 (listing SAS core functions); see also *SAS/ESC Proposal Public Notice*, 30 FCC Rcd at 14174; *Wireless Telecommunications Bureau and Office of Engineering and Technology Conditionally Approve Seven Spectrum Access System Administrators for the 3.5 GHz Band*, Public Notice, 31 FCC Rcd 13355 (WTB/OET 2016) (*SAS Conditional Approval Public Notice*).

⁷ See *2015 Report and Order*, 30 FCC Rcd at 4067, para. 372 (noting that the final compliance testing phase can include a public testing period, testing of protections for incumbent systems, and field trials). On July 27, 2018, WTB/OET released a Public Notice that described the procedure and deadline for filing ICD proposals. See *ICD Proposals Public Notice*, 33 FCC Rcd 7390. ICD is meant to fulfill the Commission’s requirement that applicants conduct a public testing period and field trials prior to final certification. *2015 Report and Order*, 30 FCC Rcd at 4067, para. 372.

⁸ *Wireless Telecommunications Bureau and Office of Engineering and Technology Conditionally Approve Three Spectrum Access System Administrators for the 3.5 GHz Band*, GN Docket Nos. 17-258 and 15-319, Public Notice, 36 FCC Rcd 8255 (WTB/OET 2021) (*Second Wave SAS Conditional Approval Public Notice*) (conditionally approving the following three SAS administrators: Fairspectrum LLC, Nokia, and RED Technologies).

⁹ While lab testing of individual SASs is required before final certification, participation in either the process of verifying and validating the test harness or the subsequent lab testing of an individual SAS with ITS is optional and is not a prerequisite to submitting an ICD proposal or to obtaining final certification. *ICD Proposals Public Notice*, 33 FCC Rcd at 7392, para. 4.

¹⁰ See *supra* note 1.

¹¹ *ICD Proposals Public Notice*, 33 FCC Rcd at 7390, para. 1.

¹² See *supra* note 2.

¹³ See *id.*

successfully implement the modified aggregate interference model described in a recently released WTB/OET Public Notice and the related NTIA letter.¹⁴

III. DISCUSSION

5. WTB/OET, in coordination with NTIA and DoD, are responsible for assessing and testing each conditionally approved SAS prior to final certification in both laboratory and real-world environments.¹⁵ ICD will satisfy the real-world element of the testing process and will allow WTB/OET to assess whether each SAS can operate under actual deployment conditions.¹⁶

6. WTB/OET, in coordination with NTIA and DoD, reviewed Nokia's laboratory test report, ICD proposal, and supplemental materials in detail. Based on the information contained therein, we find that Nokia's laboratory test report satisfies the Commission's requirement to assess and test each SAS in a controlled lab environment and that Nokia's ICD proposal meets the requirements set forth in the *ICD Proposals Public Notice*. We also find that Nokia has demonstrated the ability to successfully implement the modified aggregate interference model as described in the *Aggregate Interference Model Public Notice* and NTIA's June 11, 2024 Letter.¹⁷ We therefore approve Nokia's SAS for Initial Commercial Deployment, subject to the ongoing compliance obligations as follows:

- Nokia must file a notification in GN Docket No. 15-319 stating: (1) the beginning date of its ICD period; (2) the specific geographic areas covered by ICD deployments; (3) whether the SAS is DPA-enabled;¹⁸ (4) whether its SAS will be operating with an approved Environmental Sensing Capability (ESC)¹⁹ operator during ICD and, if so,

¹⁴ *Wireless Telecommunications Bureau and Office of Engineering and Technology Announce Modified Aggregate Interference Model Used by Spectrum Access System Administrators*, GN Docket Nos 15-319 and 17-258, Public Notice, DA 24-553 (WTB/OET 2024) (*Aggregate Interference Model Public Notice*); Letter from Charles Cooper, Associate Administrator, Office of Spectrum Management, NTIA, to Ronald T. Repasi, Chief, OET, FCC, and Joel Taubenblatt, Chief, Wireless Telecommunications Bureau, FCC (June 11, 2024) (NTIA June 11, 2024 Letter); *see also Wireless Telecommunications Bureau and Office of Engineering and Technology Approve Certified SAS Administrators to use Modified Aggregate Interference Model*, GN Docket Nos 15-319 and 17-258, Public Notice, DA 24-643 (WTB/OET 2024) (*Aggregate Interference Model Approval Public Notice*) (July 3, 2024) (approving five SAS administrators to use the modified criteria).

¹⁵ *See 2015 Report and Order*, 30 FCC Rcd at 4067, para. 372.

¹⁶ *ICD Proposals Public Notice*, 33 FCC Rcd at 7392, para. 6.

¹⁷ *See* Letter from Dr. Milind Buddhikot, Head of Nokia Spectrum Controller, Nokia and David Bartlett, Vice President—Federal Regulatory and Government Affairs North America, Nokia to Marlene H. Dortch, Secretary, FCC, GN Docket No.15-319 (July 2, 2024); *Aggregate Interference Model Public Notice*; NTIA June 11, 2024 Letter. WTB/OET stated that they would consider Nokia's submissions as part of its ICD proposal. *See Aggregate Interference Model Approval Public Notice*, at 1 n.2.

¹⁸ Dynamic Protection Areas (DPAs) are pre-defined protection areas that extend beyond the coastline or that enclose a protected terrestrial radar facility, which may be activated or deactivated as necessary to protect DoD radar systems. *Promoting Investment in the 3550-3700 MHz Band*, GN Docket No. 17-258, Order, 33 FCC Rcd 4987, 4990, para. 5 (WTB/OET 2018) (*DPA Waiver Order*). In the *DPA Waiver Order*, WTB and OET conditionally waived sections 96.7(a), 96.15(a)(2)-(3), 96.15(b)(2)-(3), 96.45(b), 96.53(g), and 96.57(d) of the Commission's rules to allow: (1) DPA-enabled SASs to authorize both Category A and Category B CBSDs in the 3.5 GHz band prior to ESC deployment and certification; and (2) DPA-enabled SASs to be certified without being tested for compliance with phase one Exclusion Zone requirements in areas where NTIA has published DPAs.

¹⁹ ESCs will consist of a network of sensors—infrastructure-based, device-based, or a combination of both—that will detect federal radars operating in and around the 3.5 GHz band and relay information regarding those transmissions to the SAS in order to protect incumbent federal operations. *See* 47 CFR §§ 96.3, 96.15, 96.67.

which ESC it will be using;²⁰ and (5) the expected end date of the ICD reporting period. The notification must also include a primary point of contact for incumbent operators to use to report potential interference issues to the SAS²¹ and to obtain additional information about ICD operations, if needed. The ICD period may begin once this notification is filed.

- ICDs must continue for a minimum of 30 consecutive days, consistent with Nokia's ICD proposal, and they must demonstrate compliance with the Commission's rules and other requirements set forth in the *ICD Proposals Public Notice*.²² ICDs must involve a variety of testing scenarios featuring multiple Citizen Broadband Radio Service Devices (CBSDs)²³ that result in the generation of data upon which the Commission can reasonably predict that its SAS can reliably operate in compliance with the Commission's rules.²⁴
- During ICD, Nokia must operate a SAS that is functionally consistent with its SAS tested in the laboratory environment.²⁵ SAS operators may implement software upgrades and patches to address any issues identified during ICD.
- Nokia must comply with all current and future Commission rules, instructions, and procedures.
- Nokia must comply with all instructions issued by WTB and OET pursuant to sections 0.241(j) and 0.331(f) of the Commission's rules.²⁶
- Nokia must promptly respond to any Commission, WTB, Enforcement Bureau, or OET requests for additional information.
- During ICD, each conditionally approved SAS must promptly deactivate, or make changes in the operational parameters of any CBSD or group of CBSDs, if directed to do so by the Commission, WTB, OET or the Enforcement Bureau. If, during ICD, a SAS is continually shown to cause interference to incumbents, WTB/OET may require that SAS to cease all operations until the underlying issues are resolved.

7. In addition, consistent with the *ICD Proposals Public Notice* and Nokia's ICD proposal, Nokia must comply with the following requirements during ICD:

- Nokia must demonstrate that users can register with its SAS, receive authentication, and obtain user IDs during ICD.²⁷

²⁰ See *Wireless Telecommunications Bureau and Office of Engineering and Technology Announce the Approval and Registration of Environmental Sensing Capability Sensors of Three ESC Operators for the 3.5 GHz Band*, GN Docket No. 15-319, Public Notice, DA 19-718 (WTB/OET July 29, 2019); *DPA Waiver Order*, 33 FCC Rcd at 4993-94, para.16.

²¹ See 47 CFR § 96.17(f).

²² See *ICD Proposals Public Notice*, 33 FCC Rcd at 7392-94, paras. 7-8, 10.

²³ CBSDs are fixed stations, or networks of such stations, that operate on a Priority Access or General Authorized Access basis in the Citizens Broadband Radio Service. 47 CFR § 96.3.

²⁴ *ICD Proposals Public Notice*, 33 FCC Rcd at 7394, para. 10. These scenarios are included in Nokia's ICD proposal. See *supra* note 2.

²⁵ As set forth above, Nokia is authorized to utilize the modified aggregate interference model described in WTB and OET's *Aggregate Interference Model Public Notice* and NTIA's June 11, 2024 Letter. See *supra* note 17.

²⁶ See 47 CFR §§ 0.241(j), 0.331(f).

²⁷ See, e.g., 47 CFR §§ 96.25(c), 96.33, 96.39, 96.57.

- Nokia must demonstrate how its SAS will communicate with and manage multiple CBSD or Domain Proxy (DP) products, including the protocols for SAS-CBSD communications for registration, channel grant, and channel release.²⁸ Nokia must identify all of its commercial partners that will operate during ICD.
- Nokia must demonstrate that a certified professional installer (CPI) can register CBSDs/DPs during ICD and must explain how that professional installation will ensure its SAS can accurately locate devices in compliance with Part 96.²⁹
- Nokia must demonstrate that its SAS can access, read, and use data directly from FCC databases during ICD.³⁰
- Nokia must demonstrate its ability to correctly synchronize and exchange information with other SASs and to correctly apply information security procedures and incumbent protection methods during ICD.³¹
- Nokia must demonstrate the processes that it will use to ensure the correct implementation of all relevant interference protection criteria, including how its SAS's over-the-air propagation testing addresses the protection of Fixed Satellite Service earth station sites, federal inland radar test sites, and area-based protections.³² Nokia should include the results of these protection tests in its ICD Report consistent with its final approved ICD deployment plan.
- If Nokia is DPA-enabled, it must demonstrate the ability to implement notification-based DPA protection using a DPA portal.³³
- Nokia must provide a method by which WTB, the Enforcement Bureau, OET, NTIA, and DoD will have access to the SAS and data generated by its SAS during ICD in order to verify that the SAS complies with the relevant rules. Nokia must also provide a primary point of contact to address questions about SAS operations or information from the Commission, NTIA, and DoD.
- Nokia must demonstrate real-world application of interference reporting and timely interference mitigation processes, including providing FCC enforcement personnel with access to SAS data upon request.³⁴
- Once Nokia completes its ICD, it must submit an ICD Report to the Commission, according to its approved proposal format and including a demonstration of compliance with these conditions, as well as any outstanding issues identified in Nokia's lab test

²⁸ See, e.g., 47 CFR §§ 96.39, 96.55-59. ICD will not need to cover all test cases performed in ITS lab testing.

²⁹ See *3.5 GHz First Report & Order*, 30 FCC Rcd at 4028, para. 220 (stressing the importance of accurate CBSD geo-location for coordinating interactions between and among users in the band and for protecting Incumbent Users from harmful interference in compliance with Part 96). WinnForum has developed standards and a program to approve CPIs that successfully complete their training in the relevant Part 96 rules and the associated technical best practices, per the Commission's strong encouragement to multi-stakeholder groups and industry associations in the *See id.* at 4028-29, paras. 221-222.

³⁰ See 47 CFR § 96.55(d), 96.63.

³¹ See 47 CFR §§ 96.55(a)(2), 96.57, 96.59, 96.63(i).

³² See 47 CFR §§ 96.15, 96.17, 96.21, 96.57, 96.59; <https://www.ntia.doc.gov/fcc-filing/2015/ntia-letter-fcc-commercial-operations-3550-3650-mhz-band>.

³³ *ICD Proposals Public Notice*, 33 FCC Rcd at 7393, para. 7.

³⁴ See, e.g., 47 CFR §§ 96.53, 96.55.

report.³⁵

8. These conditions will ensure that Nokia will comply with the Commission's rules. Nokia will not receive final certification unless the conditions described in this *Public Notice* are met and such certification may be revoked at any time if Nokia fails to comply with the Commission's rules and guidance on an ongoing basis.

IV. NEXT STEPS

9. WTB/OET will oversee carefully Nokia's operations during the ICD period. WTB/OET, in coordination with NTIA and DoD, will review Nokia's ICD Report and will publicly announce if Nokia successfully completes ICD and receives final certification to operate a SAS.

10. After Nokia submits its ICD Report to the Commission, it may continue Initial Commercial Operations, subject to the conditions described in this *Public Notice*, during the review period and pending further Commission review. Nokia may expand operations seven business days after providing notice to the Commission, provided that such notice includes all information required by the *ICD Proposals Public Notice*. All ICD deployments must comply with all conditions listed above and contained in the *ICD Proposals Public Notice*.³⁶

11. If Nokia successfully completes ICD and receives final certification to operate, it will be allowed to make its SAS available for commercial use for the five-year term specified in our rules.³⁷ WTB/OET will publicly announce the availability of each SAS, at which time the five-year term will commence.

V. PROCEDURAL REQUIREMENTS

12. Nokia must file: (1) ICD Reports and any supplements; and (2) ICD notifications with the Commission using the Commission's Electronic Comment Filing System.³⁸ *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998). Nokia may request confidential treatment of information contained in its filings consistent with Section 0.459 of the Commission's rules.³⁹

13. Questions regarding this *Public Notice* may be directed to Paul Powell, Associate Division Chief, Wireless Telecommunications Bureau, Mobility Division at (202) 418-1613 or paul.powell@fcc.gov, or Navid Golshahi, Electronics Engineer, Office of Engineering and Technology, Policy and Rules Division at (202) 418-2422 or navid.golshahi@fcc.gov.

14. By the Chief, Wireless Telecommunications Bureau, and the Chief, Office of Engineering and Technology.

-FCC-

³⁵ *ICD Proposals Public Notice*, 33 FCC Rcd at 7394, para. 10.

³⁶ *ICD Proposals Public Notice*, 33 FCC Rcd at 7392-94, paras. 7-10.

³⁷ *See* 47 CFR § 96.63(e).

³⁸ While we will accept proposals electronically, we are not requesting public comment on the reports or notifications at this time.

³⁹ *See* 47 CFR § 0.459.