**IEEE P802.24**

**Smart Grid TAG**

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| Project | IEEE P802.24 Smart Grid Technical Advisory Group | |
| Title | Licensed Narrowband Amendment Draft PAR from 802.24 teleconference series | |
| Date Submitted | 2019-10-01 | |
| Source | Tim Godfrey (EPRI) |  |
| Re: | 802.24 TAG Teleconference 2019-08-05 | |
| Abstract | 2019-10-01 Teleconference discussion and PAR document development | |
| Purpose | Document meeting activity and action items. | |
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**P802.16t**

**Submitter Email:**

**Type of Project:** Amendment to IEEE Standard 802.16-2017

**PAR Request Date:** XX-November-2019

**PAR Approval Date:** XX-XXXX-XXXX

**PAR Expiration Date:** XX-XXXX-XXXX

**Status:** PAR for an Amendment to an existing IEEE Standard

**Root Project:** 802.16-2017

**1.1 Project Number:** P802.16t

**1.2 Type of Document:** Standard

**1.3 Life Cycle:** Full Use

**2.1 Title:** Standard for Air Interface for Broadband Wireless Access Systems Amendment: Fixed and Mobile Wireless Access in Channel Bandwidth up to 100 kHz

**3.1 Working Group:** Vertical Applications TAG (C/LM/WG802.24)

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**3.2 Sponsoring Society and Committee:** IEEE Computer Society/LAN/MAN Standards Committee (C/LM)

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**4.1 Type of Ballot:** Individual

**4.2 Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot:** November 2021

**4.3 Projected Completion Date for Submittal to RevCom** May 2022

**Note: Usual minimum time between initial sponsor ballot and submission to Revcom is 6 months.:**

**5.1 Approximate number of people expected to be actively involved in the development of this project:** 15

**5.2.a. Scope of the complete standard:** This standard specifies the air interface, including the medium access control layer (MAC) and physical layer (PHY), of combined fixed and mobile point-to-multipoint broadband wireless access (BWA) systems providing multiple services.

**5.2.b. Scope of the project:** This project specifies WirelessMAN Time Division Duplexing (TDD) operation in licensed spectrum with channel bandwidths greater than or equal to 5 kHz and less than 1.25 MHz. The amendment is frequency agnostic but focuses on spectrum less than 2 GHz. The project introduces amendments to the IEEE Std 802.16 as required to support narrower channel widths and other functionality as needed to support operation in adjacent and non-adjacent Private Land Mobile Radio (PLMR) channels. The range and data rate supported by the narrower channels are commensurate with those of the base standard, as scaled by the reduced channel bandwidth. The project adds a modified air interface protocol at the PHY and MAC layers.

**5.3 Is the completion of this standard dependent upon the completion of another standard:** No

**5.5 Need for the Project:** Mission critical entities have a strong preference for private, licensed networks in for their data communications needs. Licensed channels from 5 kHz to 1 MHz are available from the FCC and other regulators or in the secondary markets at a lower cost than commercial channels. Example operating frequencies include 160 MHz, 450 MHz, 700 MHz, and 900 MHz. The base standard, and thus this amendment, is not limited to specific operating frequencies. Furthermore, VHF/UHF channels have superior propagation characteristics requiring less infrastructure and are capable of meeting capacity needs of private networks. The amendment facilitates the development of innovative, cost-effective, and interoperable multivendor products for private licensed wireless access systems for mission critical networks. Applications include smart grids supporting generation, transmission, and distribution; field area networks; smart fields and smart pipes for oil and gas; intelligent transportation for rail systems; and federal, state and local uses for homeland security, environmental and seismic monitoring and military communications.

**5.6 Stakeholders for the Standard:** Stakeholders include users and customers in multiple markets, including electric, water, and natural gas utilities, oil and gas companies, transportation including commercial and public rail, and public sector entities including federal, state, and local governments. Stakeholders also include spectrum license holders, equipment and chipset manufacturers with an interest in standardized products to achieve economies of scale.

**Intellectual Property**

**6.1.a. Is the Sponsor aware of any copyright permissions needed for this project?** No

**6.1.b. Is the Sponsor aware of possible registration activity related to this project?** No

**7.1 Are there other standards or projects with a similar scope?** Yes

**If Yes, please explain:** Narrowband Internet of Things (IoT) is a standard of LTE included in 3GPP Release 13. NB-IoT is designed to operate in 180 KHz wide blocks of spectrum. As such, NB-IoT cannot operate when the continuous spectrum is less 180 KHz, e.g., a single PLMR channel, in multiple adjacent PLMR channels of less than 180 KHz or in non-adjacent PLMR channels. NB-IoT is limited to a standard list of frequencies and is not designed to meet FCC requirements that are applicable for PLMR frequencies. A NB-IoT sector is limited to the throughput associated with a 180 KHz channel and Quadrature Phase Shift Keying (QPSK) modulation which does not allow for high throughput applications. In NB-IoT, the remotes receive the entire sector channel and therefore are subject to in-band interference in a non-adjacent channel scenario. NB-IoT does not support vacating a PLMR channel upon detection of voice activity within the channel.

**and answer the following**

**Sponsor Organization:** 3GPP

**Project/Standard Number:** Release 13

**Project/Standard Date:** June 2016

**Project/Standard Title:** LTE Advanced Pro

**7.2 Joint Development**

**Is it the intent to develop this document jointly with another organization?:** No

**8.1 Additional Explanatory Notes:**

5.2.a In the names of the WirelessMAN PHY alternatives, OFDM is used to signify Orthogonal Frequency-Division Multiplexing, OFDMA is used to signify Orthogonal Frequency-Division Multiple Access, and SC is used to signify Single Carrier.

5.2.b TDD is an abbreviation for Time Division Duplex. The term “spectrum harvesting” refers to using non-adjacent channels combined to act as a single, larger channel.

5.4 The term "private wireless access" is used to describe wireless access systems in which the spectrum, infrastructure, and terminal devices are all privately owned by a business or entity for purposes other than offering the wireless access as a commercial product

7.1 Other standards and projects, including the one in 7.1, and others, such as IEEE 802.20, exhibit surface similarities to this focused amendment project, but are technically quite different.

7.1 The following abbreviations are used - 3GPP: 3rd Generation Partnership Project; LTE: Long Term Evolution; FDMA: Frequency Division Multiple Access; GMSK: Gaussian Minimum Shift Keying; OFDMA: Orthogonal Frequency-Division Multiple Access; IoT: Internet of Things.