July 16, 2019

To: IEEE 802 Executive Committee

Fr: Klaus Bender, PE
        Vice President, Engineering, Standards & Training
        Utilities Technology Council

The Utilities Technology Council (UTC) is a global association focused on the intersection of telecommunications and utility infrastructure. UTC has over 350 gas, water, and electric utilities as core members and over 200 associate members made up of equipment venders and consulting engineering firms. The council's primary focus has been matters related to telecommunications, both wireline and wireless. UTC has embraced and supported standards in order to promote interoperability of equipment for our utility members in the past. The UTC membership has expressed its desire to support the IEEE 802.16 standard, as discussed below.

The IEEE 802.16s amendment (and subsequently IEEE 802.16–2017) allowed for use of channel sizes down to 100 kHz enabling use of some spectrum bands available to mission critical industries. Mission critical industries, including utilities, oil & gas, rail, transportation, and government, have application requirements and access to spectrum bands that often offer less than 100 kHz channel bandwidth. It is the desire of these industries to revise the standard to include smaller channel sizes down to 12.5 kHz or even less. Additionally, addressing non-contiguous narrowband channels through carrier aggregation has been discussed as another possibility while revising the standard.

Meetings with communications equipment manufacturers, users, and industry stake holders have been held at various trade show venues including DistribuTECH (New Orleans, February 2019), International Wireless Communications Expo (Las Vegas March 2019), ENTELEC (Houston, April 2019), and Utilities Technology Council (Fort Worth, June 2019). In addition, users from the rail industry attended the UTC meeting to pledge their support for the standard, and further discussions with the American Association of Railroads (AAR) are being scheduled. The list of attendees from these meetings can be reviewed in attached documentation.

In addition to these two requests (narrower channel bandwidth and carrier aggregation), there are other user requirements that should be discussed and considered for inclusion in the standard. As the ecosystem has expanded since the IEEE 802.16 – 2017 release, the opportunity for more user input into the standard has also expanded.   This additional user input and the deeper engagement with mission critical industries will allow the standard to be expanded and appeal to a broader group of users and applications.

Input from user meetings include the following goals:

- An interoperable standard for wireless point to multipoint networks
- Frequency agnostic, but focused on spectrum below 2 GHz
- Channel sizes which include 12.5 kHz, 25 kHz, 50 kHz as well as possibly 5 kHz and 6.25 kHz
- Single carrier operation, and non-contiguous channel aggregation
- Provide a minimum of 6 bits/Hz spectral efficiency (64 QAM)
- Roundtrip latency of less than 30 ms for the minimum packet size
- Strong authentication and encryption at the wireless link layer

- Pricing similar to current proprietary solutions
- Link budget similar to the link budget of current solutions (don't lose anything by moving to a standard)
- Keep it simple to configure
- Common hardware platform
- Listen before transmit half duplex operation (if required, based on license)

It is intended to present a PAR and CSD for approval by the IEEE 802 Executive Committee at the November 2019 Plenary meeting. As there is no current standard that addresses data connections for these channel sizes, and since mission critical industries have limited spectrum options, it is imperative for the IEEE 802.16 working group to continue work and make a further amendment to the standard.

UTC will provide a supporting role for this effort, linking utility members unfamiliar with the standards process to the working group under IEEE that is actually doing the work. Working group leadership and membership is being developed by the stakeholders in this effort.

UTC is providing this introductory correspondence to facilitate moving forward with the proposed changes to the standard. Any additional information on this will be available at your request.

Sincerely,

Klaus Bender, PE
Vice President, Engineering, Standards & Training
Utilities Technology Council

Attendees at UTC National Conference - Ft. Worth Texas, June 2019

Name	Company
Alessandra Rocha	WiMax Forum
Daoud Serang	CML Microcircuits
Craig Tedrow	GE MDS
Leonhard Korowajezuk	Celplan
Cristine Crompton	Celplan
David Hattey	Lockard & White
Steven Maxwell	Lockard & White
Robert Finch	Select Spectrum
Zachary Thompson	Select Spectrum
Rod Kaufman	First Energy
Zach Smith	BNSF
Robert Burchard	Ondas Networks
Lon Renner	NPPD
Scott Hughes	GRE
Tim Godfrey	EPRI
Brett Kilbourne	UTC
Bob Saffari	Telewave
Kreg Christoff	Motorola Solutions
Daniel Quant	Multitech
Klaus Bender	UTC
Scott Schoepel	Motorola Solutions
Ryan Harfield	Entergy
Kathy Nelson	Ondas Networks