Hi Bob,

Below is a draft application list as compiled by Steve.  I will have to do a lot more R&D to get you technical performance requirements.  This probably will not be in time for your conference this week, but I will work on it.

**Anticipated FirstEnergy applications**

IEEE 802.16s GRIDMAN standard for critical infrastructure wireless communications

If a decision is made to proceed with use of the upper 700 MHz A Block spectrum at FirstEnergy, we anticipate the following applications to leverage this wireless communications media:

***Telecom Transition*** *(Migration from Leased Services to Private Networks)*: Where cost-effective, replacement of both wireline and wireless leased carrier circuits to existing substations and line devices that are currently communicating over 2/4-wire analog, DS0, DS1, Frame Relay, MPLS, cellular, and other leased services.  The primary applications (existing and new) included in this transition that may communicate over the 700 MHz frequency are:

         SCADA circuits

         Teleprotection circuits

         Dial-up modem lines (facility services, remote access, etc.)

         Security cameras (configured to communicated over reduced bandwidth)

         Remote thermal imaging cameras (configured to communicated over reduced bandwidth)

         Remote access to operational devices (relays, DFRs, etc.)

         Asset health monitoring (e.g. transformer monitoring)

Additional applications not associated with the Telecom Transition that may leverage this technology in the future:

         Distribution Automation / Volt-VAR Control (DA/VVC)

         Advanced Metering Infrastructure (AMI)

Thanks and enjoy Hawaii!

…Rod

**From:** Robert Finch [<mailto:rfinch@selectspectrum.com>]   
**Sent:** Wednesday, May 11, 2016 11:42 AM  
**To:** Osvath, Stephen P. <[osvaths@firstenergycorp.com](mailto:osvaths@firstenergycorp.com)>; [murphyr@fistenergycorp.com](mailto:murphyr@fistenergycorp.com); Kaufman, Rodney D <[rkaufman@firstenergycorp.com](mailto:rkaufman@firstenergycorp.com)>  
**Cc:** Tim Godfrey ([tgodfrey@epri.com](mailto:tgodfrey@epri.com)) <[tgodfrey@epri.com](mailto:tgodfrey@epri.com)>  
**Subject:** Request for potential applications and technical specifications to be supported by IEEE 802.16s GRIDMAN standard

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Stephen, Richard, Rod:

I enjoyed meeting you in Denver and will be back in touch separately about the potential uses of the upper 700 MHz A Block spectrum in your area.

This email relates to the IEEE standards effort for critical infrastructure wireless communications.  At its March meeting in Macau, China, the IEEE 802 Executive Committee approved the 802.16s GRIDMAN Project Approval Request “PAR” and Criteria for Standards Development “CSD”.  I’ve spoken with Tim Godfrey of EPRI (leader of the GRIDMAN Working Group), and he agrees that one of the next key steps is to gather technical and applications requirements from potential users of the standard.  (See attached Call for Contributions).  Since your company may in the future consider buying GRIDMAN standard equipment, and may stand to benefit from the standard through reduced cost, increased interoperability, and functionality to match your company’s requirements, I ask you to consider submitting on or more lists of applications that you would like to see supported on this “wideband” wireless standard.

Example uses may include:

1.            Replacement for cancelled or expensive wireline solutions

2.            Upgrades of network capacity to support Smart Grid or NERC CIP requirements

3.            Installation or upgrades of enhanced SCADA, Distribution Automation or Substation Automation connections.

4.            And any other critical-infrastructure related use of licensed wireless networks below 1 GHz.

In addition to general applications descriptions, please consider supplying technical parameters including: required range, bit rate, number of sites, interfaces, required latency or jitter and other technical parameters.

At this point, we are just gathering ideas about requirements, so please feel free to cut and paste from existing documents.  The format is not important, and there will be more time later to consider additional needs, but the working group has proposed a fast schedule, so whatever you can provide by Friday, May 13, would be greatly appreciated.

Thank you,

Bob

Robert Finch

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