**IEEE P802.15**

**Wireless Personal Area Networks**

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| Re: | [Proposed text on 15.4m for Smart Grid White Paper] |
| Abstract | [Working document] |
| Purpose | [] |
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802.15.4m amendment specifies a physical layer definitions and MAC layer extensions for 802.15.4 enabling operation according to TV white space regulatory requirements in various regulatory domains. The standard enables operation in the VHF/UHF TV broadcast bands between 54 MHz and 862 MHz, supporting typical data rates in the 40 kbits per second to 2000 kbits per second range, to realize optimal and power efficient device command and control applications.

The alternate PHYs support principally outdoor, low-data-rate, wireless, TV white space (TVWS) network applications. The TVWS PHYs are as follows:

— Frequency Shift Keying (TVWS-FSK) PHY

— Orthogonal Frequency Division Multiplexing (TVWS-OFDM) PHY

— Narrow Band Orthogonal Frequency Division Multiplexing (TVWS-NB-OFDM) PHY

802.15.4m TVWS devices are expected to operate indoors and outdoors at frequencies from 54 to 862 MHz. Frequency availability varies by location and time. Frequency management is done using centralized coordination databases. Regulatory authorities have established operating and access rules in North America, EU, UK, parts or Asia and other regions.

The frequency band and transmit power limits available in TVWS operation typically allow radio range up to several kilometers. 802.15.4m leverages features of 802.15.4, such as narrow band channelization, inherently low duty cycles, and favorable coexistence characteristics enable scalability to large network topologies. For example in some regions the TVWS channel allocation is made in 6 to 8 MHz per TVWS channels, which using 802.15.4m narrow band PHYs allows for many PHY channels to be used in a single TVWS channel which enables support for high device density. The 802.15.4 MAC security features may be used to meet the confidentiality requirements imposed in some regulatory domains for exchange of channel availability information.

802.15.4m PHYs provide features to improve link reliably such as forward error correction, multiple modulation and coding schemes as well as existing features of the standard such as 32-bit frame check sequence, and acknowledged frame exchange with automatic retransmission.