

Before the
Federal Communications Commission
Washington DC 20554

In the Matter of)	
)	
Amendment of Parts 2, 15, 80, 90, 97, and 101)	
of the Commission’s Rules Regarding)	
Implementation of the Final Acts of the World)	ET Docket No. 15-99
Radiocommunication Conference (Geneva,)	
2012)(WRC-12), Other Allocation Issues, and)	
Related Rule Updates)	

REPLY COMMENTS OF THE UTILITIES TELECOM COUNCIL

The Utilities Telecom Council (“UTC”) hereby files the following reply comments in response to the Commission’s Notice of Proposed Rulemaking in the above-referenced proceeding.¹ The record reflects general agreement around the interference characteristics between utility PLC systems and Amateur operations. Based on the data, the ARRL appears to agree with the Commission’s proposal to require 1 km separation between PLC and Amateur 1 Watt/200 km AGL operations. Further, ARRL fundamentally agrees with the concept of providing utilities with advance notice of such operations. Given the remarkable degree of agreement on the record, UTC urges the FCC to adopt the proposed technical restrictions. As more fully described below, where there is disagreement on the record, UTC urges the Commission to refrain from any further allocation of the spectrum in the 472-479 kHz band for Amateur operations and to adopt processes and procedures, as well as to elevate the status of PLC systems in order to protect against the potential for interference between secondary Amateur operations and PLC systems.

¹ Amendment of Parts 2, 15, 80, 90, 97, and 101 of the Commission’s Rules Regarding Implementation of the Final Acts of the World Radiocommunication Conference (Geneva, 2012)(WRC-12), Other Allocation Issues, and Related Rule Updates, ET Docket No. 15-99, *Report and Order, Order and Notice of Proposed Rulemaking*, 30 FCC Rcd 4183, FCC 15-50 (rel. April 27, 2015) (“NPRM” or “WRC-12 Notice”).

I. The Commission Should Refrain from the Allocation of the 472-479 kHz Band at This Time, and Should Adopt its Proposed Limitations on Operations in the 135.7-137.8 kHz Band.

ARRL's main divergence from UTC is on the issue of the allocation of the 472-479 kHz band. ARRL supports the allocation, while UTC opposes it at this time. ARRL offers only conclusory statements to support the allocation of the 472-479 kHz band. What little technical support ARRL offers is bootstrapped to evidentiary support for Amateur operations in the 135.7-137.8 kHz band, and even ARRL concedes that its study "did not address the [472-479 kHz band] or operations at 5 watts EIRP now proposed in the instant *Notice*."² The studies that ARRL have cited in support of the 135.75-137.8 kHz are based upon modeling and not upon actual measurements. To be sure, modeling is useful, but it is not a substitute for nor is it as accurate as actual measurements. In any event, ARRL offers very little technical information in support of the proposed allocation at 472-479 kHz, and as such there is no technical basis for its assertion that the power level proposed by the Commission at 472-479 kHz is a "non-issue".³

UTC opposes the allocation of the 472-479 kHz band at this time because there is simply insufficient understanding about the interference potential between Amateur operations and PLC systems. UTC reiterates that opening up the 472-479 kHz band as well as the 135.7-137.8 kHz band to Amateur operations will only increase the probability of interference to and from PLC systems. UTC also reiterates that allocating the 472-479 kHz band would unnecessarily constrain utility access to the band, thus depriving them of the flexibility they would need to deploy PLC systems. Finally, it is worth noting that PLC systems that use the 472-479 kHz band are more likely to be used for distribution lines, where they are likely to be in proximity to residential areas.

² Comments of the ARRL at 14.

³ *Id.*

Given the importance of PLC systems to protecting the grid against faults and outages, it would be reasonable to take a phased-in approach to permitting Amateur operations. In that regard, UTC supports the comments on the record by Amateur operators who support a phased-in approach for Amateur access to the bands, and who recognize the need to work together with utilities.⁴ There simply is not enough experience with Amateur operations to understand the interference potential between co-channel Amateur operations and PLC systems in the 472-479 kHz band.

While there have been experimental licenses granted for Amateur operations in this band, it is unclear whether and to what extent these operations were located within 1 km of a PLC system, let alone whether a nearby PLC system used frequencies in the same band. Moreover, these experimental operations were not authorized for the purpose of determining the interference potential between Amateur operations and PLC systems. Apart from generalized statements on the record that such Amateur operations did not result in interference complaints from utilities, there is nothing specific upon which to conclude that there is no potential for interference between Amateur operations and PLC systems, even if they are geographically separated by 1 km and are subject to antenna height and power restrictions.⁵ Moreover, UTC reminds the Commission that many PLC systems operate on an exception basis, and that therefore, utilities may not be aware of interference from Amateur operations – undercutting any

⁴ See e.g. Comments of James Edward Whedbee at 1 (urging that Amateur operators “be conciliatory to the electrical power companies”, and stating that “I strongly advise that Amateur Radio enter in the 2200 meter band on a phased basis, with Amateur Extra Class operators being the first to use the band, then the Advanced Class, then General.”) See also Comments of and Omnibus Informal Request by James E. Whedbee at 1 (recommending a phased entry of amateur radio into these new radio bands, and prohibiting portable and mobile amateur radio operations.)

⁵ See e.g. Comments of the ARRL at 36 (“ARRL is unaware of any reports of interference to PLC systems arising from operation conducted pursuant to numerous Part 5 experimental licenses issued by the Commission to radio Amateurs in the large band utilized by PLCs, or otherwise.”)

conclusions that might be drawn by the absence of interference complaints. Therefore, UTC reiterates its position that the Commission should refrain from allocating the 472-479 kHz band, at least until such time that there is more real-world experience about the interference potential between Amateur operations and PLC systems.

There is general support on the record for adopting the Commission's proposals for limiting Amateur operations in the 135.7-137.8 kHz to 1 watt EIRP, as well as limiting the antenna height to 200 feet AGL and separating Amateur operations from PLC systems by 1 km. While there is some opposition to the proposed restriction against mobile and portable Amateur operations, UTC believes that such a prohibition is necessary and appropriate at this time. There is support even from among Amateur operators for the prohibition against mobile and portable operations.⁶ Given the general support for the Commission's proposed limitations on Amateur operations, UTC recommends that the Commission adopt these limitations for Amateur operations in the 135.7-137.8 kHz band.

II. The Commission Should Require Amateurs to Provide Notice and Obtain Concurrence Prior to the Commencement of Operations, and Utilities Should Not be Obligated to Modify PLC Systems to Accommodate Amateur Operations.

ARRL also diverges with UTC on the process by which to mitigate the potential for interference. First, ARRL would permit the radio Amateur to operate after 30-day advance notice, absent an objection with an explanation/technical justification from the utility or UTC. Further, ARRL would obligate utilities to use alternate frequencies for PLC systems in order to mitigate potential interference between PLC and Amateur operations.⁷

⁶ Comments of James E. Whedbee at 3. This is consistent with the Commission's proposal in the NPRM. *See NPRM* at ¶168 (stating "we propose to limit amateur stations to operations at fixed locations only to ensure that this separation distance can be maintained reliably.")

⁷ Comments of the ARRL at 16 (stating that "the available remedies in such rare circumstances [of potential interference] should include use by the utility of alternate frequencies for the PLC system...").

UTC believes that the Commission should not permit Amateur operations within 1 km of a transmission line unless it has obtained the affirmative concurrence from the utility to do so. Failure to respond within a 30 day time period should not give Amateur operators the green light to operate; instead, there should be put in place an escalation process. This should not represent an undue burden, particularly if there are as few Amateur operations in the band, as ARRL predicts. Conversely, it will help to ensure protection against the potential for interference between Amateur and PLC systems, because it will guard against the possibility that utilities may miss the notification of the Amateur operation and the possibility that the commencement of such operations in the proximity of a co-channel PLC system without the use of any mitigation techniques would cause harmful interference. As such, UTC respectfully recommends that the Commission require that Amateurs provide notification and obtain concurrence from utilities prior to commencing operations in the band or bands used for PLC systems.

UTC also believes that utilities should not be obligated to use alternative frequencies for PLC systems in order to accommodate Amateur operations. To be sure, utilities may choose to use alternative frequencies, but they should not be obligated by the Commission or Amateur operations to do so. As has been described on the record, and as explained below, retuning PLC systems is not a simple matter and can involve significant time and expense. Conversely, it should be a relatively simple matter for Amateur operators to modify their operations in order to mitigate the potential for interference between Amateur operations and PLC systems. Amateurs have no existing systems that would require retuning, such that there might be stranded investment. Further, modifying Amateur operations would only involve one or a handful of sites in one general location; whereas PLC systems can stretch for miles and retuning them would affect many transmitters all along the line. Finally, PLC systems should not be disturbed, given

the impact that this could have on electric delivery and reliability.

ARRL makes certain inaccurate assumptions and conclusions about the tolerance of PLC systems. Specifically, it asserts that PLC systems in the 135.7-137.8 kHz range use carrier-sense, multiple-access protocol (CSMA), and that this listen-before-transmit protocol would necessarily mean that PLC systems “can tolerate having to wait occasionally without causing significant harm to the desired operation of the device or system.”⁸ UTC has previously contradicted this assertion by pointing out that PLC systems in the U.S. are not subject to CENELEC requirements, and further those CENELEC requirements apply to PLC systems that are used for distribution (i.e. not transmission) PLC systems that connect to the home. Moreover, PLC systems are highly *intolerant* of latency, such as latency that would be caused by interference from Amateur operations. They must be able to operate within milliseconds in order to isolate faults from cascading across the transmission grid. As such, the Commission should not be misled to believe that PLC systems would be tolerant of harmful interference from Amateur operations.

Moreover, it is not a “simple matter” for utilities to retune PLC transmitters, as ARRL asserts. PLC systems operate on multiple frequencies which are selected by the utility to coordinate with each other; any retuning of a PLC transmitter frequency has an impact up and down the line on the other transmitters and receivers. In addition, the selection of frequencies can be limited by various factors, including coordination with Federal government operations. As such, finding another available frequency is not as easy as the ARRL asserts.

As such, if a utility objects to Amateur operations near its PLC systems, the burden

⁸ *Id.* at 23.

should not fall on the utility to justify its objection, as the ARRL proposes.⁹ Instead, the parties should work together to modify the proposed Amateur operations in order to mitigate the potential for interference. Under the framework that the Commission proposes to establish, “Amateurs will not be able to use their allocation status to force unlicensed PLC operations out of the band, and utilities will have no cause to abandon or incur large costs to modify existing PLC systems.”¹⁰ Forcing utilities to modify their systems and/or to provide an exhaustive technical justification for their objection to an Amateur operation, as ARRL suggests, would have the practical effect of displacing utilities and shifting unnecessary burdens and large costs onto utilities. For all of these reasons, Amateur operations should be obligated to work around around PLC systems, and utilities should not be obligated to modify PLC systems to accommodate Amateur operations.

III. The Commission Should Elevate the Status of PLC Systems

UTC reiterates its request that the Commission elevate the status of PLC systems in order to ensure grid reliability. As UTC explained, this is a reasonable request in light of the entry of Amateur operations in the band or bands that utilities use for PLC systems. This is so, because utilities are able to guard against interference from other radio operations, because their operations are coordinated with federal government operations in the band. As such, interference with federal government operations is avoided through coordination.

However, the introduction of Amateur operations into the 135.7-137.8 kHz without any coordination would introduce the threat of interference to a much greater extent than currently

⁹ Comments of the ARRL at 20, 37 (requiring that utilities provide within 30 days clearance to proceed, or an explanation with a technical justification for any objection or proposed modification of the planned Amateur operation based on actual calculations.)

¹⁰ NPRM at 4196, ¶26.

exists. Moreover, the magnitude of the risk and probability that it would occur would be greater, because there are likely to be a large number of Amateur operations in the band, which would increase the likelihood of interference. Unlike federal operations, these Amateur operations are not discrete and readily identified; but instead can operate on a fixed or mobile basis anywhere in the country.

Interestingly, there is support on the record from Amateur operators for elevating the status of PLC systems. “Control and monitoring of the power grid is a serious business and warrants more than an unlicensed part-15 communications system. Infrastructure PLC systems should become a recognized radio service. This (in contrast to the part 15 rules will entitle them to protection from interference.”¹¹ By elevating the status of PLC systems, it would help to protect them from interference; otherwise, the PLC systems would be required to suffer with interference from other licensed operations, such as secondary Amateur operations, or they would be forced to modify or shut down operations altogether if they caused interference to a licensed operation.¹² UTC would therefore support elevating PLC systems to a higher status above unlicensed operation so that they would be on the same level as secondary Amateur operations in the band.

CONCLUSION

UTC remains concerned about the potential for interference from Amateur operations on frequencies that utilities use for PLC systems. UTC supports the Commission’s decision to take a “measured and deliberate approach to the introduction of licensed amateur operations into the band,” under which “Amateurs will not be able to use their allocation status to force unlicensed

¹¹ Comments of Frederick H. Raab at 2 (filed Aug. 31, 2015).

¹² See 47 C.F.R. §15.113. See also 47 C.F.R. §15.5.

PLC operations out of the band, and utilities will have no cause to abandon or incur large costs to modify existing PLC systems.”¹³ More specifically, UTC agrees with the Commission’s decision to defer from authorizing amateur operations in the 135.7-137.8 kHz band until the rules for their operation are developed through the WRC-12 Notice.¹⁴ UTC also agrees with the Commission’s proposal to avoid interference by establishing a separation distance between PLC and Amateur operations.¹⁵

Specifically, UTC supports the proposed separation distance of 1 km between PLC systems and Amateur operations in the 135.7-137.8 kHz band. UTC support supplementing this separation distance by placing a 1 watt limit on EIRP and a 200 foot restriction on antenna height, as well. Finally, UTC urges the Commission to elevate the status of PLC systems relative to Amateur operations. This is appropriate given the relative importance of PLC systems and the experimental nature of the proposed Amateur operations in the band. In addition, it will not affect the allocation for amateur operations; but will help to ensure that PLC systems won’t be affected by the allocation.

The comments on the record generally support the technical restrictions on Amateur operations, including restricting Amateur operations to only fixed operations and prohibiting portable and mobile operations. UTC supports the comments that encourage amateurs to work together with utilities to avoid the potential of interference between Amateur operations and PLC systems. UTC also supports the comments that recommend a phased approach to the introduction of Amateur operations into the band or bands that are currently used by utilities for

¹³ *Id.* at 4196, ¶26.

¹⁴ *Id.*

¹⁵ *See Id.* at 4243, ¶168 (stating that “the cornerstone of the technical rules we are proposing is physical separation between amateur stations and the transmission lines upon which PLC systems may be present.”)

PLC systems. Finally, UTC supports the comments that support elevating the status of PLC systems, consistent with the comments of UTC. In sum, these comments recognize the importance of PLC systems and are sensitive to the need to minimize the disturbance to PLC systems.

In order to manage the introduction of Amateur operations into the bands that are used by utilities for PLC systems, UTC opposes any flash-cut introduction of Amateur operations into the 472-479 kHz band at this time. In addition, UTC opposes any comments that would propose to displace PLC systems in the 135.7-137.8 kHz band (or in the 472-479 kHz band, if the FCC allocates that band for Amateur operations) or which would force utilities to modify their systems to accommodate Amateur operations. Any modification of PLC systems should be voluntary. Utilities are interested in coordinating their PLC systems with Amateur operations in order to ensure PLC systems are not subject to interference, and the process for coordinating those operations should not impose unnecessary burdens or large costs on utilities which would have the practical effect of displacing utilities from the bands that they use for PLC systems.

As UTC explained in its comments, PLC systems are a mainstay of utility protective relaying. The PLC systems must be able to instantly isolate a fault on the electric grid; otherwise the fault may cascade and widespread outages and damage could occur. Interference to PLC systems could prevent them from actuating in time to isolate such a fault. PLC systems continue to be widely used by utilities, as both a primary and secondary means of protecting the electric grid.

The Commission should require Amateur operations to coordinate with PLC systems prior to operation. Utilities need to have prior notice before an Amateur commences operation so that they can work together to ensure coexistence from the start – not after interference has

occurred. Utilities must ensure that PLC systems won't receive interference and that their PLC interference does not interfere with Amateur operations. Otherwise, safety and operational reliability will be compromised. Coordination of PLC systems with Amateur operations at the outset will help to avoid the potential of interference, and is a reasonable measure that would not impose any undue burden on Amateur operations.

UTC remains ready to work with the Commission to develop a coordination process under which Amateur operations could notify utilities about their proposed operations and work together in order to achieve the proper distance separation, power and antenna height, based upon the parameters of the Amateur operations and PLC systems. Such a process could overcome some of the practical difficulties that the Commission has identified, such as the inability of Amateur operators to know whether a power line is a transmission or distribution line and whether a PLC system is operating on that line.¹⁶ By coordinating with the utility, the Amateur operator will be able to ensure that the proposed Amateur operation is sufficiently separated in distance from PLC systems, and that it is operating at the right power and antenna height where it would not cause or receive interference to or from PLC systems.

¹⁶ *Id.* at ¶176 (inviting comment on “whether amateur licensees will be able to identify the transmission lines in their locality,” and asking whether the FCC should “require amateurs or ARRL to affirmatively verify the locations of transmission lines with utilities or UTC before an amateur station begins transmitting.”)

UTC appreciates the opportunity to file its reply comment on the record, and looks forward to working with the Commission to develop a coexistence mechanism for PLC systems and Amateur operations to share the 135.7-137.8 kHz band.

Respectfully,

Utilities Telecom Council

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