

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	
Amendment of Parts 1, 2, 15, 25, 27, 74, 78, 80, 87, 90, 97 and 101 of the Commission’s Rules Regarding Implementation of the Final Acts of the World Radiocommunication Conference (Geneva, 2007) (WRC-07), Other Allocation Issues, and Related Rule Updates)	ET Docket No. 12-338 (Proceeding Terminated)
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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
)	
Petition for Rulemaking of ARRL to Amend Parts 2 and 97 of the Commission’s Rules to Create a New Medium Frequency Allocation for the Amateur Radio Service)	
)	

To: The Commission

***EX PARTE* STATEMENT OF ARRL, THE NATIONAL ASSOCIATION
FOR AMATEUR RADIO**

ARRL, the national association for Amateur Radio, formally known as the American Radio Relay League, Incorporated (ARRL), by counsel, hereby respectfully submits a written *ex parte* statement relative to the *Notice of Proposed Rule Making* portion of the *Report and Order, Order, and Notice of Proposed Rulemaking*, FCC 15-50, 30 FCC Rcd. 41835, released April 27, 2015 (the *Notice*). This statement is further to the comments and reply comments previously submitted in these proceedings by ARRL, addressing the specific subject of notification

procedures that may be under consideration for the new Amateur Radio Service Low-Frequency (LF) and Medium-Frequency (MF) domestic allocations¹ and the service rules for those new Bands addressed in the *Notice*. ARRL states as follows:

1. ARRL has been made aware that the Commission is soon to consider a *Report and Order* in this proceeding that will specify service rules applicable to the 2200-meter band, and which may firm up the domestic allocation of the 630-meter band to the Amateur Service and adopt service rules governing that allocation as well. Among the regulatory provisions under current consideration for both bands is a possible notification requirement by some radio Amateurs to the utilities which operate PLC systems, prior to commencement by the Amateur station of operation in one or both of the subject bands. ARRL does not object to such a notification requirement, provided that it is appropriately circumscribed, not overbroad in its applicability, and not overly burdensome for radio Amateurs to comply with.

2. The *Report and Order* released with the *Notice* in this proceeding added a secondary allocation for the Amateur Service of the 2200 meter band which limited Amateur stations in the band to a maximum radiated power of 1 Watt EIRP. The *Notice* asked for suggestions for Part 97 service rules for that Band. The *Notice* also proposed to allocate the 630 meter band to the Amateur Service on a secondary basis and with that Part 2 allocation proposed a footnote, RR 5.80A, which would limit U.S. amateur stations to a maximum power of 5 Watts EIRP in that band. The *Notice* also asked for comment on service rules for amateur stations that promote compatibility with Power Line Carrier (PLC) systems in both bands, assuming those parameters.

3. The comments of the Utilities Telecom Council (UTC) filed on or about August 31, 2015 asked that there be “quasi-coordination” (apparently with UTC) required for Amateur

¹ These include the 135.7-137.8 kHz (2200-meter) band; the 472-479 kHz (630-meter) band.

station operation at 2200 meters prior to commencement of operation.² UTC claimed that it was ready to work with the Commission to “develop a process under which Amateur operations could notify utilities about proposed operation and work together to achieve the proper distance separation, power and antenna height based on parameters of Amateur operations and PLC systems.” UTC, however, made no proffer as to how an Amateur station might know how the process might work. For example, it made no suggestion of a means to determine which transmission lines are carrying PLC or which PLC-carrying transmission lines make use of either of the two Amateur allocations. Neither did UTC offer to provide that database information to ARRL or to Amateur radio operators generally to allow them to make that determination for themselves.

4. ARRL is very much concerned that this vague reference of UTC to a notification procedure might lead to the Commission’s adoption of an overbroad notification requirement for Amateur Radio operators who intend to operate in either of these bands. As ARRL noted in its Reply Comments in this proceeding, it is well-established that PLCs operate as unlicensed devices and without allocation status. Footnote US2 currently reads as follows:

In the band 9–490 kHz, electric utilities operate Power Line Carrier (PLC) systems on power transmission lines for communications important to the reliability and security of electric service to the public. These PLC systems operate under the provisions of 47 CFR part 15, or Chapter 8 of the *NTIA Manual*, on an unprotected and non-interference basis with respect to authorized radio users. Notification of intent to place new or revised radio frequency assignments or PLC frequency uses in the band 9–490 kHz is to be made in accordance with the Rules and Regulations of the FCC and NTIA, and users are urged to minimize potential interference to the extent practicable. This footnote does not provide any allocation status to PLC radio frequency uses.

Footnote US2 is quite clear that PLC systems operating in the band 9-490 kHz are unprotected as against any licensed service, and their regulatory status is and has been firmly established for

² UTC made no suggestion for service rules with respect to the 630-meter band because it opposed the allocation generally.

many years. The Commission has clearly stated its intention to not confer any allocation status on PLCs.

5. Nevertheless, ARRL has stated its willingness to accept: (1) distance separation criteria between Amateur stations operating at 2200 or 630 meters and PLC-carrying transmission lines making use of part or all of either band (outside of which there is no interference potential and no justification for any regulatory obligation on Amateur stations relative to PLCs); and (2) in those few instances in which an Amateur station may wish to operate in one of the two small subject bands within close proximity to a PLC-carrying transmission line which is using either of those subject bands, a notification process. Accordingly, ARRL's Reply Comments in this proceeding contained the following plan for compatibility between Amateur stations and incumbent³ PLC systems using the 2200-meter or 630-meter bands:

A. PLCs and Amateur stations do not in general operate in the same geographic areas. PLCs are restricted to operating only on *transmission* lines [per 47 C.F.R. § 15.3(t)] and, as the *Notice* states, "therefore, in general, do not operate in residential areas." Because the Amateur Service is expected to use the 2200-meter and 630-meter bands principally for experimental purposes (and thus non-intensively) from the licensees' residences in most cases, there is an inherent geographic separation between the two uses.

B. There is no evidence anywhere in the record in this proceeding, or in Docket 12-338, or otherwise to ARRL's knowledge that Amateur stations operating *further than 1 kilometer* from PLC-carrying transmission lines have any co-channel interference potential whatsoever. The NTIA TR-85-181 Study⁴ evaluated the compatibility of PLC systems and relatively high-powered licensed transmitters operating in the same

³ PLC systems installed in either the 2200-meter or 630-meter bands *after the effective date of a Report and Order in this proceeding* should not be entitled to protection from Amateur stations operating in accordance with adopted technical rules in those segments. Indeed, this is the very latest date after which PLCs using either of the two subject bands or any portion thereof should be entitled to any interference consideration by radio amateurs at all. Utilities have known since the end of WRC-07 (in the case of 2200 meters) and since WRC-12 (in the case of 630 meters) that these allocations had been added to the international Table. Utilities should not be entitled to protection between the respective dates of those conferences (or, more generously, the effective dates of the respective Final Acts of those conferences) and the effective date of a future Report and Order. While the Commission cannot apply its rules retroactively, it is inescapably true that UTC and utilities have had years of notice that a new, low power licensed service was going to be introduced into these two, very narrow segments and that utilities should avoid new installations using either band.

⁴ Andrew Farrar et al., *Evaluation Techniques—Fixed Service Systems to Power-Line-Carrier Circuits*; NTIA Report 85-181 (1985).

frequency range as PLC systems. This study indicates that the potential for interference to PLCs is very low overall, and the only area for any concern whatsoever are those Amateur stations that may be located closer than 1 km to an existing transmission line carrying PLC signals *in that frequency range*.

C. The likelihood of an Amateur station conducting operations in the 2200- or 630-meter bands from a fixed station located less than 1 kilometer from a PLC-carrying transmission line upstream from a distribution substation is exceptionally low.⁵ Many transmission power lines do not carry PLC at all. Most PLC systems do not use the very small Amateur allocations at 2200 or 630 meters. And finally, the experimental purpose of these bands for radio amateurs and the concomitant fact that all equipment and antennas must be constructed by the licensees themselves leads to the conclusion that Amateur use of the small frequency bands for the foreseeable future will be relatively low compared to other Amateur allocations.

D. Contributing to the level of compatibility is the fact that PLC systems are required by Commission rule to “adhere to industry approved standards designed to enhance the use of power line carrier systems.”⁶ PLC systems are or can be frequency agile (either using software-defined radio equipment or by simply notching small segments of the 9-490 kHz band). PLC system design in compliance with the immunity standard IEEE-1613-2009 ensures no interaction between Amateur Stations and PLC systems in this range, even if the latter were operated on a co-channel basis. PLC devices sold to utilities and placed within substations since 2002 have been subject to this standard.

Given the foregoing, any notification procedure should be applicable only in those exceptionally rare and few instances in which an Amateur 2200-meter or 630-meter station might plan to operate within a kilometer of a PLC-carrying transmission line which makes some use of either Amateur allocation. It would be an unreasonable regulatory burden to require more than this, and there is no record justification for a requirement that all radio Amateurs who wish to operate in these bands to have to participate in a notification process.

⁵ Amateur stations must avoid high ambient noise areas in order to make use of the LF, MF or HF bands generally. They will therefore not locate LF stations near transmission lines, because the noise from the lines (whether or not related to PLC) will inhibit or preclude two-way Amateur communications or reception of propagation beacons in the LF allocation in close geographic proximity to the line. Electrical noise on transmission lines is radiated more efficiently than is the PLC signal, generally making the noise environment near the lines high enough that Amateur operation in the immediate vicinity of the power lines is unlikely due to preclusive noise at the Amateur receiver.

⁶ See, 47 C.F.R. §15.113(e).

6. ARRL's proposed plan for a circumscribed notification procedure is similar to the procedure envisioned by UTC in its comments, except that the recipient(s) of any notification must be limited to those utilities which are, as of the effective date of a *Report and Order* in this proceeding, actually operating PLC systems on transmission lines that pass nearer than one kilometer from the planned fixed or temporary fixed operating site of the Amateur station, on frequencies such that the occupied bandwidth of the PLC signal actually overlaps either the 2200-meter band or the 630-meter band. It is reasonable for the Amateur station to provide advance notification to UTC of the intent to operate under those circumstances. It is completely unnecessary and unhelpful on the other hand to impose a notification requirement on an Amateur licensee if the transmission line that the Amateur identifies as being nearer to the Amateur station than one kilometer either is (1) not carrying PLC at all, or (2) carrying PLC but is making no use of part or all of either 135.7-137.8 kilohertz or 472-479 kilohertz. It is only where all three elements (less than 1 kilometer separation, transmission line carrying PLC, PLC use of 2200 or 630 meters) are present that there is any chance at all of any interaction.⁷ UTC, because it has (or is supposed to have)⁸ information as to which transmission lines are now carrying PLC and on what frequencies, should make available to ARRL or to the general public a list of the transmission lines carrying PLC in these two frequency ranges. If that is done, the Commission

⁷ UTC is in agreement with ARRL that it is not necessary to impose any distance restrictions on Amateur stations proximate to PLC-carrying transmission lines where Amateur allocations are not used or overlapped by the PLCs. At page 6 of its comments, UTC states as follows: "UTC also supports restrictions on Amateur operations in the 135.7-137.8 kHz band, as proposed by the Commission. Specifically, UTC supports restricting Amateur operations in the 135.7-137.8 kHz band from a distance of at least 1 km *from a PLC system operating in the 135.7-137.8 kHz band.*" (emphasis added).

⁸ A power utility operating a PLC system is required to submit the details of all existing systems plus any proposed new PLC systems or changes to PLC existing systems to an "industry-operated entity." 47 C.F.R. §§ 15.113(a), 90.35(g). Currently, UTC acts in this capacity. The provisions of 47 C.F.R. § 90.35(g) are repeated in the *NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management* (the "NTIA Redbook"), at § 8.3.27. Assuming that these procedures are followed by utilities operating PLC systems and that the database is current as per the Commission's Rules, it can be concluded that the location and characteristics, operating frequency, and bandwidth of each and every PLC system in the United States is known to UTC and knowable by others and it can and should be used for notification purposes.

might reasonably require that an Amateur station notify the relevant utility if an Amateur station wishes to operate in either of the two bands within one kilometer of a PLC-carrying transmission line where either band is in use by that PLC system.

7. It is anomalous for the Commission to require notification of a licensed service's operations to a representative of, or directly to users of unlicensed, unallocated low power RF devices, and especially unintentional radiators. However, it could be practical in this unique instance to implement a limited notification plan due to the exceptionally low likelihood of an Amateur Station experimenting with LF communications being located at distances of less than 1 kilometer from a power line carrying PLC and using these small frequency segments. It is not difficult for an Amateur station to identify a transmission line (which might be carrying PLC) versus a distribution line (which will not be carrying PLC) due to the presence or absence of step-down transformers. Amateur Radio operators are sophisticated users of the radio spectrum and are fully capable of making such determinations. It is a simple matter to precisely determine the distance of an Amateur station from the nearest transmission line using Google Maps or other online tools. ARRL would be pleased to provide educational material to assist Amateurs in making such determinations. Thereafter, ARRL would be pleased to assist the Amateurs in determining which short-spaced transmission lines (if any) are carrying PLC on frequencies that include portions of either the 2200-meter or 630-meter band, provided that UTC make that information available to ARRL.

8. Once a notification to UTC is made, however, as ARRL noted in its comments, the burden should shift to the utility to make a supported technical showing within a reasonable time (30 days would be more than sufficient) demonstrating quantitatively that there will be harmful interference to PLC operations that existed before the effective date of any *Report and Order* in

this proceeding from the operation of the properly operating Amateur station. The parties can resolve any interference concerns cooperatively thereafter without necessitating the expenditure of Commission resources.

9. ARRL urges that the foregoing plan be implemented. It would be clear regulatory overkill for the Commission to subject all Amateur Radio stations wishing to operate in either or both of these bands to the obligation to provide notification to UTC before operating in either band; nor would it be reasonable to call for such notification by even those Amateur stations located within one kilometer of a transmission line. The chances that a particular transmission line (1) is carrying PLC, and (2) makes use of either of these small bands are extremely small.⁹ A blanket notification requirement applicable to all radio Amateurs creates the potential for arbitrary objections by a utility or by UTC and it is completely unnecessary in all but a very small number of cases.

Given the foregoing, ARRL again urges that the Commission proceed with the allocation for the 630-meter band as proposed in the Notice; it urges the Commission to reject UTC's inchoate proposal to "elevate" the status of PLC's in the 9-490 kilohertz band; and the Commission should implement a notification procedure for those Amateur stations which are to be located within one kilometer of a transmission line carrying PLC and where the PLC system

⁹ This is because (1) many transmission power lines do not carry PLC at all; (2) most PLCs do not use the very small Amateur allocations at 2200 or 630 meters; and (3) the purpose of this band for radio amateurs is experimentation; all equipment and antennas must be constructed by the licensees themselves. Therefore the Amateur use of the bands for the foreseeable future is expected to be considerably less than the 160-meter or higher frequency bands. With respect to the 630-meter segment especially, any notification requirements should be closely circumscribed. In that band there is virtually no PLC operation at all. According to the 2002 article in *IEEE Transactions on Power Delivery* entitled *Evaluation of the Potential for Power Line Carrier (PLC) to Interfere With Use of the Nationwide Differential GPS Network* (Silva, Michael, Senior Member, IEEE and Whitney, Bruce, Member, IEEE),⁹ of the 28,816 PLC transmitters that existed in the United States in 1999, only 20 operated anywhere in the band 450-490 kHz. Of the 40 kHz-wide segment referred to in that article, only 7 kHz is proposed to be allocated domestically to the Amateur Service now. Therefore, even if any of those 20 PLC transmitters that operated *somewhere* in the 450-490 kHz band in 1999 are still operational 17 years later, and even if any of those which were operating in 1999 and which are still operational are presently operating in the small segment 472-479 kHz, the chances of a given Amateur station interfering with one are infinitesimally low.

is operating on frequencies which are within or which overlap the Amateur 2200-meter or 630-meter bands. In order to implement this, UTC should be called upon to provide to ARRL or to the general public a list of transmission lines carrying PLC which make use of either of the two subject bands, thus to facilitate notification. This would have the double benefit of encouraging a complete PLC database while permitting accurate determinations of which transmission lines are carrying PLC which have any potential at all of adverse interaction with Amateur stations.

Therefore, the foregoing and ARRL's prior comments and reply comments in this proceeding considered, ARRL, the national association for Amateur Radio requests that the Commission timely issue a Report and Order making the LF and MF allocation changes in Part 2 and the Part 97 service rule changes as proposed by ARRL and not otherwise.

Respectfully submitted,

**ARRL, THE NATIONAL ASSOCIATION FOR
AMATEUR RADIO**

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