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May 13, 1999

Magalie Roman Salas
Secretary
Federal Communications Commission
445 Twelfth Street, SW,
Washington, D.C., 20554

**Ex Parte**

Re: RM-9404

Dear Ms. Salas:

Pursuant to Section 1.1206(b)(1) of the Commission's Rules, enclosed herewith are two (2) copies of a letter that was sent today by UTC to Chairman Kennard regarding the above-referenced proceeding.

Should any questions arise concerning this matter, please contact undersigned counsel.

Very truly yours,

Thomas E. Goode
Associate General Counsel

Enclosures

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May 13, 1999

Hon. William Kennard
Chairman
Federal Communications Commission
445 12th Street, SW
Washington DC 20554

Re: RM-9404
*Ex Parte*

Dear Chairman Kennard:

UTC, The Telecommunications Association, is writing to express grave concerns with a *Petition for Rulemaking* (*Petition*) filed by the American Radio Relay League (ARRL) to introduce new amateur radio operations in the 135.7-137.8 and 160-190 kHz bands.[1] UTC is concerned that a new hobbyist allocation in these bands may interfere with the important power line carrier (PLC) operations of the nation's electric companies, and urges the FCC to deny the ARRL *Petition*.

## I. Statement of Interest

UTC is the telecommunications representative for nearly 1,000 electric, gas and water utilities and pipelines. UTC's members range in size from the nation's largest electric utilities to some of the smallest and provide electricity to the vast majority of businesses and consumers in the United States. UTC is the FCC-authorized frequency advisory committee for private land mobile channels in the Industrial/Business Radio Pool that had been previously allocated to the Power Radio Service. UTC is also authorized by the FCC and the National Telecommunications and Information Administration as the industry-operated entity pursuant to Sections 15.113(a) and 90.35(g) of the FCC's Rules[2] to maintain information regarding the deployment and modification of PLC systems. UTC's PLC database is used to coordinate PLC use with licensed users in the 10-490 kHz bands. UTC, therefore, has a strong interest in any allocation that may affect PLC operations.

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[1] ARRL *Petition*, RM-9404, filed October 22, 1998. ARRL's Petition was placed on *Public Notice* on November 23, 1998. The *Public Notice* did not reference which frequency bands were at issue, nor had the petitioner consulted with UTC or the power industry prior to filing its petition. Therefore, the electric power industry was unaware of the threat posed to its PLC systems until after comment deadlines had passed.

[2] 47 CFR §15.113(a); 47 CFR §90.35(g).

## II. The FCC Must Deny the ARRL *Petition*

UTC is extremely concerned about the potential adverse impact that a new hobbyist radio allocation could have on existing and future PLC operations in the 135.7-137.8 and 160-190 kHz bands. A review of UTC's PLC database indicates that there are approximately 10,000 PLC terminals operating in the bands targeted by the amateur radio community. The PLC operations may be threatened by the allocation of new, uncoordinated hobbyist operations. UTC, therefore, urges the FCC to deny the ARRL *Petition.*

### A. PLC Operations Are Vital to the Safe and Reliable Operation of the Nation's Power Grid

PLC systems transmit radio signals by conduction over electric utilities' transmission lines for protective relaying, telemetry, voice communications and the general supervision of the electric system.[3] All high voltage lines have some means of protective relaying, which is used to isolate the line from the power grid in case of a line fault. These systems protect the electric grid by sending signals that close off the flow of electricity on transmission lines, by tripping breakers, when there is a fault in the line. In other words, if a transmission line is down, the PLC signal will shut off the electricity to that line. Without the ability to interrupt the flow of electricity, the electric system may simply interpret the downed line as a demand for more power, overloading generators and other components of the power system – creating a dangerous situation. Indeed, blackouts have been caused by this very situation. To prevent this, many electric utilities and industry coordinating councils require protective relaying on high voltage lines.

One large western utility has expressed concern regarding how hobbyist operations would affect the dependability of PLC systems, noting that the concern is two-fold: (1) ensuring that the systems trip the system when they should; and (2) ensuring that they do not trip the system when they should not. Arizona Public Service (APS) notes that a large portion of the major outages in the western US involve relay system security in which a system tripped when it shouldn't have. APS is therefore very concerned about anything that might impact security and reliability of its PLC system.

PLC operations are critical to the reliability of the electric grid. UTC commends ARRL for its interest in the avoidance of interference to incumbent PLC users.[4] As ARRL acknowledges in its *Petition*, the FCC has noted the importance of PLC operations. In the FCC's *Report and Order* in Docket No. 20271, the FCC declined to introduce new broadcast and amateur operations in the PLC bands, stating: "We must acknowledge...the importance of PLC operations in this band." Section 90.35(g) of the Commission's Rules further note that: "The frequencies 10-490 kHz are used to operate electric utility Power Line Carrier (PLC) systems on power transmission lines for

[3] 47 CFR §15.3(t)
[4] ARRL *Petition*, ¶16.

communications essential to the reliability and security of electric service to the public..."[5]

However, despite its interest in avoiding interference, ARRL seems to downplay the importance of PLC operations and the threat to these operations posed by new low frequency operations. Arguing that it would not be "reasonable" for a power utility to use an unlicensed system if RF interference could cause malfunctions and endanger the life of power utility personnel. ARRL seems to downplay any potential public safety issues raised by hobbyist radio interference to PLC.[6]

ARRL's opinion aside, the fact is that PLC communications remain the only cost-effective method for many utilities to provide protective relaying. Given the need to provide electric service across the US, the nation's electric companies have constructed thousands of miles of electric transmission lines. Deploying an alternative communications media, such as fiber, for protective relaying and the other applications provided by PLC systems would be prohibitively expensive. Even radio-based alternative media, such as microwave, would be cost prohibitive in many areas and for long transmission lines requiring numerous microwave links. Moreover, pending proposals to "share" microwave spectrum with a variety of new services could restrict the availability of microwave spectrum in many areas.[7]

While ARRL is correct that PLC use of the spectrum is secondary, Footnote US294 to the US Table of Frequency Allocations found in Section 2.106 of the FCC's Rules states that radio users are "urged to minimize potential interference to the degree practicable."[8] Through this footnote, the FCC acknowledges the importance of PLC.

**B. Utilities Have Experienced Interference from Low Power Radio Systems**

One of the conclusions drawn by ARRL in its *Petition* is that interference to PLC systems is unlikely in part because they could uncover no documented instances of interference to these systems, "though the League would be pleased to consider and address any published or unpublished reports documenting interference to PLC receivers..."[9]

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[5] 47 CFR §90.35(g) (emphasis added).

[6] In light of ARRL's comments, it would be appropriate for the FCC to revisit the status of PLC operations and confer some degree of protection for these important operations.

[7] *See* Redesignation of the 17.7-19.7 GHz Frequency Band, Blanket Licensing of Satellite Earth Stations in the 17.7-20.2 GHz and 27.5-30.0 GHz Frequency Bands, and the Allocation of Additional Spectrum in the 17.3-17.8 GHz and 24.75 25.25 GHz Frequency Bands for Broadcast Satellite Service Use, IB Docket No. 98-172 Order (released February 10, 1999) permitting the use of a portion of the 18 GHz band by fixed satellite services; Amendment of Parts 2, 25 and 97 of the Commission's Rules with Regard to the Mobile-Satellite Service Above 1 GHz, ET Docket 98-142, Notice of Proposed Rulemaking (released August 4, 1998) proposing the licensing of mobile satellite service feeder links in the 6700-7075 MHz band; pending applications for authorization for Global Broadband Maritime Communications in the 5925-6425 MHz band.

[8] 47 CFR §2.106, footnote US 294.

[9] ARRL *Petition*, ¶18.

UTC was also interested to learn of the lack of documented cases of interference and conducted an informal survey of approximately 300 of its members. The responses were enlightening. Utilities have experienced problems with their PLC systems that could be caused by interference. These instances of interference are not generally documented because most utilities do not have monitoring equipment to detect the source of undesired tripping of breakers. Moreover, utilities generally do not make public instances of interference because there is no recourse for this interference under the existing FCC rules. Recognizing that PLC operations are secondary to licensed users, utilities have simply resolved instances of interference internally.

In other cases, utilities undertake extensive investigations of undesired tripping but are unable to confirm the source of the interference. For example, Ameren, an electric utility located in St Louis, Missouri, identified a potential case of interference from a long range navigation system called LORAN-C used by river barges. By disconnecting part of its PLC system that was experiencing false signals, Ameren was able to determine that the incorrect signals were not being caused by the PLC system itself, but by another source. Based on the location and frequency of the affected PLC equipment, Ameren was able to identify LORAN-C operations as the probable cause of this interference.

Another utility, Carolina Power and Light (CP&L), was also affected by interference to its PLC operations, but was unable to identify the source. Two separate instances of interference occurred, interrupting communications with a neighboring utility and threatening the stability of the system. After an extensive investigation by CP&L, it was determined that the false signals were coming from stray radio signals. Only the work of the utility communications personnel in replacing the equipment prevented further threats to the electric grid.

Indeed, there can be no doubt that radio systems have caused interference to PLC systems. Even the 1995 survey information relied on by ARRL in its *Petition* demonstrates this fact.[10] While 88% of respondents indicated that they have experienced no interference problems from low frequency stations, apparently 12% must have experienced such interference. With new uncoordinated operations such as those proposed by ARRL, the occurrence of such interference will only increase.

### C. Utility Use of PLC Remains Widespread

ARRL relies on a 1995 survey of 150 electric utilities to show that the use of PLC is decreasing.[11] Hence, in ARRL's view, the potential for interference by *hobbyist* operations will also decrease. However, ARRL's conclusion appears to overlook one essential fact – PLC operations are extremely widespread. UTC's database includes approximately 10,000 terminals in the bands targeted in the ARRL *Petition*. Even assuming that the use of PLC operations is decreasing, and that fewer new systems are

[10] ARRL Petition, ¶22 (citing Hohn, J. W. et. al. *Power Line Carrier Practices and Experiences*, IEEE Transactions on Power Delivery, Vol. 10, No. 2 (April 1995)).
[11] *Id.*

being deployed, it is extremely unlikely that many of the incumbent systems will ever be deactivated. There is simply no cost-effective and reliable replacement for PLC.

Moreover, the future will see continued utility reliance on PLC. For instance, with changes in the electric industry that may be brought about by deregulation, utilities will be under more pressure than ever to provide safe, reliable and cost-effective service to the public. The reliability and security of interconnected transmission systems will be even more critical. PLC will continue to play a significant role in the protection and maintenance of the nation's electric grid for many years to come.

### D. The Nature of the Amateur Allocation Requested Poses a Threat to PLC Operations

Finally, UTC notes that nature of the amateur operation requested poses a significant threat to PLC operations. The FCC initially rejected a low frequency allocation for hobbyist operations in 1978, citing "the extreme difficulty of satisfactory frequency coordination due to the unpredictable nature of amateur operations."[12] ARRL has not provided any evidence that the nature of hobbyist operations has changed. Amateur radio operations are unpredictable and uncoordinated, and cannot co-exist as proposed with PLC operations.

ARRL appears to acknowledge that there is some potential for interference, providing in Table 3 of the *Petition* information on the "Separation Distance to Avoid Interference to PLC Systems Operating on the Indicated KV Power Lines." However, ARRL provides no information about how these separation distances could be enforced. It is unclear from the ARRL *Petition* even whether it intends for the FCC to impose separation distances on hobbyist operations at all. Despite the interest in protecting incumbent PLC operations, ARRL states only that it "would accept any geographic limitation necessary to protect government facilities remaining in this band;" no mention is made of geographic or frequency use limitations to minimize interference to PLC.[13] Instead, ARRL appears to discount the possibility of interference to PLC operations, providing few suggestions about how the possibility of interference could be mitigated.

Indeed, the threat posed by the allocation requested in the ARRL *Petition* is increased by two other factors: (1) ARRL's request that no antenna height restrictions be imposed; and (2) ARRL's proposal that restrictions on power be relaxed.[14] These proposals, along with the unpredictable and uncoordinated nature of hobbyist operations, could jeopardize PLC operations.

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[12] *Report and Order*, Docket No. 20271, ¶21 (December 28, 1978).

[13] ARRL *Petition*, ¶26. ARRL does appear to indicate that hobbyists would be "able to" consult UTC's PLC database prior to commencement of operations in its recently-filed "Motion to Strike, or In the Alternative, Reply to Written *Ex Parte* Submissions," ¶12 (filed March 30, 1999). For obvious reasons of security, third-party access to the PLC database is not permitted. UTC therefore objects to any attempt by outside parties to directly access its proprietary database.

[14] ARRL *Petition*, ¶¶26-27.

**Conclusion**

UTC understands all too well the amateur radio community's desire for additional spectrum. However, UTC cannot support an allocation of spectrum that could potentially disrupt the provision of electric service to the public. They cannot be jeopardized by the introduction of new spectrum for hobbyists, especially at a time when resources are needed to prepare for possible problems related to the Year 2000 computer problems. UTC remains willing to work with the amateur community outside the context of this proceeding to identify alternative bands or to develop technical standards that would protect incumbent operations. UTC therefore urges the FCC to deny the ARRL *Petition*.

If you have any questions regarding this matter, please do not hesitate to contact the undersigned.

Very truly yours,

Jeffrey L. Sheldon
Vice President/General Counsel

Cc: John Reed, Technical Rules Branch,
FCC Office of Engineering and Technology