NPSTC
National Public Safety Telecommunications Council

68 Inverness Lane East, Ste #204
Englewood, CO 80112
Fax 303-649-1844
866-807-4755 ● 303-649-1843
Website: www.npstc.org

MEMBER ORGANIZATIONS

American Association of State Highway and Transportation Officials
American Radio Relay League
American Red Cross
Association of Public Safety Communications Officials - International
Forestry Conservation Communications Association
International Association of Chiefs of Police
International Association of Emergency Managers
International Association of Fire Chiefs
International Association of Fish and Wildlife Agencies
International Municipal Signal Association
National Association of State Emergency Medical Services Directors
National Association of State Foresters
National Association of State Telecommunications Directors

LIAISON ORGANIZATIONS

Federal Communications Commission
Federal Partnership for Interoperable Communications
Telecommunications Industry Assn
U.S. Dept. of Agriculture
U.S. Dept. of Justice
CommTech Program
U.S. Dept. of Homeland Security
FEMA
Safecom Program
U.S. Department of Interior

FILED ELECTRONICALLY

September 28, 2004

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Subject: ET Docket No 04-37

Dear Ms. Dortch,

The National Public Safety Telecommunications Council (NPSTC) has reviewed the Ex Parte submission filed with the Federal Communications Commission ("Commission") on September 16, 2004 by Aeronautical Radio Incorporated (ARINC) on the matter of ET Docket No 04-37, regarding carrier current systems, including broadband over power line systems, and the amendment of Part 15 regarding new requirements. ARINC's Ex-Parte presentation dealt with a particularly grave matter, the real possibility of interference to Aeronautical air traffic control and operational communications from broadband over power line (BPL) systems operating in the Aeronautical Mobile(R) high frequencies. NPSTC concurs with ARINC's analysis, and empirical measurements demonstrating the very high probability of BPL causing serious interference to aircraft communications.

ARINC's models and analysis of BPL interference showed the Part 15 40 dB/decade factor to be overly optimistic by approximately +20 dB. This factor was based upon the highly unlikely scenario that measurements are made at a point along the radiator providing the maximum field strength. ARINC concluded that an extrapolation factor of 15 to 20 dB would be more realistic. The second conclusion showed that a significant variation in received interference signal level can be experienced as one moves along the radiator. The resulting fluctuations in signal level based upon their analysis show 30 dB or more as being typical. The third conclusion showed that although the simplified model may not represent a full BPL system, predicted results show significant departures from the Part 15 30 uV/m limits. The fourth conclusion predicts that due to the higher gain observed at higher look angles, interference to high sites will be even higher than those predicted in their studies. The fifth conclusion revealed that a significant increase in gain is observed off the ends of the BPL radiator. For distances less than 2000 ft and parallel to the BPL radiator installations will see an increase in interference level. The sixth conclusion was based upon the cumulative effect of multiple BPL radiators. In ARINC's analysis only

single BPL radiators were considered. They concluded that the cumulative effect of multiple BPL radiators could dramatically increase the received interference level. ARINC did not include the effects of sky wave propagation but they concluded the combined effects of multiple radiators and ionospheric conditions could dramatically increase the received interference level and should be considered.

Perhaps the hardest hitting portion of ARINC's ex-parte presentation was their third and final exhibit which provided real world evidence of the detrimental effects of BPL interference on aircraft communications. ARINC investigated interference at two of their West Coast receive sites – Half Moon Bay (HMB) and Point Reyes (PYE). They concluded there was a very high likelihood that interference to these sites was emanating from power line carrier (PLC) devices. Before making their hypothesis, they investigated measurements of a PLC telephone extension device in a laboratory environment. Next, they considered interference to their HMB and PYE sites. They found interference to the HMB site was emanating from BPL devices over 5 miles away. At the PYE site they observed the worst effects of BPL interference. Reception of weaker aircraft signals over oceanic waters was found to have been completely blocked. The periodicity of the denial of service or outages was intermittent in nature, thereby further compounding the problem. The erratic nature of the interference is characteristic of PLC devices being activated and deactivated by users – further pointing to a high probability of interference from PLC devices. ARINC stated the amount of bandwidth used by PLC devices when being modulated with information can be as much as 50 kHz. This has been found to be the cause of considerable interference even though the frequencies used by the PLC devices were outside the bandwidth of ARINC's receivers.

ARINC's ex-parte presentation is a sobering reminder of the reality of BPL's ability to cause harmful interference to licensed services – in this case the aeronautical services. Interference can be serious enough to make communications impossible. Air carriers must have highly reliable effective communications systems. The welfare of their customers and the financial health of an airline depend upon the safe and timely delivery of their human cargo. In the airline industry inability to communicate effectively can have serious consequences. Their conclusion is very clear and concise and backed up by sound engineering analysis and actual reports of measured interference. The bottom line is BPL should not be considered simply as a source of interference but as a potential danger to life and property. This is especially the case when the service that is being subjected to harmful interference is the aeronautical services. It may only be a matter of time before a lawsuit is initiated as a result of damages caused by interference from BPL resulting in the inability to establish communications during an emergency or a time of crisis.

While the ARINC study addresses only the potential for interference into their aeronautical mobile services, NPSTC believes these studies to be a harbinger of the problems public safety entities will experience in their own systems operating in these bands. Many disaster response agencies (state and local governmental agencies, non-governmental agencies, and the amateur community) use portions of the 2-30 MHz band for critical communications in the event of a major disaster such as a hurricane, tornado, or earthquake; specifically 2-7 MHz is used for Operation SECURE stations. State and local agencies continue to use the 30-50 MHz portion of this spectrum as their primary band for mission-critical voice communications. In particular, thirteen states use the 30-50 MHz band for state police systems, with nine states (including California) using this band for primary state police/highway patrol dispatch. Finally, the 72-76 MHz band is used nationwide for fire alarm remote box reporting.[1] Any interference caused to these emergency communications is unacceptable.

[1] The Joint APCO/NPSTC filing on this Docket dated May 3, 2004 discusses the specifics of these various public safety uses of the 2-76 MHz HF/VHF bands.

NPSTC is convinced that the deployment of BPL technology carries with it an unacceptable risk to life and property due to its interference potential to disrupt these critical public safety and disaster response communications. NPSTC consequently believes the evidence presented throughout the ET 04-37 NPRM proceeding to be compelling and has raised serious doubt that BPL can be deployed without causing harmful interference to many other radio services. If the Commission were to deploy BPL services on a wide scale we strongly urge the Commission to take the only equitable course of regulation possible and provide interference protection to public safety services operating in the 2-76 MHz region similar to those being offered to ARINC and the Coast Guard. NPSTC also urges the Commission to impose strict enforcement of Part 15.209 Section F rules to protect higher frequency bands up 800 MHz from out of band emissions.[2] Without these safeguards in place we remain unconvinced that BPL can be deployed without causing harmful interference to mission critical public safety systems that directly impact safety of life and property throughout the United States.

Sincerely,

Marilyn B. Ward, Chair
National Public Safety Telecommunications Council

[2] Part 15.209 Radiated emission limits; general requirements., (f) "In accordance with § 15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation of a digital device."