Environmental Side Effects of Proposed Increase of Power to 95 kW from AM Radio Towers in Oak Hill, Newton Are Not Acceptable

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History of EM safety standards and drive toward environmental standards in addition to exposure and product standards

History of environmental side effects near AM radio towers--- arcs, shock and burn hazards;
RFI and sound generation phenomena at environmental levels far below those in existing exposure standards and FCC Rules.

Criteria for environmental acceptance; cf. WHO definition of adverse health effects.

FCC Rules have deferred on contact current and do not address side effects.

Recent measurements of RF voltages and currents in Concord and Newton (up to 23 volts) suggest that magnitude of RF voltages and currents from a 95 kWAM tower complex will be excessive and cause unacceptable loss of quality of life to nearby residents, schools.....

Review of Reports of Environmental Side Effects Near AM Radio Stations

Numerous reports of RFI and sound generation; Hull, Waltham, Newton, Mass.; Burlington, Vermont; Pennsylvania.....

Anecdotal report of arc encountered when amateur radio operated connected cable to new amateur radio antenna rig near AM towers.

Arc, shock and burn concerns for workers operating cranes in Seattle and elsewhere.

Report by governmental scientist of injury to window washer on rig with metal chains near AM towers

Report by government scientist of sounds from shower plumbing and air-conditioning ducts near AM towers.

Shock and burns encountered in school in Spokane near AM towers (1987).

Shock and burns to workers in Pennsylvania constructing water tower near 5 kW AM towers; municipality seeks land; tower move.

Brief History of Limits on Contact Currents

1991: IEEE C95.1 introduces limits on contact current with two tiers from 3 kHz to 100 MHz; with some ambiguity on time-averaging.

1996 – 1997: FCC adopts new rules derived from IEEE C95.1 and NCRP (1986) guidelines; defers any limits on contact currents.

1998: ICNIRP adopts limits on contact current with two tiers.

2002: IEEE/ICES issues C95.6 with limits on contact current below 3 kHz.

2004: IEEE/ICES balloting revision of C95.1 with contact current limits, two tiers, from 3 kHz to 100 MHz and new electrostimulation limits from 100 kHz to 5 MHz---no time averaging.

Key Steps Toward Environmental Standards for EM Energy

1983: Massachusetts regulation as surrogate.

1986: NCRP follows Massachusetts on lower tier.

1994: Rationale for lower tier and environment discussed in Rome meeting.

1996: Osepchuk calls for environmental standard.

1998: Environmental standard as key for harmonization with Eastern Europe discussed in Slovenia meeting.

1999: International meeting on environmental effects of EM energy; Ismaning, Germany.

2000: IEEE seeks international harmonization with ICNIRP at meetings in Munich and San Antonio.

2002: Birth of IEEE/ICES with plan for environmental standards committee.

2004: Osepchuk delivers paper on environmental standard as key for international harmonization.

Magnitude of AM Radio Voltages in Concord and Newton; Random Metal Pipes and Conduits

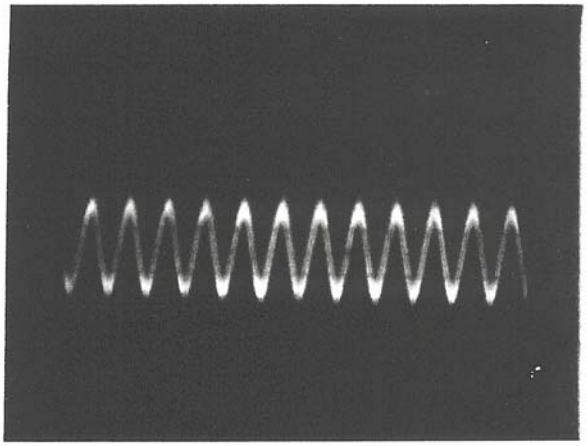
Concord: **Pipe A:** **Peak voltage = 1 Volt**

Pipe B: **Peak voltage = 1.5 Volts**

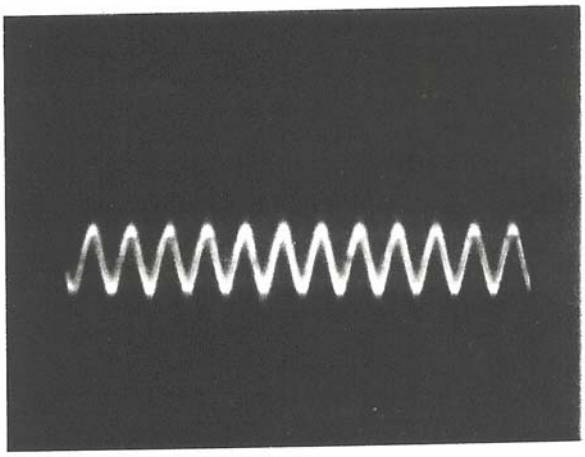
Peak current = 0.5 mA through 675 Ω resistor to ground.

Drain pipe: **Peak voltage = 2.3 Volts**

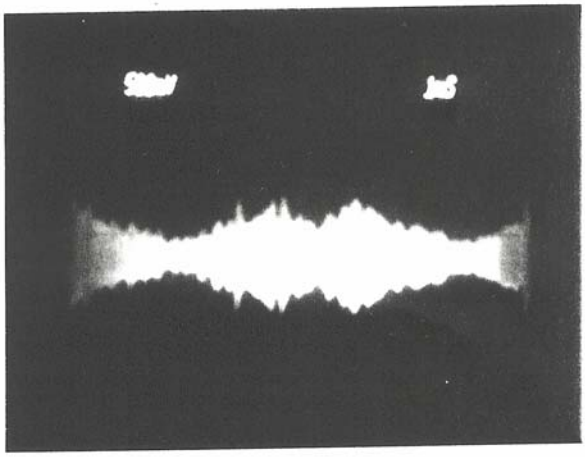
		Peak Voltage
Newton:	**Location A: basement pipe**	**7.7**
	Location B: baseboard	**9.0**
	drain pipe	**18.5**
	“ “	**14.3**
	Location C: drain pipe	**20.0**
	outside pipe	**22.5**
	baseboard	**16.5**
	utility room pipe	**7.5**
	Location D: drain pipe	**5.0**
	outside pipe	**2.3**



(a) Voltage on Pipe B
0.5 V/div; before correction
1 microsec/div



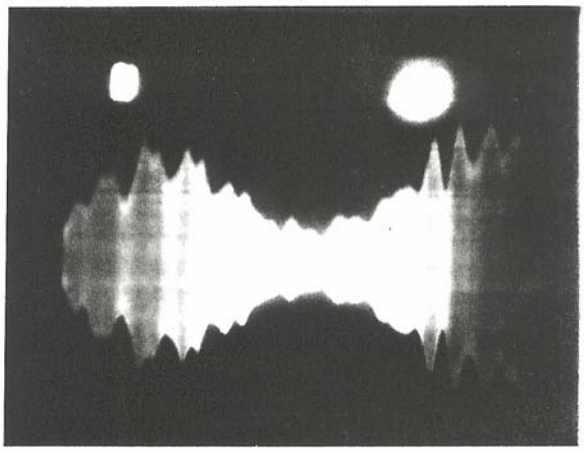
(b) Voltage across current resistor of 675 ohms;
0.2 V/div.; 1 μ sec/div



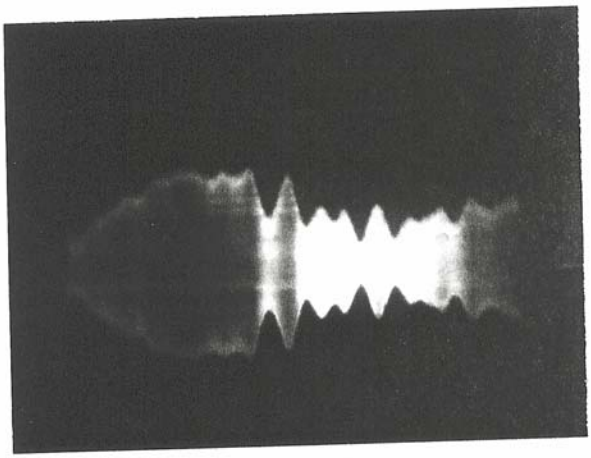
(c) Voltage on pipe B
o.5V/div.; 1 msec/div

Figure 1; Sample Voltage Waveforms at Concord

(a)Location C; Outside water pipe
5 V/div; 1 msec/dic



(b) Location C; Kitchen baseboard
5 V/div.; 1 msec/div



(c) Location D; Outside water pipe
2 V/div/; 1 msec/dic.

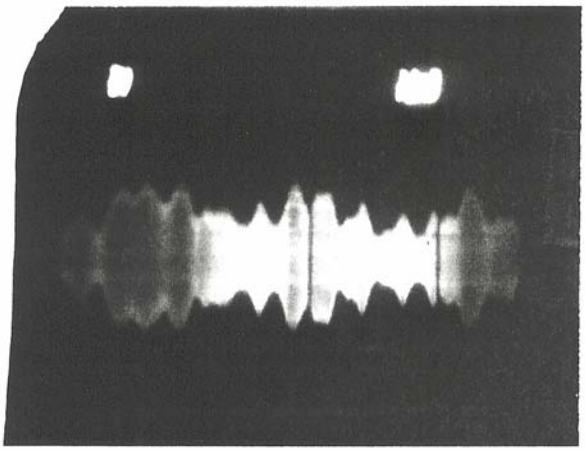


Figure 2; Voltage Waveforms in Newton