THE MONITORING OF DIRTY ELECTRICITY IN A SECONDARY SCHOOL IN KAZAN, REPUBLIC OF TATARSTAN, RUSSIA

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ABSTRACT

Electromagnetic fields from electronic equipment are detrimental environmental factors. Recently, a new type of electromagnetic pollution referred to as "dirty electricity" was discovered to affect human health. The current research measures levels of dirty electricity in one secondary school in Kazan, Republic of Tatarstan, Russia. A Microsurge II meter that measures high frequency transients and harmonics between 4 to 100 kHz (expressed as Graham-Stetzer units) was used in this study. Levels of dirty electricity were elevated in all areas of the school and the installation of Graham-Stetzer filters significantly reduced these levels. Taking into account the detrimental effects of the dirty electricity on human health, plugging one Graham-Stetzer filter into each classroom is highly recommended.

KEYWORDS: electromagnetic pollution, electrohypersensitivity, dirty electricity, Graham-Stetzer filter, Graham-Stetzer meter, microsurge meter.

INTRODUCTION

People living in a modern world are adversely affected by many environmental factors. A totally new risk to human health appeared during the twentieth century. Electromagnetic fields and radiation from electronic equipment (video monitors, mobile phones, personal computers and others) are among the modern risks to which we are exposed at work and at home. One adverse health response to electromagnetic fields is electrohypersensitivity (EHS) and symptoms include adverse skin reactions, disturbances of the heart and the central nervous system as well as psychological problems [1,2]. Recently, a new type of electromagnetic pollution referred to as dirty electricity was discovered to affect human health [3,4]. The dirty electricity (DE) presents itself as high frequency voltage transients found on electrical wiring caused by an interruption of electrical current flow. Monitoring DE is an important first step to protect populations from this kind of electromagnetic pollution.

This article presents data on the monitoring of DE in a secondary school in Kazan, Russia.

MATERIALS AND METHODS

This research was performed in Kazan Municipal Educational Formation "Gymnasium 94". This includes an elementary, middle and high school that are located in the same building. A Microsurge II meter (GS meter) measuring high frequency transients and harmonics between 4 to 100 kHz (expressed as GS units) was used in this study (Figure 1A). GS units reflect the average magnitude of the rate of change of voltage as a function of time. This meter provides a digital reading from 1 to 1999 with an accuracy of 5% [5].

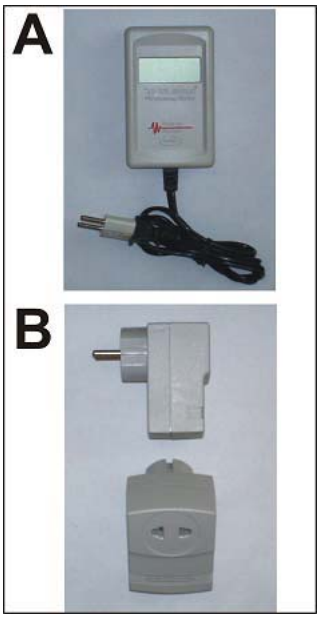

FIGURE 1 - The physical configuration of the GS meter (A) and GS filters (B).

To reduce the values of DE, Graham-Stetzer filters (GS filters, Figure 1B) were plugged into outlets within the school building where the measurements were done. The detection of DE was performed during the middle of workweek at noontime (without and with the GS filters). A scheme of classrooms and other school areas, where the measurements were performed, are presented in Figure 2. Data in Table 1 are given as mean ± SEM.

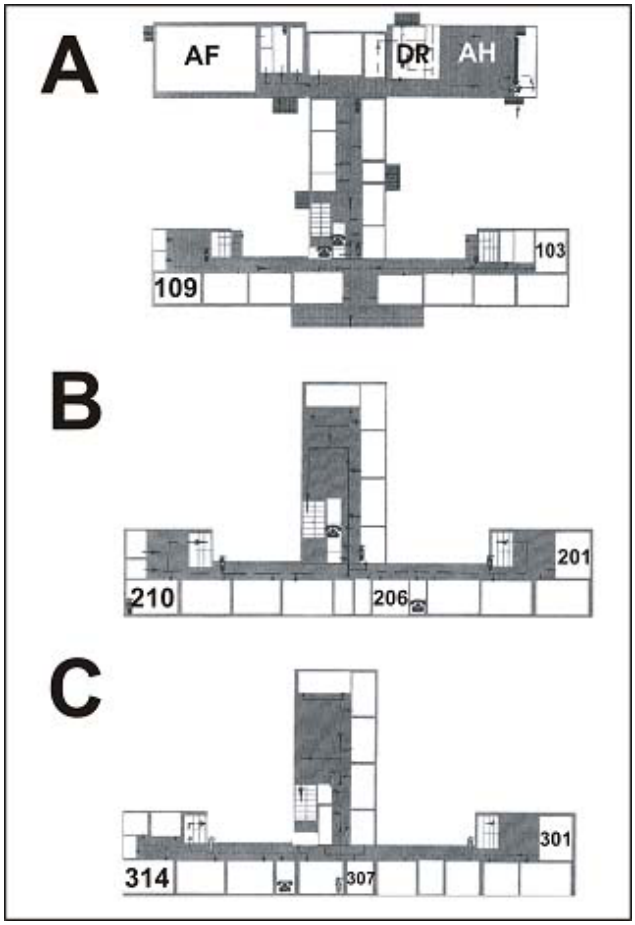

FIGURE 2 - A scheme of the school areas. (A) the entry level; (B) the second floor; (C) the third floor. Note: DR – dining room; AH - assembly hall; AF - athletic field. The classrooms and other school areas, where the measurements were performed, are indicated by Arabic numerals.

RESULTS AND DISCUSSION

The levels of DE were measured on all school floors. On the entry level, the following places were monitored: the dining room, the assembly hall, the athletic field and classrooms # 103 and 109 (Figure 2A). On the second floor, the levels of dirty electricity were measured in classrooms # 201, 206 and 210 (Figure 2B). On the third floor, the levels of dirty electricity were measured in classrooms # 301, 307 and 314 (Figure 2C). These classrooms were chosen because of their location: they are in-between the schools and skirt the school outbuilding. In all places monitored, the levels of DE were elevated (Table 1). As one can see, the installation of GS filters significantly reduced the DE levels.

TABLE 1 - The levels of DE in school areas with and without the GS filter.

Floor	School area	Before installation of the GS filter	After installation of the GS filter
The entry level	The athletic field	298±37	4±1
	The dining room	>2000	68±2
	The assembly hall	>2000	60±5
	Classroom 103	293±9	5±1
	Classroom 109	90±6	4±1
The second floor	Classroom 201	1122±17	21±1
	Classroom 206	>2000	44±2
	Classroom 210	1376±70	37±2
The third floor	Classroom 301	1910±37	56±4
	Classroom 307	>2000	57±5
	Classroom 314	>2000	47±2

The analogous results were recently reported for various schools in Canada and USA [6,7]. The studies by Havas [4] revealed for the first time the detrimental effects of DE. These include headaches, fatigue among teachers and attention deficit disorder among the pupils. In our study, we did not analyze health but intend to do this in as a follow-up study. At present we are convinced that the effects of DE are real as the recent studies show that DE may provoke the development of cancers [8] and type 3 diabetes (electrically sensitive diabetes) [9]. Our measurements show that GS filters effectively reduce levels of DE.

CONCLUSION

The study revealed excess levels of DE in all student classrooms and other school areas. The use of even one GS filter resulted in significant reduction of the DE. Taking into account the above-mentioned detrimental effects of DE on human health, the plugging of one GS filter into each classroom is highly recommended.

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