Report on the Travel to Almaty, Kazakhstan to attend the

International Conference
"Electromagnetic Fields and Human Health"

September 4-12, 2003

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On behalf of

National Foundation for Alternative Medicine

Washington, DC

Table of Contents

Background:

The International Conference on Electromagnetic Fields (EMF) and Human Health was organized in large part by Yuriy Pak, Director of Y.D. Systems in Almaty, Kazakhstan with active collaboration of the Kazakh Republic's Ministry of Public Health. Mr. Pak is a business associate of Mr. David Stetzer of Stetzer Electric Co. in Blair, WI. Both men are very concerned about the increased electromagnetic radiation environment, especially the high frequency microsurge transients called "dirty electricity" that is now ubiquitously present on the electrical wiring in homes, schools, offices and in the power distribution system. Mr. Stetzer has been measuring this form of electromagnetic pollution actively since 1998 and has been working with Dr. Martin Graham, Emeritus Professor of Electrical Engineering at the University of California Berkeley, to quantitatively assess this problem and develop remediation filters.

The Kazakhstan government is becoming increasingly aware of the danger that electromagnetic radiation is posing to its population. This conference was to outline some of the existing forms of radio frequency radiation (RFR) and the danger it poses to the people of Kazakhstan. To that end they had invited experts from Russia, Ukraine and America to present their findings. Dr. Maret was sent on behalf of NFAM to meet some of the scientists and report on the meeting. David Stetzer presented the American work with power line pollution which has not been studied at all in Russia, Kazakhstan or the Ukraine. Kazakhstan does not have a research program in this area and it did not appear that they had any sizable budget for this type of research.

Kazakhstan became independent as a nation from the former Soviet Union in December 1991. Its plentiful petroleum and mineral resources has made it attractive to many foreign governments, including especially the United States, for economic development in joint ventures and natural resource developments. Its current government appears stable and many new laws have been passed in a democratic manner. With regard to the assessment of electromagnetic radiation hazards in Kazakhstan, the officials rely especially on many of the current RFR standards developed in Russia, which are apparently reviewed every 5 years.

Already in 1970s, the then USSR Ministry of Health Protection, the Council of Ministers of the USSR, Ministry of Defense paid great attention to the problem of EMF biological effect research considering its effect on human health both in occupationally-exposed workers and on the population as a whole. Compared to the United States and Europe, the recommended exposure limits in Russia for microwave radiation are considerably lower. For example, in the microwave region where the cellular telephones operate, the Russian safe power density levels are set at
10 microWatt /cm2 compared to a US level of 1000 microWatt/cm2, a hundredfold lower level.

The Russians have carried out research in various RF EMF frequency spectra in the following areas:
1) study of the mechanisms of EMF biological effects;

2) study of EM effects in acute and chronic exposure conditions;
3) evaluation of safe working conditions in the industrial and manufacturing sectors to evaluate the levels of EMF exposure leading to pathology in exposed workers and to characterize these adverse health effects;
4) analysis of collected data and determination of EMF exposure standards (called sanitary rules in Russia) for occupationally exposed workers and the general population.

The USSR, and now Russian, EMF biological effects research was carried out by the Hygienic Institutes in Kiev, Kharkov, Leningrad and Moscow; by the Military Medical Academy, Central Aerospace Institute at the USSR Ministry of Defense, Institute of Medical Radiology of the USSR AMS, USSR AS Institute of Biophysics and Institute of Biophysics at the USSR Ministry of Health Protection. These institutes had been funded for fifteen years. Special interdepartmental problem commissions, problem commissions of USSR AS, USSR Ministry of Health Protection and USSR Academy of Medical Sciences and the Commission of Military-Industrial Establishment exercised control over this research. Research results were regularly discussed in different scientific and administrative forums.

Among the leaders of research on EMF biological effects were academicians: Letavet, M.G. Shandala and L.A. Iljin and also professors: Ju.D. Dumansky, Z.V. Gordon, A.G. Subbota, I.G. Akoev, B.I. Davydov, Ju.G. Grigoriev. Professor Grigoriev, who is currently the Chairman of the Russian National Committee of Protection on Non-ionizing Radiations, was present in Kazakhstan for this meeting. Clearly the Russian and Ukrainian scientists have carried out a considerably larger research program on EMF effects and are still actively working in this field, although with a smaller staff now. Dr. Grigoriev's group involves 400 scientists and associated personnel, which is down from 1100 in earlier years.

(Some of this work was reported at The Third International Conference "Electromagnetic Fields and Human Health. Fundamental and Applied Research." September 17-24, 2002. Moscow-Saint Petersburg, Russia. See *Grigoriev Ju.G., Shafirkin A.V., Vasin A.L. : Radio frequency electromagnetic field (RF EMF) standardization for Russian population.)*

Report on Conference Presentations

Overview:
The conference took place on September 8, 2003 in an associated facility near the Hyatt Hotel in Almaty, Kazakhstan. There were 8 presentations made as outlined below. The meeting was followed by a press conference with the 8 TV stations present to film much of the discussions. At the press conference there were questions from the audience, some of whom obviously felt were concerned about the currently perceived dangers from EMF radiation. A TV journalist was the moderator for the meeting. He read congratulatory telegrams including one from B.Tutkushev, a Deputy of the Kazakhstan Senate, and Member of the Committee on Social-Cultural Development of the Parliament.

The meeting was to be opened by A. Belonog, First Vice-Minister of Health of Kazakhstan and the, Head State Sanitary Physician (somewhat like our Surgeon General). Due to a death

in his family Vice-Minister Belonog was instead represented by his deputy, Victor Merker, who is Chairman of the Committee of National Sanitary Epidemiological Surveillance.

List of Participants who presented at the conference in order of appearance:

Victor Merker on behalf of A. Belonog - First Vice-Minister of Health of RK, Head State Sanitary Physician of RK:
"Electro-magnetic Fields: Its Sources, Influence on Health, the Problems of Protection, and the Current Situation in the Republic of Kazakhstan"

Yuri Grigoriev – Professor of Medicine, and Chairman of the Russian National Committee of Protection from Non-ionizing Radiation:
"EMF as a Risk Factor for the Population's Health (Current State of the Problem)"

Ju. D. Dumansky – Professor of Medicine, and Head of Laboratory of Hygiene of Physical Factors at the Institute of Common and Municipal Hygiene of Ukrainian Scientific Hygienic Center, Ukraine.
"Problems of Population's Health Protection from EMF influence"
(He could not attend and his presentation was read by Dr. Alla Semenyuk)

Vladimir Kozlovsky - Professor of Medicine, Science Deputy Director, BSE "Infracos-Ecos", Almaty, Kazakhstan:
"Problems of Electromagnetic Field Influences on Living Organisms, including Children"

E. Zharkinov – Professor of Medicine, and Head of Department of Occupational Hygiene of the Kazakh Scientific Center of Hygiene And Epidemiology:
"Sickness Rate of Workers in Electrolysis Sections of Titanic-Magnesium and Zinc Industries of the Republic of Kazakhstan"

Valentina Nikitina – Medical doctor, and Head of the Center for Electromagnetic Field Effect Prevention, Member of the Russian National Committee of Non-Ionizing Radiation Protection:
"Occupational and Population Health Risks of Radio Frequency Electromagnetic Fields"

David A.Stetzer - President of "Stetzer Consulting LLC", USA (presenting also on behalf of Dr. Martin Graham, UC Berkeley):
"Electrical Pollution in the Standard Electrical Wires and their Influence on People's Health"

Vitali Reznik – Professor of Medicine, and Head of Sub-faculty of Hygiene and Epidemiology of High School of Public Health of Kazakhstan:

"EMF as a Factor within the Environment"

Kenes Ospanov - Head Physician of the Kazakh Republic Sanitary-Epidemiological Station, Almaty, Kazakhstan:
Conference Overview and presentation of the findings of the Conference.

Victor Merker (see above):
Closing Remarks and Position of Government Ministry

Karl H. Maret – Medical Doctor, Biomedical Engineer, and Energy Medicine Specialist, representing the National Foundation for Alternative Medicine, Washington, DC, USA (Observer at the Podium but did not present a paper).

Russian scientist Dr. Yuri Grigoriev with translator preparing for the conference

Brief Summary of the Presentations:

1. Victor Merker : ***"Electro-magnetic Fields: Its Sources, Influence on Health, the Problems of Protection, and the Current Situation in the Republic of Kazakhstan"***

He gave a general overview of the increased prevalence of EM fields from computer, monitors, keyboards, power lines too near to homes, the increase in electronic devices in the home, the increased prevalence of antenna systems from radio and TV stations and especially the wide proliferation of cellular phone systems. There were no formal standards yet adopted in Kazakhstan outside of the Russian norms that needed to be reviewed. He reported on the Russian and Ukrainian work in this area and the stringent standards existing there.

The symptoms were described for radio frequency sickness including spasms and back problems, leg pains and diffuse muscular symptoms. The importance of proper grounding of people and equipment was mentioned. He felt that mobile phones had not been studied at all in a proper scientific way and needed additional research.

The whole question of who is at risk is open to further exploration. In Kazakhstan it would need the collaboration of technical specialists, sanitary specialists (public health officials), and medical researchers. It was the government's full intent to have people live under safe EMF conditions.

Devices were not up to date that could properly measure EMF pollution and quantitate the results. There was a problem of not enough qualified specialists being educated in the Kazakh universities. The government needed to address this issue urgently. They needed comprehensive approaches that would also involve the media to inform the public.

Emphasis was to be on risk assessment and risk management. He suggested the following specific issues be addressed:

1. Define the problem more exactly including times and durations of exposure.
2. Characterize the spectra of biological influence with great precision
3. Lay a broader scientific foundation for these effects including causes
4. Involve the technical and engineering communities in addressing these issues
5. Define standards for population exposure that were safe and effective
6. Utilize the state health departments (sanitary stations) in the proper monitoring
7. Continue to review the biological effects and improve the standards as needed

2. Yuri Grigoriev : ***"EMF as a Risk Factor for the Population's Health (Current State of the Problem)"***

He described the most scientific data of the conference reporting on Russian research with EMF exposure over the last 20 years. He stated that the former Soviet Union had done research for the last 50 years on the damaging effects of EMF exposure. He is part of the World Health Organization which is aware of the increasing EMF problems and 40 countries

are working together to develop better standards for safe exposure. He reported both his personal views and those of the official Russian position on this topic.

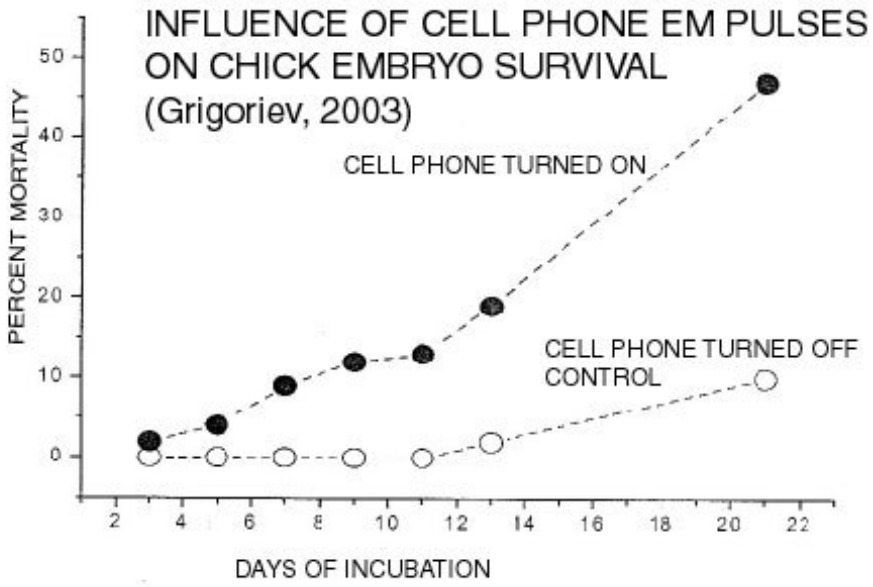
He felt that EMF represented perhaps the greatest danger facing humanity at this time. Exposure of magnetic fields greater than 0.2 microTesla (2 milliGauss) at 50 Hz power line frequencies has definitely been shown to cause leukemia in populations. He showed how various devices commonly used exceed the safe magnetic exposure levels as shown in the table below:

Localized 60 Hz Magnetic Flux Density in MicroTesla (< 0.2 is recommended safe level)		
Appliance	**Field at 3 cm distance (1 in)**	**Field at 30 cm distance (1ft)**
Vacuum Cleaner	200 - 800	2 - 20
Hair Dryer	6 - 2000	0.01 - 7
Food Mixer (Blender)	60 - 700	0.06 - 10
Electric Drill	400 - 800	2 - 3.5
Can Opener	1000 - 2000	3.5 - 30
Soldering Gun	105 - 200	0.3 - 0.6
Fluorescent Desk Lamp	40 - 400	0.5 – 2.0
Halogen Lamp	25 – 80	0.6 – 1.7
Electric Shaver	15 – 1500	0.08 - 9
Electric Clock	300	2.25
Dishwasher	3.5 – 20	0.6 – 3
Washing Machine	8 – 50	0.15 – 3
Electric Iron	8 – 30	0.12 – 0.3
Television Set	2.5 – 50	0.04 – 2
Personal Computer	0.5 – 3	1
Video Display Terminal	5.6 – 10	0.45 - 1
Slide projector	240	45
Heating Pad	10 – 180	0.15 – 0.5
Cooking Stove	1 – 50	0.15 – 0.5
Microwave Oven	73 – 200	4 - 8

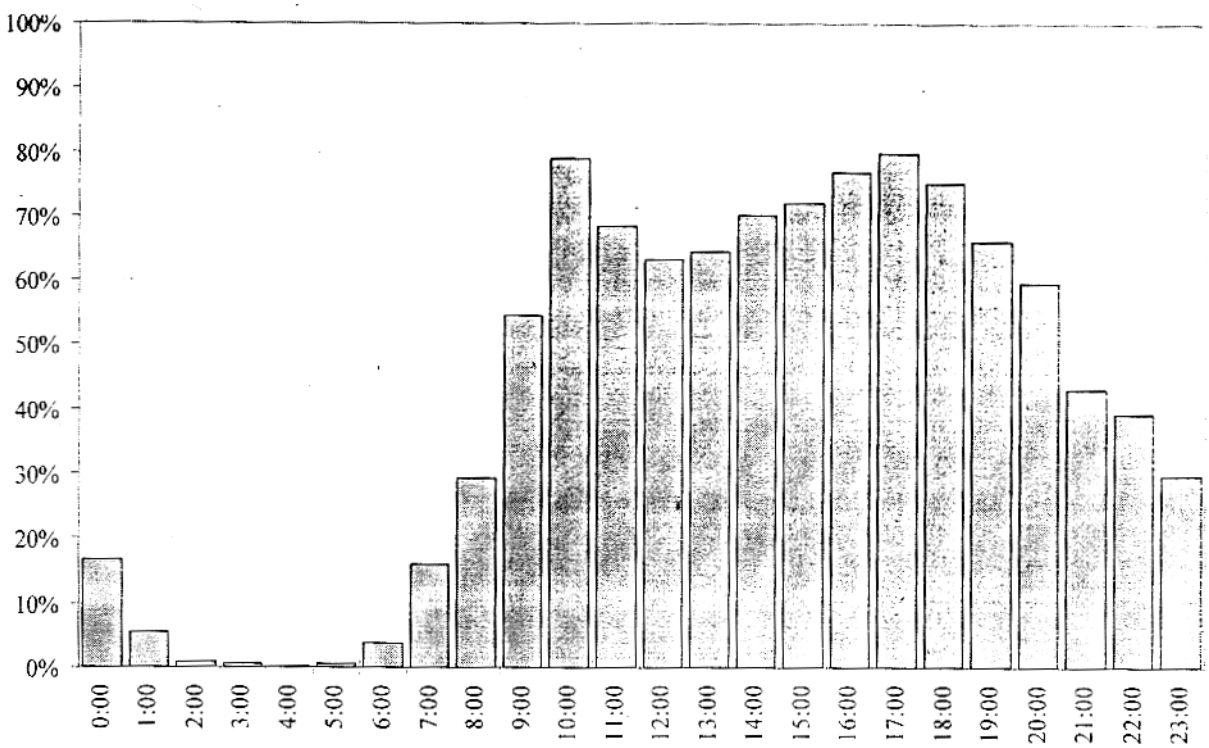
Clearly many of our common household devices exceed the recommended magnetic field intensity at close range and many even at 1 foot distance. He also showed many graphs of the magnetic field distribution in room and offices showing especially the influence of computers and workstations on the increased EMF now being experienced.

He stressed the negative influence of cell phones and the irradiation patterns of the brain. He cautioned children from being exposed to these devices due to their greater absorption of EMFs. Many people in Russia are now electrosensitive, many from second-hand irradiation who don't even own these devices. He mentioned the assessment procedures used for cell phones with phantoms used to ascertain absorption levels. He talked about the Salzburg meetings on Cell Towers and how an international alliance is now forming to warn more people of these radiation problems. 42 countries now have reported in Geneva as part of WHO regarding non-ionizing radiation effects and an active need to fight the existing electropollution is now being recognized.

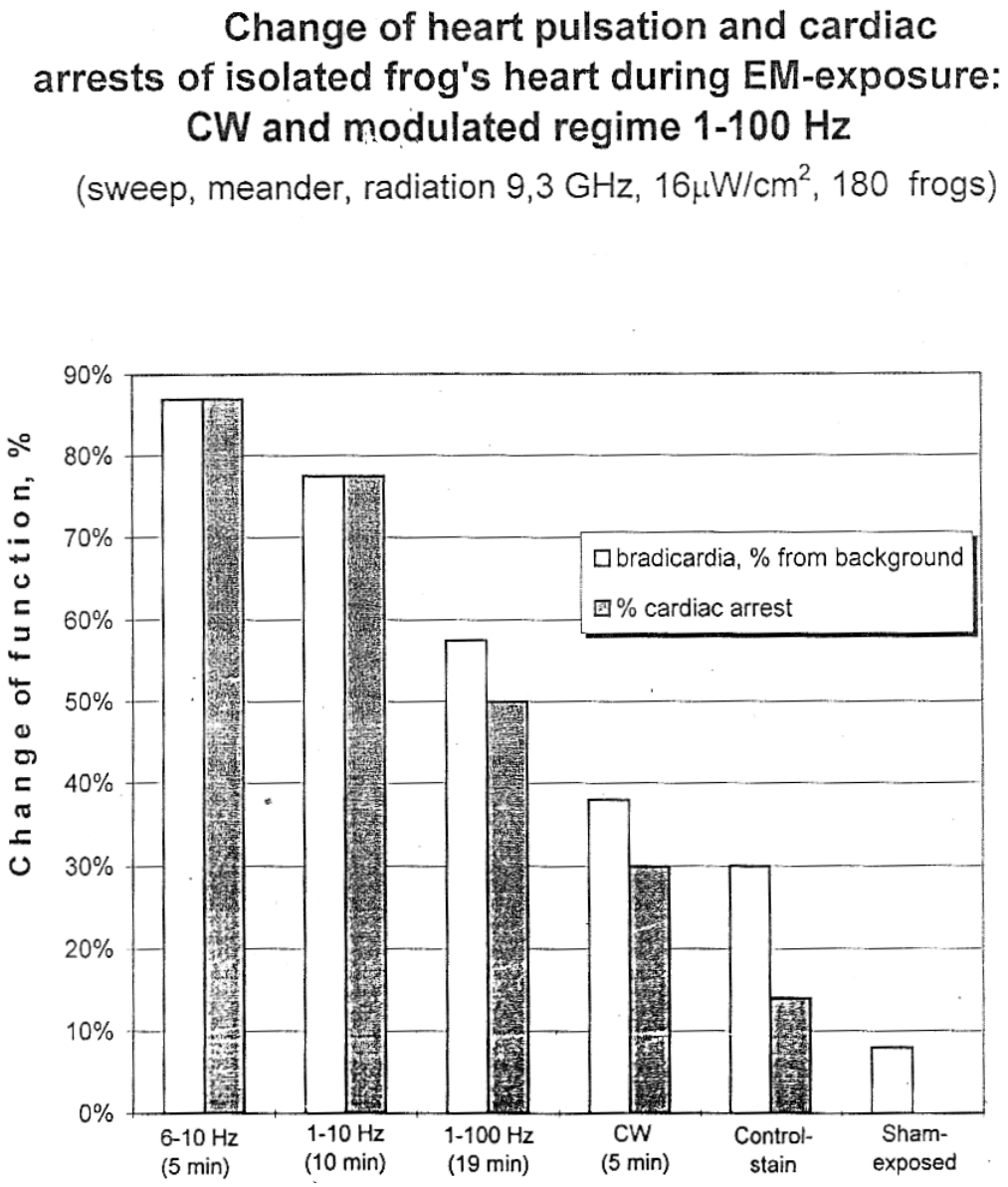
He showed several very impressive slides on animal studies they had done to show the effect of EMFs on chick embryos. This data is shown below shows that there is a 50% mortality in chick embryos after 21 days of cell phone exposure compared to only 10% in control animals.



The radiation patterns from cell phones are also important and he showed data of the usage pattern throughout a typical day which clearly illustrates that we have different levels of electromagnetic microwave exposure at various times of the day. This data is reproduced below.



He also stressed the importance at looking at low frequency modulation patterns of microwave radiation because of the powerful biological effect this causes. Below is reproduced one of his slides showing the effect of low frequency modulated microwaves on isolated frog hearts. The microwave frequency used was 9.3 GigaHertz which is somewhere between a cell phone (in US around 2 GHz and a satellite TV signal 12 GHz). The modulation frequencies used were between 1-100 Hz and are similar to brain wave EEG frequencies (0.5 –30 Hz) and other biological signals. He also compared these modulated signals to continuous wave (CW) signals which were very much less effective in causing slowing of heart rate (bradycardia) or cardiac arrest. This research is very important because there has not been very much investigation of the impact of low frequency modulation of microwave signals. Every digital cellular telephone sends these type of low frequency data signals out continuously when making calls.



He mentioned the great danger confronting the present population with these cell phones since insufficient research had been done to date. To support the magnitude of the challenges facing us, he mentioned how widespread the use of cell phone technology has become. For example in Great Britain 56% of children now had cellular phones and 70% of German children in certain age ranges. He warned against putting cell towers near kindergardens. He emphasized the neurological effects and the reproductive impacts of EMFs. In Russia children younger than 16 years were told to avoid cell phones as well as all pregnant women.

He made numerous references to scientific studies and invited the Kazakhstan government to develop a good program of protection for its population.

3. Ju. D. Dumansky: ***"Problems of Population's Health Protection from EMF influence"*** (Read by Dr. Alla Semenyuk)

There was only little that was translated on this talk. Dr. Dumansky is a leading Ukrainian specialist in EMF exposure. The Ukrainian exposure standards are even lower than the Russian standards which are already a 100-fold lower for certain frequencies (like cell phones) than the European and American standards. Kazakhstan has actually been using some of the lower exposure criteria recommended by the Ukrainians and Dr. Reznik had been instrumental in making these lower standards become used in Kazakhstan. The Ukrainians have an active sanitary program in place and Dr. Dumansky's paper reported on their concern about nuclear power station placement, the location of cellular base stations and the general EMF problems in cities. Equipment for measurement of EMFs should be standardized and measurements should be done frequently, but this is not always implemented. It was recommended that with the increased exposure durations of EMFs that more monitoring and testing of the general population be carried out.

4. Vladimir Kozlovsky: ***"Problems of Electromagnetic Field Influences on Living Organisms, including Children"***

Dr. Kozlovsky reported on the problem of non-ionizing radiation, the basic components of the E and B field and the practical use of these fields in medical applications like diathermy. He mentioned how living cells exchanged information by EMFs like infrared frequencies and that different frequency spectra have differing effects. Like all the other speakers, he was concerned by the increased EMF density that now exists and listed some of the negative effects.

He then reported on some studies that had been done with Polymetallica – apparently some of the mineral extaction industries in Kazakhstan – yet said the adverse EMF effects had not been conclusive. He stressed the importance of the modulation patterns of EM fields and signals and especially the impact of certain frequencies like 70 Hz which can influence man. He expressed the concern of the local Almaty population who don't want power lines near their houses.

He stressed the damaging effects of certain EMFs in their capacity to cause cataracts, induce skin problems and adversely affect metabolism, especially if that was already sluggish.

He then described the growing concern about children being affected by increased computer usage, the games, closeness to monitors and TV displays, the growing number of computer classes (800 in cities in Kazakhstan) and the growing use of wireless networks. He listed new norms that needed to be in place that would limit exposure of children to computers based on their age. For example, he suggested that children younger than 7 years be exposed to no more than 5 minutes, primary school children to no more than 10 minutes, 5th grade and older children to be limited to 30 minutes per day, and that teenagers older than 16 years limit their computer exposure to less than 3 hours daily. He said parents didn't understand the dangers of computers and hence were not giving guidance to their children. He suggested that pregnant women not be exposed to computers at all. He said that learning was negatively affected by the frenetic aspects of computers and that school lessons should be conducted in a calm, quiet and relaxed manner so that the child could learn with all its sensory faculties.

He suggested that international laws needed to be created once there was greater agreement of the damaging effects of EMFs including possibly the computers. He then discussed some of the electrical safety issues including the lack of standardization of wiring, the lack of grounding in cars and older buildings that can all contribute to the present problems being increasingly found in the population.

5. E. Zharkinov: ***"Sickness Rate of Workers in Electrolysis Sections of Titanic-Magnesium and Zinc Industries of the Republic of Kazakhstan"***

He presented his findings of workers in the metallurgical industries that are exposed to high intensity fields associated with electrolytic metal extraction. The extremely high field levels measured near the electrodes affected electrical and maintenance workers adversely. He said that the electrical field exposures had a synergistic negative effect with the simultaneous heavy metal exposure to make the situation in those industries more hazardous. He showed data about certain magnetic exposure levels (600 oersted) at which many of the fish died. In Kazakhstan metallurgical industries, there was a high morbidity and many people become invalids. Many exposed workers had reduced life spans with people often dying by age 50.

6. Valentina Nikitina: ***"Occupational and Population Health Risks of Radio Frequency Electromagnetic Fields"***

This was another more extensive scientific presentation by a well-respected Russian researcher. She presented clinical effects in workers exposed to 3-30 MHz EMFs as well as workers which worked with microwave radiation in the region of 3 cm to 10 cm. Many of these workers worked in industries or in broadcast facilities.

Her subjects had a workplace energy exposure (E^2T) that did not exceed the legal maximum permissible values (7000 V/m^2/hours). In these workers she demonstrated EMF damage to both the central nervous system and the cardiovascular systems, confirmed by altered of hematological and biochemical blood indices as result of the EMF influence. Complaints included headaches, cardiac pains, insomnia, heightened fatigue and irritability, memory loss as the fundamental subjective disorders. Functional disorders of the nervous system revealed as vegetative dysfunctions, asthenic-vegetative and neurasthenic syndromes. Neurocirculatory dystonia, hypertension, low blood pressure were some of the diagnosed diseases of the cardiovascular system. Decreased testosterone levels in blood serum was revealed for controllers working with transmitting equipment. Depression of testicular function takes place under contact with EMF for more than 10 years.

The operators of radio transmitting equipment complained of headaches, pain in the heart, sleep disturbances, epigastric pains, dyspeptic disorders and increased fatigue significantly more often than the workers of other groups. The rate of somatic disorders in this group was significantly higher than that in the control (77.8% compared to 28.9%, $P<0.01$). Peripheral nervous system diseases were registered in both groups (exposed and controls), but the differences were not significant. CNS and cardiovascular system pathology level is significantly higher in the EMF exposed population and in persons previously exposed to EMF than that in the control group. Health status changes induced by EMF-exposure are persistent.

The percentage of CNS functional disturbances in workers having employment duration less than 20 years was practically the same as that in workers with 10-20 years of employment. The incidence of CNS functional disturbances decreases in the working group having employment duration over 20 years, but cerebral atherosclerosis is registered in this group. Total percentage of subjects with CNS pathology is the highest in the latter group.

Cardiovascular system pathology observed in workers exposed to HF radiation was manifested as vegetative vascular dystonias, hypertonic disease, atherosclerotic and myocardial cardiosclerosis (calcification of coronary vessels). In other words, the high frequency irradiation significantly contributed to the development of heart disease.

(Editorial note: It would be wise to treat this data seriously, as much of the increase in cardiovascular disease in this country in the last 50 years may be due to the adverse effects of electromagnetic radiation including the possibility of the transients found on top of our power line signals and present in the wiring of our houses as reported in the following report by David Stetzer).

What was not officially studied as part of this reported paper were the increased incidence of birth defects where parents worked under increased EMF exposure conditions. If the mother was irradiated with RF, there was an 8-fold higher incidence of birth defects. If the father was irradiated, there was a 5-fold higher incidence of birth defects in the offspring.

The influence of low frequencies and modulation patterns leads to different disturbances in humans. Often there is damage to the brain and the reproductive system. In general the

clinical picture from EMF exposure resembles premature aging. Many of the disease patterns look like diseases of dysregulation of the homeostatic mechanisms of the body including autonomic nervous system stress.

Finally there was specific information mentioned about the metabolic effects of EMF radiation in her studied population. 76% of the exposed group had ß-lipoprotein levels significantly exceeding physiological standards in comparison with 36.4% of the control group ($P<0.01$). The exposed group had a tendency to increased total blood lipid concentration. Carbohydrates metabolism changes in the exposed group demonstrated statistically significant increases in levels of lactic acid (23% increase), pyruvic acid (17% increase) and glucose concentration (21% increase), as compared to the controls. Four subjects with glucose levels exceeding physiological standards also belonged to the exposed group. Thiol disulphide system changes were characterized by SH-groups concentration decrease and disulphide group concentration increase.
(Editors note: This data appears in part to confirm the anecdotal observations that Mr. Stetzer had found in some subjects who had elevated blood sugar readings when exposed to a "dirty electricity" environment).

Dr. Nikitina, closed her presentation by summarizing that the key impact of EMFs on human beings appears to be:

1. The nervous system leading in the long term to cerebral sclerosis
2. The vegetative nervous system with regulatory imbalances and long term stress
3. The cardiovasculator system leading to heart disease and atherosclerosis
4. The reproductive system leading to decreases in testosterone and FSH hormone elevation.
5. A wide variety of gastrointestinal and other complaints.

She said there was an urgent need for public health officials, engineers, clinicians and ecologists to work together to find ways to minimize EMF exposure and set safer standards.

7. David A.Stetzer: ***"Electrical Pollution in the Standard Electrical Wires and their Influence on People's Health"***

Mr. Stetzer reported on his research with "Dirty Electricity" that he has been doing in collaboration with Dr. Martin Graham. He has done most of his work in various communities in Wisconsin, Michigan and Minnesota. He showed excerpts from a video that he had commissioned called " Beyond Coincidence" which showed mostly some farmers describing their personal experiences with this type of electrical pollution and the impacts on their families and sick cows. There was a clear correlation with stray currents and this type of electrical pollution and the decreased milk production that many farmers have been finding.

He then outlined the symptoms of radio frequency sickness and listed a long string of these symptoms that have been in the medical literature. He suggested that with the 1972 oil embargo and the changing energy usage patterns, there had been a move to more energy efficient devices including ones that use more pulsed power and various forms of switching power supplies that all generate many high frequency transients. These impulse and transient spikes, with their complex harmonic relationships, are generated by many of our modern electronic devices including TVs, VCRs, computers, FAX machines, printers, dimmer switches and so on. These signals are "parasitic oscillations" that ride on top of the existing 60 Hz power and radiate electromagnetic fields through the house wiring into our bodies. He suggested that the new disease classifications of the 1980s and 1990s like fibromyalgia, attention deficit disorder, chronic fatigue syndrome and even Gulf War syndrome, might all be manifestations of radio frequency sickness and be related to this "dirty electricity".

He suggested that the current US epidemic of diabetes, asthma, hypertension, and immune dysfunction may all be related to the microsurges in our power system. He suggested that from his preliminary measurements in Kazakhstan, there was a similar high level of electrical pollution in the power lines that could be filtered with special capacitive filters that could be plugged into the wall receptacles.

He concluded by describing the experience of a school nurse in Wisconsin where 37 children were able to dispense with their brochodilator medication after their school had been remediated by Mr. Stetzer from the dirty power line transients. He said that discipline problems disappeared and symptoms of ADD went away. People with diabetes needed less insulin and in some cases went off medication. He called for more studies so that this phenomena could be properly studied and invited more conferences, like this one in Kazakhstan, to be held if we are to come to grips with this problem.

8. Vitali Reznik: ***"EMF as a Factor within the Environment"***

Dr. Reznik presented a systematic investigation of the EMF risk. He also stressed that besides the known adverse thermal effects, that the non-thermal effects deserved our serious attention. The effects of these were on the nervous system, the cardiovascular system, the immune system and the reproductive system leading to genetic changes. Many of these EMF effects were more general and harder to pin down specifically.

He called for an enlarged investigation to ascertain:

1. The level of EMF problems in the general population
2. Assessment of the use of EMF radiation in the home and exposed workers
3. Assessment of the ability of radiation to accumulate in the organism depending on duration of exposure and dosage levels
4. Assessment of the synergistic nature of EMF with other environmental pollutants such as hazardous chemicals and pollutants
5. An epidemiological assessment of the long-term consequences of these higher exposure levels.

He suggested that the social and economic factors need all to be taken into account and the need for society to be well informed of the consequences of exposure to EMFs. Only qualified people should do the proper measurements with enough equipment available to meet the current need for a widespread national assessment.

He then outlines a 12-point plan to address this issue. Some of these points included:

- Assessment of the source of EMF pollution such as electrical, electronic, magnetic etc.
- Determination of which components of the EMFs are the most damaging
- Which factors are most important for biological organisms
- Which parts of the population was most vulnerable and what type of epidemiological research needed to be carried out in this regard
- The extent of laboratories and technical facilities that needed to be in place in various research and public health institutes to address these questions
- What forces existed that supported these approaches and what ones were opposed to this approach
- What effective outcome strategies needed to be developed
- What innovative proposals needed to be solicited from various quarters so that this effort could ultimately succeed.

His final conclusions were that:

1. An Electromagnetic cartography of Kazakhstan be organized to exactly determine what regions and cities were most exposed this EMFs and at what levels
2. Standards be developed for all type of devices so that one can properly determine the EMF pollution sources and find remedial solutions to mitigate these
3. The old adage: "Let sleeping dogs lie" would be no longer appropriate, since the problem of EMF pollution is with us and the "dog must be awoken!"

9. Kenes Ospanov: ***Conference Overview and presentation of the findings of the Conference.***

He briefly summarized some of the findings and invited the mass media to widely be involved in bringing these issues to the public. He set up the following tasks:

1. To organize strict sets of controls on various devices once their levels of emission were determined in order to safeguard the health of the general population with special emphasis on children's health and safety.
2. To work to develop new comprehensive standards of electromagnetic hygiene for the Republic of Kazakhstan.

10. Victor Merker : ***Closing Remarks and Position of Government Ministry***

He answered many questions from the audience and gave several governmental reassurances. He wanted to learn more about the filters that Mr. Stetzer had mentioned and called for more study to see if these could help the general population. He felt that this conference was most

timely and the problem was now needing to be faced since the problem of EMF exposure is increasing. He also called on the mass media to assist in bringing a balanced presentation. He said that it needed the financial aspects, the political aspects and the health and social aspects to be all considered if this issue is to be successfully faced.

Limitations for the Writer:

The major difficulty was language since the dialogue was all in Russian and there was a lack of professionally qualified English translators. Our conference translator was Ludmilla, a very charming English teacher, but who had difficulty with simultaneous translation and a lack of familiarity with the technical nature of the subject. Despite these limitations, enough of the gist of the presentations was able to perceived to make this report. Apparently, there will be a complete professional translation of the papers from the conference that Mr. Pak had commissioned. These were not completed by the time Dr. Maret left Kazakhstan and were promised to be forwarded to him later.

The other challenge was adequate access to the scientists before the conference due to their being required by Mr. Pak for conference planning purposes and afterwards for private consultations with Mr. Stetzer and Mr. Pak. However, there has been a successful dialogue established with the Russian and Kazakh scientists since returning from Kazakhstan which will be ongoing.

Scientific Networking:

Meetings were held with the Russian scientists on the day prior to the conference. These took place in Mr. Pak's office. A special digital meter that measures separate magnetic and electric fields, called a B & E meter, was briefly demonstrated. There are apparaently several versions of such a meter manufactured in Russia. Mr. Stetzer purchased such a meter for his ongoing research with EMF exposure and to correlate the readings with the Microsurge Meter developed by Dr. Graham.

Dr. Maret also had a meeting with Dr. Vladimir Kozlovsky two days after the conference to discuss participation as a foreign advisor to a proposed Kazakhstan research project involving assessment of the "dirty power" transients and their possible health impact. The proposed protocols are still being worked out, however, they seem to involve some alternative medicine approaches including the energetic assessment of acupuncture meridians using various measurement devices as well as simultaneous biochemical parameters. They hope to attract some international funding for a 3 year research project.

In dialogues with Dr. Grigoriev from Moscow, it became apparent that their staff were willing to prepare an extensive English language monograph about their research involving thousands of animals. This would be extremely valuable as much of this work has not yet been translated. Dr. Maret will explore a collaboration in this regard with their group and try to find sources of funding for this type of translation and EMF research compilation.

A measurement of the fields around the body of Mr. Stetzer demonstrating the B & E meter

In addition, the Russian scientists were introduced to the measurement technique of Elecromagnetic pollution in the power lines using a Fluke Scope Meter as shown below:

From L to R: Dave Stetzer, Dr.Valentina Nikitina, Dr. Yuri Grigoriev, Dr. Alla Semenyuk (translating from English to Russian for the Russian scientists)

Scientists from Russia with their American colleagues. From L to R: Dr. Karl Maret, Dr. Valentina Nikitina, Dr. Yuri Grigoriev, David Stetzer, and Ludmilla (translator).

The day following the conference, on September 9th , there was a joint presentation of Russian, Kazakh and American scientists at the Sanitary-Epidemiological Station in Almaty. This was invited by Dr. Kenes Ospanov, their Chief Medical Officer, as well as from Dr. Magripa Makhmutova, the Head of the Laboratory of Electromagnetic Fields and Other Physical Factors. More in depth presentations were made again especially by Dr. Grigoriev, and Dr. Nikitina, both from Russia, with shorter presentations by Mr. Stetzer and Dr. Maret. Also attending were Dr. Kovlosky and Dr. Osparov's deputy Chief Medical Doctor. Dr. Alla Semenyuk did some translation from English into Russian for the Americans but somewhat less from Russian into English due to the rapid presentation style of the Russian scientists. Many of the public health doctors from the different Kazakh health regions were present to hear the presentations.

Dr. Grigoriev again outlined the EMF problems for the general population. He stressed that this problem concerned not only the scientists and health specialists, but was a global problem that required the cooperation of many international scientists. He stressed the need to establish a National Committee on Non-Ionizing Radiation since the current problems involved much more than the thermal effects from EM fields. He stressed the danger of the magnetic component of the radiation which is very difficult to shield. Exposure limits to the magnetic component (B field) has been set not to exceed 0.2 microTesla (2 milliGauss). He showed numerous slides again showing the ubiquinous of low level fields in homes and offices and innumerated the extensive research done in Russia in this field.

Some of the participants at the Sanitary- Epidemiological Station in Almaty. From L to R: Dr. Grigoriev, Dr. Makhmutova, Dr. Nikitina, Dr. Maret, Mr. Stetzer, Dr. Semenyuk.

Some of the participants of the Sanitary-Epidemiological Station in Almaty, Kazakhstan who participated in the Institutes meeting on September 9, 2003.

Summary:

This trip was most valuable from the perspective of networking and general assessment of the state of affairs in Kazakhstan. The Public Health physicians are very interested in collaboration and would like to explore mechanisms of working with international experts to help their population. It was not clear whether there would be governmental financial support for such efforts. It appears that most of this conference expense was privately underwritten by the business interests of Mr. Pak. The research of the Russian and Ukranian scientists is quite extensive and needs to be made available to the Western scientists.

There appears to be little awareness and has been no formal research in the past into the problem of “dirty power” outside the United States, although that situation may change in Russia in the coming months. There appears to be some confirmation that EMFs can have a significant impact on metabolic systems including elevated blood glucose levels, elevations in lipid levels, increased neuro-regulatory disturbances, decreased testosterone levels in males and impacts on the CNS, cardiovascular, and immune systems. In general, it appears that EMF stress leads to conditions of more rapid aging and the current proliferation of EMFs, especially the increased use of low-level microwave devices such as cell phones by our children, may have important socio-economic consequences. NFAM could play an important role in this field to help inform the general population about these issues.