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1. Dr Kyong H Nam from the Tsawwassen powerlines group in British Columbia, Canada, has challenged the WHO on health concerns from EMFs from powerlines. He sent an open letter 21-3-08 with a 24-page explanatory scientific appendix. The text of Nam's letter is at APPENDIX A herewith.
2. The essence of Nam's case is the claim that WHO erroneously relies on dismissing exposures with a signal-to-noise ratio of 1 or less, in the context of biological systems, particularly in cells and between cells, which form complex, organised and electrically-driven systems. This is not a peer-reviewed paper and Dr Nam admits venturing beyond his specialist expertise, so there is an increased risk of error on his part. The general lines of his argument as distilled above seem reasonable in principle.
3. Much depends on the definition and assessment of noise, as distinct from organised activity, and on whether signal-to-noise ratio should be substantially less than 1, not just comparable with 1, before an exposure is to be dismissed.
4. The WHO position is set out in EHC 238 of 2007. It does discuss noise, including the potential increased sensitivity of neural networks, (e.g. pages 97-104), and derives noise levels which turn out to be much higher than the signal levels from typical EMF exposure (e.g. Table 32). However, neural network effects are rather glossed over and not compared in Table 32; they could have much greater sensitivity for larger networks which could bring them easily in the detection range for typical EMF exposures. After all, animal navigation studies suggest very sensitive magnetic field bio-detection mechanisms exist. WHO acknowledges this in its final paragraphs in section 4.4 but still dismisses the plausibility of such mechanisms in humans.
5. The WHO approach relates "*plausibility*" to "*whether the mechanism challenges scientific principles and current scientific knowledge*". The claim that there is no plausible biological mechanism is at the heart of official resistance to effective precaution. That claim, because of the word "plausible", rests significantly on the signal-to-noise argument. However, WHO underplays the plausibility of sensitive networks, such as suggested in animal navigation and demonstrated in nano-radio developments (news242). At least WHO calls for further research in this area with a High Priority classification (page19).
6. Further to the public health survey in France (news), objectors to the proposed powerlines are proposing a weekend conference in Laval - county town of the department of Mayenne - 25 and 26 October this year. Steve Nuttall writes: "At the moment those are the only details decided. The proceedings will be in French, but it

would be great to hear some new voices or even distribute some different sorts of material here. The debate is hotting up with the president's promise to do a deal on a line to Spain by June under a lot of pressure, this weekend 10,000 on the streets Spanish side, and our recent press campaign flushed out a commune in the suburbs of Paris that exists under a veritable cat's cradle of HV lines.”

7. A reply 28-3-08 from BERR (news250-251) clarifies its position relative to safety clearances, in the context of its role in granting compulsory (“necessary”) wayleaves (APPENDIX B). In that context, BERR would appear to disregard effects of safety clearances upon neighbouring properties over which they may apply, as it sees its role as limited to wayleaves where the line is physically on, over or under the land in question. That leaves the constraints and safety impositions on neighbouring land which result from Secretary of State’s decision (or, in the case of voluntary wayleaves and easements, from agreements between company and grantor) as a civil matter with the burden on the affected landowner to take it to court. Such behaviour of BERR, and of Secretary of State, to disregard such serious impositions on uncompensated neighbours when making their decision, does not seem fair, but perhaps that’s the legal power of government! Legal advice on whether such disregard could be challenged would be welcome; meanwhile, like BERR, we look to the court dealing with the Finnigan case to indicate a civil law precedent.

8. A reply 20-2-08 from Ofgem has been received by Andrew Darke (news249.4, 250.3) on the Beaulieu-Denny precognition from Europacables on undergrounding and on Lord Hinton’s suggestion that cost ratios ratios of 4:1 would make it supportable. In short, Ofgem argues (rather defensively) with some points in the Europacables precognition, affirms that “the principle is always life cost optimisation and not capital cost only”, and suggests that Lord Hinton’s 1962 view has been overtaken by Environmental Impact Assessment requirements. It’s a disappointing reply in its cost and compliance orientation, reflecting Ofgem’s limited corporate strategy. A more positive quality-of-life oriented environmental watchdog is needed.

APPENDIX A letter from Dr K H Nam to WHO

Open Letter to the WHO Director-General

March 21, 2008

Dr. Margaret Chan
WHO Director-General
mcnabc@who.int

Dear Dr. Chan:

As you know, modern technology has increased electromagnetic fields (EMFs) and radiation (EMR) in our living environment to a limit that is reported to be hazardous to our health. To protect the public, your organization - the World Health Organization (WHO) - adopted 833 mG as a safe magnetic field exposure limit for 60-Hz power frequency. This was a level recommended by the International Commission on Non-ionizing Radiation Protection (ICNIRP), while ignoring

numerous epidemiological study results relating to childhood leukemia risk and other abnormalities, at levels as low as 2 to 4 mG.

This grave mistake on the WHO's part appears to be the result of a flawed assumption that for any incoming electromagnetic signal to affect cell functions, it must have a **signal-to-intrinsic noise ratio greater than one** (where intrinsic noises in a cell are thermal, shot and 1/f noises) However, **this is a totally incorrect notion** given that a cell is not an electronic system designed to retrieve useful signals, and therefore does not have to discriminate signal from noises. Quite the contrary, any signal coming into the cell will superimpose vectorially on to intrinsic noises to affect particle motions in the cell and subsequently, the biological system. The cell in homeostasis can be compared to a full glass of water, which is ready to spill over with any addition of a minute drop. This means that any **low-level incoming signals will affect cell functions** like 1 or 2 °C body temperature changes make people sick. Because thermal noise is white noise, there must exist frequencies that resonate with incoming signals to maximize the effects when they are in phase.

Many researchers, including those from your own organization, have believed that the thermal noise (Brownian motion noise, also known as Johnson noise) dominates the particle motions to be random in the cytoplasm. Cytoplasm is the substance surrounding the nucleus and inside the cell plasma membrane. It contains many organelles such as the nucleus and mitochondria, as well as macromolecules, such as proteins, carbohydrates, lipids, and adenosine triphosphate (ATP). The organelles and macromolecules are suspended in cytosol, a liquid electrolyte in the cytoplasm. The cytoplasm also contains cations of hydrogen, sodium, magnesium, calcium, and the anions of chloride and bicarbonate. As such, cytoplasm is considered to be a gelatinous, semi-transparent **colloid** in which macromolecules are stabilized by electric charges. While many proteins are bound to the plasma membrane and enclosed in the organelles, others are organized into filaments or tubes called a cytoskeleton, which acts like a highway to transport cytoplasmic elements including the organelles and charged macromolecules. In a charge-stabilized colloid, colloid particles entrain the nearby fluid to follow along without forming much wake in the electrolyte ion clouds.

All these phenomena suggest that cytoplasmic flow is well organized and intrinsic noises are over-damped accordingly. Therefore, it is reasonable to assume that particles most likely form queues at the entrances of channels or pumps. This effect may be more pronounced with multiply ionized molecules like ATP^{4-} and ADP^{3-} (adenosine diphosphate) due to reactions with the negative membrane electric field. There will also be opportunities when the incoming signal is superimposed in phase with the intrinsic noises and transversely displace ADP^{3-} and/or ADP^{4-} from the queue. These molecular deflections can be augmented when geomagnetic fields and gravity push them in the same direction as the incoming signal, and if ADP^{3-} cannot reach mitochondria due to the deflections, APT^{4-} production will be reduced. In fact, there are reports that claim ATP^{4-} production is reduced by incoming EMFs. When ADP^{4-} cannot reach the sodium-potassium or calcium pumps because of the deflection and/or reduced production, cells will experience an ATP depletion situation, thereby inducing DNA fragmentation, apoptosis, necrosis and eventual genotoxicity. Many research results support such biological developments (Appendix)

Thus far, I have briefly described how **low level EMFs can cause health hazards** and how the WHO has made a mistake by adhering to the **incorrect notion that signal-to-noise ratio has to be greater than one to see adverse health effects**. Because of the WHO's mistake, our local government and power companies have decided to upgrade the existing 50-year old power lines going through 150 residential backyards and school grounds from 138 kV – 50 MW to 230 kV – 1,200 MW for another 60 years. They claim that **the new power line EMFs – estimated to be more than 150 mug - are “safe” because they are well within the WHO's guidelines**. Thanks to the WHO's guidelines, the power companies have abandoned one **perfectly-good alternative route** (Delta Port Road, shown in Picture 1) without acceptable reasons. Furthermore, the government and power companies decided to decommission the power lines and release the right-of-way (ROW) (Highway 17 in Picture 2), which is **thought to be the best alternative route**. In effect, the WHO has given license to the government and power companies to commit biological havoc by allowing them to choose our residential backyards as the route for the heavy current power lines (Pictures 3a and 3b).

Further to these, the government becomes **authoritarian** by revealing its initiation of an **exodus plan to remove dissident residents from their beloved Homes attached so long, many cases decades**. On March 18, Neufeld, the minister responsible for the power line project was quoted as saying, “We haven't absolutely confirmed [buyout] but we will be willing to talk to people. And at the end of the day I don't think they'd be on the market long. If we had to buy them and resell them I think they'd be off the market fairly quickly” The news paper continued, “Residents are concerned about possible health hazards from electromagnetic fields in the vicinity of the lines – although Neufeld noted the fields will be **substantially lower than thresholds established by the World Health Organization**”

Very soon, we will be asked to choose between ‘vacating our **Homes** at depleted prices or ‘being told to shut our mouths because the WHO says so.’ The government seems ready to **purge** dissident residents and replace them with EMF skeptics - the people who do not believe power line EMFs are health hazards. **Home is defined as an environment offering affection and security; home is where the heart is and there's no place like home on earth**. It seems **Home** does not mean anything to this government that will claim though human rights are paramount - the WHO has made them blindly arrogant.

With your conscience, imagine the lives of unsuspecting people, especially the innocent children, who will be immersed in high EMFs without realizing its adverse effects until it is too late. While ignorant assurances from the government and power companies are prevailing, our cells will continue to receive biological stimulation from these EMFs and many of us will later see and feel the harmful effects accordingly. Thousands of positive research reports testify to the health hazards of low-level EMFs; **have these results piled up in the refuse baskets of the WHO and ICNIRP?** I retrieved a few of them and organized in Appendix for your information.

This is the time for the people with authority to be **less hubristic** and to fix past mistakes. Please arrange to issue an **immediate moratorium** on building new or upgraded high voltage power lines in or near to residential areas to rescue the affected

people and avoid future accusations that the WHO and ICNIRP have willingly and knowingly contributed to illnesses of human beings, especially our children for generations to come.

Sincerely,

Dr. Kyong H. Nam
Affected Resident in Tsawwassen, B.C., Canada
Ph.D. in High Power Laser,
P. Eng. Alberta

APPENDIX B Email response 28-3-08 from BERR on safety clearances.

“A complex issue but we need to recognise that there are various jurisdictions in play when it comes to overhead lines and land matters. There is the regulatory jurisdiction of statutory regimes administered by the Secretary of State and alongside that the civil law jurisdiction administered by the courts. We have to, in exercising the Secretary of State's responsibilities, be careful not to transgress into the jurisdiction of the courts. At the same time the Courts themselves exercise administrative law jurisdiction over our administration of the regulatory functions i.e. they consider judicial reviews of our decisions and are the ultimate interpreter of the relevant legislation (see health warning on our public guidance on the wayleaves regime).

In this case we regard the Secretary of State's wayleave function as relating to the physical imposition of electricity lines on land given the reference in the legislation to consent to install and keep installed *an electric line on, over or under* land (paragraph 6(1) of Schedule 4 to the Electricity Act 1989). But that power has never been read as extending as far as we know to safety clearances. We have not received any compulsory wayleave applications for such things, have no case notes covering them and generally no precedents for dealing with them exist. However, given the 1989 Act provisions were not creating something new but replacing section 22 of the Electricity (Supply) Act 1919, we would have expected that if the regime had been intended to cover such things it would have been clear from past casework. We would therefore not see such coverage as an appropriate feature of the regime administered by BERR.

If it is outside the regulatory jurisdiction of the Secretary of State then it falls into the civil law jurisdiction of the courts. We understand that part of the action for trespass in the Finnigan case is about whether NG's line through its safety clearances constitutes a trespass or a nuisance. We see it as entirely right for the Courts to opine on the matter, and do not see it as appropriate for us to transgress into that area. Even more so when there is a "live" case on the go.

Hopefully the Court case will resolve the matter and we can all reflect on what is said.”
