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TETRA – by Jay Griffiths

Before the TETRA mast was erected in Llanidloes, the nearest thing to a health scare was that the local Kwik-Save was no longer selling prunes in apple juice.

Llanidloes is a small, open-hearted market town in a damp and lovely valley in mid-Wales. It is a town with a strong identity and long memory; some people still live in the street where they were born. Solidly Welsh, and surrounded by farmland, Llanidloes also has a smattering of English blow-ins; into organic veg and eco-design and jazz. They chirpily co-exist with no more than the odd grumble from locals about the “hippy contingent.”

And then, stealthily, on a bank holiday weekend in May, the company 02 (through its subsidiary MM02) erected a TETRA mast in the heart of town. 02’s idea of “consultation” was legal but risible; barely more than informing the mayor and town council that they were imposing the mast in town, whether Llanidloes liked it or not.

And Llanidloes did not.

There was an outcry. Posters were put up in windows, a march held, banners made. (One flew from the top of the mast itself.) Llanidloes became part of what the Times has called a “popular revolt” against TETRA.

The town felt bullied by a giant of a company. For many, it’s an issue of local democracy; a town should have the right to refuse. “But,” comments the stalwart and thoughtful Councillor Morgan, “in Llanidloes we have a history of David beating Goliath.” And, someone tells me, “we had a Chartist riot right here in Great Oak Street.”

And then people began informing themselves. What Llanidloes discovered – like hundreds of communities around the country – is the staggering story of TETRA. A story which involves science being “perverted for political ends”; a police officer dying in agony; one of the country’s leading scientists in an extraordinary *volte face*; a company which openly confesses to taking no responsibility for the safety of what they produce; a whistleblower; a financial scandal, a political scandal and a health scandal above all.

It involves you directly if you live near a TETRA mast. And considering that at least 3,200 such masts will be erected in the UK, there *will* be one near you.

TETRA (Terrestrial Trunked Radio) is a new digital communication system for a national police radio network which is meant to provide secure and fast radio communications. 02 call their system “Airwave” “Airwave is better than the old system for voice traffic – at least we don’t get interference from Dutch cabbies anymore,” says a police source. At present police forces run their own analogue radio system and there can be a problem “interoperating” with neighbouring forces. The police cannot continue to use their old radio frequencies because the government has sold them off.

The feature considered potentially risky is that the modulated part of the signal comes in bursts with a frequency of 17.6Hz, close to the 16Hz at which the brain “loses” calcium, (calcium efflux) and the frequency is also within the frequencies used by the brain’s beta waves. The first warning over this came in the influential independent “Stewart Report” on mobile phones in 2000 which stated that frequencies around 16Hz “should be avoided, if possible.” Because of that caution, the National Radiological Protection Board (NRPB) was commissioned to write a report on TETRA’s possible health effects in 2001. (The AGNIR Report). Although their conclusion appeared to say “All’s Well”, there were worrying details in the body of the report. So the Police Federation commissioned independent research scientist Barrie Trower to write a report on the possible risks of TETRA, completed in September 2001.

The Trower report was dynamite.

Dr. Gerard Hyland, expert in low level radiation and biophysicist from the International Institute of Biophysics, and a prominent TETRA critic, states: “With the TETRA roll-out, we could be seeing a pandemic of brain tumours in ten years.” Low frequency radiation, says Hyland, affects brain function and the blood/brain barrier and degrades the immune system. Children are known to absorb far more radiation than adults. Dr Hyland reported in *The Lancet* that “Radiation is known to affect the brain rhythms and children are particularly vulnerable... The main effects are neurological, causing headaches, memory loss and sleeping disorders.”

When a TETRA mast was switched on in Dursley in Gloucestershire: people reported being “shocked awake” up to fifteen times a night; migraines; sleeplessness; nose bleeds, none of which they had routinely suffered before. At a school in Littlehampton, Sussex, eleven children had to be sent home from school on the day that a nearby TETRA mast was switched on, because they were ill with severe headaches, nosebleeds and dizziness. (Interestingly, residents did not know the mast had been switched on, so the children’s reaction could not have been psychosomatic.)

Llanidloes doesn’t want the mast. Nor did Professor Sir David Lane, (director of the Cancer Research UK Cell Transformation Research Group at the University of Dundee) who submitted a formal objection to a TETRA mast/base station near his home, on the grounds that “this type of transmitter may constitute a health hazard to the occupants of the neighbouring houses.”(1)

TETRA uses microwave radiation, as well as pulsing at an extremely low frequency. Low frequency electromagnetic and microwave radiation were identified in the 1960s as a potential anti-personnel weapon and the Pentagon has confirmed that it has developed microwave crowd control weapons.(2) Documents from the US Department of Defense reports that “Animal experiments have demonstrated the use of low-level microwave signals to produce death by heart seizure or by neurological pathologies resulting from breaching the blood-brain barrier.” (3) Can a system which is developed as weaponry be considered safe for the police and public?

Let’s ask those canniest of all arbiters of public safety. *The insurance companies*. Lloyds of London and Swiss Re have recommended to other insurance companies that exclusion clauses should be written against paying compensation for illnesses caused by exposure to continuous long-term low level radiation. John Fenn of Sterling Underwriters has said: “I’ve been concerned about this for some time and a few years ago I began writing exclusion clauses. I’m convinced there is a problem.”(4)

Some call it the Precautionary Principle. In Llanidloes, they call it common sense. If something may have risks, and has not been proved safe, it must be assumed that it may be dangerous.

Dr Hyland is explicit. If you ask “whether there is an established *risk* to human health from exposure to GSM/TETRA radiation: the answer is undoubtedly ‘Yes’.” (5) He adds: “If there were the same degree of uncertainty over a food or medicine, the government would never have licensed it.” Food or drugs are subject to stringent tests over years, (although this testing regime is certainly not infallible). However other technologies, be they genetic engineering, nanotechnology or TETRA, do not have to pass through the same stringent procedures. Green MEP Jean Lambert has said: “Reports of TETRA being responsible for tumours, leukaemia, motor neurone disease and other cancers must be taken seriously... With risks like these the precautionary principle must apply.” There is a clear need for tougher regulation and testing of new technologies, but the government doesn’t see it that way at all, and the person they have put as head of their “Better Regulation Task Force” is David Arculus, who is also chair of MMO2. The fox is in charge of guarding the chicken coop.

When Barrie Trower finished his work for the Police Federation, his report was too hot to handle: the Police Federation sat on it for a few months, but it was leaked onto the internet. Trower, with a background in government microwave research, was a careful collator of the evidence and wrote the report in a style which would be comprehensible to a non-scientific reader; he was thus a profoundly important whistleblower – for the police and public alike. (6) “When I wrote the TETRA report, I said it must never be used, and I haven’t changed my mind,” he said. “I believe that the government, government scientists and this industry will be responsible for more civilian deaths in peacetime than all the terrorist organisations put together.”

Astonishingly, the Home Office is rolling out TETRA nationwide without proper studies being done first: an act which is in Hyland’s words “totally irresponsible.” The NRPB admits: “No epidemiological study as yet

has explored the risks associated with telecommunications systems such as TETRA which use RF radiation modulated at frequencies around 16Hz” (7)and says that “Human volunteer studies should be carried out”. (8) I asked Professor Challis, (member of the NRPB’s Advisory Group on Non-ionising Radiation,) if proper studies had been done. “No,” he said, “because you’ll never be able to say that something is safe unless you have an infinity of studies, but there is no evidence of any harm and the police are happy with the system.” The Home Office last year commissioned a five million pound study from Imperial College, London, to study the effects on police officers – not volunteers – over a ten year period. But the study won’t look at the effect of masts, only that of handsets, and is being done while the system is already in use nationwide.

Since many of the potential effects could take years to surface, some say any studies should run for a lifetime. But at Porton Down, the government’s experiments were conducted in three and a half months and involved exposure to TETRA signals lasting twenty minutes. (9)

“A death you wouldn’t wish on your worst enemy”

The TETRA handsets for the police are considered far more potentially dangerous than the masts because the handset is a brief but intense source of radiation close to your head. When the technology was first used in Lancashire, 177 police officers (out of 246 respondees to a questionnaire) reported symptoms including migraine, nausea, sleeplessness and lack of concentration. Norfolk Police have confirmed that six people including a chief inspector at North Walsham police station have become ill, with dizziness and headaches, since a mast on top of the station went live in late February/early March this year. Twenty five people living near the mast have reported similar illness.(10)

The late Professor Ross Adey, at the University of California, who studied the effects of pulsed low frequency and microwave radiation on people for several decades, and whose work was funded by NASA and the American military, has commented: “I would be very concerned about a four-watt TETRA hand-held radio against my head day after day.” (11) While researching this article, I heard of officers “terrified” (their word) of using TETRA but also pressured not to speak openly about it.

One brave Lancashire police officer wrote to the Police Federation Magazine in March 2002 saying “I personally know of new cases of skin problems, sleeplessness, migraines, depression, difficulty in concentrating and headaches”. He has been moved to another section. One police source said to me that the system was a “done deal the first day we heard of it.” They felt they had no choice in the matter. “It was something we couldn’t stop.”

Speaking only in confidence, a senior police source told me “I’ve got to be guarded. There’s an awful lot of political pressure regarding this issue.” He was not allowed to speak to other officers about the risks of TETRA, and felt that his career was on the line if he objected publicly. He spoke of his feelings of being kept ignorant and isolated. He asked for information and he asked for help – any help; legal help or campaign help. I was moved: it isn’t often that someone so powerful sounds so helpless.

I spoke to Steve Pierce, Chair of Devon and Cornwall Police Federation. “We need 21st century technology,” he said. “And in that sense we welcome TETRA. But if you ask me am I easy about TETRA, the answer is no. How can I be?” In October 2002, at a Police Federation meeting on TETRA, Pierce spoke to Dr. Mirielle Levy, the Home Office Health and Safety Officer in charge of TETRA. Levy remarked that, “Nothing will stop TETRA and if the Officers don’t like it, they can resign...” Heads swivelled. Conversations stopped, said Pierce. An officer asked her who would be responsible if he contracted leukaemia. “No one is,” she replied.

Tell that to Dr. Ian Dring. His brother Neil, a police officer from the Leicester constabulary, died in agony of oesophageal cancer this summer. Neil, he said, was convinced that it was TETRA which caused his death. “If people want to know how it feels to have your brother die in your arms, fighting for 48 hours for every breath, then I’ll tell them. It was a death you wouldn’t wish on your worst enemy.”

Dr. Dring, himself a scientist, has spent much of his working life in Health and Safety and monitored his brother’s condition. “As soon as he started using TETRA, he got severe headaches. And the site of the tumour was where he mounted the handset.” Neil had none of the preconditions for oesophageal cancer; he was only 38, younger than the age group associated with it, he was a non-smoking, light-drinking triathlete

with no stomach problems and whose diet was good. "To us," said Dr. Dring, "that's suspicious. And then another officer of similar age and equally healthy has been diagnosed with oesophageal cancer in the Leicester force and in the same place." Dring quotes the U.S. Cancer Society as saying that for a man under forty without preconditions, the incidence rate would be one in 100,000 and, they added, the chances of two people getting that kind of cancer simultaneously would be millions to one.

Stan Sexton, health and safety adviser for Leicestershire police has said that the second officer rarely used TETRA for radio calls. Dr. Grahame Blackwell, who formerly led a team researching and developing third generation mobile communications, says that's not the issue. "Even infrequent use could initiate cell disorders that are then accelerated by radiation" (from masts, often sited at police stations) which "inhibits the body's own immune response." In other words: radiation from handsets could trigger problems which are then worsened by constant exposure to radiation from masts. I spoke to Professor Challis about these two officers. "Sadly people die of cancer every day," he said, and dismissed the case of two identical and rare cancers as chance.

Meanwhile, Llanidloes is realising the diversity of its talents. The mayor and his town councillors energetically oppose the mast. An ex-physics teacher reads up on the science. In the buildings around the mast, people inform their landlords they will move out of rented business space if the mast is switched on. People who have never campaigned over anything in their lives get active. ("Never," says Councillor Morgan, "never, ever underestimate Llanidloes.") The guys in the local printers stay working till ten at night to help produce information leaflets. The town council organises a leaflet drop to every house. Someone begins a subvertising campaign NO2 TETRA. Llanidloes is famous for its annual Fancy Dress Night competition, when thousands of people flock to the town in costume and this year the local MP, Lembit Opik, gleefully chooses the winner of the competition: "Doctor TETRA" in a lab coat brandishing a toy silver TETRA mast.

A public meeting is called. 02 are invited. And the NRPB. And the helpful MP. Local people come in their hundreds. Virtually everyone is there. Except, that is, 02. They send an insulting letter saying "the nature of public opposition and local activism have raised serious concerns with regard to the safety of 02 employees at such a meeting." (*They are worried about their safety?*) Further, they say: the site "perfectly fits the needs of the Airwave service." Quite, comments Lembit Opik, "but it does not fit the needs of Llanidloes."

The man from the NRPB, Dr Michael Clark, arrives and speaks of sunshine, x-rays and ordinary radio signals. He says very little of TETRA. And he lies to the town, claiming that the Trower report was not commissioned by the Police Federation. (When I spoke to Steve Pierce, I asked him about the Trower report. "Do you know who commissioned it?" "Yes." "Can you tell me?" "Yes." "Who was it?" "Me.")

The NRPB is an organisation which exists to regulate radiation. It is half government-funded. Like many regulatory bodies, it has unhealthily close ties to the industry which it claims to regulate, and there are clear conflicts of interest. The NRPB subcontract research on microwave radiation to "Microwave Consultants Limited" whose director is Dr Camelia Gabriel. Meanwhile a senior consultant for Orange plc is none other than... Dr Camelia Gabriel. Concerns over this were noted in *The Observer*.(12)

Dr. Keith Baverstock, who was the World Health Organisation's senior radiation adviser in Europe, addressed a conference on low-level radiation in July 2004, accusing the NRPB of "misusing" science (in studies of nuclear test veterans). He said science has been "perverted for political ends" by government agencies which should be protecting public health. Baverstock alleged a "serious flaw" in the NRPB's methodology in these studies. (13)

The *Observer* reports that "vital evidence of harmful effects on children from transmitter masts" was kept from the Stewart Committee. The panel had asked the NRPB for copies of a particular study on children. The NRPB informed the committee that the research was unpublished and unobtainable. Not so. As the *Observer* remarked: "the research, published in an international scientific journal in 1996,... has been easily obtained by ordinary members of the public." (14)

There is a yawning discrepancy between the NRPB and others over safe levels of this kind of radiation. If, comments Alasdair Philips, (Cambridge researcher in electronic and bio-medical engineering and founder of campaign group *Powerwatch*,) you compare the NRPB's recommendations with others, in terms of miles per

hour, it is as if in the UK an acceptable speed limit would be 2847mph while the EU recommends a limit of 9mph. (See panel)

Why the difference? Crucially, the NRPB and ICNIRP (International Commission on Non-Ionising Radiation Protection) set their standards only taking into account *thermal* effects. Dr. Hyland says: “That’s not the problem” – the non-thermal effect of radiation from TETRA handsets and masts “is far more serious.” (“Thermal effects” means that there is enough energy to heat tissue. “Non-thermal effects” means that although heating has not taken place, there are other effects on biological structure and the body’s communication systems.)

So, says Hyland, there are effects which cannot be measured simply by measuring heat. Hyland writes: “For ‘official’ standard setting bodies... to be so confident that their *purely thermal* guidelines afford a completely adequate degree of protection is effectively to deny that, when alive, our sensitivity and vulnerability to pulsed microwave radiation are no higher than when we are dead...” (15)

Roger Coghill, who runs the independent Coghill Research Laboratories, specialising in bio-electro-magnetics, remarks that if non-thermal evidence is accepted then low frequency radiation is demonstrably able to induce biological effects, some of which may be adverse. “The scientific community in general is shocked that the regulatory authorities of the West (in contrast to China and non Western countries) are ignoring plentiful and robust evidence that non-thermal radio frequency exposure can cause serious adverse health effects.”

The Home Office and O2 insist the system is safe by referring to the NRPB’s “AGNIR” report. But this work is not peer reviewed (16) and a court case in 1998 revealed that virtually none of the NRPB documents on non-ionising radiation (including TETRA) are peer reviewed. (17) Dr Michael Clark, the NRPB’s spokesperson on TETRA is by his own admission not a specialist in it. (His background is ionising radiation.) (18) (Ionising radiation means that there is enough energy to strip electrons from atoms and to leave the atoms electrically charged. Non-ionising radiation, including microwaves, doesn’t have so much energy and is therefore often more benign. *But*. The “but” is that certain particular wavelengths can have certain particular effects. Which is why you don’t put your poodle in the microwave oven. And why Professor Ross Adey didn’t want to put a TETRA handset to his head.)

The NRPB has been furiously attacked by the Coghill Research Laboratory. The NRPB, they say, “fail to mention or discuss the hundreds of studies being reported in the literature of adverse effects at levels well below the so called thermal levels.” Standards set in the West are, they say, “influenced by commercial not biological considerations.” The work of the NRPB completely ignores the exposure levels set in China and the former Eastern bloc and this “raises the question whether such deliberate wilful omissions by experts purporting to carry out a protective function on behalf of the public constitute criminal neglect.” (19)

O2’s response to public disquiet has been cavalier. They have been accused in court of “corporate bullying” and, in reference to protesting residents, O2 has said “We had to bring certain places into line”. (20) A spokesperson for O2 has even stated that: “The safety of what we supply is nothing to do with us.” (21)

At a meeting in the House of Commons between Llanidloes residents and O2, Josh Berle (head of regional PR) referred to the use of TETRA by the “police, fire and ambulance services”. Not so fast. You can read in the House of Commons Library Research paper on TETRA that the fire and ambulance services have rejected TETRA, apparently for reasons of cost.

TETRA, said Berle, is in use in many countries. Careful. In fact, the system used by many police forces including France, Switzerland and Germany, is the French-standard TETRAPOL, which, crucially, does not pulse at 17.6 Hz. Alasdair Philips says TETRAPOL is “intrinsically more bio-friendly as it does not pulse in the same way or at similar endogenous brain-wave frequencies.” TETRAPOL, then, doesn’t pulse at the brain’s own frequencies, and is safer.

TETRAPOL is also far cheaper than the initial cost of TETRA of £2.9 billion. Here we get to the financial scandal. Not only very expensive, the TETRA system doesn’t Do What It Says On the Tin. (Data transmission speeds are about a quarter of the promised speeds) (22). Further, it *does* do things it shouldn’t.

The Medical Devices Agency has complained that it interferes with defibrillators and incubators, can upset heart pacemakers and could have “direct impact on patient care” (23).

In September 1999, the European Commission severely criticised the Home Office, proposing that the Home Office had unlawfully limited the contract to tenders that could supply the TETRA standard. (24) The system was secured under Public Private Partnership and the contract was given by the Home Office to BT (which has since hived off the “Airwave” contract to 02) with the American company Motorola.

The Public Accounts Committee scrutinised the deal and were underimpressed with Airwave as a system, and with the behaviour of the Home Office. The Committee concluded that “Airwave might be more sophisticated and expensive than it really needs to be.” They commented “In negotiating a deal with 02, PITO [Police Information Technology Organisation] and the Home Office failed to secure any clawback for the taxpayer of additional profits if ... the system is sold by 02 to overseas governments.... Failure to negotiate a clawback agreement was a product not just of 02 being in a powerful position as the only bidder but also the inability of the Home Office to bring the fire service and other safety organisations on board...” They also commented “It was by no means clear to us who will bear the risk if concerns about the effects on health of using the Airwave system prove to be real.”(25) This is the political scandal; that the Home Office should apparently put the interests of a huge private company before the safety of the police and the public.

The Tetra Industry Group admits on its website that they have their eye on the lucrative market of security, construction and transport industries. The industry dearly wants to sell the TETRA system to many countries around the world, as the newsletter Electromagnetic Hazard and Therapy reports. (26) Trower quotes some thirty-two countries: “I know because I’ve spoken to most of them, and they’re worried,” says Trower. And, he tells me, one country to have rejected the TETRA system for their own emergency services is America.

The industry seeks the endorsement of the British police force, seen as conservative, safety-conscious and well-equipped. For the industry, it is a kind of celebrity endorsement: *As Seen On The Bill*. “That,” says Dr Grahame Blackwell, “is a strong selling point. It’s a very cynical use of our emergency services.”

Blackwell shows me extracts of e-mails about TETRA from a Crime Scene Examiner in Lancashire which grow increasingly desperate over the weeks, describing how all but one member of their team “are suffering from symptoms ranging from headaches/toothache/neuralgia to high blood pressure and even a cancerous tumour in the throat... It is the tumour which has finally been the last straw...” This officer, says his colleague, had been “very pro tetra radios – needless to say he’s changed his mind since finding out he has cancer.”

As I finish this article, an e-mail arrives. The officer is now dead. As his colleague remarks: “We are a group of people who love our job and we are not “trouble makers” – but we are genuine in our belief that these radios are killing us.”

Meanwhile, around the country hundreds of local campaigns have sprung up and are linking nationally. In Llanidloes, the spirit of the Chartists lives on. Fighting for the rights of ordinary people to make the decisions affecting their lives, Chartists faced imprisonment and transportation for their part in a popular revolt. But ultimately they won. So, in the end, will Llanidloes.

The story of Drumcarrow

At Drumcarrow Hill, Fife, in Scotland, a TETRA transmitter has been “live” since the late ‘90s. Only about two hundred people live around the mast but there are at least seven recent cases of cancer and five cases of Motor Neurone Disease diagnosed over the past five years. (Roughly one person in 50,000 to 100,000 is diagnosed with MND per year.) Scientist Dr Neil Cherry researched the potential health hazards of low frequency radiation: he died of MND in 2003, convinced he contracted it as a consequence of his long exposure. Research on calcium imbalance linked to MND, plus studies (listed in the Stewart report) of calcium efflux, suggest MND as being potentially linked to TETRA technology.

Dr Cherry’s work suggests other health effects including calcium interference; heart problems; blood problems; interference with bone marrow and tumours. On the subject of tumours, a thirty year old woman of Drumcarrow was diagnosed recently with a brain tumour. (27)

Health

Dr Cherry’s work shows some illnesses thought to be caused by long-term low level electromagnetic radiation include: depression; difficulty in concentration; neurological illnesses; headaches; fatigue; miscarriage; infertility; and a reduction in melatonin. (Stanford University Medical Center reports that without melatonin, the cell’s DNA may be more prone to cancer-causing mutations.) The work of Dr Russell Reiter shows links between electromagnetic frequencies, melatonin and cancer. James E. Trosko, Professor of pediatrics and human development at Michigan State University, reports that electromagnetic fields have a biological effect on body cells, an effect that can contribute to the complex cellular process that leads to cancer. Henry Lai, Professor of Bioengineering at the University of Washington, describes experiments using radiofrequency radiation which caused damage to the DNA of rat brain cells and, he remarks, DNA damage that accumulates in cells over a period of time may be the cause of slow onset diseases, such as cancer. Meanwhile, he adds, cumulative DNA damage in nerve cells of the brain has been associated with neurodegenerative diseases, such as Alzheimer’s Huntington’s and Parkinson’s.

The inexplicable volte face...

The “Stewart Report” stated that frequencies around 16Hz “should be avoided, if possible.” This was penned by Professor Colin Blakemore, Chief Executive of the Medical Research Council. Mysteriously, Blakemore (member of the NRPB’s Advisory Group on Non-ionising Radiation,) now says: “on reflection (there is) absolutely no cause for alarm at all” (28) Why? Blakemore says “My mind hasn’t changed. I still hold to both of my previous statements. In principle, it would have been better if 16Hz pulsing could have been avoided. But that was said in the context of the quite strict precautionary approach adopted by the Stewart report.”

The NRPB's AGNIR report

The NRPB's report from their Advisory Group on Non-ionising Radiation includes worrying statements such as this: studies "do not exclude the possibility of a risk of cancer that appears only after many years of exposure, nor of a hazard from RF radiation modulated specifically at around 16 Hz." (29)

Yet if you phone the NRPB as a member of the press you will be told that: "AGNIR concluded that it was unlikely that special features of the TETRA system posed a risk to health." (30) The Tetra Industry Group's website cheerfully say they "noted AGNIR's conclusion that research published since the Stewart Report does not give cause for concern."

Why? The Police Information Technology Organisation candidly says of this report that "the research was commissioned to reassure users of systems like Airwave that they do not pose a risk." The report itself echoes this: one study "could be of crucial importance in helping to reassure users of the safety of amplitude-modulated and pulse-modulated communication systems." (31)

Call me old-fashioned, but I rather thought the job of a National Radiological Protection Board might be to protect the nation from hazardous radiation; instead it seems its job is to protect the industry from a hazard to their profits.

Safety levels

What is considered a safe level of exposure to this kind of radiation? It depends where in the world you live. If you live in the UK, the guidelines are set by the National Radiological Protection Board, (NRPB) who have recently adopted the levels set by the International Commission on Non-Ionising Radiation Protection (ICNIRP). If you live elsewhere, including China, the guidelines will be far stricter.

Alasdair Philips of *Powerwatch* comments that modern scientific concern has been taken on board by a number of countries when setting guidance for the maximum signals from base stations that members of the public should be subjected to. He notes the guidelines, (as volts per metre) and gives the analogy of speed limits, with the Salzburg limit set as 30mph. (The Salzburg limits refer to the "Salzburg Resolution" of 19 international scientists and public health doctors.)

For 1800MHz, public exposure guidelines are as follows: the first column as volts per metre, the second as mph.

| | | | |
|--------------------------------------|---|------|------------|
| The NRPB and ICNIRP | - | 58 | (2847 mph) |
| Russia and China | - | 6 | (300 mph) |
| EU Parliament | - | 0.2 | (9 mph) |
| Salzburg (GSM/3G inside houses 2002) | - | 0.02 | (1 mph) |

"To pulse or not to pulse..."

Critics of the TETRA system say that a worrying feature of it is that of pulsing. 02 and the NRPB admit that the handsets pulse but they insist that base stations do not pulse, because emissions do not drop to zero. (Which is rather like saying that humans do not have a pulse, because the pressure in the veins never goes to exactly zero.) Others disagree. "There is a periodic signal pattern (modulation) at 17.6Hz," says Grahame Blackwell. Alasdair Philips challenges the NRPB view, insisting that the masts do pulse and that the NRPB misinterpret the readings because they average out the pulses over time. ("If you average it out, of *course* it's continuous.") If you look at the mast signals as an electrical engineer you could interpret them as not pulsing, but if you're looking as a biophysicist with knowledge of the human brain, you will interpret the signals differently. Precisely because the modulation of TETRA occurs at a frequency which the brain normally uses, the brain will "notice" the modulated frequency and not the average signal level. Alan Preece, Professor of Medical Physics at Bristol University referred to TETRA masts pulsing and said that "there is a modulation of the TETRA transmission from the mast." The NRPB's attempt to deny it was, he said, "splitting hairs". (32)

The People's Charter Against TETRA masts.

("The situation is very worrying but what can I do about it?" -The NRPB's Dr Michael Clark) (33)

There will be a TETRA mast in your area, so scour planning applications in local papers: look for O2, MM02, Airwave or names of agents, including Don Proctor, Comms Solutions, Waldon, PD Savill.

Meet county councillors, with experts on TETRA, to inform councillors.

Ask councils to let people know if there is an attempt to put masts through under "permitted development". If so, send five letters of objection from the public, recorded delivery, to the named person from the company responsible and to the council planning department.

Put pressure on the council. Although TETRA masts under fifteen metres do not usually need planning permission, some councils have denied permission. The companies have gone to court – only to find the courts back the council. Planning authorities often say they cannot take into account a fear of health risks. Not so. There is legal precedent for health and *perceived* risk to health being accepted as a material planning consideration. (Skelt v. the First Secretary of State) Be aware that there are reports that a company may put in two planning applications simultaneously for one mast site.

Speak to local landowners. If local people wish to make claims for ill health or depreciation of property, they can claim against the landowner but not O2. (In one case, a landowner is being sued for £5.2 million.)

Inform yourself: ("Intelligence Is Everywhere" is Motorola's slogan. How very true.) See the websites of www.tetrawatch.net and www.mastsanity.org and www.mastaction.co.uk and www.powerwatch.org.uk and Dr Grahame Blackwell's website www.starweave.com and Electromagnetic Hazard and Therapy on www.em-hazard-therapy.com

Inform your community with leaflets and public meetings: form a local campaign, link up with other groups

Talk to the local police, and give them information.

Put pressure on the company, with press releases, and petitions. Switch your phone, if you have Motorola or O2, to another company, and tell them why.

Contact your MP and MEP. Dr Caroline Lucas, Green MEP has called for an EU-wide ban on TETRA. If her declaration for a ban attracts 313 signatures from MEPs, it will become the official policy of the European Parliament, and TETRA could be stopped in its tracks. Find your MEP by phoning 0207 227 4300.

Contact local and national press

Keep a daily health diary before a mast is switched on and after:important for raw evidence

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ENDNOTES

(1) The Courier November 3, 2003

(2) Guardian Tues 8 May 2001.

Electromagnetic Hazard and Therapy 2001, Vol 11 No. 2-4:

Extracts from US Defence Intelligence Agency documents from 1972-1983, Donald Stevens, Nov 2000]

(3) DST-1810S-074-76, quoted in Police Magazine March 2001, author: Alasdair Philips

(4) Electromagnetic Hazard and Therapy 1998. Vol. 9, No's 1&2

(5) "How Exposure to GSM and TETRA Base-station Radiation can Adversely affect Humans" – GJ Hyland May 2003

- (6) B. Trower "Confidential Report on TETRA Strictly for the Police Federation of England and Wales" 2001
- (7) NRPB Advisory Group on Non-ionising Radiation (AGNIR) Vol 12 No. 2. 2001. Para 122
- (8) NRPB AGNIR para 135
- (9) Porton Down Biomedical Sciences: an investigation of the effects of the Airwave TETRA signal on cellular calcium and brain function contract no. CS 652 July 2002
- (10) Norfolk Evening News August 17 2004 and Daily Telegraph August 14 2004
- (11) Police Magazine March 2001
- (12) The Observer, 19 April 1999
- (13) Sunday Herald July 4, 2004
- (14) The Observer, 14 May 2000
- (15) Hyland May 2003
- (16) Hyland May 2003
- (17) Trower 2001
- (18) Dr Michael Clark, pers. comm 10 August 2004
- (19) www.cogreslab.co.uk
- (20) BBC website Jan 11, 2004
- (21) South Wales Evening Post Dec. 11, 2003
- (22) Investigation by "Computing" magazine, reported in The Times June 17, 2004
- (23) New Scientist Nov 2002
- (24) Electromagnetic Hazard and Therapy Vol 12 No.s 3&4 2002
- (25) Public Accounts Committee Report on Airwave 28/11/02
- (26) Electromagnetic Hazard and Therapy Vol 12 No. 3&4 2002 and Vol 13 No. 1, 2002
- (27) Dr. Neil Cherry: "Evidence that electro-magnetic radiation is genotoxic; the implications for the epidemiology of cancer and cardiac, neurological and reproductive effects." June 2000
- (28) UK Parliament select committee on Trade and Industry, 20 March 2001 incl. the Western Daily Press
- (29) NRPB AGNIR 2001 para 133
- (30) Telephone call 10/8/04. See also Telegraph 20/7/04
- (31) NRPB AGNIR para 130
- (32) Radio Scotland interview May 5th 2003
- (33) Dr. Michael Clark to a member of Sutton Coldfield Residents Against Masts, June 2003