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The procrustean approach: setting exposure standards for telecommunications frequency electromagnetic radiation

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The Procrustean Approach

**Setting Exposure Standards for Telecommunications
Frequency Electromagnetic Radiation**

A thesis submitted in fulfilment of the
requirements for the award of the degree

Doctor of Philosophy

from

University of Wollongong

by

Donald Raymond Maisch

Science, Technology and Society Program
Faculty of Arts

2009

Abstract

Since the 1950s there has been an ongoing controversy regarding the possibility of health hazards from exposure to non-ionizing radiation emissions from radiofrequency and microwave (RF/MW) technology: from military radar to telecommunications. In response to these concerns, and with support from the World Health Organization's International EMF Project (IEMFP) human exposure limits have been developed by the Institute of Electrical and Electronics Engineers (IEEE) and the International Commission on Non-Ionizing Radiation protection (ICNIRP). These limits, although differing in detail, are founded on the same scientific literature base and deem that the primary hazard to be considered in setting human exposure limits is thermal. This is defined as an excessive and harmful rise in body temperature as a consequence of exposure to high-level RF/MW emissions. This viewpoint has come to dominate the debate at an international level and is justified by these organizations as a product of expert risk assessments of peer reviewed data. The thesis challenges the validity of this viewpoint by critiquing regulatory risk assessment and the peer review and advisory processes that have shaped RF/MW regulation. It will be shown that these processes have been prone to political manipulation and conflicts of interests leading to various scientific perspectives being marginalised with reluctance on the part of regulators to make decisions that might inconvenience industry interests. To substantiate these claims the thesis provides an assessment of the development of the American RF/MW standard from the 1950's and its later revisions under the IEEE, the ongoing development of guidelines and standards by ICNIRP and IEGM and RF/MW standard development in Australia. The thesis concludes with the argument that, given the sheer number of people exposed to RF/MW from telecommunications devices, there is an urgent need to reform the standard setting process and to conduct an international re-assessment of the biological limits placed on current RF/MW standards.

Certification

I, Donald R. Maisch, declare that this thesis, submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the Faculty of Arts, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

Donald R. Maisch

Date:

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Abbreviated Contents

Preface	xiii – xiv
Introduction	1 – 9
Chapter 1: Risk Analysis/ Assessment: Valid science or spin	11 – 68
Chapter 2: Peer review and expert advisory committees: towards ‘sound science’?	69 – 120
Chapter 3: The Development of the IEEE C95.1 RF standard	121 – 238
Chapter 4: IEEE’s thermal paradigm spreads internationally	239 – 295
Chapter 5: A case study on ICNIRP Harmonization and the Australian RF exposure standard	297– 345
Overall conclusions	347 –350
Appendix 1: John D. Graham on risk assessment	351 –362
Appendix 2: Other relevant presentations at the 1998 International Seminar on ‘EMF Risk Perception and Communication’, Ottawa, Ontario, Canada	363 –369
Appendix 3: Summary of the ‘no’ votes from the Australian TE/7 committee	371 –379
Appendix 4: Australian / New Zealand public resource documents	381 –383
Glossary	385 –394
Bibliography	395 - 421

Contents

Preface	xiii - xiv
Introduction	1 - 9
Chapter 1: Risk Analysis/Assessment: Valid science or spin	11 – 68
Overview	11
The rise of the risk society: the golden years and the loss of innocence	17
The new globalised risks	23
The rise of risk analysis	25
Nuclear power	26
Chauncey Starr	27
The Compensating Wage Differential (CWD)	28
Nuclear power and probabilistic risk assessment	31
The Rasmussen Report	34
Handling uncertainty	37
Addressing uncertainty with the Precautionary Approach	41
An early exploration of how to apply risk/benefit analysis (risk assessment) to RF	44
Telecommunications and manufacturing uncertainty	53
Risk assessment for chemicals reversed for non-ionizing electromagnetic radiation	55
John D Graham and a primer for a 'revisionist' risk assessment process	56
Risk assessment, perception and communication as applied to EMF	59
Graham on influencing government policy	60
Influencing EMF risk governance (regulation) globally	61
Life after Graham: OMB blocks EPA's risk assessments	62

On Weight of Evidence (WOE)	64
Conclusions	66 - 68
Chapter 2: Peer review and expert advisory committees: towards ‘sound science’?	69 - 120
Overview	69
Peer review takes hold of the scientific process	71
Definitions and pros and cons of peer review	73
Weaknesses of peer review	77
Rustum Roy critiques traditional peer review	80
The Royal Society reconstructs ‘independent’ peer review	81
Several alternatives to the traditional peer review model	83
Super Peer Review	83
The DARPA model	84
Expert elicitation	85
Open peer review (open to public comment)	86
The extended peer community	87
The <i>Daubert</i> Appeal: Judges as ‘gatekeeping’ court evidence reviewers	88
<i>Daubert</i> stalls mobile phone / brain tumour lawsuits	93
OMB peer review	100
Using the Data Quality Act to block science	103
Conclusions: Science quality under threat	114 - 120
Chapter 3: The Development of the IEEE C95.1 RF standard	121 - 238
Overview	121
The foundations of a thermal approach for RF standard setting: electrotherapy & diathermy	125
Early research focuses on heating	130
The importance of radar realized during WWII	133
The search for standards during the early Post War years	134
Conflicts of interest endemic	138

The Tri-Services Research Program	139
Soviet standards	145
Tri-Services Program: pros and cons	148
Early and short-lived alternatives to the military's 10 mW/cm ² standard	150
PAVE PAWS: Health concerns or a threat to national security?	153
Microwaves get bad press	156
The Moscow affair: inconvenient signals	161
The international dimension	164
ASA C95.1 - 1966	167
ANSI C95.1 –after 1966	173
Challenges to the 1992 ANSI/IEEE standard	181
Industry reasoning in favour of the standard	187
Turf Wars: The battle of the standards for FCC approval	191
The Radiofrequency Interagency Work group (RFIAWG)	197
IEEE SCC-28 Subcommittee 4 tackles the mobile phone compliance problem	198
Other uses of microwaves	202
Standard setting, 2001 -	207
SCC-28's Risk Assessment Working Group on revisions	210
Harmonization with ICNIRP on the agenda	212
ICES meeting of September 2003	215
ANSI/IEEE C95.1 - 2006	218
A syndrome of paranoia and neglect	223
<i>Bioelectromagnetics Supplement 6</i> and the IEEE's compromised peer review process	225
Table 1: Authors' affiliations for the 13 papers in Supplement 6 (including introduction)	231
Conclusions	235 - 238

Chapter 4: IEEE's thermal paradigm spreads internationally	239 - 295
Overview	239
The WHO International EMF Project	242
Establishment and make-up of ICNIRP	242
Statements on RF adverse health effects	246
Conflict of Interest or a shared interest?	247
A questionable oversight committee	254
Forgotten lessons: Big Tobacco and protecting the integrity of WHO decision making	255
Setting the scene internationally	257
EU / CENELIC	257
The United Kingdom	258
The Russian Federation	259
China	262
The Czech Republic	267
The military dimension of harmonization: The Asia-Pacific 2004 EMF Conference	270
ICNIRP's illusory precautionary approach	279
Expert criticisms of the thermal limitations of both IEEE C95.1 and the ICNIRP Guidelines	284
Conclusions: An inability to learn?	292 - 295

Chapter 5: A case study on ICNIRP Harmonization and the Australian RF Exposure standard	297 - 345
Overview	297
CSIRO and the Standards Association of Australia's (SAA) Committee 1979-1984	299
The Standards Australia TE/7 Committee: Human Exposure to Electromagnetic Fields 1984 – 1999	305
TE/7 Standard revisions	307
Consideration of public submissions to TE/7 in 1995	309
A precautionary approach becomes centre stage	314
Is a precautionary approach incompatible with standards?	317
Uncertainty or not?	319
The Shirley School Decision	321
A 'paper tiger' to stifle dissenting voting within TE/7	325
Final TE/7 voting	326
Attitudes to public participation	328
Comforting the community	330
Public trust in the experts	334
Beyond TE/7: ARPANSA's Radiation Health Committee incorporates an ICNIRP based RF standard for Australia	336
Democracy excluded from the RHC decision making process	338
Political considerations end CSIRO's involvement with telecommunications	339
Conclusions	342 - 345
Overall conclusions	347 - 350
Appendix 1: John D. Graham on risk assessment	351 – 362
Appendix 2: Other relevant presentations at the 1998 International Seminar on 'EMF Risk Perception and Communication', Ottawa, Ontario, Canada	363 –367

Appendix 3: Summary of the 'no' votes from the Australian TE/7 committee	371 - 379
Appendix 4: Australian / New Zealand public resource documents	381 – 383
Glossary	385 - 394
Bibliography	395 - 421

Preface

My interest in the somewhat arcane issue of telecommunications frequency standard setting for human health protection dates back to March 1994 when the late Australian Democrats' Senator Robert Bell from Tasmania asked me if I would be interested in writing a Senate background paper on electromagnetic radiation (EMR) exposure standards. The Democrats were then involved in a controversial Eastlink powerline inquiry on a proposed 1500 kilometre high voltage power line to link the New South Wales and Queensland electricity grids and wanted a close look at the adequacy of the public safety standards. This report was tabled in the Senate in October 2004 and focused primarily on the standards relevant to powerline exposures and the inadequacies for public health protection. By late 1995 Senator Bell's office was receiving frequent calls from the public over concerns of possible hazards from mobile phones and towers and I was given the task of preparing a background report on what was known on the topic at the time. This was tabled in April 1996 with numerous copies being sent to local governments and other interested organizations. Then, in 1997, I was given the opportunity to further my interest in EMR exposure standard setting when I was offered a place on the Standards Australia TE/7 Committee on Human Exposure to Electromagnetic Fields. My position on the committee, along with another committee member, was to represent the interests of the Consumers' Federation of Australia (CFL), the national peak body for consumer groups in Australia. Our role in the TE/7 committee was basically to represent the public interest – and this included the concerned public activists with whom we closely worked .

It seemed apparent at the first of the final series of meetings in early 1998 that the factions wanting to incorporate the RF guidelines of the International Commission on Non-Ionizing Radiation Protection (ICNIRP) had the required voting majority (80%) to approved the draft standard in their own right. We thought it was inevitable that the ICNIRP based proposed standard would be approved by the TE/7 committee in the end. The other CFL representative and I therefore worked out a strategy where we would be prepared to vote in favour of the proposed standard, thus offering the industry the tantalizing possibility of short-circuiting community opposition in

Australia. Our proviso, however, was that we would only do so if the standards included a strong precautionary approach, including a clear statement on the limitations of the standard for health protection. We considered that if our recommendations were accepted it would be the best possible outcome that we could achieve for the public interest.

As Chapter 5 examines, however, at the final round of TE/7 meetings none of our recommendations were adopted and we could only cast a no vote. Surprisingly, the other 6 no votes of dissenting TE/7 members were enough to block the passing of the proposed ICNIRP standard and TE/7 was terminated after failing to approve the standard. This was a unique situation as no other Standards Committee had ever been terminated for failing to approve a standard.

The legacy of this direct involvement was a keen interest in how scientific knowledge can be suppressed or ignored in regulatory standard setting when the process is allowed to be influenced by vested interests (including government policy considerations) directly affected by that regulation.