

2009

# 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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**Relevant writings on EMR health protection standards and telecommunications issues by Don Maisch**

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## 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.