



























Irrelevant



**RF Standard:**

Australia does not currently have a RF exposure standard. The development of this Standard was considered by the Committee to be of a very high priority, and would be finalised by the end of the year 2000. This Standard would be developed by ARPANSA.

Irrelevant





















### 5.3 Radiofrequency Standard

Mr Cornelius (ARPANSA) attended this session, and gave a brief status report on the development of an Australian RF Standard.

Originally, an Australia and New Zealand Joint Standards Committee (TE/7) had been formed to develop an ANZ RF Standard. However, this Committee failed to reach the required 80% consensus, although the NZ members did. Consequently, Standards New Zealand published a RF standard while Standards Australia abandoned the development of a new RF Standard. Mr Cornelius stated that both ARPANSA and the Australian Communications Authority (ACA) have agreed on the need for a new standard to limit human exposure to radiofrequency radiation, to be developed via an Expert Working Group of the RHC. Mr Cornelius presented a paper that contained the suggested composition of the Expert Working Group, and the organisations that were requested to provide nominations for the drafting group. The Committee discussed this issue.

It was apparent from the list of organisations asked to provide nominees for the working group, that not all had responded. Mr Cornelius was uncertain as to why this was the case. Mrs Fitch stated that initially the proposal to develop a new standard would be forwarded to the RHSAC for their consideration, and that the organisations that did not respond to the original request for working party nominees would be again contacted and asked if they wished to be involved. The Committee concluded that an Australian RF Standard would be developed under the auspices of the RHC and promulgated as an ARPANSA Standard.



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## RF EXPOSURE STANDARD WORKING GROUP

### Draft Meeting Record for 23/24 February 2000

#### 1. ATTENDANCE

Chair:	Dr Colin Roy
Members:	Mr Vitas Anderson
	Dr Stan Barnett
	Mr Wayne Cornelius
	Dr Bruce Hocking
	Mr David McKenna
	Mr John Lincoln (attended second day)
	Ms Jill Wright
	Dr Andrew Wood
	Dr Ken Joyner
Consultants:	Prof Mark Elwood
	Dr David Black
Secretariat:	Mr Alan Melbourne
	Mr Michael Bangay
Observers:	Mr Ian McAlister
	Dr Graeme Dickie
	Mrs Jill Fitch (Chair, RHC, attended first day)

#### 2. OPENING OF MEETING

Dr Roy opened the meeting and welcomed all present. Each member gave a brief description of their background. Dr Roy also outlined the importance of Australia having a Standard for limiting radiofrequency radiation exposure.

#### 3. ARPANSA'S ROLE AND RESPONSIBILITIES

Dr Roy provided background on the formation of ARPANSA, the role of the CEO, the Radiation Health & Safety Advisory Council (RHSAC), the Radiation Health Committee (RHC) and the Nuclear Safety Committee (NSC). He also mentioned ARPANSA's role in promoting uniformity.

#### 4. RADIATION HEALTH COMMITTEE ROLE & RESPONSIBILITIES

Mrs Fitch, Chair of RHC, outlined the RHC role, and that it was intended to operate with as little formality and as quickly as the requirements of the regulations and proper consideration of the issues allow. RHC had previously existed under NHMRC, but had now been re-formed under



ARPANSA. The membership of the RHC included senior radiation protection officers from all States, Territories and the Commonwealth, a member of NSC (Dr Peter Jezukaitis), a public representative (Dr Harry Cohen), the CEO of ARPANSA, and two others (Dr Andrew Wood and Dr Nick Daunt). RHC had met for the first time in November 1999. This working group was formed to develop a draft standard for consideration by RHC.

## **5. ACA REGULATORY ROLE**

Mr McAlister outlined the role of ACA, which had been formed by merging Austel and Spectrum Management Agency in 1997, but with new powers to regulate the telecommunications industry. ACA had been looking to mandate the standard expected to arise from TE/7, but instead have mandated a standard based on the interim standard. ACA intend to adopt the ARPANSA standard with an accompanying Code of Practice developed by ACIF. It was noted that codes may be voluntary, however registered codes are mandatory.

## **6. TERMS OF REFERENCE/OPERATING PROCEDURES**

The draft terms of reference were tabled. After discussion some changes to points 1 and 2(i) were agreed. The revised terms of reference at Attachment 1 were then agreed. The terms of reference will be referred back to RHC for ratification.

The draft working procedures were also tabled. After discussion changes to several paragraphs were made. The revised version circulated later in the meeting (see Attachment 2) was agreed to still require an additional sentence in clause 2 regarding accessory advisers, and that a sentence about media releases after meetings could be added to this clause subject to discussion with RHC and the CEO. A final version of the working procedures will be circulated by the secretariat.

It was noted that there was an inconsistency in the title of the working group between the two documents. This will be corrected.

The Secretariat also advised that information was expected soon on IT options available to expedite the work of the ARPANSA Committees and their working groups. It was also noted that the template document referred to in the procedures was nearing completion and would be circulated as soon as it was available.

## **7. GENERAL BUSINESS**

### **7.1 Development of ARPANSA Standards/Codes/Safety Guides**

Mr Melbourne provided a summary of the proposed process for development of publications through the RHC. The proposal includes Standards, Codes of Practice and Safety Guides, and sets out priorities for reviewing and developing publications in the Radiation Protection Series. The proposal had been accepted by RHC with a small number of changes. These included an additional category of publication called recommendations, and some adjustment to the listed priorities.

### **7.2 Regulatory Impact Assessment Requirements**

Mr Melbourne advised of the need to complete a regulatory impact assessment with the development of codes and standards, which are now regarded as 'quasi-regulation'. These

requirements arise from decisions of the Council of Australian Governments (COAG), and will apply to the development of the RF standard. The Office of Regulation Review (ORR) determines whether an RIS is necessary, and whether it is satisfactory.

### **7.3 Document Development Plan for RF Standard**

Mr Melbourne described the draft Document Development Plan (DDP) prepared to outline the development of the RF Standard. It was noted that the title listed was a working title only and was not final. It was also noted that the time-line proposed that the standard would be developed by the end of the year 2000. In discussion members of the working group identified a number of other affected parties who should be listed in the plan. Dr Roy noted that some further drafting was required to complete the DDP.

### **7.4 Introduction to tabled documents**

Dr Roy advised of the list of documents identified for consideration of the working group. Members were asked to identify any additional documents that should be considered. Documents identified were the IEEE Standard C95.1, 1999, correspondence from Environmental Health Perspectives regarding the Hocking Study, and the RF Dosimetry Handbook (available from the web). A full list of documents is appended as Attachment 3.

### **7.5-7.14 Presentations**

Members gave presentations on a range of issues. These included a an overview of RF standards development history (7.5 Mr Cornelius), Mechanisms of RF absorption (7.6 Mr Anderson), Specific Absorption Ratio (SAR) (7.7 Dr Joyner), Human Studies (7.8 Prof Elwood & Dr Hocking), in-vivo and in-vitro studies (7.9 Dr Barnett), thermal and non-thermal effects (7.10 Dr Wood). The other presentations listed on the agenda were deferred to the next meeting due to lack of time (7.11 the New Zealand Standard – Dr Black, 7.12 Occupational (industrial) RF issues – Ms Wright, 7.13 Union Perspective – Mr McKenna, 7.14 Community Concerns – Mr Lincoln. Printed copies of presentations were circulated, but are not listed in Attachment 3.

### **7.15 Where to from here?**

It was agreed that the working group should make use of previous work and not start from a blank sheet. It was agreed that the draft standard developed by TE/7 should be the starting point, but that there were several issues that needed to be debated. Task groups would be established to look at each of these areas and report back to the next meeting. Members discussed the areas that required development, and the following areas were identified:

- Averaging times
- Rationale (including uncertainties)
- Exposed population groups
- Safety factors
- Measurement brief
- Non-uniform exposure limits
- Comparison of limits

There was also discussion about inclusion of statements regarding prudent avoidance. Dr Roy advised that it was his understanding that the standard would not include prudent avoidance and

that this issue would be discussed in codes of practice. Following discussion on whether it was appropriate to include mention of prudent avoidance in the rationale, it was decided to seek clarification from RHC on this issue. This may result in a need for the terms of reference to be more specific regarding prudent avoidance.

#### **7.16 Allocation of Drafting Tasks**

It was agreed that, in some cases, the same task group could undertake more than one of the seven issues identified, and four separate task groups were formed. Members volunteered to participate in various task groups and a coordinator was identified for each. The Task Group formed are listed in Attachment 4. It was agreed that task groups would need to undertake their tasks within six weeks in order to be able to report to the next meeting.

### **8. ADMINISTRATIVE ARRANGEMENTS**

The administrative arrangements for the working group were largely discussed during discussion on the working procedures. Issues included that:

- the working group should try to complete as much work as possible between meetings, using email/electronic technology as far as possible
- reimbursement was as specified in the working procedures
- reporting was to meetings of the RHC
- confidentiality issues were also covered in the working procedures

### **9. CLOSURE AND NEXT MEETING**

The next meeting was tentatively scheduled for 18/19 April 2000 at ARPANSA's Yallambie office.

**RADIATION HEALTH COMMITTEE**

**RF Exposure Standard Working Group**

**Draft Terms of Reference**

1. Prepare a draft standard to limit exposure to radiofrequency fields, which is based on current scientific information and covers both occupational and public settings, for consideration by the Radiation Health Committee.
2. Ensure that the document:
  - (i) takes into account the recommendations of relevant international and national publications, such as those of the International Commission on Non-Ionising Radiation Protection and Health Canada;
  - (ii) takes into account international best practice; and
  - (iii) reflects Australia's particular emphasis and viewpoint on radiation protection.
  - (iv) considers comment received during the public consultation stage.
3. Ensure that the document's purpose, scope, and content are consistent with those specified in the Document Development Plan. The Working Group must also check the draft for completeness, appropriateness, technical content and internal consistency.
4. Ensure that the document's format for presentation, readability and style is consistent with the Template agreed by Radiation Health Committee for Radiation Protection Series Publications.
5. Provide information for the development of documentation to meet regulatory impact assessment requirements
6. Report progress of drafting to meetings of the Radiation Health Committee.

**RF EXPOSURE STANDARD WORKING GROUP  
DRAFT PROCEDURES**

1. The Working Group has been appointed by ARPANSA and endorsed by the RHC/RHSAC. The Secretariat is provided by ARPANSA.
2. Substitutes or alternates for members of Working Groups are not permitted unless there is to be a long-term absence, which would interfere with the operation of the Working Group or progress of the drafting. In such a case RHC may wish to seek further nominations or select from those previously nominated rather than have substitutes nominated by members.
3. The costs of Working Group meetings are met by ARPANSA (including travel and accommodation). Travel arrangements will be booked by the Secretariat, but booking of accommodation is the responsibility of the individual. Sitting fees are not normally paid to Working Group members.
4. Meeting records of Working Group meetings must be kept. They need not be full detailed minutes, but must include decisions, tasks allocated and projected timelines for completion of tasks. Meeting records will be circulated to members of the Working Group for confirmation.
5. The Working Group will be provided with a Document Development Plan (DDP) for the requested work. This will form the guideline for the working party on the expectations of the RHC. The draft documents prepared will be compared with the specifications in the DDP by RHC.
6. The Working Group will be provided with a copy of the template for Radiation Protection Series (RPS) publications, which provides detailed instructions on style, content and layout of RPS publications. An electronic Word style template for formatting of documents will also be provided. Documents must be prepared in the approved template format & style.
7. The Working Group will assist in providing information to meet Regulatory Impact Statement (RIS) needs, in cases where that requirement exists. Secretariat will lead the RIS process, including liaison with the Office of Regulation Review.
8. Drafts produced by the Working Group will be consensus documents as far as possible. As a result there will be no need for voting procedures for Working Groups. The draft presented to RHC will represent the views of the Working Group with, if necessary, dissenting views and contentious issues being identified and referred to RHC for resolution.
9. The Working Group will provide reports of progress to each meeting of the RHC/RHSAC. Drafts from the Working Group will only be presented to RHC when they are considered to be ready for wider comment, or when there is a need for further RHC advice.
10. Working Group discussions, records of meetings, circulated comments (including email)

will be considered as “in-confidence”. This is not meant to exclude general reporting of progress to members’ organisations.

11. The Working Group documents will be considered as “draft-in-confidence” until released for public comment by the CEO, on the recommendation of RHC.
12. Following the public comment period, the Working Group will review the comment received and make any appropriate changes to the draft document prior to the final draft being presented to RHC for approval. A report on public comment must also be prepared to meet RIS requirements.
13. The Working Group will be disbanded by the CEO of ARPANSA, on the recommendation of RHC.

### Attachment 3

#### Documents Tabled at February 2000 meeting of RF Standard Working Group

- 7.4.1 ICNIRP – Guidelines for Limiting Exposure to Time-varying Electric, Magnetic and Electromagnetic Fields (up to 300 GHz)
- 7.4.2 Standards Australia Draft DR 98627
- 7.4.3 NZS 2772 Part 1:1999 Radiofrequency Fields Part 1 Maximum Exposure Levels - 3 kHz to 300 GHz
- 7.4.4 Prof M Elwood, A Critical Review of Epidemiologic Studies of Radiofrequency Exposure and Human Cancers
- 7.4.5 Canada – Safety Code 6. Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz
- 7.4.6 Canada – A Review of the Potential Health Risks of Radiofrequency Fields from Wireless Telecommunication Devices. A Expert Panel Report prepared at the request of the Royal Society of Canada, March 1999
- 7.4.7 IEEE Std C95.1 1999, IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
- 7.4.8 Correspondence from Environmental Health Perspectives, Vol 107, No 12, Dec 1999, from Dr B Hocking & Prof M Elwood.
- 7.4.9 RF Dosimetry Handbook, (not tabled but accessible from internet at <http://www.brooks.af.mil/AL/OE/OER/handbook/cover.htm>)

## Attachment 4

### Task Groups formed on 24 February 2000

#### 1. *Rationale (including uncertainties)/ Safety factors*

Vitas Anderson (Coordinator)  
David Black  
Mark Elwood  
Andrew Wood  
John Lincoln  
Ian McAlister  
David McKenna

#### 2. *Averaging Time/Non-uniform Exposure Limits/Comparison of limits (incl. low frequency limits)*

Wayne Cornelius/Colin Roy (Coordinator)  
Ken Joyner  
Jill Wright  
Vitas Anderson

#### 3. *Measurement Brief*

Ken Joyner (Coordinator)  
Jill Wright  
Michael Bangay

#### 4. *Exposed Population Groups*

David Black (Coordinator)  
Ken Joyner  
David McKenna  
Bruce Hocking



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## **RADIATION HEALTH COMMITTEE**

### **Minutes of the meeting held on the 21 – 22 March 2000**

Irrelevant



18. RF Exposure Standard

15

Irrelevant



ITEM (cont...)

Released under FOI June 2018





























## 18. RF EXPOSURE STANDARD

Dr Roy (Chair RF Exposure Standard Working Group, ARPANSA) attended this session and gave an overview on the development of an ARPANSA RF Standard.

Originally, an Australia and New Zealand Joint Standards Committee had been formed to develop an ANZ RF Standard. However, this Committee failed to reach the required 80% consensus for an Australian Standard. The NZ members did reach a sufficient consensus and consequently, Standards New Zealand published a RF Standard while Standards Australia abandoned the development of a new RF Standard. Following this, ARPANSA decided that a RF exposure standard working group of the RHC would be set up to develop an Australian RF Standard. The working group met recently for the first time, and devoted a large part of their time developing draft terms of reference.

Concurrently to ARPANSA developing a RF Standard, Dr Roy indicated that the Australian Communications Industry Forum (ACIF) was developing a code of practice for the industry. Currently, ACIF was meeting every three to four weeks, with respect to telecommunications. It was expected that the Standard and Code would be complementary with the Standard being limits based and the Code providing guidance material on how to meet the Standard. Dr Roy stated that, although there was no specific overlap between the two working groups, the Chair of the ACIF group had indicated that he would endeavour to keep all informed on the progress of the Code such that the Standard or Code would not outpace each other. Mrs Fitch inquired as to whether the Code, when developed, would be distributed for public comment. Dr Roy was uncertain, but expected that it would be distributed for comment and that he would endeavour to obtain a draft of the ACIF Code for RHC perusal.

The Committee discussed the issue of including statements regarding prudent avoidance. It was generally felt that the Standard would contain statements dealing with radiation protection and that the Code would include statements dealing with precautionary approach or prudent avoidance. Dr Roy stated that the development of the original joint Standard broke down due to the issue of prudent avoidance and to the changing of limits in parts of the spectrum. It was felt that the Standard should be based on current scientific evidence in that it would include information on what is accepted as fact, and that it should clearly state the rationale that was used in determining

the numbers used. The Committee considered that the draft terms of reference should explicitly state that the Standard was to be limits-based and that the Code being developed would contain guidance material. They also decided that clause 2(iii) of the terms of reference should be deleted since it was unclear as to what was meant by it. It was expected that the revised terms of reference would clearly indicate to the working group the direction that they should take in developing the Standard. The Committee also decided that the title of the Standard should be more definitive by calling it a *Draft Radiation Protection Standard*.

Dr Roy also sought the Committee's guidance on an issue that occurred recently where a member of the RF working group had tendered their resignation in writing to the Chair following its first meeting. Dr Roy was particularly concerned about whether he could, or should, distribute the resignation letter to the other working group members. In particular he felt that if the letter was made public that it might hinder the development process for the RF Standard. The Committee decided that Dr Roy may inform the working group of the resignation, and the decision on whether or not the letter may be distributed to others, resides with the author of the letter.

Irrelevant























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## RF EXPOSURE STANDARD WORKING GROUP

### Draft Meeting Record for 17-18 April 2000

ITEM	PAGE
1. OPENING OF MEETING AND ATTENDANCE	2
2. APOLOGIES	2
3. CONFIRMATION OF THE MINUTES OF 23-24 FEBRUARY MEETING	2
4. BUSINESS ARISING FROM MINUTES	2
4.1 Terms of Reference	2
4.2 Working Group procedures	2
4.3 Advice from Radiation Health Committee regarding precautionary principle	3
4.4 Presentations deferred from previous meeting	3
4.4.1 The New Zealand Standard	3
4.4.2 Occupational (Industrial) RF issues	3
4.4.3 Union perspective	3
4.4.4 Community concerns	4
5. GENERAL BUSINESS	4
5.1 Task Group 1 Report –Rationale/Safety Factors	4
5.2 Task Group 2 Report – Averaging Time/Non-uniform Exposure/ Comparison of Limits	4
5.3 Task Group 3 Report – Measurement Brief	4
5.4 Task Group 4 Report – Exposed Population Groups	4
5.5 Template for Radiation Protection Series publications	5
5.6 Regulatory Impact Assessment requirements	5
5.7 Status of the ACIF Code development process	5
5.8 The Next Steps	6
6. OTHER BUSINESS	6
7. CLOSURE AND NEXT MEETING	6

## **1. OPENING OF MEETING AND ATTENDANCE**

Dr Roy opened the meeting at 9:40 am. The following members were present.

Members: Dr Colin Roy (Chair)  
Mr Wayne Cornelius  
Dr Ken Joyner  
Dr Bruce Hocking  
Mr Vitas Anderson  
Mr David McKenna  
Ms Jill Wright  
Mr John Lincoln  
Dr David Black (Consultant)  
Dr Andrew Wood

Secretariat: Mr Alan Melbourne  
Mr Michael Bangay

Observers: Mr Ian McAlister  
Dr Graeme Dickie

## **2. APOLOGIES**

Professor Mark Elwood.

Dr Roy noted that since the last meeting, Dr Stan Barnett had resigned from the working group. After discussion it was agreed that at this stage Dr Barnett would not be replaced. If there were a need for expert advice in his area, ARPANSA would seek this expert opinion for the working group. If such a person was required to attend a meeting to discuss this opinion, arrangements would be agreed in advance of the meeting.

## **3. CONFIRMATION OF THE MINUTES OF 23-24 FEBRUARY MEETING**

The minutes of the 23-24 February meeting were agreed without amendment.

## **4. BUSINESS ARISING FROM MINUTES**

### **4.1 Terms of Reference**

The changes made by Radiation Health Committee were noted. Dr Hocking commented that the would have preferred that reference to Australia's particular emphasis on radiation protection to remain in the terms of reference.

### **4.2 Working Group procedures**

The changes made by the radiation Health & Safety Advisory Council were noted. Dr Hocking requested that the sentence that he had previously suggested, that advisers are not permitted without agreement, be added. This was agreed.

Mr Lincoln advised that he suspected that the circulation of an email from the task group had occurred via him to EMRAA and beyond. He apologised for its unintentional release and advised that this would not occur again.

Dr Roy indicated that the terms of reference would be updated following the RHC comments on precautionary principle and be circulated within a few weeks.

### **4.3 Advice from Radiation Health Committee regarding precautionary principle**

Dr Roy reported that RHC had advised that the Standard would set limits and could discuss protection. The rationale could draw people's attention to other documents including the ACIF Code. There would be no policy points within the Standard on precautionary principle.

The WHO position on precautionary principle was also circulated.

### **4.4 Presentations deferred from previous meeting**

#### **4.4.1 *The New Zealand Standard***

Dr Black advised that the NZ Standard was published last year. It was derived from the TE/7 work. One of two dissenting votes had to be resolved before it could get through. It includes a statement on precautionary principle in clause 10, but otherwise there was not much change from TE/7. He also discussed aspects of the ICNIRP standard, including the basis for the standard, safety margins, occupational vs public exposure limits, and the need for the working group to develop a standard that has a clear rationale for public exposure, which ICNIRP does not.

#### **4.4.2 Occupational (Industrial) RF issues**

Ms Wright described issues related to the use of various types of induction heaters and RF welders, along with the results of a survey conducted in Queensland. Maintenance of equipment, installation, and RF grounding were considered important. A MOU is being developed between Queensland DETIR and Queensland Radiation Health. Particular issues raised in relation to the drafting of a standard included the need for description of what partial body exposure means. The Working Group also raised whether employers should be required to comply with the public limit unless they can show that protection measures are in place.

#### **4.4.3 Union perspective**

Mr McKenna noted that there was not a lot of expertise in the union movement on RF issues, and that where there was a variance in scientific opinion, unions would use the most protective advice. He flagged that there will be a strong union interest in RF issues. The issue of controlled/uncontrolled vs occupational/public will be of particular interest and the unions will have to form a view. There is union support to keep the standard as a flat line in the UHF region. The unions do not want to lose the precautionary approach, and suggest that it be included in the rationale.

Mr McKenna also queried where this standard would sit in relation to NOHSC/Worksafe standards. Dr Roy noted that MOU's were being developed with both Standards Australia and NOHSC to clarify ARPANSA's role.

#### **4.4.4 Community concerns**

Mr Lincoln advised of a number of community concerns relating to various aspects of the science and research, the standard-setting process, and the perception that their views are being ignored. He commented on effects that have been reported by the public, and on community issues arising from the RF debate. Mr Lincoln also outlined community expectations regarding the standard-setting process.

### **5. GENERAL BUSINESS**

#### **5.1 Task Group 1 Report –Rationale/Safety Factors**

Mr Anderson reported on progress made by this group, which had identified a number of areas requiring further discussion. In particular, the Task Group required clarification from ICNIRP about the discontinuity at 100 kHz. ARPANSA will send an email to ICNIRP to seek advice. Dr Black and Dr Hocking were nominated to develop a Material Safety Data Sheet (MSDS). In relation to the use of controlled/uncontrolled population groups, it was agreed that the definitions in IEEE would be checked and that the opinions of Worksafe and ACIF would be obtained when the working group had a more defined position. Several other tasks were identified for members of this task group to work on. A sheet identifying these tasks was tabled.

#### **5.2 Task Group 2 Report – Averaging Time/Non-uniform Exposure/ Comparison of Limits**

A spreadsheet had been developed on the comparison of standards and this will be circulated out of session. Averaging time at high frequencies it is based on skin temperature, so that a short averaging time is needed to limit exposure. The IEEE averaging time for public exposure is considered too long – the near resonance of babies is a factor. Shorter averaging times are considered more conservative. In regard to spatial averaging, various standards with different methodologies were reviewed. ICNIRP includes only a vague description. The working group needs to cover the issue of averaging, and details of measurement protocols. This area needs more work.

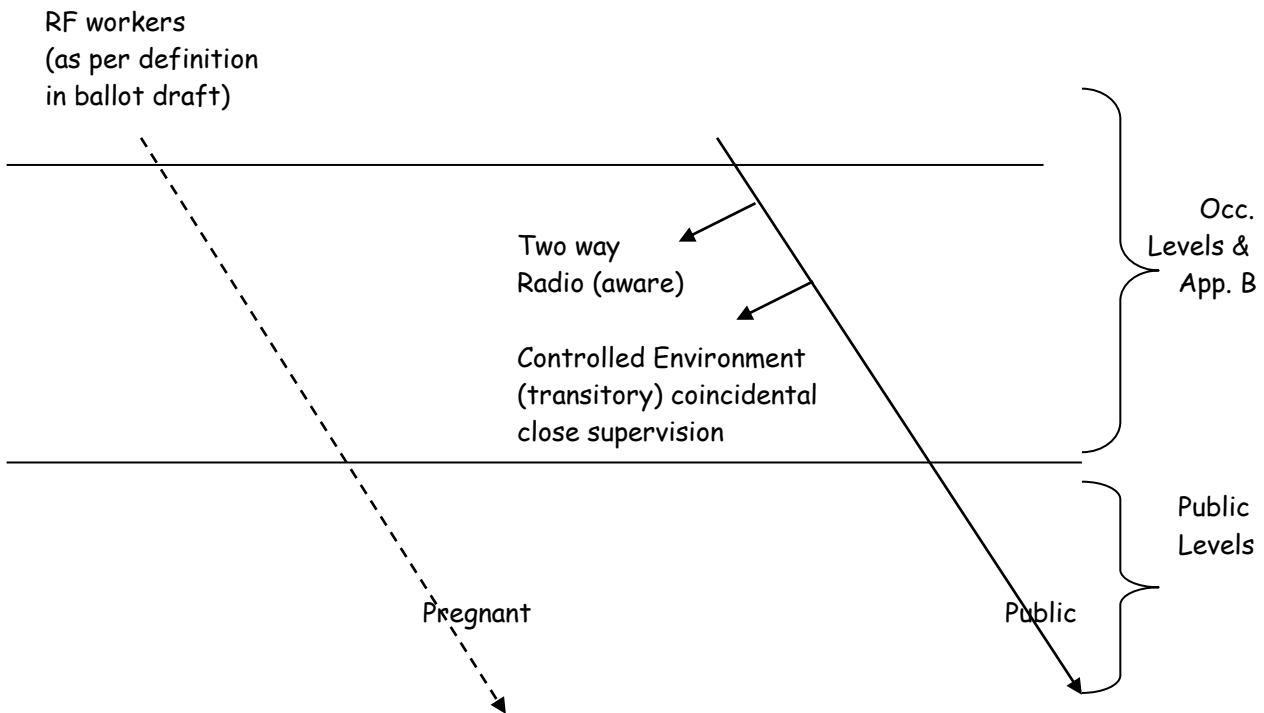
#### **5.3 Task Group 3 Report – Measurement Brief**

Work in this area had not progressed as advice was awaited from Standards Australia regarding use of the AS 2772.2 draft. It was agreed that his work should go ahead and ARPANSA would negotiate with Standards Australia on the use of documents.

#### **5.4 Task Group 4 Report – Exposed Population Groups**

The use of controlled/uncontrolled groups or occupational/public groups was discussed. It was suggested that the two approaches be put to RHC for them to decide or that the option of merging the two approaches be considered. There is a need for more discussion at the task group.

A proposed merged approach (shown overpage) was also discussed.



Note: The model is based on occupational and public exposure, but including a controlled environment where public limits may be exceeded.

### 5.5 Template for Radiation Protection Series publications

Mr Melbourne tabled and described the template for Radiation Protection Series publications, which had been developed with RHC. The working group raised a query as to whether the Rationale was intended to be included in the referenceable part of the text or as a separate Annex. It was agreed that this point would be clarified with RHC.

### 5.6 Regulatory Impact Assessment requirements

Mr Melbourne tabled a draft outlining the requirements for undertaking regulation impact assessment in the development of ARPANSA publications. It was noted that comments by the Office of Regulation Review had been incorporated, but there the draft would be looked at again by ORR before being finalised.

### 5.7 Status of the ACIF Code development process

Dr Roy had spoken to the Chair of the ACIF Code committee and expected to have something in writing to circulate for the next meeting. Dr Roy confirmed that the precautionary approach was a key plank of the ACIF Code. A draft was expected later this year. It was suggested that Mr Gerstle, Chair of the ACIF committee, be invited to the next working group meeting to discuss the ACIF Code.

## **5.8 The Next Steps**

It was agreed that the task groups continue with their allotted tasks, and that Dr Roy would prepare a version of the Ballot draft in the form of the template for Radiation Protection Series publications. This would then serve as the starting point, into which the task group deliberations could be inserted.

## **6. OTHER BUSINESS**

It was noted that the issue of health problems of plastic welder operators had not yet been covered, and that this highlighted the need to consider limits on limb currents.

## **7. CLOSURE AND NEXT MEETING**

The next meeting was set for 5 & 6 July 2000, at ARPANSA's Yallambie offices.

The meeting closed at 4 pm



















Irrelevant

### 7.6 Report on RF Exposure Standard Working Group

A report from Dr Dickie, Council's observer on the working group was tabled along with a copy of the meeting record. Dr Roy outlined the progress made, and indicated that the group had been disappointed that an email from one of the task groups had been circulated widely. Council discussed the relationship of the Standard with codes of practice developed by the Australian Communication Industry Forum (ACIF) and the ACA approach to voluntary and mandatory codes. Council noted that the issue of prudent avoidance and precautionary approaches had been included in the NZ Standard, but that it was the intention that the working group would develop a standard with limits based on the science. The Standard may allude to the precautionary approach, however this was really a policy issue, which would be included in the ACIF code. The working group's intention at this time is to have a draft ready for public comment during the third quarter of the year.

Dr Roy also gave a summary of the NHMRC-funded research on electromagnetic fields. A short summary paper from the NHMRC secretariat was tabled.

Dr Roy provided Council with comment on the issue of whether use of 'hands-free' devices increased exposure to RF from mobile phones, and also on the expected timing of the IARC assessment of whether EMF is a carcinogen.

Irrelevant





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## RF EXPOSURE STANDARD WORKING GROUP

### Draft Meeting Record for 5-6 July 2000

ITEM	PAGE
1. OPENING OF MEETING & ATTENDANCE	2
2. APOLOGIES	2
3. CONFIRMATION OF MINUTES OF 17-18 APRIL MEETING	2
4. BUSINESS ARISING FROM MINUTES	2
5. GENERAL BUSINESS	2
5.1 Senate Inquiry on Electromagnetic Radiation	2
5.2 The Stewart Report	3
5.3 Status of ACIF Code Development Process	3
5.4 Pre-publication Case Report: Neurological Abnormalities Associated with Mobile Phones	4
5.5 Report on BEMS/IEEE Meetings	4
5.6 Starting Document - Template Version of TE/7 Ballot Draft	4
5.7 Task Group 1 Report - Rationale/Safety Factors	4
5.8 Task Group 2 Report - Averaging Time/Non-uniform Exposure/ Comparison of Limits	5
5.9 Task Group 3 Report - Measurement Brief	6
5.10 Task Group 4 Report - Exposed Population Groups	6
5.11 The Next Steps	6
6. OTHER BUSINESS	6
7. CLOSURE AND NEXT MEETING	6
 ACTION LIST ARISING FROM MEETING	 7

## 1. OPENING OF MEETING AND ATTENDANCE

Dr Roy opened the meeting at 9:40 am. The following members were present.

Members: Dr Colin Roy (Chair)  
Mr Wayne Cornelius  
Dr Ken Joyner  
Dr Bruce Hocking  
Mr Vitas Anderson  
Ms Jill Wright  
Mr John Lincoln  
Dr David Black (Consultant)  
Prof Mark Elwood (Consultant)  
Dr Andrew Wood

Secretariat: Mr Alan Melbourne  
Mr Michael Bangay

Observer: Dr Graeme Dickie

Attended by Invitation for agenda item 5.3: Mr Mike Wood

## 2. APOLOGIES

Mr David McKenna  
Mr Ian McAlister (Observer)

## 3. CONFIRMATION OF MINUTES OF 17-18 APRIL MEETING

The minutes of the 17-18 April 2000 meeting were agreed subject to one amendment. In the diagram in item 5.4 the top horizontal line should be a dotted line.

## 4. BUSINESS ARISING FROM THE MINUTES

Dr Roy made the following comments. The MOU with Standards Australia had been progressing. NOHSC had wanted an observer on the working group, but had not supplied a name. This will be followed up. The spreadsheet on comparison of limits had not been circulated yet, but would be circulated after this meeting. Regarding the ACIF Code, Mr Mike Wood of Telstra, a member of the ACIF Committee will attend the meeting to discuss the Code.

## 5. GENERAL BUSINESS

### 5.1 Senate Inquiry on Electromagnetic Radiation

Two submissions had gone from ARPANSA to the Senate Inquiry, one was an ARPANSA submission and the other was from the Committee on EME Public Health Issues. A copy of Prof Elwood's submission was provided for information. It was noted that most of the Working Group members had been involved in preparing submissions to the Inquiry. It was requested that the working group be provided with feedback on the submissions to the Senate Inquiry, as there may be information that would need to be taken into account in the standard-setting process.

## 5.2 The Stewart Report

ARPANSA is preparing a review of the Stewart Report, which will be circulated when finalised. Mr Anderson has also reviewed the report in relation to children. There was considerable discussion on this issue, as well as the statements on precautionary approach in the report. The working group also discussed other public health issues such as use of mobile phones in cars. It was agreed that they were outside the scope of the standard, but that Radiation Health Committee may choose to refer such issues to the appropriate body for consideration.

It was advised that labelling of mobile phones would be dealt with internationally within the next few months. Information on exposure levels for phones will be published on a web site, explanatory information will be included on an insert in packaging, and a European standard was being developed for measurement.

The working group agreed that aspects of the Stewart Report needed to be covered in the rationale, particularly in relation to children. Mr Anderson to provide copies of his draft review regarding children, which is currently being prepared.

## 5.3 Status of ACIF Code Development Process

Mr Mike Wood, a member of the ACIF Committee, addressed the working group on the ACIF Code. He advised that it was a code for the deployment of radio infrastructure to meet the requirements of the standard. There has been some push from community groups and unions to expand the code to include property values and visual amenity, however this is beyond the scope of the code. The code includes elements of the precautionary approach and requires consultation. For a minimal impact issue, eg a microcell on a freeway bridge overpass, currently notification and minimal consultation is required. The code will require carriers to meet 5 of 10 specified consultation requirements. For medium impact issues, eg a microcell at ground level, carriers must meet 9 of 13 consultation requirements. For major issues, carriers must meet 20 consultation requirements.

The ACIF committee has a 2-day meeting scheduled in a fortnight, at which the draft code will be finalised and circulated to interested organisations for comment.

The code will be a registered code, which means that its provisions are mandatory, with penalties for consistent non-compliance. It covers all radio, but not TV or broadcasting.

In relation to the precautionary approach, the measures would depend on the type of network. Candidate sites would be chosen to minimise exposure while achieving the coverage objective. Carriers have agreed in principle that at sites not owned by the carrier, an independent assessment of EME will be conducted, showing hazard zones, recommending access restrictions, signage etc. It will be a report in layman's terms, held by the site manager.

There will be a section on the ACA web site that will have info on site hazards, for all licensed sites.

There was considerable discussion about access controls for rooftop sites.

Mr Wood advised that there was a requirement for 80% consensus for the code to be approved

(ie 3 votes against would prevent its passing).

#### **5.4 Pre-publication Case Report: Neurological Abnormalities Associate with Mobile Phones**

Dr Hocking tabled a case study expected to be published in Occupational Medicine soon. The patient was suffering long-term neurological abnormalities, which he had related to brief use of a mobile phone some 18 months prior. The working group asked a number of questions about the effects and other possible causes. The working group noted that it was valuable for case studies to be published.

#### **5.5 Report on BEMS/IEEE Meetings**

Dr Black reported on the IEEE meeting. IEEE was looking to have a new standard, which was not a rework of 1999. They had voted to remove the two tier system and have a one tier standard. They have identified 1300 papers relevant to standard-setting and have reviewed 550 so far. There was a move for ICNIRP and IEEE to work closer together. Adair's study on volunteers exposed to 8 W/kg to test the validity of thermal models was also discussed. Dr Joyner added that the IEEE meeting had very low attendance, with no government members present, so that the vote for a one tier system is likely to have been an aberration that will not survive.

The BEMS meeting had held a lack of surprises, and was fairly low-key. Dr Joyner will circulate an electronic copy of a poster by Gabriel.

Mr Anderson also reported on the Salzburg meeting, which had mostly consisted of people giving opinion, rather than scientific results. The conference resolution for a 10  $\mu\text{W}/\text{cm}^2$  limit across the full spectrum had been developed in closed session by the conference speakers, and had been presented at the European Parliament on 29 June 2000.

#### **5.6 Starting Document – Template Version of TE/7 Ballot Draft**

A copy of the TE/7 ballot draft, transformed into the Radiation Health Committee Template draft form, was tabled. Dr Roy advised that the text had just been manipulated into format, and had not been edited for content. The working group would need to examine what needs re-writing and where the various segments being developed by the working group would fit in. There was also discussion on legal adoption, mandating the provisions of the standard, and uniformity.

#### **5.7 Task Group 1 Report – Rationale/Safety Factors**

Mr Anderson led the discussion based on the action points identified at the last meeting.

1a. Paragraph comparing ARPANSA Standard with AS 2772.1 (Int): 1998. Mr McAlister has drafted a paragraph, which had not yet been provided. Its place in the document would need to be considered – perhaps in the foreword.

1b. Comparison of Russian, Swiss and Italian Standards. Mr Cornelius provided a comparison, but stated that the process was difficult without knowing the rationale for the standards, which could be health-based or technology-based. Mr Cornelius also noted that it was clear that any comparison is dependent on having adequate English translations. In the case of the Russian

Standard there was only a short summary paper with some apparent errors in it. The comparison paper would be something that ARPANSA could make available on its web site when the draft standard goes for public comment.

3. Dr Wood provided a draft list of athermal effects papers that he had identified. Mr Lincoln and Ms Wright provided other lists of papers to be considered. It was agreed that there was a need to address athermal effects in the rationale, and a need to identify the papers considered – perhaps in the web site information. Dr Wood noted that he may need some assistance with this task, depending on the level of detail required. This will be discussed with Dr Roy.

4. Measurement Averaging. Mr Cornelius tabled a draft paper on measurement averaging. It was agreed that it formed the basis for a document to be included in the rationale, however the graph was difficult to interpret and would be examined again. The draft does not address induced current yet, and electrostimulation needs further consideration. It should also possibly address spatial averaging. Vitas Anderson would provide additional information on these matters.

5. Mr Anderson tabled a quantitative assessment of safety factors that the working group agreed would provide valuable explanatory information. A section on safety factors is needed for the rationale. Mr Anderson, Dr Black, and Dr Roy/Mr Cornelius will develop this section.

7. Precautionary Approach. Dr Dickie provided a summary based on the WHO statement. Dr Dickie, Ms Wright, Mr Anderson, and Mr Lincoln would develop this further. It was noted that the concern to have a precautionary approach was more related to doubts about athermal effects than safety factors. Dr Wood and Dr Joyner would also draft a few sentences for the foreword on precautionary principle.

8a. Epidemiology. The Elwood review and the Canadian review are the most recent. The working group discussed the level of detail needed for the epidemiology review, and the relevance of epidemiology evidence to standard-setting. Prof Elwood and Dr Hocking to produce a report of about 10 pages and a 1-2 page summary for consideration by the working group.

8b. RF Dosimetry & Measurement. This has not progressed as it is awaiting an electronic copy of AS 2772.2 and approval to use it. Dr Black will attempt to get a copy of the NZ version. Mr Melbourne will contact Standards Australia to follow up their response.

9a. MSDS. A draft was tabled by Dr Black. Discussion centred around whether such a document would be useful to doctors. It was agreed that it be put on hold at this stage.

9b. Non-human species. Dr Black tabled a draft paper. It was considered to provide a good basis. It would be developed further and include resonances, and incubating eggs.

## **5.8 Task Group 2 Report – Averaging Time/Non-uniform Exposure/Comparison of limits**

Averaging time was discussed earlier in the agenda. For comparison of limits a spreadsheet is to be circulated. For non-uniform exposure, further follow up is needed. It was suggested that Ms Wright and Mr Bangay seek further information from Mr Dave Conover (NIOSH) and develop a position on what we need to do.

### **5.9 Task Group 3 Report – Measurement Brief**

Awaiting advice on use of AS 2772.2 as discussed earlier in the agenda.

### **5.10 Task Group 4 Report – Exposed Population Groups**

The working group discussed use of the occupational/public groups and controlled/uncontrolled areas. It was agreed to further develop the compromise scheme developed at the last meeting. This work would be done by Dr Black, Dr Hocking and Dr Roy.

### **5.11 The Next Steps**

The working group considered the structure of the rationale, by examining and comparing with the structure of the ICNIRP rationale. It was agreed that the rationale should include:

Quantities and Units – based on ICNIRP

Basis for limiting exposure – need to write our own section

Coupling mechanisms – based on ICNIRP except for ELF

Biological basis – generally accept ICNIRP but include our Epidemiology and athermal effects sections.

Safety Factors

Averaging Times & Spatial Averaging

A separate Annex on Precautionary Approach will be developed.

The draft rationale will be prepared by Mr Anderson, Dr Black and Dr Roy.

There was discussion on the section on compliance of communications equipment, and it was agreed that this would be a schedule at this stage, and be reconsidered later.

The working group was asked to consider broad comments on the templated draft for next meeting. A revised draft, including the segments mentioned above, would need to be circulated 2 weeks before the meeting.

## **6. OTHER BUSINESS**

It was agreed that an action list would be attached to the minutes (see Attachment 1).

## **7. CLOSURE AND NEXT MEETING**

The meeting was closed at 3:25 pm. The next meeting was scheduled for 17-18 August 2000.

<p style="text-align: center;"><b>ACTIONS ARISING FROM RF EXPOSURE STANDARD WORKING GROUP MEETING OF 5-6 JULY 2000</b></p>
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- |  |   |
|--|---|
| 1. Provide feedback on submissions to Senate Inquiry   | Dr Roy  |
| 3. Circulate electronic copy of poster by Gabriel<br>(to be provided by Dr Joyner)   | Mr Melbourne  |
| 3. Paragraph comparing ARPANSA/AS2772.1 (Int):1998   | Mr McAlister  |
| 4. Depending on adequacy of available English translations,<br>finalise comparison of relevant foreign Standards<br>(including if possible the Russian standard)<br>for inclusion on an ARPANSA information web site | Mr Cornelius  |
| 5. Review of athermal effects for rationale.<br>Required assistance to be discussed with Dr Roy  | Dr Wood   |
| 6. Measurement Averaging draft to be further developed for rationale.<br>Will need to consider induced current & electrostimulation &<br>possibly spatial averaging  | Mr Cornelius, Mr Anderson   |
| 7. Section on safety factors for rationale to be developed   | Mr Anderson, Dr Black & Dr Roy/Mr Cornelius   |
| 8. Refine document on precautionary approach for inclusion<br>as an Annex  | Dr Dickie, Ms Wright, Mr Anderson, Mr Lincoln   |
| 9. A report on epidemiology of approx 10 pages and a 1-2 page<br>Summary   | Prof Elwood, Dr Hocking   |
| 10. RF Dosimetry & Measurement section for rationale   | Mr Melbourne to contact Standards Australia<br>Dr Black to contact Standards New Zealand<br>Mr Bangay, Ms Wright, Dr Joyner to draft section based on AS 2772.2 |
| 11. Non-human species Annex to be further refined.   | Dr Black  |
| 12. Position paper on non-uniform exposure to be developed &<br>further information sought from D Conover(NIOSH)   | Mr Bangay, Ms Wright  |
| 13. Exposed population groups to be developed further  | Dr Hocking, Dr Roy, Dr Black  |
| 14. Draft rationale to be developed  | Dr Roy, Mr Anderson, Dr Black   |
| 15. Provide broad comments on Templated draft at next meeting  | All members   |

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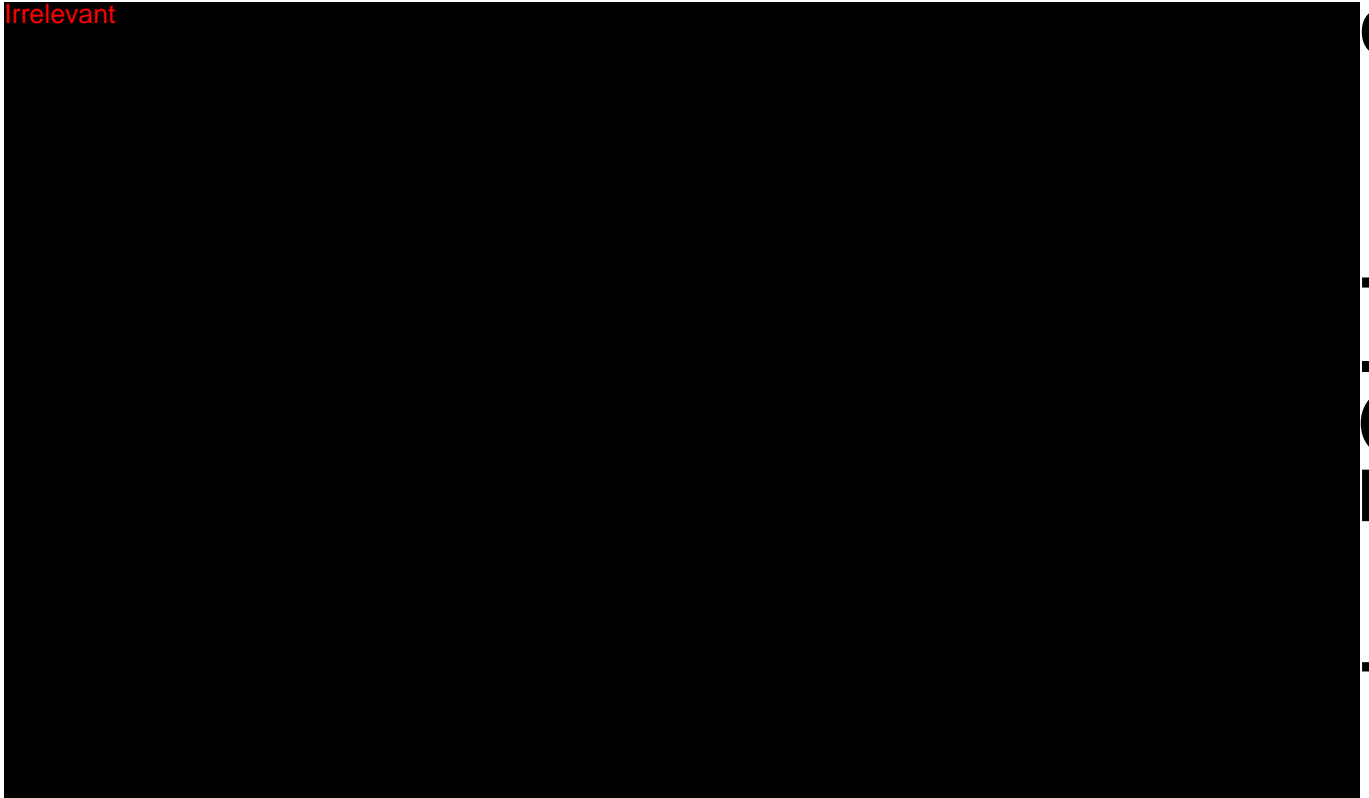
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## **RADIATION HEALTH COMMITTEE**

### **Minutes of the meeting held on 19 – 20 July 2000**

Irrelevant



**4.8.2 RF Standard - Progress Report**

**11**

Irrelevant



Released under FOI June 2018























#### **4.8.2 RF Standard- Progress Report**

Dr Roy (Chair, RF Exposure Standard Working Group) attended this session and stated that the RF Exposure Standard Working Group had already met on three separate occasions for a two-day meeting each time. These meetings had achieved the goal of bringing the Working Group up-to-date on important issues that need to be progressed in the Standard. Dr Roy presented an overview of the development of the Standard noting the following points:

- ♦ The TE/7 ballot draft was used as the working document, and had been reformatted in the ARPANSA template style. The draft had not as yet been edited for content;

- ◆ The draft Standard would adopt the ICNIRP numbers and be limits based;
- ◆ ARPANSA would maintain an up-to-date Web page containing information relating to the Standard;
- ◆ Working Group to meet again in the third week of August;
- ◆ A draft for public comment would be available by mid-November 2000; and
- ◆ A preliminary draft would be circulated to RHC members as soon as it becomes available.

As mentioned at the previous meeting, Dr Roy again noted that an ACIF draft Code was also being developed that was complementary to the Standard and would contain no numbers. At the recent RF Working Group meeting, a member of the ACIF Working Group attended and detailed the progress of the ACIF Code. It was noted that the Code would be *registered*, and that provisions of the Code would be mandated. A draft Code should be soon available.

The Committee queried if the Code would be distributed for public comment? Dr Roy responded by stating that although the Code would probably have a limited circulation, he expected that RHC would see a copy for comment. The Committee also felt that a clearer indication as to the scope of the Code needed to be determined; in particular occupational health issues.

The Committee concluded that Dr Loy would draft a letter to the Chair of the ACIF Code Working Group. He would also request that a copy of the Code be made available to the RHC for comment, seeking clarification on the scope of the Code. It was also noted that the Committee should be kept fully informed of the development of the Standard. The URL address for the WHO statement on precautionary approach was circulated to Committee members.

Irrelevant



























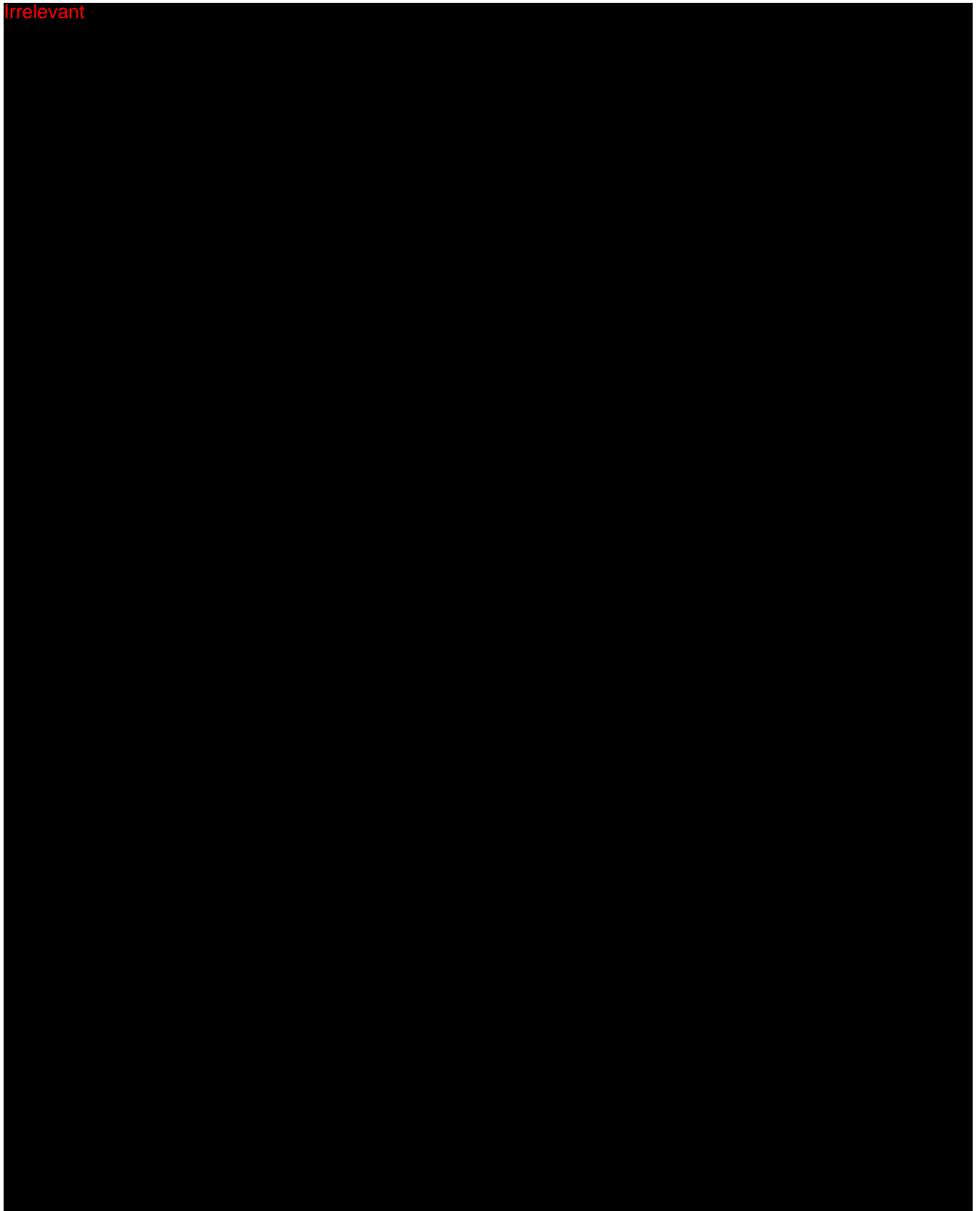












#### **4.2 Development of MOU's with Standards Australia and NOHSC**

The CEO reported that there had been a further meeting with Standards Australia and that an MOU was now being drafted. The MOU was intended to ensure information exchange and to ensure discussions took place to avoid duplication and overlap when Standards Australia and ARPANSA were considering documents on similar topics. There had been an exchange of correspondence with NOHSC, but no discussion as yet. It was noted that NOHSC had requested

an observer on the RF working group, but that a name had not been put forward yet. Mrs Fitch asked that Radiation Health Committee be advised of the details of the observer as soon as available.

Irrelevant







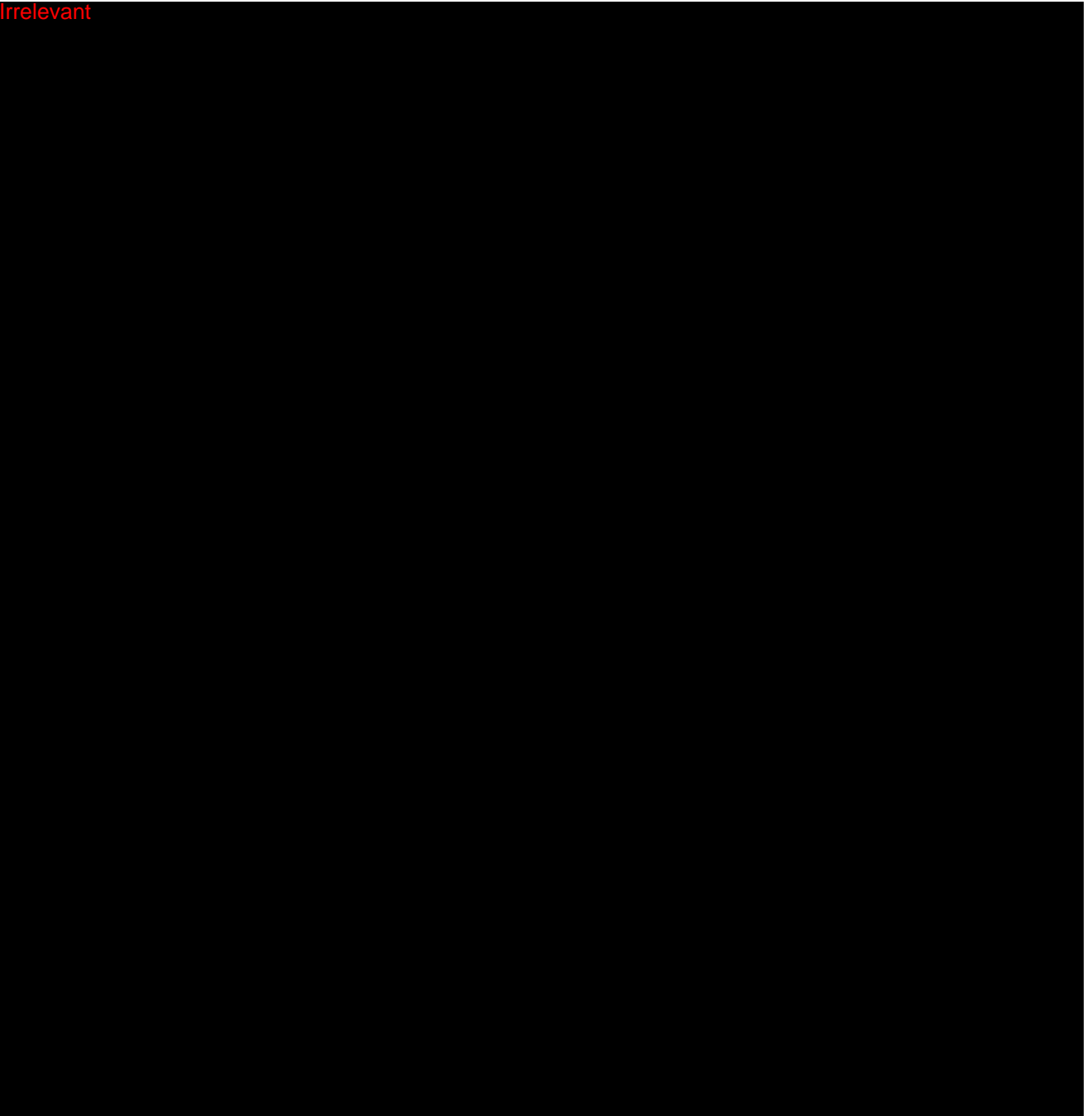








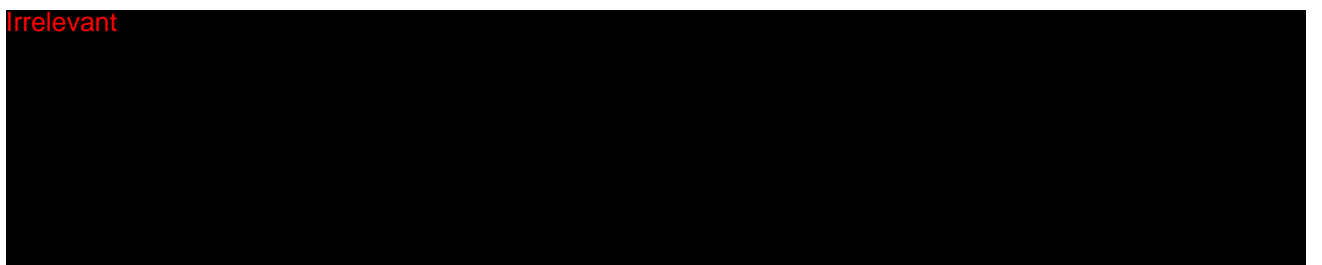
Irrelevant



### **9.1 Report on Development of RF Standard**

Dr Dickie reported that the working group had now had three 2 day meetings, and hoped to have a draft for the next RHC meeting. He commented that the process being undertaken was good and that he was confident that it would be successful. The process included provision for public consultation. The standard itself will be relatively short, and there will be a number of annexes containing the rationale and information. Sub-groups had been established to deal with specific topics. The next meeting of the working group is scheduled in about one month's time.

Irrelevant



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## RF EXPOSURE STANDARD WORKING GROUP

**DATES:** 17-18 August 2000

**TIMES:** 17 Aug: 9:30am - 5:00pm  
18 Aug: 9:00am - 5:00pm

**VENUE:** Conference Room  
Australian Radiation Protection and Nuclear Safety Agency  
Lower Plenty Road  
YALLAMBIE VIC 3085

### Draft Meeting Record

<b>1. OPENING OF MEETING &amp; ATTENDANCE</b>	3
<b>2. APOLOGIES</b>	3
<b>3. CONFIRMATION OF MINUTES OF 5-6 JULY 2000 MEETING</b>	3
<b>4. BUSINESS ARISING FROM MINUTES</b>	3
<b>5. GENERAL BUSINESS</b>	3
5.1 Senate Inquiry on Electromagnetic Radiation	3
5.2 ACIF Code development process	3
5.3 Choice 'hands-free' article	4
5.4 SAR labelling	4
5.5 ACA request	4
5.6 Actions from meeting of 5&6 July	4
5.6.1 Review of athermal effects for rationale. [any additional assistance to be discussed]	4
5.6.2 Measurement Averaging draft to be further developed for rationale [Will need to consider induced current & electrostimulation & possibly spatial averaging]	4
5.6.3 A report on epidemiology of approx 10 pages and a 1-2 page summary	5
5.6.4 Circulate electronic copy of poster by Gabriel (to be provided by Dr Joyner)	5
5.6.5 Paragraph comparing ARPANSA and	

AS2772.1 (Int):1998	5
5.6.6 Depending on adequacy of available English translations, finalise comparison of relevant foreign Standards (including if possible the Russian standard) for inclusion on an ARPANSA information web site	5
5.6.7 Section on safety factors for rationale to be developed	5
5.6.8 Refine document on precautionary approach for inclusion as an Annex	5
5.6.9 RF Dosimetry & Measurement section for rationale Mr Melbourne to contact Standards Australia Dr Black to contact Standards New Zealand Section to be drafted based on AS 2772.2	6
5.6.10 Non-human species Annex to be further refined.	6
5.6.11 Position paper on non-uniform exposure to be developed & further information sought from D Conover(NIOSH)	6
5.6.12 Exposed population groups to be developed further	6
5.6.13 Draft rationale to be developed	6
5.6.14 Discussion paper on the recommendation of the Stewart Report to discourage children from using mobile phones	7
5.7 Health surveillance	7
5.8 Management of overexposure	7
5.9 Starting Document – Template Version of TE/7 Ballot Draft	7
5.10 The Next Steps	7
<u>NOTE:</u> Items 5.9 and 5.10 were not discussed in the meeting	
<b>6. OTHER BUSINESS</b>	8
<b>7. CLOSURE AND NEXT MEETING</b>	8
<b>ACTION LIST ARISING FROM MEETING</b>	9

## **1. OPENING OF MEETING AND ATTENDANCE**

Dr Roy opened the meeting at 9:45 am. The following members were present.

Members: Dr Colin Roy (Chair)  
Mr Wayne Cornelius  
Dr Ken Joyner (Thursday pm and all Friday)  
Dr Bruce Hocking  
Mr Vitas Anderson  
Ms Jill Wright  
Mr John Lincoln  
Dr David Black (Consultant)  
Prof Mark Elwood (Consultant) (Thursday only)  
Dr Andrew Wood

Secretariat: Mr Michael Bangay

Observers: Ken Karipidis, Ian McAlister, Ms Judy Lawson

Ms Judy Lawson was welcomed to the WG and represents NOSHC

## **2. APOLOGIES**

Mr David McKenna, Graham Dickie

## **3. CONFIRMATION OF MINUTES OF 6-7 JULY MEETING**

The minutes of the 6-7 July 2000 meeting were agreed subject to one amendment. The third last paragraph of item 5.3 is to include “ the site owner is to be informed of the event of an exposure incident”.

## **4. BUSINESS ARISING FROM THE MINUTES**

Resolution of the E-mail discussion prior to the meeting that was a consequence of the distribution Gabriel’s poster by Dr Joyner and is carried over to agenda item 5.6.4.

## **5. GENERAL BUSINESS**

### **5.1 Senate Inquiry on Electromagnetic Radiation**

The Senate sub-committee has not yet called members of the WG, this may occur in late October. Dr Roy presented Ken Karipidis’ summary (5.1a and 5.1b ) of the Senate submissions to the WG. Dr Roy concluded that there was nothing of particular significance for the working group and that no new information was submitted that had not all ready been considered. WG members expressed positive approval for the manner of the breakdown.

### **5.2 Status of ACIF Code Development Process**

Dr Roy reported that the ACIF committee having their 2-day meeting in August 17-18 and a draft will be presented to the RF WG in the near future.

Discussion on the difference between “LOW” and “HIGH” impact facilities.

Mr Lincoln said that there issues yet to be resolved.

### **5.3 Choice “hands free” Article**

Dr Black gave a summary of the Choice article on “hands free kits”. The tests conducted by EMC Technologies and commissioned by the Australian and NZ Choice magazine showed, in contrast to the “Which” tests, that hands free kits gave significant reduction in head SARs. However, if the phones were simply clipped to the waist the SAR in the immediate tissue may increase by a factor of two. Only a waist clip recommended by the phone manufacturer will not increase the SAR. Dr Hocking commented that in his paper he had reported that three people had complained of sensation in the area around the phone mounted on the waist.

### **5.4 SAR Labelling**

Mr Anderson reported that there was now a voluntary industry initiative, being implemented in consultation with ACA, for SAR information to be included with the mobile phone at purchase. Various members commented on the issue adding that the FCC web site had comprehensive SAR data and that CENELEC and IEEE were going to harmonize their testing methodology.

### **5.5 ACA Request**

Dr Roy tabled two pieces of correspondence (5.5a, 5.5b) from the ACA. Two letters originally sent to the ACA, one from Prof McKenzie and the other from Ms McLean requested that the ACA re-consider the SAR limits which form the basis of the Radiocommunications Amendment Standard 2000. Dr Wood will include the McKenzie paper with those being considered by the WG, Mr Anderson will comment on the dosimetry.

### **5.6 Actions from 5-6 July meeting**

#### **5.6.1 Review of athermal effects for rationale**

Initially Dr Wood was to summarize a list of papers that addressed the issue of non-thermal effects of RF. Lengthy discussion by the majority of the WG resulted in the following:

- Where possible a full set of the abstracts and complete papers is to be obtained
- Each WG member is to be given the set of abstracts to become familiar with
- Dr Wood with the assistance of Mr Karipidis is to complete a review of the paper abstracts and present the details in tabular form
- When the review table is completed WG members will be able to discuss contentious results and the WG come to a final conclusion

#### **5.6.2 Measurement Averaging**

Three papers were submitted to the WG. Mr Cornelius presented a four page information paper (5.6.2b) which described how biological injuries may occur with time and that the measurement period should change with frequency.

Mr Anderson presented a paper by Reilly (5.5.2b), Heinrich (5.6.2c) and Bowman (5.6.2d), Mr Anderson suggested that at low frequencies the measurement period should be 100 msec and that a measurement of dB/dt as in the NZS be considered. Various comments by other members were made but it was decided that Mr Cornelius, Mr Anderson, Dr Black and Dr Joyner would produce a paragraph giving guidance on measurement times

### **5.6.3 Prof Elwood Epidemiology Report**

Prof Elwood spoke of his paper and drew attention to various pages. Dr Roy asked the WG as to their thoughts on how the information was to be presented, some members thought it should be in an informative annex or the Appendix and put part of it in the Rationale. The WG decided that the Summary from the paper (with the last paragraph omitted) would form part of the Rationale. The main body of the paper would be an informative annex.

### **5.6.4 Discussion on Gabriel poster**

Eight e-mails stemming from the Gabriel paper were sent between members prior to the meeting and related to the use of non-peer reviewed papers and SAR issues as a consequence of tissue and head size changes with age. Discussion at the meeting included comments about Schonborn and Gandhi's papers. Mr Anderson spoke to the group about the various papers pointing to the difficulties with Gandhi's work and the complexity of the issue. Dr Black asked the question that if highest tissue conductivity was used would the SAR limit for mobile phones change? Mr Cornelius stated that the Australian SAR Standard used a high conductivity phantom jelly for the test. The discussion came to an end without the need for action.

### **5.6.5. ARPANSA – AS2772.1 Comparison**

Mr McAlister suggested the comparison (document 5.6.5) be placed in the Foreword of the Standard. Dr Black suggested that the paragraph describing the increase in power flux density be reworded to use the words: "... increased to bring the reference levels in line with basic restrictions which have remained unchanged since 1983". WG members indicated their favor for these changes.

### **5.6.6 Comparison with relevant foreign standards**

Dr Wood reported that the Russian Standard was being translated and would be made available when completed.

### **5.6.7 Safety Factors**

After some discussion the WG decided that the paper on safety factors should be placed in the annex with one paragraph (and possibly a figure) included in the Rationale.

### **5.6.8 Precautionary Approach**

Mr Lincoln suggested that the paragraph from the draft AS/NZS be used. Further discussion by the WG resulted in Mr Anderson, Mr Lincoln and Dr Roy deciding to work together to further refine the tabled appendix. Dr Roy is to distribute the ARPANSA precautionary information to the WG. Dr Black reported that the recent NZ experience with Clause 10 of their Standard has proven to be positive. It was decided for the WG to continue working on this issue.

### 5.6.9 RF Dosimetry and Measurement

Mr Bangay tabled a draft paragraph that is to be included in the Standard. The need to reference measurement/procedure standards requires the need for Standards Australia to review and finalize Part 2 of the Standard, Dr Roy is to write to Standards Australia requesting the revision and issue of Part 2. A paper copy of the pre-ballot version of AS2772.2 was made available to each member. Mr Bangay, Ms Wright and Dr Joyner to finalize the measurement section.

### 5.6.10 Non-human species Annex

Dr Black stated that his contact with animal experts revealed that they did not think there was a problem with animals being exposed to RF EME. Dr Black is to produce a small paragraph for inclusion in the Standard. This is to include the fact that current standards are based on human anatomy and there are differences in the animal world eg reptiles.

### 5.6.11 Non-uniform exposure

Ms Wright reported on information received from Mr David Conover (5.6.11a,b,c) that revealed that there were problems associated with the limits when the problem of non-uniform exposure for RF heat sealer operators was looked at. Mr Anderson said that measurement of induced current should address the problem. Ms Wright and Mr Bangay suggested the same localised values to the hands, wrists, ankles and feet as those for the head ie extremity exposure. The issue remained unclear and is to be clarified by Mr Anderson, Mr Bangay, Dr Joyner and Ms Wright.

### 5.6.12 Exposed population groups

Dr Hocking introduced his paper. Ms Wright raised the question about the training of intellectually disabled workers who operate RF heat sealers. It was generally agreed that if they can be trained to operate the equipment they can be also trained to operate the equipment safely. Ms Judy Lawson suggested pre-placement health assessment  
The definition of Transitory Groups which states “aware of ..” changed to “informed or supervised”

**The last sentence in the definition of RF Worker replaced with .... From 1998 interim standard**

**Also change “need to be ..” to “to have been”**

Definition of Aware User changed from “by virtue” to “have been trained”

Definition of Non-occupational include phrase “including mobile phone user”

### 5.6.13 Draft Rationale

Dr Black spoke of the paper (5.6.13). Dr Hocking expressed some reservation with some parts, this included paragraph 2., the limitations of Adair’s study and that more could be said about the uncertainty associated with the effects of exposure to RF.



Various members made comments that the sentence in Paragraph 10 dealing with the “promotion or progression effect” needs to be reviewed or deleted.

Dr Roy reminded the WG that contributions for the Rationale need to be passed to him.

#### **5.6.14 Recommendation of the Stewart Report to discourage children from using mobile phones**

Mr Anderson spoke of his paper “Discussion paper on the Stewart Report to discourage children from using mobile phones”. The WG discussed the validity of the studies by Preece and Koivisto. Dr Wood agreed that he was going to inquire Preece and Koivisto about their data management methods which were largely criticised by the WG. The WG did not agree with the premises adopted in the Stewart Report in regard to their discussion (and recommendations) in regard to childhood exposure to mobile phone emissions. This, and the need for additional research, will be addressed in the rationale.

#### **5.7 Health Surveillance**

Dr Hocking presented a paper with a proposal for a health surveillance system similar to that developed by Dr Miro. Various members commented on the idea and while there was general support for the proposal, difficulties were foreseen with its implementation. It was concluded that Dr Roy and Dr Hocking will get together to put a request to the RHC.

#### **5.8 The Management of Over-exposure**

Dr Hocking’s paper on the management of RF over-exposure was considered. Dr Roy suggested that the Management Plan could be put on the ARPANSA web site. Dr Black questioned the use of “microwave-sickness” and Prof. Elwood questioned the use of information that did not necessarily reflect the opinions of the WG. Dr Roy on agreeing with the sentiments will see how the paper will fit in with the ARPANSA web policy.

#### **5.9 Starting Document – Template Version of TE/7 Ballot Draft & 5.10 The Next Steps**

These items were not discussed at this meeting. But the agreed structure of the rationale is reproduced here for information, as it remains an ongoing action. The rationale should include:

Quantities and Units – based on ICNIRP

Basis for limiting exposure – need to write our own section

Coupling mechanisms – based on ICNIRP except for ELF

Biological basis – generally accept ICNIRP but include our Epidemiology and athermal effects sections.

Safety Factors

Averaging Times & Spatial Averaging

A separate Annex on Precautionary Approach will be developed.

The draft rationale will be prepared by Mr Anderson, Dr Black and Dr Roy.

There was discussion on the section on compliance of communications equipment, and it was

agreed that this would be a schedule at this stage, and be reconsidered later.

The working group was asked to consider broad comments on the templated draft for next meeting. A revised draft, including the segments mentioned above, would need to be circulated 2 weeks before the meeting.

## **6. OTHER BUSINESS**

No other business was brought to the meeting

## **7. CLOSURE AND NEXT MEETING**

The meeting was closed at 3:25 pm. The next meeting was scheduled for 25-26 September 2000. A tentative date of 19-20 October was decided for the following meeting.

<p style="text-align: center;"><b>ACTIONS ARISING FROM RF EXPOSURE STANDARD WORKING GROUP MEETING OF 17-18 AUGUST 2000</b></p>
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1. McKenzie paper to be included in the list of papers addressing the issue of non-thermal effects of RF.  
Dosimetry to be commented on. Dr Wood, Mr Anderson
2. A full set of abstracts to be obtained of the papers addressing the issue of non-thermal effects of RF. Dr Wood, Dr Black
3. A review in tabulated form of all the paper abstracts addressing the issue of non-thermal effects of RF. Mr Karipidis, Dr Wood
4. Familiarisation of the paper abstracts addressing the issue of non-thermal effects of RF. All members
5. Paragraph giving guidance on measurement times.  
Mr Cornelius, Mr Anderson, Dr Black, Dr Joyner
6. Paragraph on epidemiology report for the Rationale. Prof Elwood
7. Russian standard to be made available. Dr Wood
8. Tabled appendix on the Precautionary Approach to be refined.  
Dr Roy, Mr Lincoln, Mr Anderson
9. Request for Standards Australia to review and issue Part 2 of the Standard. Dr Roy
10. Measurement section of the Standard to be finalised.  
Mr Bangay, Ms Wright, Dr Joyner
11. Clarification of non-uniform exposure.  
Mr Anderson, Mr Bangay, Dr Joyner, Ms Wright
12. Investigation of the data management methods used in the Preece and Koivisto studies. Dr Wood
13. Contributions for the Rationale to be passed on to Dr Roy. All members
14. Health surveillance request to the RHC. Dr Roy, Dr Hocking
15. Suitability of Dr Hocking's paper on the management of over-exposure with the ARPANSA web policy. Dr Roy

## RF EXPOSURE STANDARD WORKING GROUP

### Draft Meeting Record for 25-26 September 2000

<b>1. OPENING OF MEETING &amp; ATTENDANCE</b>	<b>2</b>
<b>2. APOLOGIES</b>	<b>2</b>
<b>3. CONFIRMATION OF MINUTES OF 17-18 AUGUST 2000</b>	<b>2</b>
<b>4. BUSINESS ARISING FROM MINUTES</b>	<b>3</b>
<b>5. GENERAL BUSINESS</b>	<b>3</b>
5.1 Senate Inquiry on Electromagnetic Radiation	3
5.2 ACIF Code development process	3
5.3 Actions Arising from Meeting of 17-18 August	3
5.3.1 McKenzie paper to be included in non-thermal papers addressed	3
5.3.2 Obtain full set of abstracts of non-thermal papers	3
5.3.3 Review of non-thermal papers in tabulated form	3
5.3.4 Familiarisation with abstracts on non-thermal effects	4
5.3.5 Paragraphs on measurement times	4
5.3.6 Paragraph on epidemiology for Rationale	4
5.3.7 Russian Standard to be made available	4
5.3.8 Refine precautionary approach appendix	5
5.3.9 Request Standards Australia to review and issue Part 2 of Standard	5
5.3.10 Finalise Measurement Section of Standard	5
5.3.11 Clarification of non-uniform exposure	5
5.3.12 Investigate Preece and Koivisto data management methods	5
5.3.13 Contributions for rationale to be completed	5
5.3.14 Health Surveillance request to RHC	5
5.3.15 Examine Hocking paper on over-exposure in relation to ARPANSA's web policy	5
5.4 First Draft of Standard	5
5.4(b) Population Groups	6
5.5 The Next Steps	7
5.6 Medical Surveillance	7
5.7 Microwave Sickness	7
<b>6. OTHER BUSINESS</b>	<b>7</b>
<b>7. CLOSURE AND NEXT MEETING</b>	<b>7</b>

## 1. OPENING OF MEETING & ATTENDANCE

Dr Roy opened the meeting at 9:35 am. The following members were present:

Dr Colin Roy (Chair)  
Dr Andrew Wood  
Mr Wayne Cornelius  
Mr John Lincoln  
Mr Vitas Anderson  
Dr Bruce Hocking  
Prof Mark Elwood  
Ms Jill Wright  
Dr David Black

Mr Alan Melbourne (Secretariat)

Mr Ian McAlister (Observer)  
Mr Ken Karipidis (Observer)  
Ms Judy Lawson (Observer)

## 2. APOLOGIES

Dr Ken Joyner, Dr Graeme Dickie, Mr Michael Bangay, Mr David McKenna

## 3. CONFIRMATION OF MINUTES OF 17-18 AUGUST 2000

The minutes were confirmed with the following corrections:

5.6.8. Insert before fourth sentence "Dr Hocking asked Dr Black about NZ experience regarding the paragraph in the NZ foreword *generally, it is therefore sensible in achieving service or process requirements to minimize unnecessary or incidental RF exposure*". Delete the words *with Clause 10 of their Standard* from the next sentence.

5.6.11. Replace second, third and fourth sentences with "Dr Joyner suggested that the IEEE limitations for partial body exposures (peak values from table 3 of IEEE 1999 edition) be used. This was supported by the working group. Ms Wright, Mr Anderson, Mr Bangay and Dr Joyner will develop a paragraph for the rationale and recommend how these limitations on exposure should be included in the Standard."

5.6.13. The following words to be added to the end of the second sentence "and specifically that non-thermal effects have been ignored in setting the standard".

5.6.14. Replace third and fourth sentences with "Dr Wood agreed that he was going to seek clarification from Preece and Koivisto about their data management methods. Some members of the working group did not agree...". Add the following sentence "Mr Lincoln requested that the WG write to Stewart to establish the basis of the recommendations."

5.8. Add the following sentence "Subsequently a draft paper from Komar was tabled".

The Secretariat will make the corrections and circulate the corrected minutes of 17-18 August.

#### **4. BUSINESS ARISING FROM MINUTES**

It was noted that all of the business arising had been included on the agenda. Two additional items were added to the agenda (5.6 & 5.7).

#### **5. GENERAL BUSINESS**

##### **5.1 Senate Inquiry on Electromagnetic Radiation**

Mr Lincoln noted that there were comments in the circulated ARPANSA analysis of submissions to the Senate Inquiry that were personal in nature and which should be removed. Dr Roy agreed that the comments would be removed and the revised analysis circulated.

Dr Hocking, Dr Black, Prof Elwood had all attended Senate Hearings, and Mr Anderson had attended as an observer. Dr Black provided a copy of the draft transcript of his evidence for information. Mr Lincoln advised that he had received an email from Lai regarding Dr Black's testimony. This was tabled and referred to Dr Wood.

##### **5.2 ACIF Code development process**

It was noted that the ACIF Code had been circulated to WG members and was open for public comment for some time. Dr Wood noted that there were aspects of Appendix D on Quality EMF Research that required clarification. As it was not within the WG terms of reference to make a direct submission, members should consider making individual submissions.

##### **5.3 Actions Arising from Meeting of 17-18 August**

###### **5.3.1 McKenzie paper to be included in non-thermal papers addressed**

This action had been completed.

###### **5.3.2 Obtain full set of abstracts of non-thermal papers**

Dr Wood tabled the set of abstracts along with a correction page for the last abstract. He advised that the papers included had come from lists supplied by Mr Lincoln and Ms Wright, and some additional papers from Mr Lincoln. The Stewart Report and Canadian Review had also been examined for papers that were not reviewed in ICNIRP. From about 300 papers the list had been culled by removing those for which it was hard to obtain a translation etc. Dr Wood was not sure that ICNIRP had covered the low MHz area of the spectrum very well. Synergism issues were also not covered well. It was noted that the lowest frequency at which athermal effects have been reported is 50 MHz (Blackman). Ms Wright noted the need to cover industrial frequencies from 3-50 MHz. Dr Wood would prefer to use published reviews if possible.

###### **5.3.3 Review of non-thermal papers in tabulated form**

The tabulated format was not complete yet and was not tabled. Dr Wood and Mr Karipidis were preparing it. Dr Wood tabled a draft Annex on athermal effects for discussion. It included a section on studies examining indicators of pathological change, a section on studies of markers of physiological or psychological performance (mainly mobile phone related), and a section on other issues including diathermy. A section on synergies was still to be completed, and dosimetry issues were still to be addressed.

There is growing evidence that low SAR  $\sim 4\text{W/kg}$  may have some effects that need to be evaluated. Expert advice may be needed on whether any of these effects are pathological or within the normal range. It was intended that Dr Wood's paper would become an Annex to the Standard. Dr Roy indicated a need to clarify the position on use of bits of the ICNIRP rationale.

Comments on the paper should be provided to Dr Wood (via the secretariat) after the meeting. Electronic copies will be made available. They should not be distributed outside the WG.

Dr Roy said that the issue of gene expression and health effects should be raised at NHMRC Expert Group to establish what is the normal variation with different ambient conditions. Dr Wood will frame a question for Dr Roy to put to the Expert Group.

It was agreed that Vershaave and Philips should be approached to seek advice on what information their papers contribute to the discussion about DNA breaks.

Dr Wood asked whether ultra-wide band pulses (radar) should be included. It was agreed that it was worth including.

#### **5.3.4 Familiarisation with abstracts on non-thermal effects**

There was no further discussion on this item.

#### **5.3.5 Paragraphs on measurement times**

Mr Cornelius tabled a paper on measurement averaging considerations. There were still some issues to be resolved (eg. Possible use of  $30\text{ }\mu\text{s}$  -  $1\text{ ms}$  is inappropriate). Dr Joyner's input was required as he has additional information and papers on this area. Mr Anderson will contact Jokela (ICNIRP committee) to get further information. Mr Cornelius requested feedback on the draft and the adequacy of the SA limit. Mr Anderson will add a paragraph on ICNIRP dB/dt.

#### **5.3.6 Paragraph on epidemiology for Rationale**

Prof Elwood tabled a section on epidemiology for the main text of the standard along with a more detailed Appendix. Comments are to be forwarded to Prof Elwood with copies to the Secretariat. Mr Lincoln indicated his concern with inclusion of the Motorola study, due to its lack of measurement. Dr Black considered that this was counteracted by the number of people in the study and the methodology. Prof Elwood said it was still appropriate to include.

Prof Elwood queried the copyright issue and advised that he would require copyright release of his contributed material, as would Dr Black and Dr Wood.

#### **5.3.7 Russian Standard to be made available**

Dr Wood advised that a translation of the document had been done, but it was not a published document, it was a draft in the process of revision. It was not actually a draft standard and did not have anything to assist the WG. Dr Black advised that he had a copy of the Russian Standard and would provide it to Mr Cornelius.

### **5.3.8 Refine precautionary approach appendix**

There was nothing further on this issue at this stage. Dr Hocking tabled an extract from The Age on CJD as an example of the level of precautionary measures adopted by government. Dr Black noted that the low probability, high impact situation was not surprising due to the range of issues affecting blood supplies, but that low probability, high impact did not apply to RF.

### **5.3.9 Request Standards Australia to review and issue Part 2 of Standard**

Dr Roy understands that Standards Australia are interested in reviewing Part 2. Dr Black tabled a copy of the latest draft of Part 2. Dr Roy will follow up with Roger Lyle and emphasize the NZ interest.

### **5.3.10 Finalise Measurement Section of Standard**

Ms Wright is to discuss with Mr Bangay a section based on the AS/NZS draft. Mr Bangay will draft some paragraphs directing readers to particular references for particular measurement situations. It needs to address SAR and induced current. It should be completed quickly and circulated.

### **5.3.11 Clarification of non-uniform exposure**

There was nothing further on this issue at present. A paper will be distributed prior to next meeting.

### **5.3.12 Investigate Preece and Koivisto data management methods**

"Data-culling" is routinely done at Koivisto's laboratory. It is used in situations where subjects "jump the gun" or are "distracted". It would not have changed the results. Others, eg Stough, would not do it. Dr Black has electronic copies of the 3 Koivisto papers, which he will circulate.

### **5.3.13 Contributions for rationale to be completed**

It was noted that this was still work to be completed.

### **5.3.14 Health Surveillance request to RHC**

Dr Hocking's paper has been provided to the RHC Secretariat and will be on their next agenda.

### **5.3.15 Examine Hocking paper on over-exposure in relation to ARPANSA's web policy**

Dr Roy advised that he has yet to deal with this item.

## **5.4 First Draft of Standard**

Dr Roy tabled a first rough draft of the standard. It included some of the work contributed by working group members, but required additional material to be inserted and comment from WG members. Discussion on the draft contributed editing and suggestions up to the end of section 4. The changes included:

- Working title "Maximum Exposure Levels to RF Fields, 3 kHz to 300 GHz".



- Changes to Foreword to remove first paragraph, mention WHO and IARC and other editing.
- Inclusion of a Citation Section at 1.1.
- Expanded Background that acknowledges Standards Australia.
- Rearrange and rewrite Purpose and Scope.
- Write structure section explaining what is mandatory, advisory etc.
- 2.1 to be replaced by paragraphs from Mr Anderson.
- 2.2 should use Mr Anderson's information on safety factors.
- The tables had a number of corrections including whether to specify  $f$  in MHz throughout.
- Reference levels to be renumbered to 2.4.
- Additional graphs for  $W/m^2$  to be added after Fig. 1 & Fig. 2.
- Mr Cornelius to develop additional diagram for spatial averaging, Mr Anderson to add the words.
- In Section 4 all subscripts are to be checked & an extra sentence or two about spread spectrum technologies is to be added.
- Mr Anderson & Mr Bangay to check other aspects of Section 4.
- Mr Cornelius' corrections from the NZ Standard are also to be used in Section 4.

#### 5.4(b) Population Groups

A series of emails was tabled, in which Mr Anderson had proposed a new rationale for defining exposed population groups, and other members had commented. Mr Anderson elaborated on his proposal, as set out in the table following.

	Awareness Training	Physical Limitations		4 W/kg	detectable effect (or harmful effect)
RF Surveyors RF Workers	++++	+		x 10	
Aware	+++	++	LIMIT		
Controlled	++	+++			Occ Limit
Buffer Zone	+	++++		x 5	
					Public Limit

Discussion included that workers are also protected by shielding and administrative controls, that awareness and training often failed, that RF workers need to be defined, that the proposal covered intellectually handicapped workers. Dr Black noted that the factor of 5 safety factor is in fact based on 40 hr vs 168 hr. Further discussion centred around use of the hierarchy of controls used in OH&S, ie. (1) elimination of the hazard, (2) engineering, (3) administrative controls (including training), (4) personal protective equipment. Mr Anderson agreed to develop

the ideas further. WG members felt that the alternate to occupational/public would need to be better and would need to be defensible in order to change the status quo. However, it was also noted that there were problems with the current system. Mr Anderson later tabled a short paper based on the hierarchy of controls. This would be developed further by the population groups task group. It would need to cover the following points raised by members:

- Mobile phone users
- Aware users - not apply to consumer products
- Include examples
- Clarify whether applies to continuous exposure
- Headings need refining
- More clearly define occupational vs public
- Amateur radio example, industrial examples
- Pregnant RF workers

The document will be progressed by email. Dr Wood queried whether the athermal effects annex should cover effects on the foetus.

In relation to safety factors the Anderson paper would be used, however it was noted that coupling issues in RF welders affect safety factors. Mr Anderson would check on issues from Conover/Gandhi. The paper would need to state what the coupling conditions are. It was also noted that it needed to address ground plane as well as free space conditions in order to properly assess the safety factor.

### **5.5 The Next Steps**

Dr Roy will make the corrections suggested and include the additional material provided and will circulate a second draft. WG members should ensure that they attend to their items on the action list.

### **5.6 Medical Surveillance**

Dr Hocking and Dr Black will come back to the WG with some improved words on this issue.

### **5.7 Microwave Sickness**

Dr Hocking tabled a pre-print of an article on microwave sickness for WG information. It is not for further circulation.

## **6 OTHER BUSINESS**

There was no other business.

## **7. CLOSURE AND NEXT MEETING**

The next meeting was set for 19-20 October at ARPANSA, Yallambie. The meeting was closed at 4:30 pm.

**ACTION LIST FROM MEETING OF 25-26 SEPTEMBER 2000**

1. Circulate amended version of ARPANSA analysis of Senate submissions Dr Roy
2. Consider information in email from Lai in regard to non-thermal effects Dr Wood
3. Complete tabulated format review of non-thermal papers Dr Wood, Mr Karipidis
4. Clarify position on use of bits of ICNIRP rationale Dr Roy
5. Electronic copies of draft Annex on non-thermal effects to be circulated Dr Wood
6. Comment on draft Annex on non-thermal effects All members
7. Frame question on gene expression normal variation for Dr Roy to put to NHMRC Expert Group Dr Wood
8. Approach Vershaave and Philips seeking advice on relevance of their papers to discussion on DNA breaks Dr Roy
9. Contact Jokela (ICNIRP Committee) to get information on measurement averaging Mr Anderson
10. Comment on Mr Cornelius' paper on measurement averaging All members
11. Draft paragraph on ICNIRP dB/dt Mr Anderson
12. Comment on Prof Elwood's epidemiology paper All members
13. Copy of Russian Standard to be provided to Mr Cornelius Dr Black
14. Complete precautionary approach Annex Dr Roy, Mr Lincoln, Mr Anderson
15. Follow up with Roger Lyle re Part 2 of Standard Dr Roy
16. Finalise measurement section of standard Ms Wright, Mr Bangay, Dr Joyner
17. Distribute paper on non-uniform exposure before next meeting  
Task Group (Roy/Cornelius, Joyner, Anderson, Wright)
18. Circulate electronic copiers of Koivisto papers Dr Black
19. Complete contributions for rationale All members
20. Examine Hocking over-exposure paper in relation to ARPANSA web policy Dr Roy
21. Make corrections to draft standard as discussed at meeting Dr Roy
22. Develop further the population groups paper  
Mr Anderson & Pop. Groups Task Group (Black, Joyner, McKenna, Hocking)
23. Check on issues from Conover/Gandhi re safety factors Mr Anderson
24. Further develop words on medical surveillance Dr Hocking, Dr Black

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## RF EXPOSURE STANDARD WORKING GROUP

### Draft Meeting Record for 19-20 October 2000

1.	<b>OPENING OF MEETING AND ATTENDANCE</b>	2
2.	<b>APOLOGIES</b>	2
3.	<b>CONFIRMATION OF MINUTES OF 25-26 SEPTEMBER 2000</b>	2
4.	<b>BUSINESS ARISING FROM MINUTES</b>	2
5.	<b>GENERAL BUSINESS</b>	2
	5.1 Membership of Working Group	2
	5.2 Report on Actions from Last Meeting	2
	5.2.1 Circulate amended version of ARPANSA analysis of Senate submissions	2
	5.2.2 Consider information in email from Lai in relation to non-thermal effects	3
	5.2.3 Complete tabulated format review of non-thermal papers	3
	5.2.4 Clarify position on use of bits of ICNIRP rationale	3
	5.2.5 Circulate electronic copies of Non-thermal Effects Annex	3
	5.2.6 Comment on draft Annex on Non-thermal Effects	3
	5.2.7 Frame question on gene expression normal variation For Dr Roy to put to NHMRC Expert Group	3
	5.2.8 Approach Verschaeve and Philips seeking advice on the Relevance of papers to discussion on DNA breaks	3
	5.2.9 Contact Jokela to get information on measurement averaging	4
	5.2.10 Comment on Mr Cornelius' paper on measurement averaging	4
	5.2.11 Draft paragraph on ICNIRP dB/dt	4
	5.2.12 Comment on Prof Elwood's epidemiology paper	4
	5.2.13 Copy of Russian Standard to be provided to Mr Cornelius	4
	5.2.14 Contact Current/Induced Current	4
	5.2.15 Copyright Issues	4
	5.2.16 Finalise Measurement section of standard	5
	5.2.17 Distribute paper on non-uniform exposure	5
	5.2.18 Circulate electronic copies of Koivisto papers	5
	5.2.19 Complete contributions for rationale	5
	5.2.20 Examine Hocking over-exposure paper in relation to ARPANSA web policy	5
	5.2.21 Make corrections to draft standard ass discussed at meeting	5
	5.2.22 Develop further the population groups paper	5
	5.2.23 Check on issues from Conover/Gandhi re safety factors	6
	5.2.24 Further develop words on medical surveillance	6
	5.3 Draft Standard	6
	5.4 The Next Steps	7
6.	<b>OTHER BUSINESS</b>	8
7.	<b>CLOSURE AND NEXT MEETING</b>	8
	<b>ACTION LIST</b>	9

## **1. OPENING OF MEETING AND ATTENDANCE**

Dr Roy opened the meeting at 9:45 am. The following members were present:

Dr Colin Roy (Chair)  
Mr John Lincoln  
Dr Andrew Wood  
Mr Vitas Anderson  
Dr David Black  
Mr Wayne Cornelius  
Dr Bruce Hocking  
Prof Mark Elwood  
Ms Jill Wright

Mr Alan Melbourne (Secretariat)  
Mr Michael Bangay (Secretariat)

Dr Graeme Dickie  
Mr Ken Karipidis (Observer) attended on first day

## **2. APOLOGIES**

Dr Ken Joyner, Mr Ian McAlister, Mr David McKenna, Ms Judy Lawson

## **3. CONFIRMATION OF MINUTES OF 25-26 SEPTEMBER 2000**

The minutes were confirmed without amendment.

## **4. BUSINESS ARISING FROM MINUTES**

Mr Lincoln sought clarification on whether the section of the standard edited during last meeting would be covered again. Dr Roy confirmed that it would.

## **5. GENERAL BUSINESS**

### **5.1 Membership of Working Group**

Mr Melbourne advised that ACTU had written advising of Mr McKenna's inability to continue on the working group due to other commitments. Mr Dan Dwyer had been nominated by ACTU as his replacement. The matter was to be discussed at the RHC meeting on 1-2 November. In addition, the EME Reference Group had recommended to the Committee on EME Public Health Issues that a replacement for Dr Stan Barnett should be appointed to the working group. This had also been referred to RHC. Dr Roy noted that he had recently discussed issues with Dr Barnett, but that Dr Barnett was not reconsidering his position.

### **5.2 Report on Actions from Last Meeting**

#### **5.2.1 Circulate amended version of ARPANSA analysis of Senate submissions**

This action had been completed by email between meetings.

### **5.2.2 Consider information in email from Lai in relation to non-thermal effects &**

### **5.2.8 Approach Verschaeve and Philips seeking advice on the relevance of their papers to discussion on DNA breaks**

These items were discussed together as the main point raised in the Lai email related to the work of Verschaeve and Philips. An email had been sent to Verschaeve, and a reply received. Verschaeve referred to comet-tail assay work which was not yet published, but which showed no effect. He indicated that there was no significant effect on DNA strand breaks. Dr Roy also advised that an email had been sent to Bernard Veyret, but no reply had been received as yet. Other issues raised in the Verschaeve email included

- That a small increase in temperature would explain the effects reported
- Effects usually required more than 1°C temperature change
- Micronucleus formation in rats usually occurred at 2°C change
- Heat shock protein was said to occur at 1°C temperature change

### **5.2.3 Complete tabulated format review of non-thermal papers**

The tabulation was largely complete, although a small amount of update was required. It would be circulated to the working group with a version number included and would be updated as necessary. Information would be added to the heading to say that this was work in progress and did not represent a final position on the papers.

### **5.2.4 Clarify position on use of bits of ICNIRP rationale**

This task had not been completed yet.

### **5.2.5 Circulate electronic copies of Non-thermal Effects Annex**

The Annex had been circulated by email prior to the meeting.

### **5.2.6 Comment on draft Annex on Non-thermal Effects**

Dr Wood described the changes to this version of the paper. Reference to the de Pomerai study on nematode worms was included. Feedback was required on whether to include the Rowley and Anderson paper in (ix). Dr Wood noted that he would be in Britain and could visit Tattersall and possibly de Pomerai while there. The Working Group supported Dr Wood in approaching those researchers for information. In regard to the overlap with epidemiology papers Dr Wood noted that the C..... paper would be included, but with a comment that it is uncertain whether the mechanism is thermal. Feedback on the Annex was requested as soon as possible. It was agreed that this Annex should be re-formatted to be similar to the epidemiology Annex, with a summary up front that includes conclusions. It needs a statement that there are still some unanswered issues. It should use "low level" rather than "non-thermal" effects, and it should specify the species studied in the papers throughout. Due to the RHC meeting being next week comment was required by COB next Friday (27/10).

### **5.2.7 Frame question on gene expression normal variation for Dr Roy to put to NHMRC Expert Group**

This action had not been done yet. It will be done with updated information from the Non-

thermal Annex and the Verschaeve information.

#### **5.2.9 Contact Jokela to get information on measurement averaging**

Copies of a recent Health Physics paper by Jokela were tabled.

#### **5.2.10 Comment on Mr Cornelius' paper on measurement averaging**

There had been no feedback on this paper. It was noted that there were problems in defining a pulse. The rationale was mainly protecting against microwave hearing, and it was suggested to remove the definition of a pulse and consider energy absorption within certain timescales. Mr Anderson, Dr Joyner and Mr Cornelius will look at these issues in detail. The proposal has been sent to Alistair McKinlay and will be passed on to the ICNIRP group meeting in San Antonio next month.

#### **5.2.11 Draft paragraph on ICNIRP dB/dt**

Dr Wood advised that the E-field created by the H-field is what is of interest for stimulation. The limit provides protection against startle from touching, ie contact current. The working group noted that there was more work to be done in this area. The best limit would be dB/dt, but this is not practical to measure. Mr Cornelius, Dr Joyner and Mr Anderson will develop a proposal for the working group.

#### **5.2.12 Comment on Prof Elwood's epidemiology paper**

No comments had been received on the epidemiology Annex. In relation to the overlap with the Non-thermal Annex papers, it was agreed that the Hardell paper can be included in the epidemiology Annex, but the other papers on symptoms etc would not be dealt with under epidemiology. Copies of the Reeves paper were tabled. It was agreed that there was a need to incorporate some paragraphs in the rationale on the overlap papers. Dr Hocking will prepare the first draft. The working group discussed and agreed that it was useful to leave in the material explaining what epidemiology is. The need for a similar explanation in relation to non-thermal effects was also discussed (cf Stewart Report).

#### **5.2.13 Copy of Russian Standard to be provided to Mr Cornelius**

The Russian Standard had been provided. Mr Cornelius noted that it was helpful but overall still insufficient to give a good summary.

#### **5.2.14 Contact Current/Induced Current**

This issue related to tables 9 & 10 from the last draft, and whether the currents should be added. The limit for peak current is presently not as restrictive as that for contact current. It was agreed that the tables need to specify what they apply to in a note. Further discussion on induced vs contact current is needed. Contact current is a potential exposure issue. A note will be added to table 9.

#### **5.2.15 Copyright Issues**

Mr Melbourne advised that he had determined the contact person in Ausinfo for copyright issues,

but had not been able to make contact as yet. He would follow up and circulate the information when obtained. The issue of authorship of Annexes would be raised at RHC. The issue of use of Annex material without referral back to the author was raised and a response from Ausinfo would be obtained.

#### **5.2.16 Finalise Measurement section of standard**

Mr Cornelius noted a need to include information on currents. Ms Wright referred to a two page summary in IEEE on measurement. We would need to expand the reference level MPE and induced current sections. The working group also discussed new technologies in relation to measurement issues. These included CDMA, digital TV/audio, DVBT (digital video broadcasting terrestrial), and DVBS (digital video broadcasting satellite). Mr Bangay demonstrated measurement of simulated signals to assist this discussion. It was agreed to draft a paragraph on new technologies for section 4.

#### **5.2.17 Distribute paper on non-uniform exposure**

This section was not written as yet. The material will be circulated to the task group and then the working group within about 1 week. In Table 6 it should be made clear that it only applies to pulsed RF. It was also noted that IEEE p.16 Section 5 explains the rationale for where the numbers came from.

#### **5.2.18 Circulate electronic copies of Koivisto papers**

This had been done. The working group also discussed the Richter paper, which was tabled at the meeting. Members commented that the paper assumes a relationship with cancer that is unproven. It is a collection of case histories of different diseases, not amenable to causal interpretation. Dr Black and Prof Elwood indicated that they intended to write to the journal to raise a number of issues. Dr Hocking noted that the paper seemed to be looking at the promotion effects of RF. It was agreed that the paper needed to be considered and comments produced. Prof Elwood will write a paragraph and Dr Hocking will also examine the paper.

#### **5.2.19 Complete contributions for rationale**

There were no specifics on this action at present.

#### **5.2.20 Examine Hocking over-exposure paper in relation to ARPANSA web policy**

This action had not been completed.

#### **5.2.21 Make corrections to draft standard as discussed at meeting**

This action would be discussed along with 5.3.

#### **5.2.22 Develop further the population groups paper**

Mr Anderson had further developed this paper using risk control terminology. Dr Hocking presented an alternate version as below:

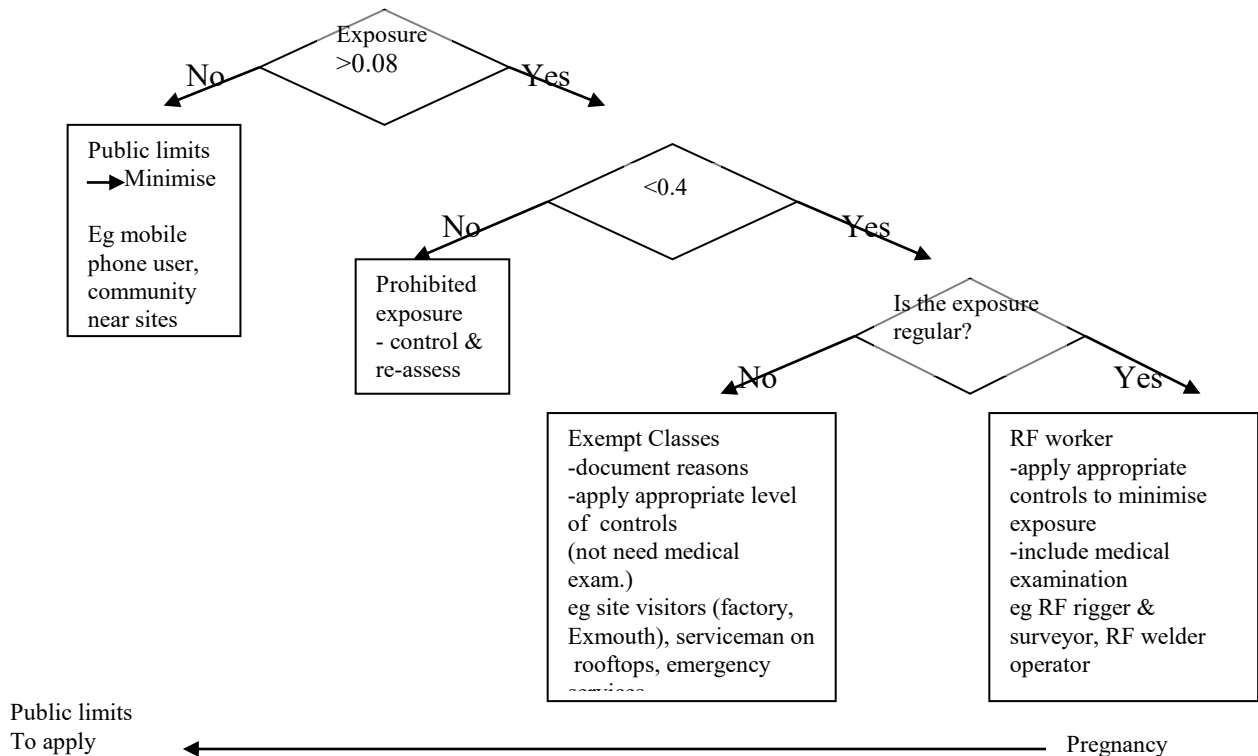


Occupational Standard 0.4 W/kg

Public (safety margin) 0.08 W/kg

Risk Management approach to OH&S requires

{  
Risk identification  
Risk Assessment  
Risk control (non-prescriptive)



Mr Anderson felt that there were two unnecessary sections. Firstly, dividing groups within occupational limits, and secondly that the time of exposure was not relevant (the words “or prolonged” were deleted from the third decision box as a result). Discussion centred on the distinguishing of occupational groups and the need for medical surveillance for the occupationally exposed group. Dr Roy advised that if necessary two options could be put to RHC. Dr Hocking’s proposal would be developed further, along with Mr Anderson’s.

### 5.2.23 Check on issues from Conover/Gandhi re safety factors

Not discussed.

### 5.2.24 Further develop words on medical surveillance

Not discussed.

## 5.3 Draft Standard

Dr Roy tabled a number of sections of the draft standard for discussion.

He noted that there was no new Foreword or Introduction at this stage. It will be circulated next

week. Changing  $f$  to MHz throughout proved to be impractical and it was decided to make  $f$  consist within a table while it may be different in different tables. For Table 2 documentation of the change from 8 to 10 for localised SAR of the head and trunk was needed in the rationale, along with the change from 1.6 to 2 for the public. Mr Anderson would provide the NRPB reference justifying this change. It was agreed that part of 2.1 should be relocated to Section 6. In 2.3 the reference to “inner ear” should be changed to “head”. In Table 3, pulse duration may be required. In table 4  $f$  will remain in kHz, and Dr Wood will consider the wording of note 3. Mr Cornelius and Mr Bangay will examine Table 7 in relation to the rounding/origin of the 24.4 figure. Mr Anderson will also review note 2 to Table 7. Mr Bangay will include the figures not in Table 7 in the look up tables (Schedules 2 & 3). E & H columns would be needed. In relation to removing rounding to remove the kinks in the graph, the working group would need to review the Jokela paper before making a decision. The graphs could go with the look up tables in an Annex. The limits should be in  $W/m^2$ . Section 2.5 should be moved to the compliance section with a better explanation of the measurement points (including improved diagrams).

In Section 4 it was noted that ICNIRP had different versions of equation 8 (without explanation) in its original article, and the book published later.

All of Section 5 will be moved to an Annex. Ms Wright will provide comment on the 2<sup>nd</sup> paragraph of 5.3. Several typographical errors were corrected.

Sections 6 & 7 will be joined. There was considerable discussion about protection of the foetus. Dr Hocking will write to Waller to get legal opinion on whether the foetus is “a member of the public”. Dr Black noted that there was a possibility of overexposure for RF workers and hence the mother should be excluded from RF work to protect the foetus. Prof Elwood noted that the critical period for protecting the foetus is before the mother knows she is pregnant. Dr Black will draft additional paragraphs about pregnancy.

In Section 7, discussion mainly centred on 7(d), and whether it belonged in an Annex. It was agreed that it should remain in the standard. A small group consisting of Dr Black, Prof Elwood, Mr Bangay and Mr Lincoln will redraft it.

The rationale needs to include Dr Hocking’s comments from an earlier meeting. Prof Elwood suggested that it needed to summarise the logic of using SAR of 0.4 and 0.08. There is a history but not a rationale. There is no rationale at present for localised limits. Dr Black will draft a section on this aspect. Mr Melbourne will forward Dr Hocking’s previous comments to Dr Black. On the dB/dt issue Mr Cornelius will develop a proposal in discussion with Mr Anderson and Dr Joyner. The low frequency end of the rationale needs work. ICNIRP will be taken as the basis.

Following Task Group discussion it was agreed to rewrite 6.1 using different examples. Ms Wright will further develop Mr Anderson’s paper (which was labelled as Section 2). In Section 7 it was agreed to delete from the comma in 7(d), and insert words referring to Codes of Practice. In 7(e) delete “the” exposure.

In the Annex on Medical Surveillance the formatting needs to be fixed.

#### 5.4 The Next Steps

Dr Roy will report to RHC on 2 November on the current status of the Draft Standard and on

issues the working group would like advice on.

## **6. OTHER BUSINESS**

There was no other business.

## **7. CLOSURE AND NEXT MEETING**

The next meeting was set for 27-28 November 2000, and a further tentative meeting was set for 19-20 December 2000.

## **ACTION LIST ARISING FROM MEETING OF 19-20 OCTOBER 2000**

1. Tabulated non-thermal review summary to be circulated with version number and “work in progress” words in heading Dr Wood
2. Feedback on Non-thermal Annex to Dr Wood by 27/10 All members
3. Re-format Non-thermal Annex similar to Epi. Annex, including summary/conclusions up front, statement about unanswered questions, “low level” rather than “non-thermal”, explanation of what non-thermal research is (Stewart Report) and identification of species studied in the papers reviewed Dr Wood
4. Question on gene expression to be put to NHMRC Expert Group Dr Roy/Dr Wood
5. Measurement averaging – replacement of definition of pulse Mr Cornelius, Dr Joyner, Mr Anderson
6. Draft proposal regarding dB/dt issue Mr Cornelius, Dr Joyner, Mr Anderson
7. Draft paragraph for rationale on overlap b/t epi & non-thermal Dr Hocking
8. Add note to table 9 on induced vs contact current Mr Cornelius
9. Follow up copyright issues with Ausinfo Mr Melbourne
10. Draft paragraph on new technologies for section 4 Mr Bangay
11. Circulate non-uniform exposure draft within 1 week Ms Wright
12. Paragraph on Richter paper Prof Elwood, Dr Hocking
13. Population Groups – develop Hocking proposal further Dr Hocking
14. Provide NRPB rationale for change from 8 to 10 Mr Anderson
15. Examine origin/rounding of 24.4 number in Table 7 Mr Cornelius, Mr Bangay
16. Review note 2 to Table 7 Mr Anderson
17. Include figures not in Table 7 in look up tables Mr Bangay
18. Comment on 2<sup>nd</sup> paragraph of 5.3 Ms Wright
19. Seek advice on status of foetus in law Dr Hocking
20. Draft paragraph on pregnancy Dr Black
21. Redraft 7(d) Prof Elwood, Dr Black, Mr Bangay, Mr Lincoln
22. Include Dr Hocking’s earlier comments in rationale Dr Black
23. Summarise logic of using 0.4 & 0.08 & localised limits Dr Black
24. Forward Dr Hocking’s previous comments on rationale to Dr Black Mr Melbourne
25. Further develop Mr Anderson’s paper on population groups Ms Wright
26. Reformat Medical Surveillance Annex Mr Melbourne/Dr Hocking

## RF EXPOSURE STANDARD WORKING GROUP

### Draft Meeting Record for 27-28 November 2000

1. OPENING OF MEETING & ATTENDANCE
2. APOLOGIES
3. CONFIRMATION OF MINUTES OF MEETING OF 19-20 OCTOBER 2000
4. BUSINESS ARISING FROM MINUTES
5. GENERAL BUSINESS
- 5.0 Discussion of Plan for Meeting
- Reports on Actions from last meeting:*
- 5.1. Report on meeting with RHC
- 5.2a Tabulated non-thermal review summary to be circulated with version number and “work in progress” words in heading
- 5.2b. Feedback on Non-thermal Annex to Dr Wood by 27/10
- 5.3. Re-format Non-thermal Annex similar to Epi. Annex, including summary/conclusions up front, statement about unanswered questions, “low level” rather than “non-thermal”, explanation of what non-thermal research is (Stewart Report) and identification of species studied in the papers reviewed
- 5.4. Question on gene expression to be put to NHMRC Expert Group
- 5.5 Measurement averaging – replacement of definition of pulse
- 5.6. Draft proposal regarding dB/dt issue
- 5.7. Draft paragraph for rationale on overlap b/t epi & non-thermal
- 5.8. Add note to table 9 on induced vs contact current
- 5.9. Follow up copyright issues with Ausinfo
- 5.10. Draft paragraph on new technologies for section 4
- 5.11. Circulate non-uniform exposure draft within 1 week
- 5.12. Paragraph on Richter paper
- 5.13. Population Groups – develop Hocking proposal further
- 5.14. Provide NRPB rationale for change from 8 to 10
- 5.15. Examine origin/rounding of 24.4 number in Table 7
- 5.16. Review note 2 to Table 7
- 5.17. Include figures not in Table 7 in look up tables
- 5.18. Comment on 2<sup>nd</sup> paragraph of 5.3
- 5.19. Seek advice on status of foetus in law
- 5.20. Draft paragraph on pregnancy
- 5.21. Redraft 7(d)
- 5.22. Include Dr Hocking earlier comments in rationale
- 5.23. Summarise logic of using 0.4 & 0.08 & localised limits
- 5.24. Forward Dr Hocking’s previous comments on rationale to Dr Black
- 5.25. Further develop Mr Anderson’s paper on population groups
- 5.26. Reformat Medical Surveillance Annex
- 5.27. The Draft Standard
- 5.29 The Next Steps
6. OTHER BUSINESS
7. CLOSURE AND NEXT MEETING

#### ACTION LIST

## 1. OPENING OF MEETING & ATTENDANCE

Dr Roy opened the meeting at 9:45 am. The following members were present:

Dr Colin Roy (Chair)  
 Dr Bruce Hocking  
 Mr Wayne Cornelius  
 Ms Jill Wright  
 Mr John Lincoln  
 Mr Vitas Anderson  
 Prof Mark Elwood (Consultant) – attended on first day only  
 Dr David Black (Consultant)

Mr Alan Melbourne (Secretariat)  
 Mr Michael Bangay (Secretariat)

Dr Graeme Dickie (Observer) – attended on second day only  
 Mr Ken Karipidis (Observer)  
 Mr Ian McAlister (Observer)

## 2. APOLOGIES

Dr Andrew Wood, Dr Ken Joyner, Ms Judy Lawson.

## 3. CONFIRMATION OF MINUTES OF MEETING OF 19-20 OCTOBER 2000

The minutes were confirmed with the following corrections:

In attendance list insert “consultant” next to Dr David Black and Prof Mark Elwood, and “observer next to Dr Graeme Dickie.

In 5.2.22 change second sentence to: .....alternate version *which put a greater emphasis on risk assessment* as below:

## 4. BUSINESS ARISING FROM MINUTES

Nil.

## 5. GENERAL BUSINESS

### 5.0 Discussion of Plan for Meeting

Dr Roy proposed that the meeting would break into task groups during the meeting to assist in developing drafts of sections of the rationale. This approach was agreed.

### *Reports on Actions from last meeting:*

#### 5.1. Report on meeting with RHC

Dr Roy reported that he had attended the Radiation Health Committee meeting on 1-2 November and had given a detailed briefing on the RF Standard. He had presented a summary chapter by

chapter, giving the status, the outstanding issues, and the approach taken in each case. Dr Roy provided RHC with a summary of the points that remain under discussion, eg pregnancy. His impression was that if RHC was kept informed and provided with a draft after next meeting, that they would be unlikely to hold up the draft from going to public comment. The main issues Dr Roy had raised included pregnancy, protection, and what should be in the Standard compared with the Annexes. RHC also discussed health surveillance, and had been interested but wanted more information, such as on the French approach. Members noted that this issue had also been raised in Senate Inquiry hearings.

RHC had also been informed of David McKenna's resignation from the Working Group, and agreed to the ACTU's nomination of Mr Dan Dwyer to replace him. A letter of reply had been sent to ACTU and it was hoped that Mr Dwyer would be available for the next Working Group meeting. RHC discussed the replacement of Dr Stan Barnett on the Working Group. This had been raised by the EME Reference Group. RHC agreed not to replace Dr Barnett as the area had been adequately covered by existing Working Group members. Dr Roy also advised that RHC had formed a Business Working Group to progress items out of session.

Dr Roy expected that after the next Working Group meeting a draft would be ready for public consultation. It would be sent to RHC and may have to iterate once or twice before it goes to public comment. Dr Roy hoped that the public comment period could proceed in January. He also advised the Working group that he would be overseas for 12 months from the end of January 2001.

#### **5.2a Tabulated non-thermal review summary to be circulated with version number and "work in progress" words in heading**

This task had been completed and the document was circulated during the meeting.

#### **5.2b. Feedback on Non-thermal Annex to Dr Wood by 27/10**

Comment on this Annex was still required as soon as possible. Dr Wood would finalise the document after his return from overseas on 6 December 2000.

#### **5.3 Re-format Non-thermal Annex similar to Epi. Annex, including summary/conclusions up front, statement about unanswered questions, "low level" rather than "non-thermal", explanation of what non-thermal research is (Stewart Report) and identification of species studied in the papers reviewed**

This task had not been completed, and awaited Dr Wood's return.

#### **5.4. Question on gene expression to be put to NHMRC Expert Group**

This issue had not been discussed with the Expert Group, however an email had been sent to Verschaeve and a reply received. A similar email had been sent to Veyret, but no reply had been received. The Working Group noted that Dr Wood was visiting some of the UK researchers in this area. Copies of two other papers were still being sought. The Juutilinen paper has not been obtained and there has been no response to emails. The Kellenyi reference is to a journal called Neurobiology, which does not seem to exist. Mr Lincoln will try to obtain a copy of this paper.

#### **5.5 Measurement averaging – replacement of definition of pulse**

Mr Cornelius table a paper on this issue. The existing SA limits relate to the exposure of the head to pulses, but there is no definition of what a pulse actually is. The approach proposed is to consider the maximum energy delivered in any 50  $\mu$ s period. It was agreed that this paper should be included on the web site to support the Standard. The Working Group decided that the Figure should not be included in the Standard but could remain with some expanded explanation in the web page. The paper should include a clearer statement of the biological effects to which it relates, a statement indicating if there is any development since ICNIRP, and comment on the safety margin.

It was agreed that there was a need to know of any recent information on auditory effects. Dr Roy indicated that the paper needed further follow up with researchers and needed further development in relation to the rationale.

#### **5.6 Draft proposal regarding dB/dt issue**

This arises in the paper by Jokela, which was distributed at the last meeting. An averaging time of 100  $\mu$ s was proposed. ICNIRP reference levels are conservative. If they were exceeded a more detailed assessment like Jokela's would be required to establish whether the basic restriction had been exceeded. The working group was advised that ICNIRP would have a new statement on this issue by mid-2001.

BHP had raised concerns about the interim standard and effects on operation of induction heaters. This had been discussed at the Senate Inquiry hearings.

It was agreed that Mr Cornelius and Mr Anderson would draft some sentences referring to dB/dt.

#### **5.7. Draft paragraph for rationale on overlap b/t epi & non-thermal**

A draft paragraph had been circulated covering dysaesthesiae. The Scott paper referred to in the summary was also tabled. WHO EHC 137 p174 was also referenced. The working group discussed the levels of exposure in the various papers in this group. Dr Hocking will further develop this paragraph. In discussion members noted that the rationale does not yet cover the psychological/behavioural studies, and it was not good at explaining the localised limits.

#### **5.8. Add note to table 9 on induced vs contact current**

The words "passively or actively" were to be added to Note 3 after "point contact with".

#### **5.9. Follow up copyright issues with Ausinfo**

There was no further information on this item. Dr Hocking advised that he did not wish to have his name added to the epidemiology Annex. The issues papers for the web site would include all authors.

#### **5.10. Draft paragraph on new technologies for section 4**

Task not completed yet. Dr Roy suggested that with some words remaining in the Standard, the rest of the compliance section should be moved to an Annex.



**5.11. Circulate non-uniform exposure draft within 1 week**

Discussion on this item related to Note 5 to Table 6, and in particular where the  $\sqrt{20}$  came from. Mr Anderson requested that the note should be more specific that it relates to limb exposure. Ms Wright, Mr Anderson and Mr Bangay will provide advice on this issue.

**5.12. Paragraph on Richter paper**

The working group agreed that it would do nothing further on this issue, other than to reference that the Richter paper had been considered.

**5.13. Population Groups – develop Hocking proposal further**

This item was discussed as part of the discussion in 5.27 in relation to chapter 5.

**5.14. Provide NRPB rationale for change from 8 to 10**

NRPB Board Statement Vol 4 No 5 (1993) was tabled. Paragraph 76 at the top of page 26 provided their rationale. Some reservations were expressed about the proposed change. The difference between ICNIRP averaging over 10g (eye) and IEEE averaging over 1g (smallest resolution) were discussed.

**5.15. Examine origin/rounding of 24.4 number in Table 7**

This action had not been completed yet. There was still some work to be done on significant figures in the tables.

**5.16. Review note 2 to Table 7**

It was agreed to change the averaging time below 10 MHz to 100  $\mu$ s.

**5.17. Include figures not in Table 7 in look up tables**

The figures have been calculated, but the numbers have not yet been included in the look up tables.

**5.18. Comment on 2<sup>nd</sup> paragraph of 5.3**

Action complete. This was taken into account in the new section 1.

**5.19. Seek advice on status of foetus in law**

The advice has been sought (Waller). The working group noted that this item had been to some extent overtaken by discussion during this meeting.

**5.20. Draft paragraph on pregnancy**

The action had been completed, however a further paragraph was required for the rationale. It would be based on the discussion on section 5 of the draft, and would include reference to the fact that there were only a limited number of studies in this area.

## 5.21. Redraft 7(d)

Refer to discussion on 5.4 (d) in section 5 of draft.

## 5.22. Include Dr Hocking earlier comments in rationale & 5.24 Forward Dr Hocking's previous comments on rationale to Dr Black

See discussion on rationale.

## 5.23. Summarise logic of using 0.4 & 0.08 & localised limits

This action was incomplete. It was expected to be completed next week.

## 5.25 Further develop Mr Anderson's paper on population groups

This item was covered in discussion on section 5 of the draft.

## 5.26 Reformat Medical Surveillance Annex

Action complete. Revised version included in current draft.

## 5.24. The Draft Standard

Chapter 5 Discussion centred around the wording in 5.1 currently capturing public exposure when it was intended to apply to occupational, whether the reference to occupational exposure in the glossary should have "and" or "or" between the statements, and whether there was a need to define occupational and non-occupational, or just occupational exposure. It was agreed to delete the Risk Priority Chart. In relation to use of personal protective equipment it was noted that their use provided an added heat load, they restricted vision, restricted movement, and were not so effective above 10 MHz. It was agreed that an example would be helpful in paragraph (e). Mr Anderson would provide an example. In regard to pregnancy, a letter had been written to Prof Waller, but there had been no reply as yet. Two options were presented in the draft. Option 2 was rejected and option 1 was edited significantly. Paragraph 5.3 on burns and shock was deleted as it was already covered in 5.1. The draft included 4 options in regard to protection, paragraph 5.4(d). It was agreed that options 2,3 & 4 would all be put forward to RHC.

Rationale It was agreed to re-format the rationale to enable it to be related to each of the basic restrictions and reference levels. It should describe the health effect and safety margin for each restriction.

A revised structure to take into account of this discussion was tabled. The basic segments were:

1. Introduction (history/development of Aust. Stds/harmonisation)
2. Studies (ICNIRP review/low level/epidemiology/case reports/molecular mechanisms)
3. Philosophical Basis of Standard Setting (population protected/pregnancy/scientific method)
4. Basic Restrictions/Reference Levels (ICNIRP numbers/guidelines/review/modify/clarification - cover each of the effects)
5. Reference Levels

## 6. Conclusion/Summary

Five task groups were formed to discuss 1-5 above. These were:

1. WC, IMcA. 2. CR, KK, BH. 3. JL, GD, JW. 4. VA, DB. 5. MB

The meeting broke into the above groups for discussion. On resumption, each group tabled and discussed progress on a draft covering its topic. Each group was given the task of further development of its section in line with the discussion. Comments included:

2. Studies - A statement that the standard provides best advice on what we know now, in the context of continuing research, is to be included. Also discussion of biological effects vs health hazards needs to be included either here or in the philosophy section.

3. Philosophy - First paragraph to refer to "all established adverse health effects" & delete the reference to short and long term exposure. The sentence on susceptibility in the 2<sup>nd</sup> last paragraph to include "at levels below the occupational limits".

4. Basic restrictions - This section needs to cover localised SAR, and needs to include the frequency range for each of the effects discussed.

5. Reference levels - Duplicates some of the Basic restriction material, and it needs to be resolved where it should sit. The means of getting to the reference level from the basic restriction should be included.

Annex 6 The statement in the first paragraph regarding safety and safety margins was queried, and it was agreed to include a paragraph stating that knowledge is incomplete, and further research was being undertaken in these areas.

### 5.29 The Next Steps

Segments of the rationale are to be completed and circulated prior to the next meeting. A full draft will be tabled at the next meeting. It will be circulated in advance if at all possible.

## 6. OTHER BUSINESS

Three papers from the Lancet (356: Rothman, Hyland, Commentary) were tabled for information.

## 7. CLOSURE AND NEXT MEETING

The next meeting was scheduled for 19-20 December 2000. Dr Dickie advised that he would be overseas for that meeting.

## **ACTION LIST ARISING FROM MEETING OF 27-28 NOVEMBER 2000**

1. Arrange for Mr Dwyer to attend next meeting/provide background papers  
Mr Melbourne
2. Feedback on Non-thermal Annex to Dr Wood  
All members
3. Re-format Non-thermal Annex similar to Epi. Annex, including summary/conclusions up front, statement about unanswered questions, "low level" rather than "non-thermal", explanation of what non-thermal research is (Stewart Report) and identification of species studied in the papers reviewed  
Dr Wood
4. Attempt to get copy of Kellenyi paper  
Mr Lincoln
5. Complete measurement averaging paper (inc. follow up with researchers)  
Mr Cornelius
6. Draft paragraph on dB/dt  
Mr Anderson, Mr Cornelius
7. Further develop paragraph for rationale on overlap b/t epi & non-thermal  
Dr Hocking
8. Follow up copyright issues with Ausinfo  
Mr Melbourne
9. Advice on non-uniform exposure (Note 5, table 6)  
Ms Wright, Mr Anderson, Mr Bangay
10. Examine origin/rounding of 24.4 number in Table 7  
Mr Cornelius, Mr Bangay
11. Include figures not in Table 7 in look up tables  
Mr Bangay
12. Draft paragraph on pregnancy for rationale  
Dr Black
13. Provide example on personal protective equipment, para 5.1.2(e)  
Mr Anderson
14. Further develop Intro section of Rationale  
Mr Cornelius, Mr McAlister
15. Further develop Studies section of Rationale  
Dr Roy, Mr Karipidis, Dr Hocking
16. Further develop Philosophical Basis section of Rationale  
Mr Lincoln, Dr Dickie, Ms Wright
17. Further develop Basic Restrictions section of Rationale  
Mr Anderson, Dr Black
18. Further develop Reference Levels section of Rationale  
Mr Bangay

















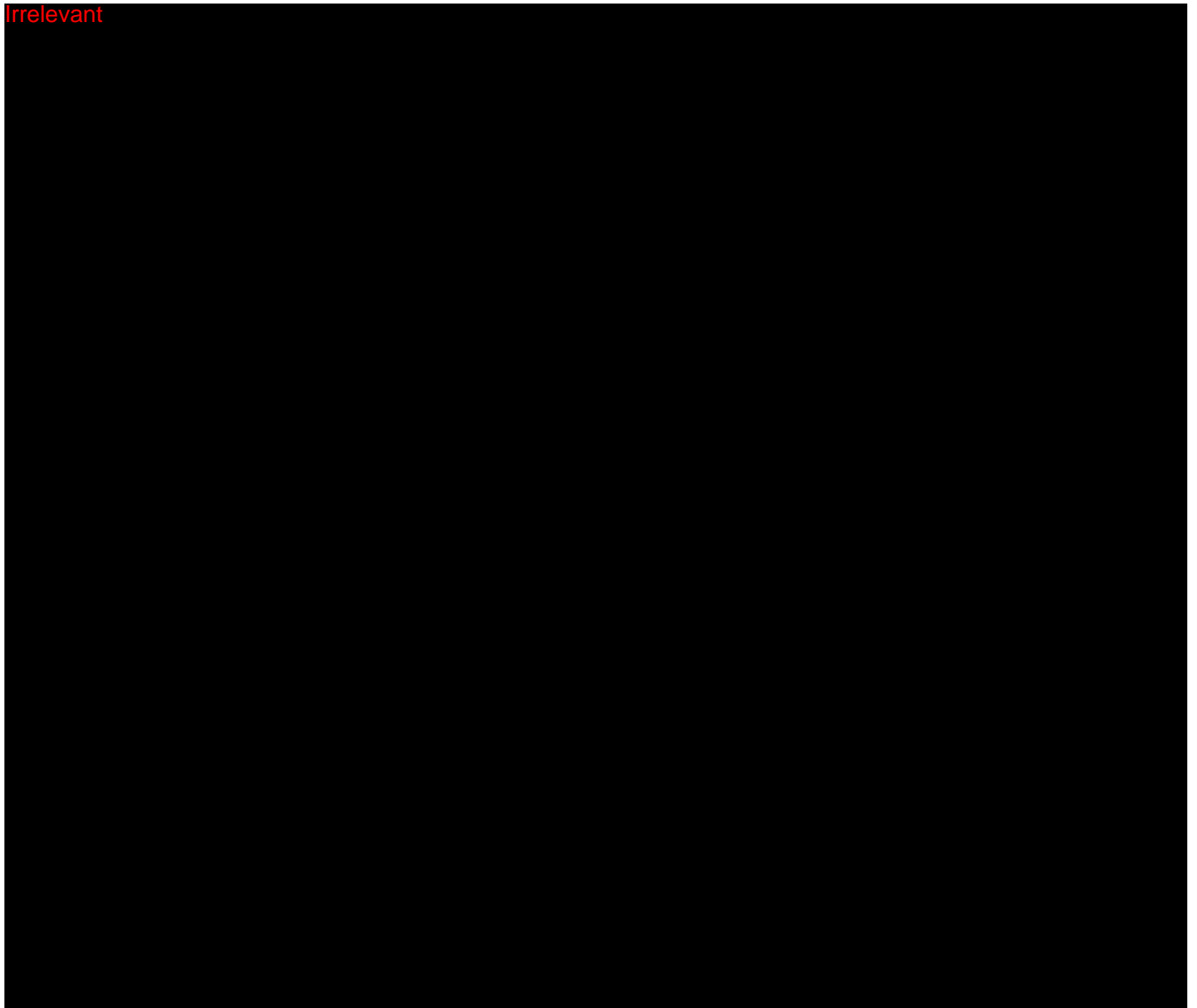








Irrelevant



#### **6.7 RF Standard — Update and Briefing on Draft**

Dr Roy, Chair of the RF Exposure Standard Working Group (RF WG), attended this session and gave a comprehensive status report on the Standard. Mr Cornelius (ARPANSA, WG member) also attended. Dr Roy distributed three documents that included the Foreword/Contents/Introduction, the draft Standard and Annex 6, and noted that the Foreword and Introduction as presented were based on the TE/7 ballot draft, and the final versions were yet to be drafted. Dr Roy proceeded to examine the various sections of the draft Standard and gave status reports.

#### ***SECTION 2: Limits for RF exposure to RF between 3 kHz and 300 GHz***

The Committee was informed that the work on this section was well advanced. Dr Roy noted that the restrictions in Table 3 were there to prevent nuisance auditory responses (microwave hearing effects), and that the Task Group was still determining the averaging times for evaluation. Table 6 contained numbers with varying significant figures. The apparent discontinuity in corresponding graph was a result of the rounding of these numbers. It was also noted that



although the frequency ( $f$ ) was consistent within a table, it may vary between tables ie, kHz or MHz. Mr Cornelius stated that although the numbers used are the same as those in the ballot draft, different averaging times were used.

Dr Roy also informed the Committee that an introductory document explaining the process followed in the development of the Standard, would accompany the Standard when distributed for public comment.

### ***SECTION 3: Simultaneous exposure to multiple frequency fields***

This section was almost complete with equations (8) & (9) changed but not yet reviewed by the Working Group. It was also noted that the ICNIRP equations in the original journal article were different from those published later in book form. There was no apparent explanation for this difference.

### ***SECTION 4: Verification of compliance with the Standard***

Dr Roy noted that the status of this section still needed reviewing but should be relatively straightforward. However, the issue raised was whether it should be only included as an annex, and Dr Roy felt that the Australian Communication Authority may want it retained in the body of the text. It was also noted that the RF Standard was not only a communication standard but dealt with broader range of industrial issues. A Standards Australia review of AS/NZS 2772.2 on measurement issues had not progressed recently. It was agreed that a measurement Standard was necessary to complement the exposure Standard.

The Committee concluded that the ARPANSA would draft a letter to Standards Australia and request that they quickly progress their Standard AS/NZS 2772.2 that would support the RF Standard.

As to whether this section should be included in the body of the text, Dr Mason made the observation that if it did not contain prescriptive language, *must*, then it should not be in the Standard.

### ***SECTION 5: Protection — occupational and general public exposure***

This section was discussed at the previous RF WG meeting but had not yet been revised. The major issues for discussion included 5.2 *Pregnancy* and 5.4 (d) *minimising of RF exposure as appropriate* — these issues were still being debated. The issue of pregnancy had been under prolonged discussion by the RF WG with the majority of time focussed on the status of the foetus — public or occupational limits? Dr Roy sought RHC's advice.

Dr Jezukaitis felt that a decision should be based on scientific information, and that other guides should be perused to see how the foetus was treated. Dr Roy responded by stating that there was no real scientific basis and no precedent had been set. Dr Cassels referred to RHS #39 where the words *declared pregnancy* are used, and felt that it was a matter of using the right words in the Standard. He also agreed that there was no scientific evidence to support NIR effects on the foetus. The Chair thought that this situation was a good case for developing advice on exposure to the foetus, and that perhaps ARPANSA may be able to develop an information bulletin. Dr Roy noted that a dedicated Web site supporting the Standard would be maintained, and that this site would include papers developed by the RF WG.

Section 5.4(d) dealt with precautionary approaches ie, the minimisation of RF exposure, as appropriate. This was an issue that was being extensively debated by the RF WG and was as yet unresolved. RHC advice was sought. The ensuing discussion raised the following points for consideration:

- ◆ There was a risk of over-management;
- ◆ Need to clearly determine what direction the Standard takes;
- ◆ Should 5.4(d) be deleted? More suitable for a Code or Annex;
- ◆ Cannot have a Standard with only numbers and no basic radiation protection principles;
- ◆ Need to have radiation protection plan for exposures;
- ◆ Cannot ignore public sentiment;
- ◆ Scientific uncertainty was a reason for including precaution; and
- ◆ *Precautionary Principle* was used in relation to chemical and other hazards.

The RHC concluded that this issue warranted further consideration before advice could be given. Dr Roy undertook to circulate a modified draft of this section following the next RF WG meeting (November 2000).

**Schedule 1:** Draft essentially completed but not reviewed in depth by the RF WG. The rationale for the low frequency range (3 kHz — 10 MHz) was to be drafted.

**Schedules 2 & 3:** Mainly comprised of look-up tables and were essentially complete. Require a small amount of additional work.

**Glossary:** May require some additions.

**Annexes 1 & 2:** Still some reviewing required, but no major issues remaining.

**Annexe 3:** This annex contained a comprehensive review on epidemiological studies of exposure to RF and human health, compiled by Professor M Elwood (RF WG member) at the request of

the RF WG. As a result of this work, the issue of copyright was raised for discussion. Dr Roy informed the Committee that work produced for the RF WG by individuals, may want to be used by them elsewhere. Also, should individual authorship of Annexes be identified in the work?

The Chair noted that in the template framework developed for RPS publications, there was a section for individuals who have made a significant contribution to the publication to be recognised. RHC had no issue if an individual published work, prepared for a RHC document, elsewhere. ARPANSA's corporate counsel may deal with any copyright issues that may arise.

**Annexe 4:** This annex contained information on the RF bio-effects at non-thermal levels, and was the second major contribution from the RF WG. The work was well advanced but not yet available, and there were no major issues for discussion. Dr Wood informed the Committee a draft would be available in the near future.

**Annexe 5:** Drafting was currently in progress on areas related to emerging technologies and some compliance issues.

**Annexe 6 & 7:** Current drafts not yet available.

Dr Roy concluded his briefing by stating that the documents distributed to RHC were RF WG documents and not for public distribution.

The Chair enquired as to the future RF WG schedule. The Committee was informed that there would be two more RF WG meetings this year and it was anticipated that a draft for public comment would be available before the next RHC meeting. Dr Roy undertook to distribute to RHC an electronic copy of the draft Standard as it would stand at the end of December 2000.

Dr Loy emphasised that it was vital that the Standard be distributed for public comment in the very near future.

In conclusion, Dr Roy undertook to draft a set of *focussed* questions regarding the Standard that needed RHC resolution. He would also ensure that Foreword, Introduction, and any other unfinished work in the Standard are completed, and circulated, along with the questions, to the RHC in the very near future.

Irrelevant



had recently been informed of the RHC decision (July 2000 meeting), to combine the Code of Practice and Safety Guide into one document. Dr Williams said that the Drafting Group intended following the timetable given on the second page of the report and would therefore complete a draft document for presentation at the March 2001 RHC meeting and for circulation to the larger combined codes group.

Lists of members of the Mining Code Drafting Group and proposed members of the Mining Code Working Group were circulated to RHC members. Mr Melbourne noted that the Secretariat had spoken to members of both previous Health and Waste Code groups. He said that there would be reduced ARPANSA membership on the new combined group and that, as some of the previous WG members had changed employment, new representatives had taken their place. The Committee requested that the Secretariat write to all members of the previous Health and Waste Code groups informing them of the new direction taken by the new Working Group in the development of the combined Code and thanking those members who would not be continuing as members. The Secretariat was also requested to send an invitation to new members of the combined Working Group.

RHC members questioned the need for a larger Working Group. Mr Melbourne replied that the Drafting Group would produce documents for the larger Working Group to comment on. He said that this working group was different from other working groups in that the mining regulators who would be users of this Code were not members of the RHC and if they were not consulted then they might not accept the Code. In view of this the Committee decided that the Mining Code *Working* Group should be renamed the Mining Code *Consultative* Group, and the Mining Code *Drafting* Group should be renamed the Mining Code *Working* Group. Dr Cassels suggested that a representative from the petroleum/gas industry be included in the Consultative Group. The Committee recommended that the Secretariat find a suitable nominee. RHC members also requested that Queensland's comments on the Mining Code be circulated.

## 6.9 RF Health Surveillance

This issue was placed on the Agenda in response to a letter from Dr B Hocking (RF WG member) to Dr Roy regarding the development of a database on occupational RF exposure. Dr Hocking requested that the RHC consider this issue.

Dr Jezukaitis noted that there were several issues that needed clarification:

- ◆ What was the objective?
- ◆ Causative issues needed to be resolved;
- ◆ Would the database be duplicated in the OH&S database? and
- ◆ Databases of some well-identified diseases have proved very useful.















Irrelevant



## 9. GENERAL BUSINESS

### 9.1 RF Standard — Working Group Composition

Dr Roy informed the Committee that this issue arose out of a letter from the ACTU to the Secretariat advising that Mr David McKenna was unable to continue as the ACTU representative on the RF Exposure Working Group due to work commitments. The suggested replacement by

the ACTU was Mr Dan Dwyer who was originally on the committee that voted on the TE/7 ballot draft.

The Committee considered various options and decided that an appointment to the RF WG at the final stages of the draft Standard was acceptable as long as issues resolved by the WG at its previous six meetings were not revisited. Mr Melbourne was requested to draft a reply to the ACTU and inform them of the RHC's decision. A copy of the reply would be circulated to RHC members.

On a separate issue, the Committee was informed that since the resignation of Dr S Barnett from the RF WG, the EME Reference Group had been lobbying for a replacement. It was decided that a replacement was not necessary since Dr A Wood could provide the required advice on non-thermal effects. Mr Melbourne would advise the EME Reference Group.

Irrelevant







## RF EXPOSURE STANDARD WORKING GROUP

### Draft Meeting Record for 19-20 December 2000

1. OPENING OF MEETING AND ATTENDANCE
2. APOLOGIES
3. CONFIRMATION OF MINUTES OF 27-28 NOVEMBER 2000
4. BUSINESS ARISING FROM MINUTES
5. GENERAL BUSINESS
  - 5.1 Arrange for Mr Dwyer to attend next meeting/provide background papers
  - 5.2 Feedback on Non-thermal Annex to Dr Wood
  - 5.3 Attempt to get copy of Kellenyi paper
  - 5.4 Complete paper dealing with basic restrictions for localised pulse exposure (inc. follow up with researchers)
  - 5.5 Draft paragraph on dB/dt
  - 5.6 Advice on non-uniform exposure (Note 5, table 6)
  - 5.7 Examine origin/rounding of 24.4 number in Table 7
  - 5.8 Include figures not in Table 7 in look up tables
  - 5.9a Provide example on personal protective equipment, para 5.1.2(e)
  - 5.9b Further develop chapter 5 of the Draft Standard
  - 5.10 Re-format Non-thermal Annex similar to Epi. Annex, including summary/conclusions up front, statement about unanswered questions, "low level" rather than "non-thermal", explanation of what non-thermal research is (Stewart Report) and identification of species studied in the papers reviewed
  - 5.11 Draft paragraph on pregnancy for rationale
  - 5.12 Further develop paragraph for rationale on overlap b/t epi & non-thermal
  - 5.13 Further develop Intro section of Rationale
  - 5.14 Further develop Studies section of Rationale
  - 5.15 Further develop Philosophical Basis section of Rationale
  - 5.16 Further develop Basic Restrictions section of Rationale
  - 5.17 Further develop Reference Levels section of Rationale
  - 5.18 Lancet papers
  - 5.19 The Draft Standard
  - 5.20 The Next Steps
6. OTHER BUSINESS
7. CLOSURE AND NEXT MEETING

#### ACTION LIST

## 1. OPENING OF MEETING AND ATTENDANCE

Dr Roy opened the meeting at 9:45 am. The following members were present:

Dr Colin Roy (Chair)  
 Mr John Lincoln  
 Dr Andrew Wood  
 Mr Vitas Anderson  
 Mr Wayne Cornelius  
 Dr Bruce Hocking  
 Ms Jill Wright  
 Dr Ken Joyner  
 Mr Dan Dwyer  
 Dr David Black (Consultant)  
 Prof Mark Elwood (Consultant) – attended on first day only

Mr Ken Karipidis (Secretariat)  
 Mr Michael Bangay (Secretariat)

Mr Ian McAlister (Observer)  
 Ms Judy Lawson (Observer)

## 2. APOLOGIES

Mr Alan Melbourne, Dr Graham Dickie.

## 3. CONFIRMATION OF MINUTES OF 27-28 NOVEMBER 2000

The minutes were confirmed with the following corrections:

Item 5.5 of minutes should read as follows:

### ***5.5 Measurement averaging – replacement of definition of pulse***

*Mr Cornelius tabled a paper on this issue. The existing SA limits relate to the exposure of the head to pulses, but there is no definition of what a pulse actually is. The approach proposed is to consider the maximum energy delivered in any 50  $\mu$ s period. It was agreed that this paper should be included on the web site to support the Standard. The Working Group decided that the Figure should be included in the Standard. The paper should include a clearer statement of the biological effects to which it relates, a statement indicating if there is any development since ICNIRP, and comment on the safety margin.*

*It was agreed that there was a need to know of any recent information on auditory effects. Dr Roy indicated that the paper needed further follow up with researchers and needed further development in relation to the rationale.*

Action 5 should be replaced with:

### ***5. Complete paper dealing with basic restrictions for localised pulse exposure (inc. follow up with researchers)***



It item 5.24 “**The Draft Standard**” under Chapter 5 the sentence:

*In relation to .....so effective above 10 MHz.*

Should read:

*In relation .....so effective below 10 MHz.*

## **5 BUSINESS ARISING FROM MINUTES**

Dr Hocking indicated that the issue of the 10g to 1g averaging in item 5.14 of the minutes had not been resolved. Dr Hocking also suggested that the Medical Surveillance Annex of item 5.26 appear on the web.

## **6 GENERAL BUSINESS**

### **5.1 Arrange for Mr Dwyer to attend next meeting/provide background papers**

Mr Melbourne organised for Mr Dwyer to attend the meeting and provided him with all the background papers. Dr Roy welcomed Mr Dwyer to the WG.

### **5.2 Feedback on Non-thermal Annex to Dr Wood**

The WG agreed that a summary of ODC studies was required. Mr Lincoln was satisfied with the content of the Non-thermal Annex and expressed that it was very useful in easing community concerns. Mr Black suggested that significant areas of study need to be highlighted. Experimental studies on humans were recommended by Mr Black as being important and in particular Neuropsychological and Blood Brain Barrier research. In response Prof Elwood suggested Heat Shock Protein studies and Cancer research (in vivo). It was agreed by the WG that in the section which mentions the WHO database a sentence would be added on the International EMF project. The WG decided that the first sentence of section A part (i) “*Epidemiological studies on human populations*” needed to be redrafted. In section B part (vi) “*Neurophysiological tests*” it was agreed to include the frequency ranges for occupational exposure. Dr Hocking felt that the last sentence of paragraph 2 in the Summary section “*Overall, the group .....increased susceptibility to disease*” needs to be redrafted. It was decided by the WG that the sentence would be redrafted.

### **5.3 Attempt to get copy of Kellenyi paper**

Mr Lincoln was unable to obtain a copy of the paper by Kellenyi.

### **5.4 Complete paper dealing with basic restrictions for localised pulse exposure (inc. follow up with researchers)**

Mr Cornelius advised that he had consulted with Richard Olsen from the Bio-engineering Department of the Naval Health Research Center at Brooks AFB. Mr Cornelius stated that from his discussion with Mr Olsen the 50  $\mu$ s averaging time seems adequate as a basic restriction for localised pulse exposure.

### **5.5 Draft paragraph on dB/dt**

The group decided that Mr Anderson would write a paragraph on dB/dt to be included as a footnote.

### **5.6 Advice on non-uniform exposure (Note 5, table 6)**

The WG decided to leave the note there, in its present condition. (Note 5, table 6 has since been changed to Note 4).

### **5.7 Examine origin/rounding of 24.4 number in Table 7**

Mr Cornelius explained the origin of the 24.4 A/m H-field strength in Table 7 and its eventual rounding to 25 A/m. Other changes to Tables 6 and 7 made by Mr Cornelius and Mr Karipidis thus resolving any discontinuities in the ICNIRP levels were mentioned. Mr Black argued that changing the ICNIRP levels does not follow a harmonisation policy. Dr Roy concluded that any significant changes to the ICNIRP levels would be shown to the RHC before a decision was made.

### **5.8 Include figures not in Table 7 in look up tables**

Dr Roy indicated that the figures depicting power flux density were completed but were not included in the draft given to the WG. Dr Roy also mentioned that the missing numbers in the Look-up Tables in Schedules 2 and 3 were filled in, however, they too, were not included in the draft given to the WG. It was agreed that numbers in tables should be expressed in three significant figures. Ms Wright asserted that in the Note of Schedules 2 and 3 reference should be made to Annex 1.

### **5.9a Provide example on personal protective equipment, para 5.1.2(e)**

An example on personal protective equipment is to be provided by Mr Anderson and to be included in the draft as a footnote of para 5.1.2 (e).

### **5.9b Further develop chapter 5 of the Draft Standard**

Chapter 5 "Protection-occupational and general public exposure" was discussed by the WG and several wording changes were established and consequently tabled. Mr Cornelius and Ms Wright are to rephrase the 4<sup>th</sup> and 3<sup>rd</sup> last paragraphs in section 5.1.2. It was decided that the last two paragraphs are to be switched around in their placement. In section 5.3 an "and/or" is to be placed between option 1 and option 2 and an "or" is to be placed between option 2 and option 3. The WG discussed the possibility of the "Precautionary approach" mentioned in option 2 of section 5.3 being called "Cautionary approach". The 3 options in section 5.3 (d) are to be shown to the RHC.

### **5.10 Re-format Non-thermal Annex similar to Epi. Annex, including summary/conclusions up front, statement about unanswered questions, "low level" rather than "non-thermal", explanation of what non-thermal research is (Stewart Report) and identification of species studied in the papers reviewed**

Dr Wood presented the first paragraph of the summary of Annex 4. He questioned the WG whether to include “artifact” methodologies. After various comments and suggestions the WG decided that Dr Wood and Dr Joyner would redraft the summary.

#### **5.11 Draft paragraph on pregnancy for rationale**

[Could I have feedback on this please?]

#### **5.12 Further develop paragraph for rationale on overlap b/t epi & non-thermal**

Dr Hocking presented his paper titled “Neurological Effects of RFR in Humans: implication for safety standard setting”. It was agreed that Dr Hocking would develop a section of the rationale, which summarises his paper. Mr Karipidis will create a table listing case studies provided by Dr Hocking. The table, which is to show various research parameters, is to be included in the draft as a separate Annex.

#### **5.13 Further develop Intro section of Rationale**

Mr Cornelius presented the revised Intro section of the Rationale.

#### **5.14 Further develop Studies section of Rationale**

Changes made to the Studies section of the Rationale were accepted by the WG.

#### **5.15 Further develop Philosophical Basis section of Rationale**

The WG agreed on several phrasing changes to section 4 of the Rationale. The alterations were accordingly tabled. Dr Joyner cited that the reference to Gandhi ie “.....*that adults absorb at least 10% more power than a five year old child.*” is wrong. The WG decided that the paragraph on foetal exposure needs to be redrafted. Dr Black and Dr Hocking will rephrase the paragraph.

#### **5.16 Further develop Basic Restrictions section of Rationale**

The WG considered different versions of the basic restrictions section of the Rationale from Dr Black and Mr Anderson. Several wording changes were cited and agreed upon by the members and were subsequently tabled. It was decided that the lower frequency ranges for the localised peak SAR in head & torso and SA absorption in the head would remain unchanged. Upon suggestion that the last paragraph be moved to the conclusion of the Rationale the WG agreed to consider the proposal further. Ms Wright, Dr Hocking, Dr Wood and Dr Joyner are to redraft the sentence “*Throughout the development ..... a significant increase in core body temperature.*” situated in the first paragraph of ‘Whole body average SAR’. In doing so a reference to the experimental details of the Adair study is to be included as a footnote. Dr Wood is to add words derived from ICNIRP to the sentence. The WG agreed that a separate section would be added addressing partial body and localised levels. Dr Black, Mr Anderson, Dr Joyner, Ms Wright and Mr Cornelius will draft this section. It was decided that in writing it a number of published papers would have to be reviewed especially institutionalised work such as from the NRPB, ICNIRP etc.

#### **5.17 Further develop Reference Levels section of Rationale**

Mr Dwyer raised concerns over the increase of the Reference levels.

### 5.18 Lancet papers

The Rothman and Hyland articles appearing in the Lancet were mentioned in regards to low-level effects. Dr Wood was unaware of their existence due to his recent absence. He advised that he would consider the papers for the review of bio-effects at non-thermal levels.

### 5.19 The Draft Standard

The Draft Standard was distributed to all the members of the WG.

### 5.20 The Next Steps

Dr Roy is to present the revised draft to the RHC and report on their response. A meeting at ARPANSA between Dr Roy, Mr Cornelius, Mr Bangay, Mr Karipidis, Mr Anderson, Mr Wood and Mr Hocking was arranged for 10 January 2001.

## 7 OTHER BUSINESS

Dr Wood reported on his recent visit to England. It was mentioned that he met with David De Pomerai, John Tattersall, Alan Preece and Michael Dollan. The following conclusions were drawn from three separate meetings:

- De Pomerai - Nematode worm study involving heat shock proteins.
  - TEM cell exposure.
  - The worms grew faster by 10% when exposed to RF for a period of days.
  - Dr Wood questioned the exposure and dosimetry of the experiment.
  - Dr Joyner indicated that there are differences in looking at heat shock proteins in worms and in mammals.
- Tattersall & Preece - Study looking at rat hippocampal slices.
  - Dr Wood cited the possibility of high SAR's.
- Dollan - Michael Dollan is the Director of the FEI in the UK.
  - Information leaflets to be distributed to the general public in the UK.
  - Topics covered in the leaflets included warnings on mobile phone use by children and while driving and SAR values of handsets.
  - Dr Wood mentioned that Mr Dolan advised him to have a lawyer examine the sensitive issues of the standard such as the use by children.

## 7. CLOSURE AND NEXT MEETING

The next meeting was set for 23-24 January 2001, Mr Black and Mr Dwyer advised that they may not be able to attend.

## **ACTION LIST ARISING FROM MEETING OF 19-20 DECEMBER 2000**

1. Send revised draft to the RHC and WG members at least one week prior to next WG meeting Dr Roy
2. Summary of ODC studies Dr Wood
3. Draft paragraph on dB/dt Mr Anderson
4. Provide an example on personal protective equipment Mr Anderson
5. Rephrase the 4<sup>th</sup> and 3<sup>rd</sup> last paragraphs of section 5.1.2 Mr Cornelius, Ms Wright
6. The three options of section 5.3 (d) to be shown to the RHC Dr Roy
7. Redraft first paragraph of the Summary of Annex 4 Dr Wood, Dr Joyner
8. Draft paragraph on Neurological effects of RFR in humans for Rationale Dr Hocking
9. Create table to be put in an Annex listing case studies Dr Hocking, Mr Karipidis
10. Redraft paragraph on Foetal Exposure in Philosophical Basis section of Rationale Dr Hocking, Dr Black
11. Redraft sentence in first paragraph of Whole body average SAR in Basic Restrictions section of Rationale Ms Wright, Dr Wood, Dr Hocking, Dr Joyner
12. Add words from ICNIRP to the redrafted sentence of action point 11 Dr Wood
13. Draft Partial body and localised levels section in Rationale Dr Black, Mr Anderson, Dr Joyner, Ms Wright, Mr Cornelius
14. Consider Rothman and Hyland articles in the Lancet for Low-level effects Annex Dr Wood

# RADIATION HEALTH COMMITTEE

## *BUSINESS WORKING GROUP*

### **Minutes of the Teleconference Meeting held on 7 December 2000**

Irrelevant



#### **6. Progress with RF Standard**

- ◆ One more meeting before XMAS, and it was hoped that all of the individual sections could be combined to produce a complete draft. This draft would need further editing to ensure continuity and cohesiveness between the various sections;
- ◆ A Wood to obtain details of UK information sheets to be provided with sale of mobile phones;
- ◆ A Melbourne to remind C Roy about providing questions to RHC;
- ◆ Contentious points to be explained to RHC.

Released under FOI June 2018













## **9. PROGRESS WITH RADIOFREQUENCY STANDARD**

The CEO presented a review of progress towards a RF Standard that had been prepared by Dr

Colin Roy, who is chairing the Working Group. Mr Wayne Cornelius from ARPANSA's NIR Branch, EMR and Optical Section attended for this item.

The CEO noted that the Standard publication would contain more than just the exposure limits. It would contain an analysis of the literature and a detailed rationale, which was important for public discussion. The previous Standards Australia-coordinated process had failed to reach consensus, and a number of aspects of the RF area were still controversial. In particular, the issue of whether there are health effects from low levels of RF (too low to cause effects by heating) would need to be examined in the Standard publication.

It was important to set the context of the Standard in the foreword to the publication. The Standard would set occupational and public exposure limits. The limits would be established in Basic Restrictions, largely in terms of specific absorption rate (SAR), which can be hard or inconvenient to measure. In addition, a series of reference levels would be set for quantities that can be measured. The relationship of the reference levels to the basic restrictions at different frequencies can be quite complex. This will need to be carefully explained to avoid misunderstandings

The Standard also deals with verification of compliance, and protection issues.

The Standard will include Annexes and Schedules. The Schedules include a detailed rationale, which is currently being reformatted to link the rationale better to the various basic restrictions and reference levels, and "look-up" tables. The Annexes will include discussion of quantities and units, epidemiological studies, non-thermal effects, measurement, precautionary approaches, and medical monitoring.

The draft is well advanced. The working group will meet again on 19-20 December 2000 and hopes to finalise the draft and present it to RHC following that meeting. The public comment period could be late January or February 2001, and the Working Group will then review public comment prior to final submission to the RHC.

While the draft is based on ICNIRP recommendations, the Working Group has meticulously examined the technical issues, and the Standard will be more up to date and comprehensive than the ICNIRP document. Council noted that the Australian Communications Industry Forum (ACIF) was developing a Code of Practice that would complement the Standard in the communications area. Further codes relating to other areas of the electromagnetic spectrum could also be developed.

Council was also advised that a replacement Union representative had been appointed to the Working Group. RHC had also decided not to replace another Working Group member who had resigned some time earlier. Other Working Group members had adequately covered the area of his expertise.

Irrelevant











## RF EXPOSURE STANDARD WORKING GROUP

### Meeting Record of 23-24 January 2001

ITEM	PAGE
<b>1. OPENING OF MEETING AND ATTENDANCE</b>	<b>2</b>
<b>2. APOLOGIES</b>	<b>2</b>
<b>3. CONFIRMATION OF MINUTES OF 19-20 DECEMBER 2000</b>	<b>2</b>
<b>4. BUSINESS ARISING FROM MINUTES</b>	<b>3</b>
<b>5. GENERAL BUSINESS</b>	<b>3</b>
<i>Reports on Actions from Last Meeting</i>	
5.1 Send revised draft to RHC and WG members at least one week prior to next WG meeting	3
5.2 Summary of ODC studies	3
5.3 Draft paragraph on dB/dt	3
5.4 Provide example on personal protective equipment	3
5.5 Rephrase the 4 <sup>th</sup> and 3 <sup>rd</sup> last paragraphs of section 5.1.2	3
5.6 The three options of section 5.3(d) to be shown to the RHC	3
5.7 Redraft 1 <sup>st</sup> paragraph of the summary of Annex 4	4
5.8 Create table to be put in an Annex listing case studies	4
5.9 Consider Rothman and Hyland articles in the Lancet for Low-level effects Annex	4
<i>Rationale - Detailed discussion including the following:</i>	
5.10 Draft paragraph on Neurological effects of RFR in humans for Rationale	4
5.11 Redraft paragraph on foetal exposure in Philosophical Basis section of Rationale	4
5.12 Redraft sentence in 1 <sup>st</sup> paragraph of whole body average SAR in Basic Restrictions section of Rationale	4
5.13 Add words from ICNIRP to the redrafted sentence of item 5.12	4
5.14 Draft partial body and localised levels section in Rationale	4
<b>6. OTHER BUSINESS</b>	<b>6</b>
6.1 New journal articles	6
6.2 Precautionary Annex	6
<b>7. CLOSURE AND NEXT MEETING</b>	<b>6</b>

## 1. OPENING OF MEETING AND ATTENDANCE

Dr Roy opened the meeting at 9:50 am and welcomed Dr Loy, CEO of ARPANSA, who attended the first day as an observer. The following were present:

Dr Colin Roy (Chair)  
 Mr John Lincoln  
 Dr Andrew Wood  
 Mr Vitas Anderson  
 Mr Wayne Cornelius  
 Dr Bruce Hocking  
 Ms Jill Wright  
 Dr Ken Joyner  
 Dr David Black (Consultant)  
 Professor Mark Elwood (Consultant) - attended on second day only

Mr Alan Melbourne (Secretariat)  
 Mr Michael Bangay (Secretariat)

Mr Ken Karipidis (Observer)  
 Ms Judy Lawson (Observer)  
 Dr John Loy (Observer)  
 Dr Graeme Dickie (Observer)

## 2. APOLOGIES

Mr Ian McAlister, Mr Dan Dwyer

## 3. CONFIRMATION OF MINUTES OF 19-20 DECEMBER 2000

The minutes were confirmed with the following corrections:

In section 7 correct the spelling of "Dolan" in three places, and under the Tattersall & Preece study, change the second line to: Dr Wood cited the possibility of SAR's being higher than thought.

Change section 5.17 to:

Mr Dwyer raised concerns over the significant increase of the Reference Levels, when compared to existing standards. Examples were:

	OLD STANDARD	NEW STANDARD	EXPOSURE INCREASE
<b>900 MHz (Analogue/digital mobile phones)</b>			
E field (V/m)	27.5	41.0	49%
H field (A/m)	0.073	0.111	52%
Power flux (W/m <sup>2</sup> )	2.0	4.5	125%
	OLD STANDARD	NEW STANDARD	EXPOSURE INCREASE
<b>1800 MHz (latest mobile phones)</b>			
E field (V/m)	27.5	58.0	111%

<b>H field (A/m)</b>	<b>0.073</b>	<b>0.157</b>	<b>115%</b>
<b>Power flux (W/m<sup>2</sup>)</b>	<b>2.0</b>	<b>9.0</b>	<b>350%</b>

It was agreed that an explanation of the reasons for the significant increase be drafted and included in the explanation.

Dr Roy noted that there was a need to address the point that changes to the reference levels are not changes to the limits. This would be included in the rationale or in an explanatory document accompanying the standard.

In section 5.11 Dr Hocking had suggested deleting the sentence starting “Whereas a pregnant woman...” and replacing it with “Because the pregnant woman has her physiological systems for heat regulation already under stress it is considered the usual safety factors do not apply to her and her foetus.”

#### **4. BUSINESS ARISING FROM MINUTES**

There was no business arising that was not already covered on the agenda.

#### **5. GENERAL BUSINESS**

##### ***Reports on Actions from Last Meeting***

##### **5.1 Send revised draft to RHC and WG members at least one week prior to next WG meeting**

A further draft of the Standard was tabled. Dr Roy summarised the changes to this draft compared with the draft that had been circulated prior to the meeting. These included the Foreword, inclusion of editorial notes, the options about protection, and that section 4 had been moved to an Annex.

##### **5.2 Summary of ODC studies**

Dr Wood advised that this task had not been completed, but that he would complete it during the meeting, including information from the Canadian update.

##### **5.3 Draft paragraph on dB/dt**

The working group noted that this paragraph had been included in the draft.

##### **5.4 Provide example on personal protective equipment**

This had also been done and incorporated in the draft.

##### **5.5 Rephrase the 4<sup>th</sup> and 3<sup>rd</sup> last paragraphs of section 5.1.2**

Ms Wright advised that the changes from lines 75-79 from last meeting were to be inserted. The words will be confirmed during the meeting.

##### **5.6 The three options of section 5.3(d) to be shown to the RHC**

This task had been done at the RHC meeting.

## **5.7 Redraft 1<sup>st</sup> paragraph of the summary of Annex 4**

This had been done and was in the circulated version of the draft.

## **5.8 Create table to be put in an Annex listing case studies**

This had been completed and is in an Annex. It needs to be discussed and a decision made what to do with it.

## **5.9 Consider Rothman and Hyland articles in the Lancet for Low-level effects Annex**

The articles will be provided to Dr Wood for consideration in relation to low-level effects.

*Rationale - Detailed discussion including the following:*

**5.10 Draft paragraph on Neurological effects of RFR in humans for Rationale**

**5.11 Redraft paragraph on foetal exposure in Philosophical Basis section of Rationale**

**5.12 Redraft sentence in 1<sup>st</sup> paragraph of whole body average SAR in Basic Restrictions section of Rationale**

**5.13 Add words from ICNIRP to the redrafted sentence of item 5.12**

**5.14 Draft partial body and localised levels section in Rationale**

These items were dealt with jointly during discussion on the rationale and on the circulated draft in general.

### *Foreword*

Dr Loy had provided a draft Foreword for discussion. The main comment was on lines 166-170 arising from the IEGMP Report in UK about children. After discussion it was agreed to delete this paragraph.

### *Background*

This section was yet to be written, but would consist of only a few paragraphs.

### *Purpose*

Need to correct numbering, and make the a,b,c consistent with the Foreword. The primary purpose is to protect human health.

### *Scope*

Editorial changes were noted. These included moving 297-299 to the Purpose section, moving 324-331 to the Structure section, and re-ordering some of the paragraphs.

### *Structure*

An interpretation section will be created for lines 350-351. A number of other editorial changes were noted.

### *Section 2*

A number of editorial changes were noted. In particular, the heading of the section to refer to basic restrictions and reference levels rather than limits, and note 3 to Table 5 to be amended to read:

“Instantaneous power flux density refers to the measured level calculated over any 1  $\mu$ s period. It is recognised that it is not practical to measure fields over such a short averaging time and that an estimate of the pulse characteristics will be required to obtain an estimate.”

A further note on public exposure to be added to tables 6 and 7, with wording consistent with the notes on occupational exposure. In 2.7 the paragraph 745-749 was deleted, the (a), (b), (c) paragraphs were re-numbered to 2.7.1 etc, the first line of Table 10 was deleted, and a number of editorial changes were made to clarify the meaning.

### *Section 3*

A number of editorial corrections were made, including correcting the references to Tables.

### *Section 4*

Editorial changes were made to the paragraph 869-872, the heading was changed to refer to Basic Restrictions and Reference Levels, and line 910 was deleted.

### *Section 5*

The options for precaution/ protection statements were discussed and it was agreed to include the following wording at line 922:

“It is generally sensible in achieving service or process requirements to minimise unnecessary or incidental RF exposure, provided it does not introduce other risks and can be achieved at modest expense.” A number of wording changes were made to the sections on risk management. A replacement sentence was to be included at 1019:

“It is advisable that persons who will be occupationally exposed to RF Fields be provided with a placement examination (See Annex 7).”

### *Schedule 1: Rationale*

A detailed discussion of the rationale for the standard was held. A large number of editorial changes were recorded. The key points included:

Discussion of the childhood exposure paragraph, 1562-1577.

The section on case studies (1423-1463) was to be moved to Annex 8 or deleted. Alternative paragraphs on case studies to be provided for the rationale.

The section on Basic restrictions starting at 1619 needs to address each basic restriction identified in the dots points 1631-1637. In particular, a rationale for localised SAR's was required. This will be drafted by Mr Cornelius, Dr Joyner, Mr Anderson, and Dr Black.

Reference to stochastic and deterministic effects at 1661 requires a footnote to explain their meaning.

The section on electrostimulation (1674-1695) needs to include the corrections referred to in the notes of the last meeting.

Some references on p46-47 required more information. Mr Karipidis will email Dr Black to complete the references.

### *Glossary*

The following terms were suggested for inclusion in the glossary:

Instantaneous

Peak

Public

Basic Restrictions

Reference Levels

A list of acronyms and a table of unit conversions were also suggested.

### *Annex 7*

Mr Lincoln would send comments on this Annex.

### *Annex 8*

In regard to the case studies Annex the working group decided that it should be removed and rewritten as a web page paper. It should not just include neurological studies, should have no

tables, and should deal with overexposure only briefly. The important aspects should be covered in the rationale and should point to the additional information being available on the web page. A task group of Dr Hocking, Dr Wood, Mr Anderson and Dr Black would draft the section for the rationale.

## **6. OTHER BUSINESS**

### **6.1 New journal articles**

The following papers were provided for members' information:

- a) Review of the Report "Criticism of the Proposal to Adopt the ICNIRP Guidelines for Cellsites in New Zealand" by Dr Neil Cherry.
- b) Editorial from Epidemiology, vol. 12 no. 1, Jan 2001, Frequent Radiation Exposures and Frequency-Dependent Effects: The Eyes have it.
- c) Stang et al article from Epidemiology vol. 12, no. 1, Jan 2001, The Possible Role of Radiofrequency Radiation in the Development of Uveal Melanoma.

### **6.2 Precautionary Annex**

It was noted that the comments received from Dr Shields (RHC member) would help with this Annex. Also there needed to be a clearer statements of how the precautionary approach related to the Standard. Dr Dickie requested that some assistance from a small task group would help in completing the Annex. This would be arranged in the week following the meeting.

## **7. CLOSURE AND NEXT MEETING**

In closing the meeting Dr Roy outlined the proposed timetable for completing the draft prior to the public comment period.

By mid-February the changes would be incorporated and distributed to the working group, and the RHC.

The draft would be finalised out of session by the end of February by including any further editorial corrections required.

There would then be a two month public comment period during March and April.

Comments would then be collated and consolidated.

Proposed responses would be prepared and distributed to the working group for comment.

A meeting to discuss the comment and proposed changes would then be arranged.

No date was set for the next meeting. This would be determined out of session.

RADIATION HEALTH COMMITTEE  
*BUSINESS WORKING GROUP*

**Minutes of the Meeting held on  
30 Jan 2001 at 2:30 p.m. (Melbourne Time)**

Irrelevant



Released under FOI June 2018

## 6. Progress with RF Standard

- ◆ A 2001 timetable for the progressing of the ARPANSA RF Standard had been distributed to the BWG. CR attended and brought several issues to the attention of the BWG. These included:
  - ◆ Public protection statements (options issue had been resolved);
  - ◆ Rationale on localised exposures. The standard basically uses the ICNIRP numbers with an updated justification for their use. Paragraphs on localised exposure were still to be included;
  - ◆ Still need to modify the draft based on the previous RF WG's meeting (23/24 Jan 2001);
  - ◆ Draft had been circulated to RHC (15 Jan 01);
  - ◆ A draft RIS was circulated to the WG, and still needs to be finalised;
- ◆ It was noted that very little comment had been received from RHC regarding the draft of 15 Jan. The BWG considered it appropriate to remind the RHC of this draft and inform them that a penultimate draft would also be distributed to them in mid-Feb with an accompanying note highlighting the changes from the Jan draft. The note should include a copy of the RIS and should advise that the comment on the protection options was no longer required as the issue had been resolved;
- ◆ CR reported that he had no further information on the issue of RF health surveillance.

























## 6.5 RF Standard

Dr Loy outlined the current status of the draft Radiofrequency (RF) Standard. The document was at the public comment stage and would remain so until 11 May 2001. The Working Group (WG) had accepted the document as a suitable draft for public comment although there was not unanimous WG agreement with its content.

In order to stimulate debate on the draft during the public comment period, a moderated discussion group (MDG) had been instituted through the ARPANSA RF Web site. This was a recent innovation intended to provide another avenue for public comment. At the time of the meeting, no one had used the MDG but it was considered important that it be there and that once people had become used to it, it would be an invaluable tool for commenting on Codes and Standards.

The RIS had not been released for the public comment period as it was not complete at the time. The ORR had agreed to this arrangement. The RIS was nearing completion however and comments on the style and content of the RIS for the Transport Code (see item 6.4) would assist in finalising the RIS for the draft RF Standard.

Some of the issues in the draft RF Standard that were raised at the Senate Inquiry hearing included:

- reference levels for some frequencies have increased;
- localised Specific Absorption Rates (SARs) are up to 25 times the whole body SAR;
- the precautionary principle, and how literal interpretation would mean that no technology could avoid a precautionary approach.

Dr Loy did not anticipate that the final report of the Senate Inquiry would be unanimous.

The Committee queried the method of handling public comment. All public comment would be considered by the WG in a meeting to be held in late June, prior to which the comments will be collated

and analysed. Depending on the amount and type of comment received, Dr Colin Roy might be requested to return from his overseas posting to Chair the meeting for continuity purposes. The working group will need to examine the comment and provide the rationale for acceptance or otherwise. The final draft would then be provided to RHC with the rationale for dealing with the comment.

Dr Loy also advised that the NHMRC had approved another round of funding for EME research.

Irrelevant





















**DRAFT SUMMARY OF  
BUSINESS WORKING GROUP TELECONFERENCE  
26 JUNE 2001**

Irrelevant



7. Mr Melbourne advised that the RF working group was to meet on 10-11 July and commence considering the 66 submissions. A second meeting was planned for August. RHC would be given a progress report at the July meeting.

Released under FOI June 2018



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## RF EXPOSURE STANDARD WORKING GROUP

### Draft Meeting Record for 10-11 July 2001

1. OPENING OF MEETING & ATTENDANCE
2. APOLOGIES
3. CONFIRMATION OF MINUTES OF MEETING OF 23-24 JANUARY 2001
4. BUSINESS ARISING FROM MINUTES
5. GENERAL BUSINESS
  - 5.1. Consideration of public comment on Draft Standard
  - 5.2. Senate Inquiry on Electromagnetic Radiation  
-- working group to note for information
  - 5.3. Briefing on Regulatory Impact Statement process
  - 5.4. Process for completion of Draft Standard
6. OTHER BUSINESS
7. CLOSURE AND NEXT MEETING

#### ACTION LIST

## **7. OPENING OF MEETING & ATTENDANCE**

Dr Roy opened the meeting at 9:40 am. The following members were present:

Dr Colin Roy (Chair)  
Dr Bruce Hocking  
Mr Wayne Cornelius  
Ms Jill Wright  
Dr Ken Joyner  
Dr Andrew Wood  
Mr John Lincoln  
Mr Dan Dwyer  
Mr Vitas Anderson  
Prof Mark Elwood (Consultant) – attended both days till lunchtime  
Dr David Black (Consultant)

Mr Michael Bangay (Secretariat)

Mr Ken Karipidis (Observer)  
Dr Graeme Dickie (Observer)  
Ms Patricia Healy (Observer) – replaces Judy Lawson as the NOHSC observer  
Dr Stuart Henderson (Observer)

## **7. APOLOGIES**

Mr Alan Melbourne, Mr Ian McAlister

## **7. CONFIRMATION OF MINUTES OF MEETING OF 19-20 OCTOBER 2000**

The minutes were confirmed.

## **7. BUSINESS ARISING FROM MINUTES**

Nil.

## **7. GENERAL BUSINESS**

### **5.1 Consideration of public comment on Draft Standard**

The Working Group considered general comments from the submissions, presented in a table, which was prepared by Dr Stuart Henderson. Responses to the authors of the comments and changes to the draft were noted.



The Working Group considered specific comments from the submissions presented in a table (sorted by line number), which was prepared by Mr Ken Karipidis. Specific comments were considered up to the end of section 4 (line 858) of the draft and it was agreed that the remaining specific comments would be considered in the next meeting. Responses to the authors of the comments and changes to the draft were noted.

## **5.2 Senate Inquiry on Electromagnetic Radiation**

Not considered.

## **5.3 Briefing on Regulatory Impact Statement process**

Not considered.

## **5.4 Process for completion of Draft Standard**

Dr Roy indicated that the Working Group will convene for two more meetings. In the next meeting consideration of the public specific comments will be completed. The final draft with the necessary amendments derived from the discussion on public comment will be reviewed by the WG in the final meeting.

## **6. OTHER BUSINESS**

Nil

## **7. CLOSURE AND NEXT MEETING**

The next meeting was scheduled for 15-16 August.

## **ACTION LIST ARISING FROM MEETING OF 10-11 JULY 2001**

### **1. Develop options for section 5.3:**

- a) Statement similar to that in the New Zealand Standard to be inserted at the end of § 5.3 on line 990.**

**Mr Dwyer, Mr Lincoln, Dr Hocking**

- b) WHO wording (not including reference to individuals) at the start of § 5.3 (where it will not be mandatory). Taken from M.H. Repacholi Toxicology Letters v120, p323 (2001).**

**Mr Karipidis**

### **2. Endeavour to establish a table listing tissue characteristics on the web.**

**Mr Anderson**

### **3. Seek explanation from submitter 010 regarding what is difficult to interpret in the standard.**

**Mr Bangay**

### **4. Contact submitter 004 to seek further explanation of their submission (regarding maximum exposure levels).**

**Mr Bangay**

### **5. Provide translation of the French paper that was critical of the Czech work on effects of pulsed RF referred to in submission 065.**

**Mr Anderson**

### **6. Definition of “point contact” to be included in glossary.**

**Mr Cornelius**

### **7. Meeting with submitter 023 to discuss reference levels, means of ensuring compliance with basic restrictions and issue that basic limits do not appear to include extremities (eg. hands).**

**Mr Bangay**







Irrelevant

## 7. RADIOFREQUENCY STANDARD - PROGRESS REPORT AND DISCUSSION OF ISSUES

The CEO informed Council of the current progress towards a Standard on Radiofrequency Fields, and issues that had arisen in working group discussions. Copies of the Agenda papers from the Radiation Health Committee meeting were tabled, along with a draft extract of the minutes on the Committee's discussions. The draft Standard had been released for public comment in March for a period of two months. Over sixty submissions were received. The working group had met in July and was still considering the comment received. The issues that had arisen relate to the magnitude of the basic limits, where the spatial peak SAR was important to the public as it related to mobile phone use. Tissue averaging volume (whether 1 gram as in IEEE or 10 gram as in ICNIRP) was a consideration in this debate.

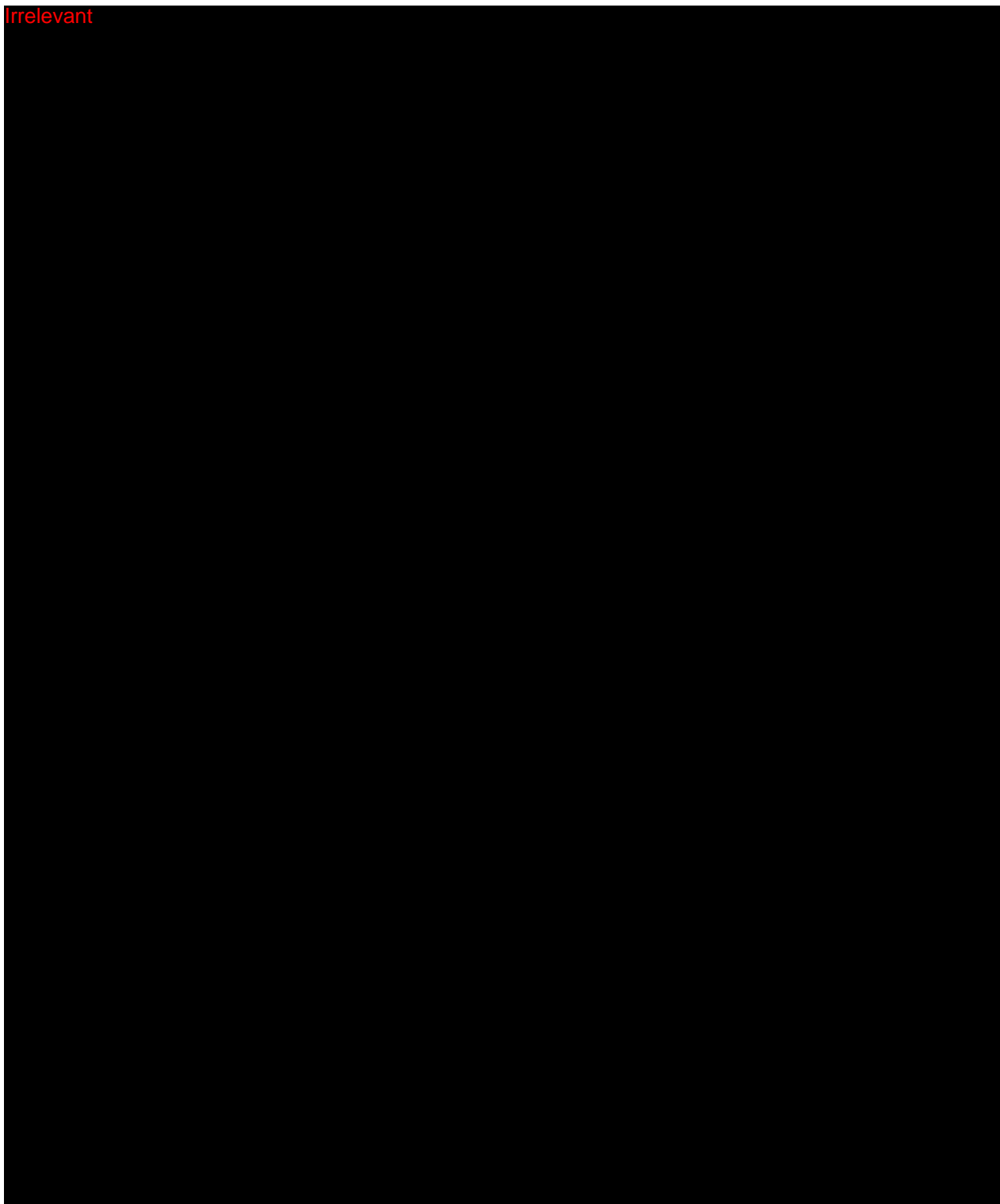
Companies operating induction heaters had indicated a problem in complying with the Reference Levels in the draft Standard, but may still be able to demonstrate compliance with the Basic Restrictions. There may be a need for a Code of Practice to cover use of this equipment.

The working group had presented the Radiation Health Committee with three options in relation to the precautionary approach. These centred around whether or not the precautionary approach should be a mandatory part of the Standard. The Radiation Health Committee had prepared some observations for the working group, and asked that they

consider the matter further. Council discussed the options presented and some members generally agreed with the intent of option 2 but felt that the wording was inappropriate. Dr Smith offered to talk to the working group about the Sutherland Shire Council's approach to planning issues and the precautionary principle.

The working group is due to meet again on 15-16 August to complete consideration of the public comment. It is then likely that there will be a meeting in September to finalise the draft.

Irrelevant













## RF EXPOSURE STANDARD WORKING GROUP

### Draft Meeting Record for 15/16 August & 6 September 2001

ITEM	PAGE
1. Opening of meeting & Attendance	2
2. Apologies	2
3. Confirmation of the minutes of 10/11 July 2001	2
4. Business Arising from the Minutes	2
5. General Business	
5.1 Review of Public Comment (continued)	3
5.2 Revised Epidemiology Sections	3
5.3 Review of actions from Last Meeting	3
5.3.1 Develop options for Section 5.3	3
5.3.2 Establish table listing tissue characteristics for web page	3
5.3.3 Seek explanation from submitter 010 re interpretation	3
5.3.4 Contact submitter 004 to seek further explanation	3
5.3.5 Provide translation of French paper in submission 065	4
5.3.6 Draft definition of "point contact" for Glossary	4
5.3.6a Rationale for Localised SAR	4
5.3.7 Arrange meeting with submitter 023 to discuss reference levels, ensuring compliance with basic restrictions, and issue that basic restrictions do not appear to include extremities	4
5.4 Presentation on Sutherland Shire Council planning approaches and precautionary principle	4
5.5 Extract of draft RHC minutes on Precautionary Options	4
5.6 Extract of draft Council minutes on Precautionary Options	4
5.7 Progress on Regulatory Impact Statement	4
6. Other Business	5
7. Closure and next meeting	6
 ACTION LIST for Aug/Sep 2001 meeting	 7
 Attachment A: Paragraphs edited during meeting	 8

## **1. Opening of meeting & Attendance**

Dr Wood opened the meeting at 9:45am and welcomed all members. The following were present:

Dr Andrew Wood (Acting Chair)  
Mr Wayne Cornelius  
Dr Bruce Hocking  
Ms Jill Wright (15/16 August only)  
Dr Ken Joyner  
Mr John Lincoln  
Mr Dan Dwyer  
Mr Vitas Anderson  
Prof Mark Elwood (Consultant, 15/16 August only)  
Dr David Black (Consultant, 15/16 August only)

Mr Alan Melbourne (Secretariat)  
Mr Michael Bangay (Secretariat)

Mr Ken Karipidis (Observer)  
Dr Stuart Henderson (Observer)  
Mr Ian McAlister (Observer, 15/16 August only)  
Mr Phillip Beaumont (Observer, 15/16 August only)  
Ms Patricia Healy (Observer, 6 September only)  
Dr Graeme Dickie (Observer, 15 August only)

## **2. Apologies**

Dr Colin Roy  
Ms Patricia Healy (for 15/16 August)  
Dr Graeme Dickie (for 16 August & 6 September)  
Ms Jill Wright (for 6 September)  
Mr Ian McAlister (for 6 September)  
Dr David Black (for 6 September)  
Prof Mark Elwood (for 6 September)

## **3. Confirmation of the minutes of 10/11 July 2001**

The minutes were confirmed, subject to the following:

Mr Dwyer asked that the last minutes include reference to his understanding “that the reason for changing the standard was that we may miss 3G technology if we don’t raise the levels”.

Dr Joyner requested that the minutes include the statement that “Stewart had recommended adopting the ICNIRP limits”.

The following addition was made to the action list:

8. Revise rationale for spatial peak SAR (W Cornelius, K Joyner, V Anderson, D Black)

## **4. Business Arising from the Minutes**

An email from Dr Dickie including a range of editorial corrections would also need to be considered.

It was also noted that the table summarising response to comment included two incomplete actions. In relation to line 450, the issue of sub-headings was to be further considered by the working group. In relation to line 285, Telstra had requested advice on how "agreed" best practice was determined.

Mr Cornelius also noted that he had circulated information on pulse limits, which shows that the protection is adequate.

## **5. General Business**

### **5.1 Review of Public Comment (continued)**

The meeting completed the review of all public comment. Responses to all submissions were drafted for inclusion in the tables being prepared by Mr Karipidis. Proposed changes to the draft in relation to issues raised in some of the submissions were also drafted. These revised sections are included as attachment A to these minutes. It was proposed that the table of responses to the submissions would be made available to all responders, without identifying who made each submission.

### **5.2 Revised Epidemiology Sections**

Prof Elwood discussed the updated epidemiology sections for the main body of the rationale and for the epidemiology Annex. These sections had been revised to take into consideration information from the public submissions. It was agreed to accept these revised documents.

### **5.3 Review of actions from Last Meeting**

#### **5.3.1 Develop options for Section 5.3**

These options had been developed and discussed by RHC and the ARPANSA Advisory Council. Their comments would be considered elsewhere in the agenda.

#### **5.3.2 Establish table listing tissue characteristics for web page**

Mr Anderson had forwarded a spreadsheet providing this information to Mr Cornelius. Some copyright issues in relation to Telstra would need to be considered.

#### **5.3.3 Seek explanation from submitter 010 re interpretation**

Mr Bangay noted that this issue related to the induction heating industry, and while he had not spoken directly to Inductoheat, he had spoken to Mr Peter Hart, who consults to the industry, and he will relay the information back. The industry is prepared to work with ARPANSA to resolve the current situation. It was noted that there may be a need for a Code of Practice for this industry, as well as the need to convey that the limit is for head and trunk, not extremities.

#### **5.3.4 Contact submitter 004 to seek further explanation**

Mr Bangay has not followed up this issue yet. It related to Category A & B classifications, where if there was a risk of contact current then the lower limit applied. Mr Bangay would discuss with Ray Leeson.

### **5.3.5 Provide translation of French paper in submission 065**

Mr Anderson noted that the Zmirou paper had been forwarded to the Secretariat by email on 13/7/01. It related to comment from Marcela Bilek. A copy was printed and provided to all members during the meeting.

### **5.3.6 Draft definition of “point contact” for Glossary**

This had not been completed yet. Mr Cornelius would draft a definition.

#### **5.3.6a Rationale for Localised SAR**

Mr Cornelius tabled a rationale for the localised SAR limits, which was accepted for inclusion into the rationale subject to inclusion of proper referencing of IEEE/ANSI and inclusion of reference to the Dosimetry Handbook.

### **5.3.7 Arrange meeting with submitter 023 to discuss reference levels, ensuring compliance with basic restrictions, and issue that basic restrictions do not appear to include extremities**

Mr Bangay has held discussions with Mr Hart, however there needs to be a more general meeting with the induction heating industry to consider these issues.

## **5.4 Presentation on Sutherland Shire Council planning approaches and precautionary principle**

Dr Garry Smith, Principal Environmental Scientist of Sutherland Shire Council made a presentation detailing SSC's experience with the rollout of base stations and the resulting planning issues. SSC had developed a policy based on exposure rather than the Standard as carriers can meet levels considerably less than the Standard. The level of  $0.2 \mu\text{W}/\text{cm}^2$  was used as a planning tool. Dr Smith said that in public submissions about the policy, Telstra were equivocal, Vodaphone did not like it and Optus said they could live with it. The implications for standard-setting were that there was clear demonstration and implementation of prudent avoidance was very important in the development of the Standard. Dr Smith provided a handout giving more details on the SSC policy. The Working Group discussed a range of issues about the policy with Dr Smith, including noting that the policy may not achieve the objective as phone handsets will draw more power if they are further from a base station.

## **5.5 Extract of draft RHC minutes on Precautionary Options &**

## **5.6 Extract of draft Council minutes on Precautionary Options**

The RHC and Council extracts of minutes were discussed along with the options put to RHC. After discussion it was agreed to use option 1 along with words from the first sentence of option 2. The agreed wording is included in Attachment A to these minutes.

## **5.7 Progress on Regulatory Impact Statement**

Mr Melbourne advised of the need for a Regulatory Impact Statement on the Standard, and that a number of drafts had been discussed with the Office of Regulation Review over a period of time, and there were still some issues raised by ORR to be addressed before they would clear the RIS to go to public comment. The latest draft had attempted to deal with these issues and would be provided to ORR before the end of the week. It was hoped to get their clearance soon after that. The RIS would then be released for 1 month for comment, placed on the ARPANSA web site, provided to all submitters of comment on the draft Standard, and others on the Secretariat RF mailing list. The working group would also be provided with copies.

## 6. Other Business

A copy of the latest draft of the ACIF code was provided to members for information.

A number of editorial amendments not covered in the public comment were also identified. These are listed below:

Section 5 needs words to refer to Annex 5, eg "It is recommended that when undertaking measurements, the methods used in Annex 5 are used."

176 change to "telecommunications"  
 991 Change Heading to "References & Bibliography"  
 957 change to "assessment"  
 993 Delete line.  
 1176 add after specification, "or where ICNIRP gave incomplete specifications"  
 1288 changes to "of on-going investigations"  
 1397 add "As explained previously,"  
 1428 add "and ionizing radiation".  
 1554 delete  
 1555 delete "at".  
 1570 change "proportional" to "related".  
 2061 Change heading to "Equipment Intended for Use by Aware Users"  
 2076-2080 Turn into dot points (a) to (e)  
 2106 change heading to "Equipment Intended for Use by General Public Users"  
 2123-2128 Turn into dot points (a) to (e)  
 2209 wrong font size.  
 2311-2312 Delete the words between "per" and "metre".  
 Annex 1 check all symbols for consistency of bold, italic etc  
 2583 superscript needed " $Wm^{-2}$ "  
 4179 change to "Field Assessment of RF Exposure Levels"  
 4229 magnitude signs to be included.  
 4231 should be " $377 \times S$ "  
 4421 consistency of font.  
 Annex 7 – look for "should"  
 4447 change "exam" to "assessment"  
 4472 insert heading "(b) Records"  
 4599-4644 All members to check their details in the Working Group list.

Dr Hocking provided a reference (Heaps & Constable, 1995) on sweating rates of monkeys in relation to the section of the rationale dealing with the Adair papers. The text was modified as a result. The revised text is in Attachment A to these minutes.



## **7. Closure and next meeting**

The meeting was closed at 5pm (6 Sept). The next meeting was set for 11 October 2001. In addition, members should keep 12 October 2001 clear in case a second day is required to complete review of the final draft.

## **ACTION LIST FOR 15-16 AUGUST & 6 SEPTEMBER**

- 1. Contact Mr Leeson (004) to seek further explanation** **Mr Bangay**
- 2. Develop definition of “Point Contact” for glossary** **Mr Cornelius**
- 3. Complete and circulate Regulatory Impact Statement** **Mr Melbourne/Mr Kumar**
- 4. Draft response to Telstra on how “agreed” best practice is determined** **Mr Cornelius**
- 5. Obtain advice from Telstra re: use of Tissue characteristics spreadsheet**  
**Mr Melbourne**
- 6. Incorporate agreed changes from minutes & attachment A in draft** **Secretariat**
- 7. Complete Safety factors paper** **V Anderson, D Black**
- 8. Complete Non-human Species paper** **D Black**
- 9. Complete Table of Responses to Public comment** **K Karipidis**
- 10. Contact ACA re: additional definitions** **A Melbourne**

## ATTACHMENT A

Amended paragraphs after September meeting]

### Aware users

Users who are appropriately trained to use two-way radios and other portable wireless devices (see S5.1.2) which expose the user to levels likely to exceed the basic restrictions for general public exposure. Appropriate training includes awareness of the potential for exposure and measures that can be taken to control that exposure. The following categories may be covered by this definition:

- (a) Emergency service personnel.
- (b) Amateur radio operators.
- (c) Voluntary civil defence personnel.

### **General Public exposure**

All radiofrequency exposure experienced by members of the general public. This definition excludes occupational exposure, exposure of aware users, and exposure during medical procedures. It is recognised that some persons may need to transit controlled areas (see glossary), and this is permitted under adequate supervision.

### **Occupational exposure**

For the purposes of this standard, occupational exposure is defined as exposure of a RF worker (as defined) when on duty.

### **RF worker**

A person who may be exposed to radiofrequency radiation under controlled conditions, in the course of and intrinsic to the nature of their work. Such persons are subject to the requirements of section 5.1.

### Controlled Area

A controlled area is an area or place in which RF exposures may reasonably be expected to exceed public limits, and with the following characteristics:

- a) The area must be under the supervision of a competent person who must ensure that exposures cannot exceed occupational levels;
- b) The area may only be entered by persons who are made aware that they are doing so, and of the need for RF safety;
- c) There must be documentation or signage to clearly indicate
  - 1) areas above occupational limits
  - 2) areas above public limits

### 5.1.3 Training and supervision [Amended Sept meeting]

RF workers must be trained in safe work practices, and supervised when appropriate. They must also be trained about the controls in place to manage the potential RF hazard. There must be procedures in place to ensure that the safe systems of work are utilised.

### 5.4 Allowable exposures in controlled areas [Aug meeting]

The allowable exposure limits in controlled areas (see glossary) are as for occupational exposures.

**Amendment to Wayne's page on WBA SAR that was tabled at Aug meeting – ie replacing lines 1554-1556 [amended Sept meeting]**

Adair et al. (1999) studied 7 sedentary fit volunteers, exposed over 36% of their body for 45 minutes to 450 MHz and later 2400 MHz CW RFR at a SAR level of 8 W/kg. It was found that this exposure did not produce a significant core body temperature rise due to the response of their thermal homeostatic mechanisms. However, it was observed that sweating had not yet reached equilibrium by the end of the exposure period. On the other hand, several studies using monkeys showed no significant rise of core temperature after 90 minutes exposure at WBA SAR levels of 9 W/kg and equilibrium of their sweating response (Adair et al. 1992), although monkeys have substantially lower sweat rates than humans (Heaps & Constable, 1995).

**Precautionary approach (Alan's option 4)**

**Under section 5.3 (e)**

Minimizing, as appropriate, radiofrequency exposure which is unnecessary or incidental to achievement of service objectives or process requirements, provided this can be readily achieved at reasonable expense. Any such precautionary measures should follow good engineering practice and relevant codes of practice. The incorporation of arbitrary additional safety factors beyond the exposure limits of this Standard is not supported.

### 5.2 PREGNANCY [amended Aug meeting]

In order to reduce the risk of accidental exposure above occupational limits a pregnant woman should not be exposed to levels of RF fields above the limits of public exposure. Pregnant occupationally exposed women should advise their employers when they become aware of their pregnancy. After this notification they must not be exposed to RF fields exceeding the general public limits. Pregnancy should lead to implementation of relevant personnel policies.

**Revised text at line 897 [Aug meeting]**

Where there is potential for overexposure, the hazard should be managed through application of the most appropriate control priorities as indicated below. The measures higher in the control priorities are usually more effective than those lower, and should be given greater consideration accordingly. The Control Priorities are:

**5.1.6 Assessment of reference levels [Aug meeting]**

Advice on measurement or calculation of exposures relevant to the reference levels is given in Annex 5.

**Intro to Section 5**

This section prescribes processes so as to ensure that:

- i. no person, either occupationally exposed or from exempted categories, is exposed to RF fields that exceed the occupational exposure limits; and
- ii. no member of the general public is exposed to RF fields in excess of the general public limits.

As mentioned in Section 2, occupational exposure is only permitted under controlled conditions. In particular, a thorough risk analysis must be performed, and an appropriate risk management regime implemented, prior to the exposure occurring.

More stringent exposure conditions are applied to the exposure of members of the general public. Individual members of the public may be continually exposed and cannot reasonably be expected to take precautions to minimise or avoid exposure. Indeed in some circumstances members of the public may not be aware that the exposure

## RF EXPOSURE STANDARD WORKING GROUP

### Draft Meeting Record for 11/12 October 2001

ITEM	PAGE
1. OPENING OF MEETING AND ATTENDANCE	2
2. APOLOGIES	2
3. CONFIRMATION OF MINUTES OF AUGUST/SEPTEMBER MEETINGS	2
4. BUSINESS ARISING FROM MINUTES	2
5. GENERAL BUSINESS	2
5.1 REVIEW OF FINAL DRAFT	2
5.2 NON-HUMAN SPECIES PAPER	3
5.3 REGULATORY IMPACT STATEMENT	3
5.4 REVIEW OF ACTION FROM LAST MEETING	4
5.4.1 Contact Mr Leeson to seek further explanation	4
5.4.2 Develop definition of "Point Contact" for Glossary	4
5.4.3 Complete and Circulate Regulatory Impact Statement	4
5.4.4 Draft Response to Telstra on how "agreed" best practice is determined	4
5.4.5 Obtain advice from Telstra on use of Tissue characteristics spreadsheet	4
5.4.6 Incorporate agreed changes from minutes & attachment A in draft	4
5.4.7 Complete Safety Factors Paper	4
5.4.8 Complete Non-human Species Paper	4
5.4.9 Complete Table of Responses to Public Comment	4
5.4.10 Contact ACA re Additional Definitions	4
6. OTHER BUSINESS	4
6.1 CORNELIUS RE-DRAFT FOR SECTION 3	4
6.2 HEALY COMMENTS ON SECTION 5, ANNEX 7, GLOSSARY & EDITORIAL CORRECTIONS	5
6.3 JOYNER EMAIL ABOUT AWARE USER	5
7. CLOSURE AND NEXT MEETING	5

## 1. OPENING OF MEETING AND ATTENDANCE

Dr Wood opened the meeting and welcomed all members. Those present were:

Dr Andrew Wood (Acting Chair)

Mr Wayne Cornelius

Dr Bruce Hocking

Ms Jill Wright

Mr John Lincoln

Mr Dan Dwyer

~~Mr~~ Dr Vitas Anderson

Prof Mark Elwood (Consultant)

Dr David Black (Consultant)

Mr Alan Melbourne (Secretariat)

Mr Michael Bangay (Secretariat)

Mr Ken Karipidis (Observer)

Dr Stuart Henderson (Observer)

Mr Ian McAlister (Observer, attended 11 October only)

## 2. APOLOGIES

Dr Colin Roy, Dr Graeme Dickie, Dr Ken Joyner, Ms Patricia Healy

## 3. CONFIRMATION OF MINUTES OF AUGUST/SEPTEMBER MEETINGS

The minutes were confirmed without amendment.

## 4. BUSINESS ARISING FROM MINUTES

In relation to the previous addition to the minutes of Aug/Sep on 3G technology, it was noted that there was a need for something probably in the web site on this issue. It could be referred to as a web link near table 11 in the Standard. [I don't recall this recommendation. Why do we need to comment on this particular technology? Are we then obliged to make similar comment on all radio technologies? Remember, this is meant to be a GENERIC standard for ALL radio technologies. Table 11 refers to the side length of a spatial averaging square – what was the mooted connection to 3G? By the by, you should probably change the title of Table 11 to spatial averaging dimension (or something similar) as it also refers to a line length (see 2.7b).

The need for a statement in the Foreword to advise people of the web site information using the generic ARPANSA web link was also suggested.

## 5. GENERAL BUSINESS

### 5.1 Review of Final Draft

The draft was reviewed in detail and corrections noted by the secretariat. The changes included:

- A typographical error in the copyright statement was noted (*altered* should be *unaltered*);
- clarifications to section 1.2 in relation to the former Standards Australia process;
- clarifications to 1.4 on medical exposure;
- Fix formatting of Table 1 and an addition to the note;
- Table 3 to be split into two tables and re-number tables accordingly;

- A replacement section 3 to be inserted – based on Wayne’s and Vitas’ drafts;
- Section 5 was reviewed in detail as a result of considering of Pat Healy’s comments (for detail of changes see 6.2);
- Some updates to References and Bibliography were still required;
- A new table summarising differences between ICNIRP and the draft standard had been inserted and was agreed with some minor amendments;
- Changes to the rationale section on the Adair studies were made as follows:  
 “Adair et al. (1999) studied 7 sedentary fit volunteers, non-uniformly exposed over 36% of their body surface for 45 minutes to 450 MHz and later 2400 MHz CW RFR at a predicted WBA SAR level of up to 0.9 W/kg. The peak surface SAR was estimated to be 7.7 W/kg. It was found that this exposure did not produce a significant core body temperature rise due to the response of their thermal homeostatic mechanisms. However, it was observed that sweating had not yet reached equilibrium by the end of the exposure period. On the other hand, several studies using monkeys showed no significant rise of core temperature after 90 minutes exposure at WBA SAR levels of 9 W/kg and equilibrium of their sweating response (Adair et al., 1992), although monkeys have substantially lower sweat rates than humans (Heaps and Constable, 1995)”;
- Changes to the headings in Tables S1 & S2;
- A range of changes were made to the Glossary;
- Corrections to Tables A1 and A2;
- The wrong version of Annex 3 had been included – it would be replaced with the 20 July version;
- A change to the Epidemiology paragraph in Annex 4 to delete all after *Annex 3*;
- The References from Annex 7 had been intended to be moved to Section 5 with the text;
- Changes to the titles etc in the listing of working group members were also noted; and
- A range of other editorial corrections was noted.

## 5.2 Non-Human Species Paper

The draft paper prepared by Dr Black, and including comments from Dr Joyner, was discussed. The following comments were provided:

- A Purpose section be included;
- The introduction be changed so as not to refer to “this Australian Standard”;
- In 9 change *heating* to *hearing*.
- In 10 the section on physical barriers is to be made more general;
- In 11 change *added heating* to *excess heating*; and
- A reference list is to be added.

Dr Black will complete the paper in line with these comments.

## 5.3 Regulatory Impact Statement

A regulatory impact statement (RIS) is required to be prepared in the development of all national codes and standards. An RIS must be agreed by the Office of regulation Review (ORR) as providing an adequate analysis of the costs and benefits of the draft standard and other options considered, and being consistent with the COAG *Principles and Guidelines for National Standard-setting and Regulatory Action by Ministerial Councils and Standard-setting Bodies* (Nov 1997). ORR had not yet agreed that the RIS was adequate, although only a few issues remained, and a table summarising these questions had been prepared for the working group by Mr (Luke?) Kumar of the ORR. In relation to the questions raised by ORR, the working group noted that the inclusion of the precautionary material was the major difference with the draft standard from ICNIRP, that most of the GSM world used ICNIRP, that there shouldn’t be an impact on importers except where the ARPANSA standard deviates from ICNIRP. The



Interim Australian Standard had some problems, and ~~that~~ tables outlining the differences in the standards was now included in the rationale. Mr Melbourne will provide Mr Kumar with the working group comments to enable him to complete the RIS. The final version as agreed by ORR will be circulated to the working group for information. It will be sent to all who made submissions on the draft standard and will be made available via the ARPANSA web site. Comment will be invited for a period of 4 weeks.

#### **5.4 Review of Action from Last Meeting**

##### **5.4.1 Contact Mr Leeson to seek further explanation**

Mr Bangay advised that he had contacted Mr Leeson and discussed the issues with him. Mr Leeson would like to see a Code of Practice for protection of workers around broadcast sites.

##### **5.4.2 Develop definition of "Point Contact" for Glossary**

Draft wording was modified during the meeting to be "Contact of a small area of the body, such as a fingertip, with an energised or passively charged conductive surface."

##### **5.4.3 Complete and Circulate Regulatory Impact Statement**

Mr Melbourne advised that there were still some queries from the Office of Regulation Review to be resolved before the RIS could be released for public consultation. A copy of the questions from ORR was tabled and discussed (see 5.3).

##### **5.4.4 Draft Response to Telstra on how "agreed" best practice is determined and arbitrated**

This action had not been completed, and would be completed by ARPANSA staff.

##### **5.4.5 Obtain advice from Telstra on use of Tissue characteristics spreadsheet**

This had been done and appropriate words to give acknowledgement would be included and the spreadsheet placed on the web site soon.

##### **5.4.6 Incorporate agreed changes from minutes & attachment A in draft**

Discussed under other agenda items.

##### **5.4.7 Complete Safety Factors Paper**

This paper required input from the working group to be finalised. Dr Black and ~~Mr~~Dr Anderson will complete the paper after the meeting.

##### **5.4.8 Complete Non-human Species Paper**

Had not been completed prior to meeting but to be discussed elsewhere in the agenda (see 5.2).

##### **5.4.9 Complete Table of Responses to Public Comment**

Completed and tabled.

##### **5.4.10 Contact ACA re Additional Definitions**

Completed. An email from ACA was tabled. Whether these definitions are needed would be discussed in discussion on the Glossary.

#### **6. OTHER BUSINESS**

##### **6.1 Cornelius re-draft for Section 3**

Mr Cornelius tabled a revised version Section 3 for consideration. An amended version provided by ~~Mr~~Dr Anderson was also tabled. A final version based on Vitas' draft was accepted using parts of each draft. The main changes were:

- Correcting the numbering of the equations;
- Using Wayne's first paragraph;
- Delete 3.5;
- Move last paragraph to end of 3.1;
- Sentence on coincident pulses to be included at end of 3.1; and
- Refer to particular equation numbers in 3.6 (and re-number to 3.5).

## **6.2 Healy comments on Section 5, Annex 7, Glossary & editorial corrections**

Ms Healy had provided two sets of comments from NOHSC. The first included a revised version of Section 5, some definitions for the Glossary and some revisions to Annex 7. The second was an email giving some specific comments and a range of editorial corrections. The working group considered the proposed changes and electronically accepted/rejected the changes during the meeting. In general, the working group accepted changes that improved the readability of the draft, but did not accept changes in areas where there had been considerable working group discussion and decisions at earlier meetings. The secretariat would examine the editorial corrections after the meeting and make appropriate changes.

## **6.3 Joyner email about Aware User**

Dr Joyner had forwarded an email pointing out a problem with the definition of aware user in the draft. The working group felt that amendments made to the definition during the meeting in response to other comments had resolved this issue.

## **7. CLOSURE AND NEXT MEETING**

It was not expected that there would be any further working group meetings as the draft would now be completed by inclusion of the agreed changes by the secretariat and the draft would then be forwarded to Radiation Health Committee for consideration.

**DRAFT SUMMARY OF  
BUSINESS WORKING GROUP TELECONFERENCE  
4 OCTOBER 2001**

Irrelevant



Released under FOI June 2018

- RF Standard
  - The final draft is to be distributed to RHC members after 12 October.
  - The RHC is to decide whether the draft is ready for consideration by Council subject to completion of the RIS process
  - ORR to advise;
    - whether the RIS consultation can be limited to parties who provided comments on the draft Standard or whether it needs another full public consultation process.
    - whether the RIS consultation should have the final Standard attached or not.
  - Wayne Cornelius' paper on the web comparing present and the new draft of the standard is to be provided to the RHC

Irrelevant









## 6.2 RF Standard

Mr Wayne Cornelius of ARPANSA's Non-Ionising Radiation Branch joined the meeting for this item.

The Radiation Health Committee reviewed the draft RF Standard dated 19 October 2001 as received from the working group.



The Committee noted and agreed with the precautionary statement at paragraph 5.3(e).

The Committee considered the letter of 23 October 2001 from Ms Dusanka Sabic on behalf of the National Occupational Health and Safety Commission, and:

- Accepted the changes suggested to clause 5.1.2, 5.6(v), 5.6(vi) and Annex 7;
- Did not accept the suggested change to clause 5.2 and 5.7 (ii);
- Agreed that a response be prepared to advise the Working Group that the RHC intends to accept the changes proposed by NOHSC (excepting those proposed for clause 5.2 and 5.7) and that the Working Group to provide any comment in the next 7 days; and
- Agreed to send a response to NOHSC advising of the Committee's decision with respect to the suggestions in their letter.

The Committee considered the letter of 24 October 2001 from Mr John Lincoln (a member of the working group) on behalf of Electromagnetic Radiation Alliance of Australia, and:

- Discussed the implications of the Adair data on human subjects;
- Noted that the issue of athermal effects was well treated by the working group and as set out in the draft RF Standard;
- Considered the issue of pulses and satisfied itself that the treatment in the RF Standard was appropriate;
- Were advised that additional explanatory material would be made available on the ARPANSA website;
- Discussed the increase in reference levels above approximately 450 MHz and satisfied itself that these levels were consistent with the basic restrictions;
- Were advised that a *Tissue Properties* spreadsheet was to be added to the ARPANSA website to explain the absorption of RF in different tissues; and
- Agreed that the Chair should respond to EMRAA on the basis of the above decisions.

The Committee also considered the letter of 22 October 2001 from Mr Dan Dwyer (a member of the Working Group) of the Telecommunication Officers Association, and:

- Noted that Mr Dwyer does not support the draft Standard;
- Agreed that the approach taken by the Working Group in commencing with the ICNIRP guidelines was appropriate as these represent the most authoritative international guidance;
- Agreed that the draft be reviewed to remove references to the Working Group in the Rationale and Annexes;
- Agreed that the CEO of ARPANSA respond to Mr Dwyer along the lines of the above.

The Committee noted the letter of 31 October 2001 from Dr David Black and agreed that the Chair would write to thank him for his comments.

The Committee noted other comments received on the draft RF Standard from the Department of Health and Human Services, Tasmania and Queensland Health and that, as they were mainly editorial in nature, these would be considered by the working group secretariat.

Following consideration of the draft standard and correspondence from members of the working group, the Committee recommended the following actions for the Working Group Secretariat:

- the removal of references to the working group throughout the document other than in the background section of the document;
- the addition of a sentence to the copyright statement indicating that updates to Internet links will be notified on the ARPANSA website; and
- deletion of the second paragraph after Table 12 in Schedule 1.

The Committee asked that the editorial changes be completed and recognised that the Standard could not be finalised until after the Regulatory Impact Statement process had been completed. The Committee asked to be provided with the report on RIS consultation, and recommended that, subject to any issues arising from the RIS process, the Standard should be forwarded to Radiation Health and Safety Advisory Council for their recommendation to the CEO.

Irrelevant





































## 7 RADIOFREQUENCY STANDARD – APPROVAL OF FINAL STANDARD

Dr Andrew Wood, member of RHC and member of the RF Standard working group, attended for this item. The CEO discussed the report tabled to brief Council on the process undertaken to develop the draft RF Standard, including the former Standards Australia process, the establishment of the working group and its meetings, public consultation, the differences with the former standard and with ICNIRP Guidelines, the key issues arising in working group discussions, the RHC process, the letters from working group members to RHC, and the regulatory impact statement (RIS) process. Dr Wood added that NZ did pass a Standard in 1999, when Standards Australia did not. All of the Standards are based on 4 W/kg, above which there may be concern. The differences arise in how to estimate local heating, even with a plane wave, and that there is now a clearer understanding of how Specific Absorption Rate (SAR) distribution in the body takes place. It was noted that even with 0.4 W/kg there can still be a factor of 25 higher in some parts of the body.

Dr Wood noted that the reference levels at some frequencies are now stricter than they were before, in some cases up to 10 times stricter. Dr Wood explained that reference levels were simpler to measure and confirm compliance, whereas the basic restrictions were the actual limits, but were expressed in quantities that were often difficult to measure directly.

Council suggested that as the Standard was a technical document, there was a need for a plain language guide describing the changes and their rationale to accompany the Standard. It was also noted that the RIS process had not been finalised and that Council would want to be satisfied that comment had been adequately addressed.

Council requested that the completed RIS report and the plain language guide be tabled at the next meeting.

Irrelevant







*RHC BUSINESS WORKING GROUP*

*MINUTES OF TELECONFERENCE  
2.00PM 7 FEBRUARY 2002*

Irrelevant



- Progress report on RF Standard
  - Editing has been completed
  - Office of Regulatory Review are considering the table of public comments and ARPANSA responses, and the revised RIS
    - A response from ORR is expected in the next week
  - A plain language guide requested by RHSAC is close to completion and will be circulated to RHC and RHSAC for comment
    - Given current timing the final RIS may not be ready until the March RHC meeting
  - ORR has requested further distinction between the option analysing the adoption of ICNIRP guidelines and that on adoption of the ARPANSA Standard
    - The plain language guide contains material that will help meet the request for further distinction
  - The ARPANSA webpage is to be updated.

Irrelevant



Released under FOI June 2018











#### 4.1 RF Standard

Dr Loy summarised progress on completion of the RF Standard.

Mr Jim Turnbull tabled the WHO report 'Establishing a Dialogue on Risks from Electromagnetic Fields' for the Committee's information.

The RHC noted:

- the outcome of the consultation process for the RF Standard Regulatory Impact Statement (RIS) and that the Office of Regulation Review had now agreed to the final RIS.
- the completion of responses and actions arising from the last meeting.
- the plain English guide to the Standard, which has been prepared in the form of Questions and Answers, will be released simultaneously with the Standard and will be available through the ARPANSA website.

The Committee:

- discussed the inclusion of a further reference in the Standard.
- agreed to include the reference and any other relevant papers in the ARPANSA website with the question and answer document.
- accepted Mr Turnbull's offer to provide the minutes of the New Zealand RF Review Committee to the Radiation Health Committee for information.
  - The New Zealand review Committee has agency, community, medical research and oncology representatives.
  - The Business Working Group will review the minutes of the New Zealand Committee before deciding whether to pass them on to the Radiation Health Committee.
- Noted Mr Potapof's comment that the RIS did not meet NSW requirements.
- Discussed the AHMC uniformity decision with respect to the issues resolution process agreed to at the August 1999 AHMC meeting.
  - The Secretariat was requested to forward a copy of the Australian Health Minister's Conference decision and issues resolution paper to the Committee
- Noted that any comments from Committee members the question and answer document would be welcome and that they are to be provided to Mr Alan Melbourne.

The Committee agreed that the Standard is suitable for publication and that it should now be forwarded to the Radiation Health and Safety Advisory Council for its recommendation to the CEO of ARPANSA.







































## 6 RADIOFREQUENCY STANDARD - ADVICE ON ADOPTION OF STANDARD

Council discussed the final version of the RF Standard, and noted the completion of the Regulatory Impact Statement (RIS) process, and the development of a plain language question and answer guide (Q & A Guide) to be published at the same time as the Standard. Council made recommendations for some further editing of the Q & A Guide, and recommended that it be reviewed and edited to simplify the language wherever possible. Ms Plues, although not attending the meeting, had forwarded comments on the Standard and the regulatory impact statement (see attachment), which were considered by Council.

Council noted that the appropriate processes and procedures had been followed, and advised the CEO that he might consider adoption of the Standard, while noting comment from Ms Plues that the RIS did not meet NSW requirements, and from Dr Smith who had reservations about the wording of the precautionary statement in the plain language guide. Dr Smith would provide suggested wording for a paragraph to be included in the guide on this issue.

Council was also provided with a copy of the Australian Communications Industry Forum (ACIF) Code of Practice, which had recently been made available via the ACIF web site.

Irrelevant

Released under FOI June 2018









## ATTACHMENT - LORRAINE PLUES COMMENTS

### Agenda Item 6.1 - Draft RF Standard

Lorraine Plues advised that if the draft standard is published without a quantitative regulatory impact statement it will not be suitable for adoption on the National Directory for Radiation Protection.

Should ARPANSA publish the document, any reference to 'approved by the Radiation Health Committee' and the 'Radiation Health and Safety Advisory Council advised the CEO to adopt..' should be removed. NSW representatives on each committee do not support the Regulatory Impact Statement. These statements are only appropriate for the adoption of documents on to the National Directory and it is premature to have them on this standard. More appropriate words may be 'developed by the Radiation Health Committee' [See ARPANS Act 1998, section 23 (1) (b)]. Both these committees are advisory only and do not have majority decision approving powers under the ARPANS Act. Decisions have to be reached by consensus and differing opinions have to go forward.

Irrelevant















Irrelevant

Released under FOI June 2018

#### **15.4 Feedback on RF Standard**

Council asked whether ARPANSA had received feedback on the RF Standard and the accompanying Explanatory Guide. A report on feedback will be prepared for the next agenda.

Irrelevant



















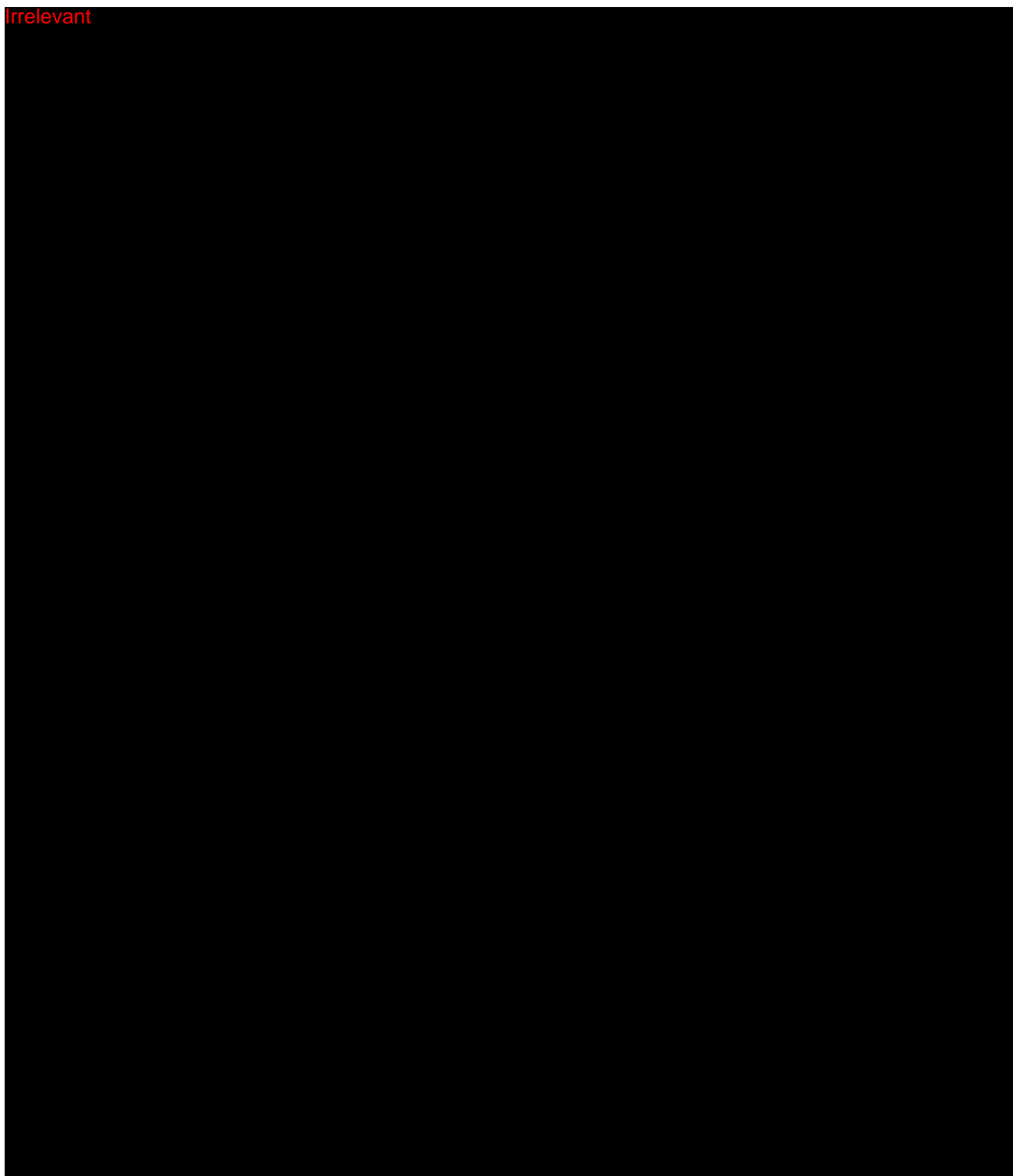












### **3.5 Report from National Uniformity Implementation Panel (Radiation Control) including National Directory for Radiation Protection**

The report from the NUIP(RC) highlighted potential implementation issues for *Radiation Protection Series 3 Radiation Protection Standard – Maximum exposure levels to radiofrequency fields – 3kHz to 300 GHz*. Members were advised that responsibility for the application of the Standard where there are multiple transmitters on a third party's premises requires clarification.

Members were advised that it is expected that the next version of the National Directory will be available for consideration by the Committee at the November 2005 meeting. Mr Melbourne advised that the AHMAC had confirmed that the additional quantitative analysis undertaken met all jurisdictions' requirements and that Ministers are to be advised by AHMAC that the National Directory is ready for adoption and implementation in all jurisdictions.

Irrelevant

































Irrelevant

### **3.5 Report from National Uniformity Implementation Panel (Radiation Control)**

The Committee briefly discussed the implementation of RPS3 from the NUIP(RC) agenda and noted that regulators were awaiting responses to letters sent to Workcover agencies in relation to the matter.

The Committee noted that the experience of implementing RPS3 demonstrated some of the issues that putting an entry in the National Directory where there is no regulatory system in place to support its operation could have, and agreed that discussion of the implementation of RPS3 continue on the RHC agenda.

Irrelevant













Irrelevant

### 2.1.2 Implementation of RF Standard

Mr Melbourne presented a summary of the action taken by each jurisdiction regarding the implementation of ARPANSA Radiation Protection Series (RPS) No. 3, *Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields - 3 kHz to 300 GHz (2002)*, and asked the Committee to decide whether further action was required on the issue. The Committee requested that the ACT and Victoria send, and SA resend, the letter regarding the implementation of the RF Standard to their respective Workcover Authority and advise the Secretariat of the outcome.

Irrelevant

Released under FOI June 2018

































Irrelevant



## **2.11 Discussion paper on a process for review of the RF Standard**

Dr Colin Roy, Manager of ARPANSA's NIR Branch, presented a paper proposing that a working group be established to assess whether the scientific basis underpinning ARPANSA RPS 3 is still current and whether the derivation of the exposure levels in the RF Standard is therefore still valid. Dr Roy informed the Committee that it was now more than five years since the RF Standard was published and ARPANSA had received a number of queries as to whether the RF Standard is still current. He advised the Committee that there had been several major international research programs and reviews and that the final report of the 13 country Interphone Study was expected in early 2008.

Dr Roy proposed that a small working group, comprising ARPANSA staff and a couple of external members, be established to undertake a preliminary assessment of the current science relevant to RPS 3. The Committee agreed to this proposal and asked for a report to be prepared for the March 2008 RHC meeting recommending whether a formal review of RPS 3 be undertaken. The timing of the report would, however, depend on the report of the Interphone Study.

Irrelevant





























#### **2.4 RPS 3, RF Exposure Standard – review of current literature and updated risk assessment**

Dr Lindsay Martin, Acting Director of ARPANSA's Non-Ionizing Radiation Branch, informed the Committee of the progress on ARPANSA's review of the scientific literature related to radiofrequency (RF) electromagnetic radiation (EMR) and health. ARPANSA had commenced cataloguing and collecting copies of relevant primary research papers published since 2000 and had completed an internal review of the 167 epidemiological research papers. Dr Martin advised the Committee that ARPANSA intended to establish a small working group of experts to assess the collected literature, including the results of the multinational Interphone study. The working group would report to RHC in late 2010 or early 2011 on the results of the review and also on whether there will be a need to review or modify the Annexes in RPS 3. Dr Martin noted that regardless of the working group's recommendation, it was expected that the annexes of RPS 3 dealing with the scientific research would be updated to include 2000 - 2010 research and may be published separately, or incorporated into a revised RPS 3 if this was deemed necessary. Dr Martin mentioned that the International Agency for Research on Cancer (IARC) will be informing Member States of the Interphone study a week before publication and that the World Health Organisation (WHO) will publish a monograph on RF as part of the Environmental Health Criteria publication series.

**The Committee endorsed** the proposed plan of action and **asked Dr Martin** to seek further information on the “Radio Frequency Assisted Lipoplasty” procedure, which will be a session of the COSMETEX Conference to be held in Adelaide on 21-24 April 2010.

Irrelevant

































## 9.2. Roadmap for revision of Radiation Protection Series No 3

Dr Solomon provided an update on the roadmap for revision of the document Radiation Protection Series No. 3 *Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields – 3 kHz to 300 GHz (2002)* (RPS3). The RHC discussed the roadmap at the November 2013 meeting and agreed that RPS3 currently provides an adequate standard until international documents are updated. ARPANSA will continue to monitor the publications expected for delivery during mid-late 2014. This includes a monograph by the World Health Organization (WHO) on RF and the revised ICNIRP guideline. ARPANSA and the RHC will consider the integration of the RPS3 revision into their work plans during 2014 after publication of these documents. Commencement of work is not expected until end of 2014 or early 2015. Dr Solomon advised that the RF review tabled at the August meeting had now gone through final editing and would be published as an ARPANSA technical report during the first quarter of 2014.

Council were advised that the main meeting of ICNIRP is planned to be held in Australia in 2014 and that this would provide a good opportunity for communication and consultation with respect to RF exposures in Australia. ARPANSA is currently planning a national RF Forum to coincide with the ICNIRP meeting.

Em Prof Lowe noted that it was reassuring that ARPANSA is committed to these documents and keeping up to date on the science. He also supported the view that if a document similar to the *Fundamentals for Protection Against Ionising Radiation* is developed for 'non-ionising' radiation, then it is appropriate to split up the types of non-ionising radiation.

Council agreed with the proposed process for revising RPS3, supported the communication and management plan for advising the public on these matters and looked forward to receiving updates.





















Irrelevant

**Item 3.9****RF Research Report**

The Committee noted the draft report and acknowledged the contribution of the experts who worked on it.

The report concludes that RPS3 continues to provide an adequate level of protection to the public however the quantum of the safety factor has been reduced on the basis of improved knowledge. A proposal to revise RPS3 will be put to the next meeting. The Committee requested that, given his expertise in the area, Dr Andrew Kerans be approached to undertake the role of project manager for the revision project.

This subject is of significant public interest and explanatory material will be released with the RF Research Report later in March.

**ACTION 20: Approach Dr Kerans to undertake the role of Project Manager for the revision of RPS3 [KB/ARPANSA (NU)]**

**ACTION 21: Prepare PDP including a 21 Step Workplan for revision of RPS3 for June meeting [ARPANSA (RHS)]**

**Item 3.10**

(See Item 2.7)

**4. OTHER BUSINESS****Joint Convention**

ARPANSA will shortly write to all jurisdictions to provide their current waste inventory to ARPANSA to assist in the national reporting requirements under the Joint Convention.

**Australian Clinical Dosimetry Service (ACDS)**

The Committee noted the ACDS workshop being held on 6 March 2014.

<b>Close</b>	1600
<b>Next meeting</b>	0930, 25 June 2014, ARPANSA Miranda Office



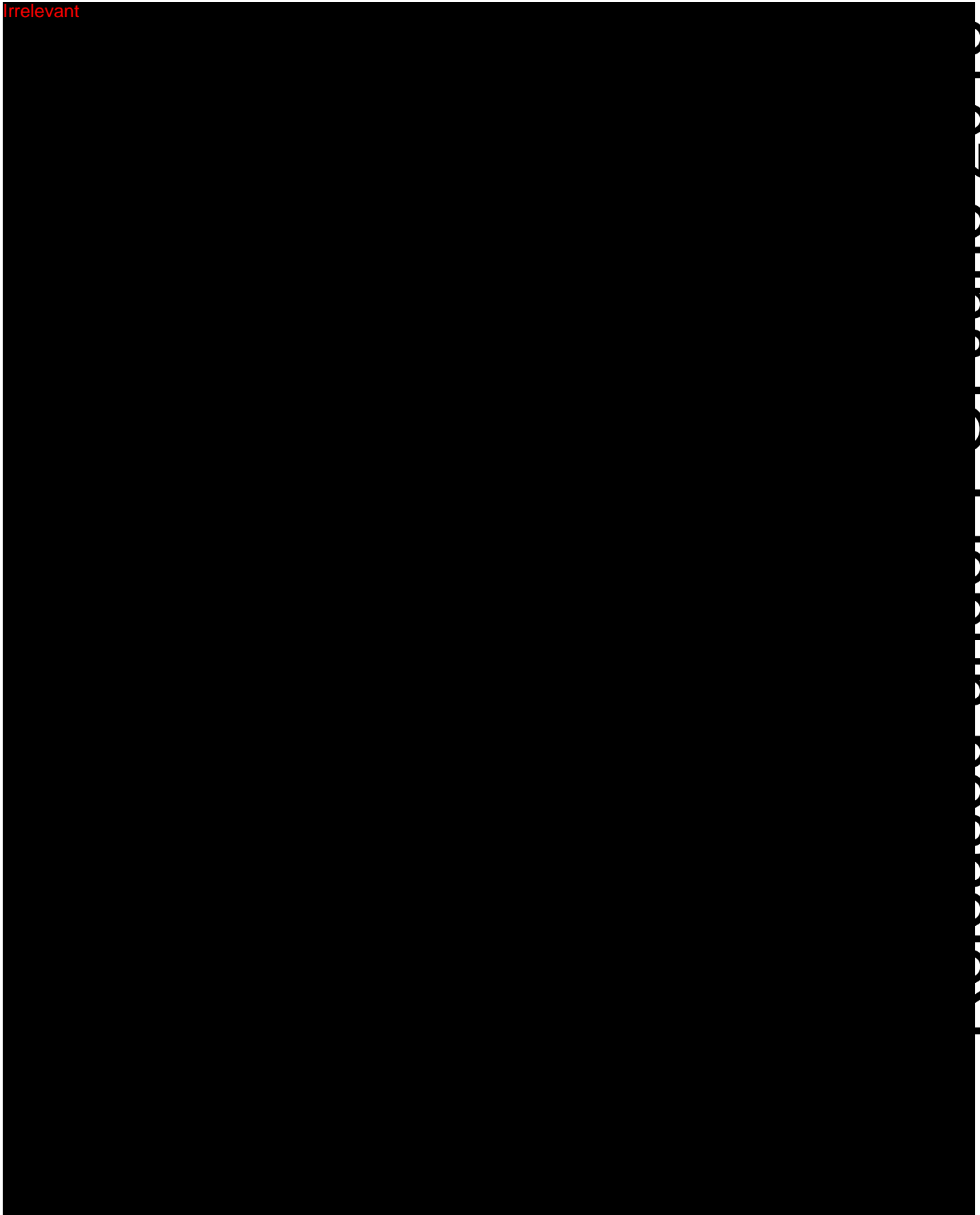


**Australian Government**

**Radiation Health and Safety Advisory Council**

**SUMMARY OF THE MEETING HELD ON 13-14 NOVEMBER 2014**

Irrelevant



Irrelevant

**Update on ARPANSA's review of RPS3 (Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields – 3 kHz to 300 GHz)**

Members were updated on ARPANSA's current activities in relation to non-ionising radiation research, services and advice, and on emerging issues in this area. Members were also advised of the outcome of an expert panel review of RPS3, which found that while RPS3 remains fit for purpose there are opportunities for improvement. RHC and ARPANSA have committed to begin reviewing RPS3 in 2015.

Irrelevant

Released under FOI June 2010











Irrelevant



#### 2.3.2c Proposed Addendum to Schedule 5 of RPS 3

Author: Ken Karipidis

Dr Karipidis outlined the limitation of Schedule 5 in RPS3 and informed the Committee that the Australian Communications and Media Authority has requested it be amended to increase the frequency range.

In response to a question about consequences of the proposed change, Dr Karipidis confirmed that the change is a compliance issue rather than a health issue. Dr Larsson questioned the consequences of the changes. ARPANSA is to undertake an assessment and produce a report for the RHC.

**ACTION 11: Investigate the consequences of the proposed changes in Schedule 5 of RPS3 and produce a report for the RHC [RHS]**

Irrelevant













Irrelevant



*Revision of RPS 3*

PM: TBA

A project manager is yet to be appointed.

Irrelevant













UNCLASSIFIED

**Australian Government**  
**Radiation Health Committee**

**MINUTES**

Date:

18 November 2015

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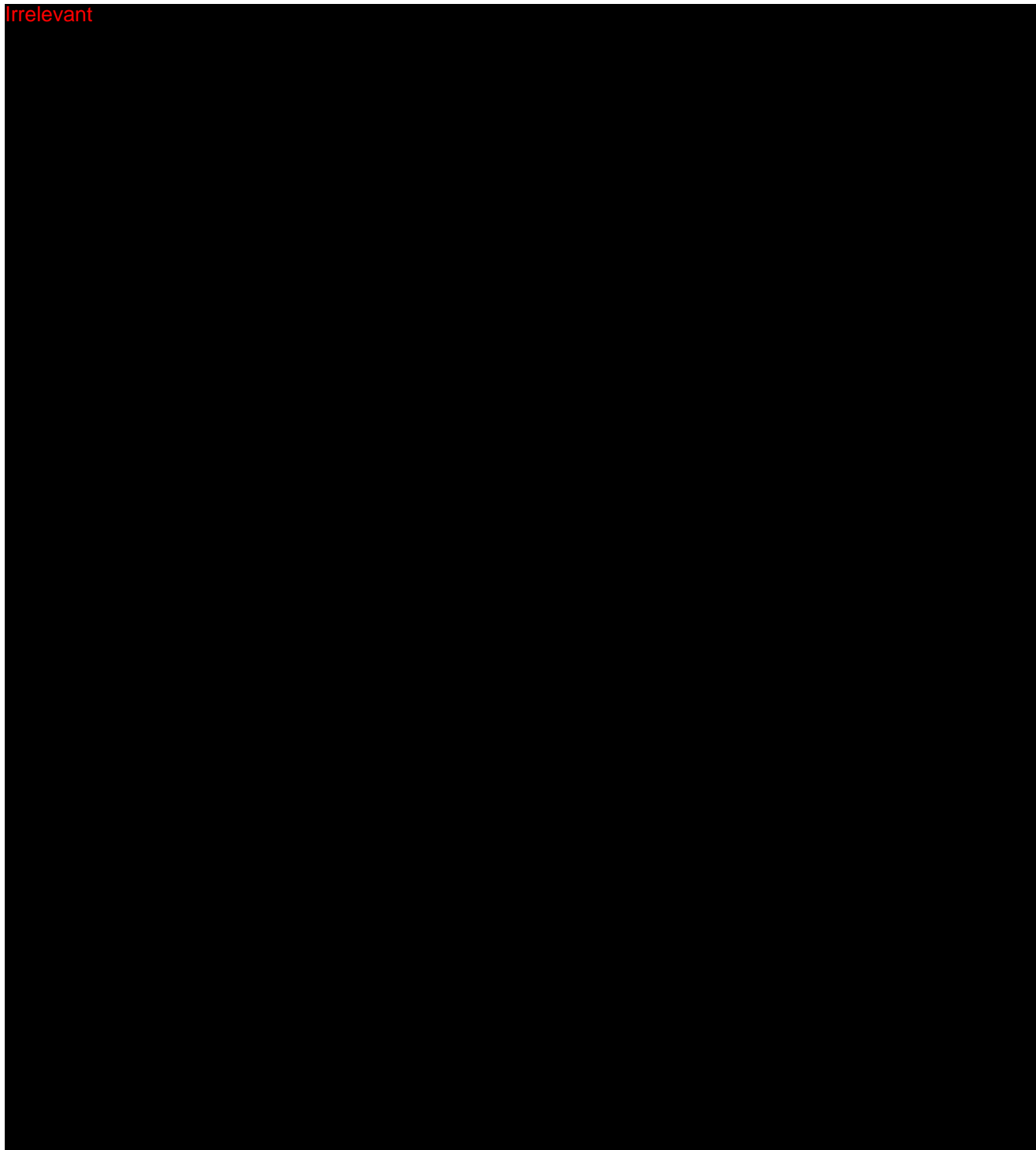
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Released under FOI June 2018





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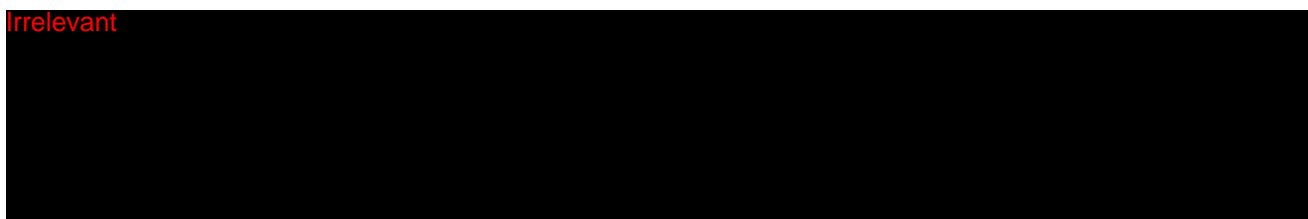
**Item 3.4 RPS 3 Schedule 5**

**Peter Colgan/Ken Karipidis**

The Committee considered the changes made in response to comments from the Tasmanian Radiation Advisory Council and the Australian Communications and Media Authority (ACMA), and agreed to the proposed amendment of Schedule 5 of RPS3. A preliminary assessment must now be prepared for the OBPR.

**ACTION 15: Complete preliminary assessment and submit to OBPR (KK/RA)**

Irrelevant







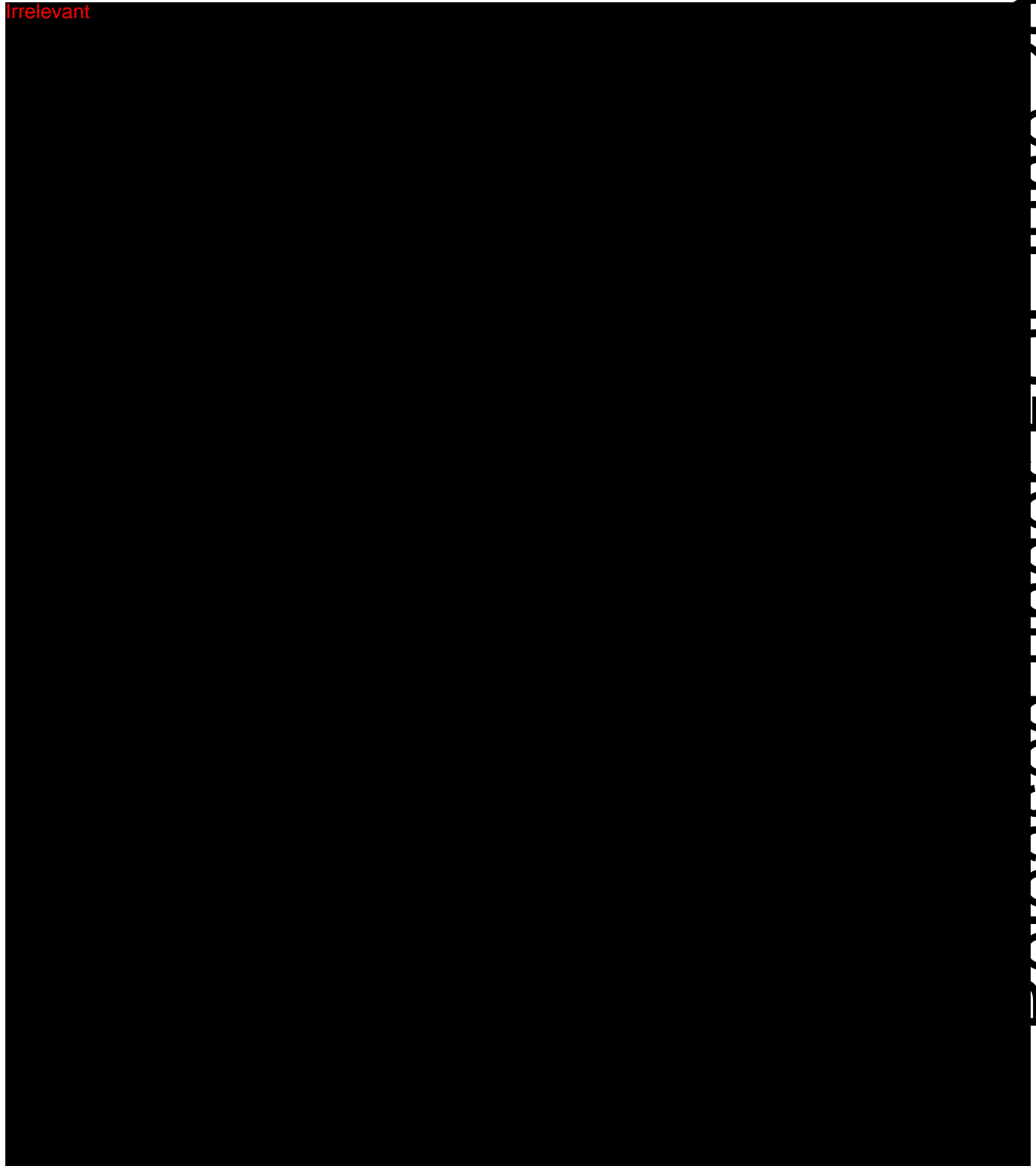
Australian Government  
Radiation Health Committee

Radiation Health Committee

MINUTES

Date:	15 June 2016
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CONFIRMED

Released under FOI June 2018





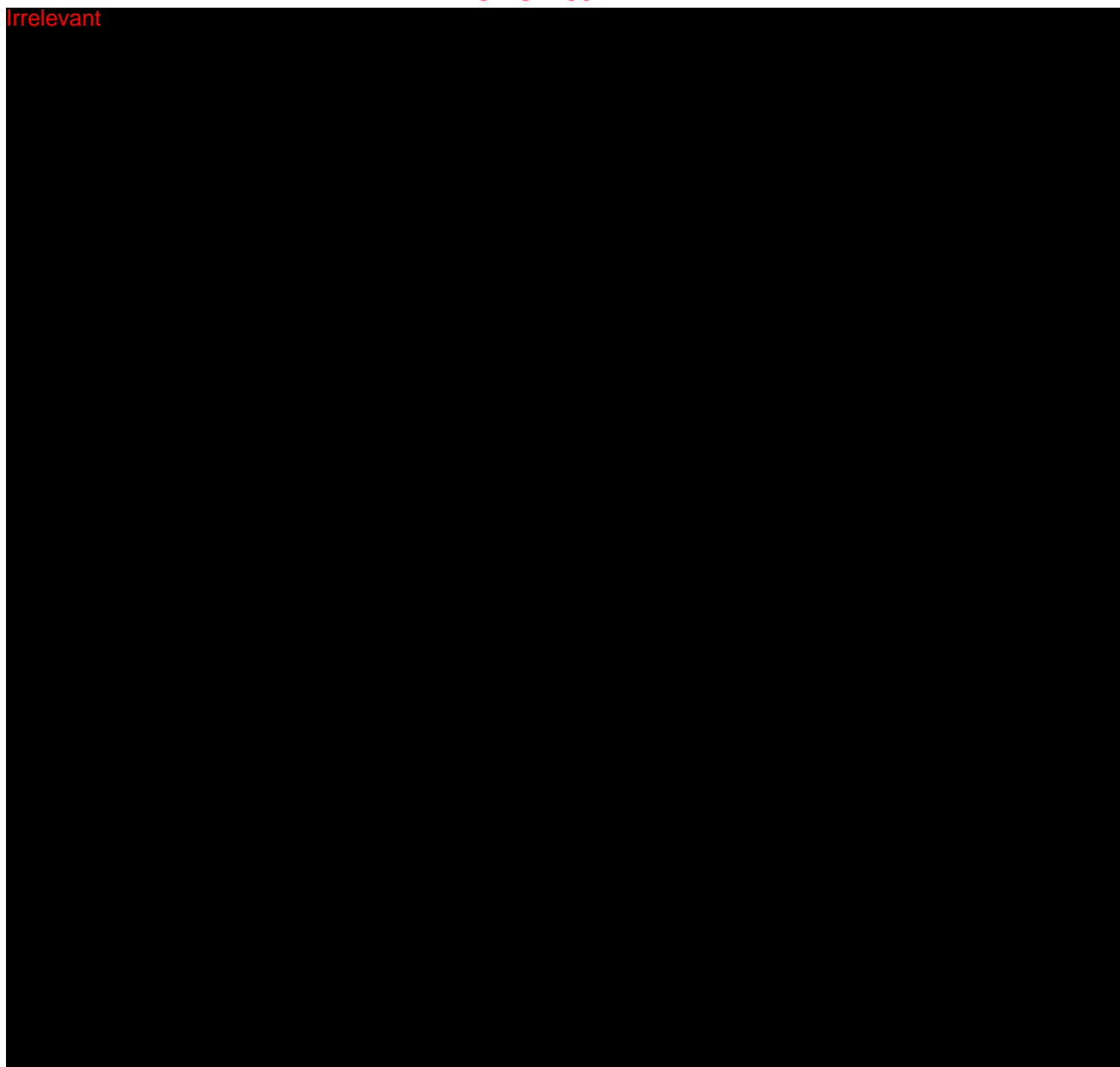








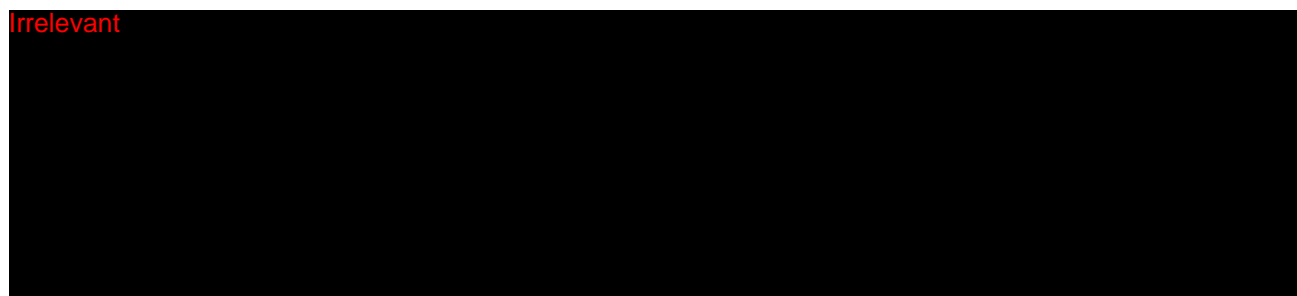
Irrelevant



Item 3.11      Public concerns regarding the suitability of RPS3 with      Dr Cassels  
reference to smart meters

A submission was tabled seeking RHC support for making a more definitive statement, in conjunction with Australian Communications and Media Authority (ACMA), advising publicly that the collection of devices operating in the RF communications sector do not present any significant exposure by virtue of the small percentage of the standard that persons are exposed to. The recent ARPANSA Study over the greater Melbourne metro area has confirmed this via direct measurement, however RHC Members stated their function is not to promote any form of technology and this does not fall within the purview of the RHC.

Irrelevant







UNCLASSIFIED

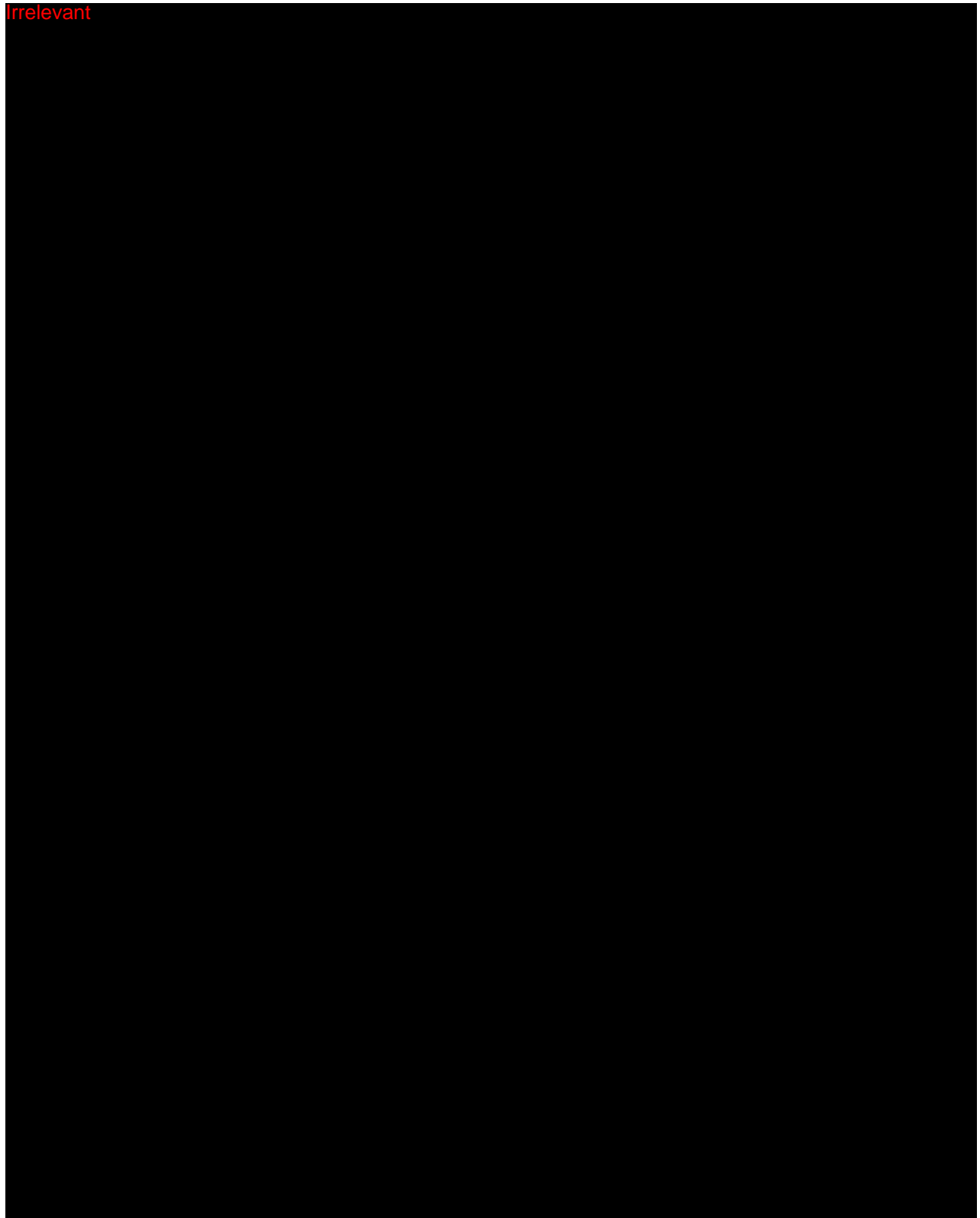
Australian Government  
Radiation Health Committee

Radiation Health Committee

MINUTES

Date:	16 November 2016
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Irrelevant



CONFIRMED

Released under FOI June 2018













Irrelevant

## Item 3.8

## Review of RPS3

Dr Tinker

Dr Tinker advised the Committee that ARPANSA is planning a review of the RF Standard (RPS 3) following the publication of the revised ICNIRP Guidelines and the WHO scientific review. The ICNIRP and WHO reviews are not expected to be published until late 2017.

It is proposed that the RPS 3 is published as an ARPANSA code and aligned with ICNIRP Guidelines using a risk-informed, evidence-based approach. A working group will be established with members from government, industry and the community to review how workers and the public are protected. Once drafted the preliminary assessment will be forwarded to OBPR to seek advice on whether a RIS is required.

Dr Hocking provided a document titled 'Definition of Occupational Exposure' which was drafted after consideration of Agenda Items 1.4, 3.3, 3.8 and 4.4 and noted the following:

- There needs be a logical and consistent definition of 'occupational exposure'
- There should be a distinction between 'public' and 'occupational exposure levels'
- RF workers should be aware of their exposure and potential hazards
- RF exposure of pregnant workers should be within public exposure levels

The Committee agreed to the appointment of Dr Hocking as sponsor for this project. The Committee agreed to set up a working group to prepare the protection section.

**Action 18: Progress to be reported at next RHC meeting (GH/RT)**

Irrelevant

CONFIRMED

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Irrelevant



**Item 3.8      Review of RPS 3**

**Mr Hocking**

Mr Hocking (Project manager) briefed members that he was working with ARPANSA staff to ensure that international developments including International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines are taken into account. A working group will be formed in the next few months with representation from representative stakeholders.

**Action 13: Progress work on review of RPS 3.**

Irrelevant

















Item 3.8    **Review of RPS 3****Dr Hocking**

Dr Hocking provided Members with a verbal update on the review of RPS 3, *Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields – 3 kHz to 300 GHz (2002)*. The Members noted that the International Commission on Non-Ionizing Radiation Protection (ICNIRP) is currently updating its guidance and it may take some time for this to be finalised. The Committee suggested that a concept draft of a revised RPS 3 could be developed that may influence the ICNIRP draft regarding occupational aspects that lacked clarity in the past.

**Action 11: The Working Group to develop a concept draft RPS3 for viewing at the next RHC in November.**

Irrelevant



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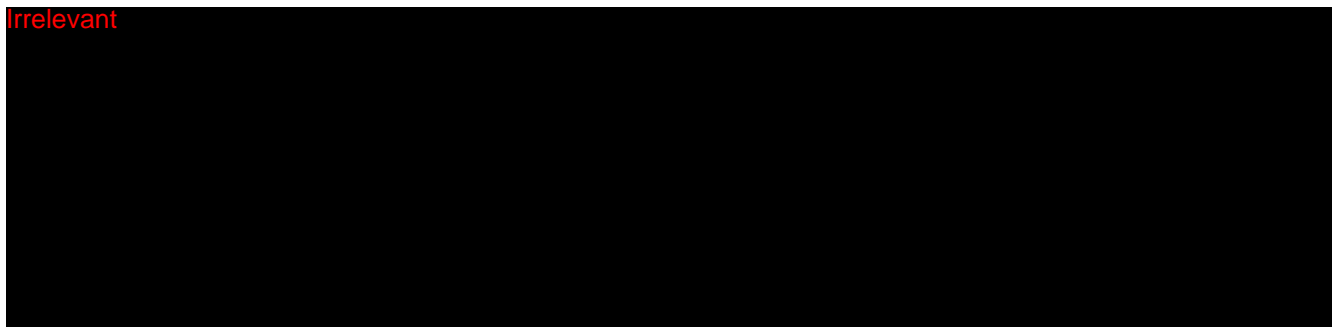








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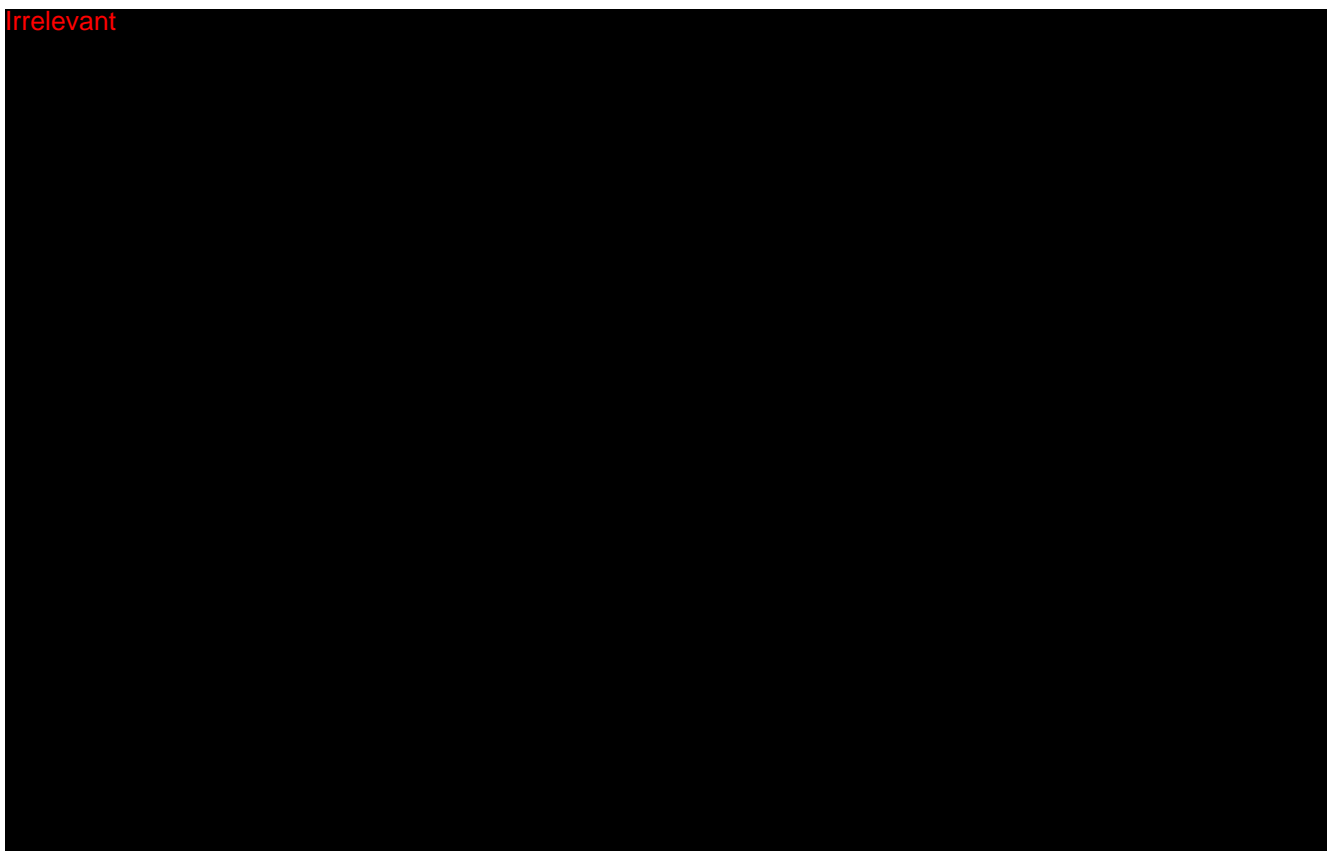
Item 3.4 **Review of RPS 3****Dr Hocking**

Dr Hocking provided an update on the progress of the concept draft of the revised RPS 3. It was agreed that the revision of the document be continued noting that the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines will be published in mid-2018. In addition, Dr Hocking informed the members that in the past the ICNIRP glossary had been less than clear regarding the applications of occupational and community exposure limits, and that this development in Australia may be a constructive contribution to the new guidelines. Dr Larsson invited members to consider the 'Fundamentals' as a way to move forward regarding justification and optimisation of exposures. It was agreed that members would provide feedback by February 2018 out of session.

**Action 16: Members to provide feedback on the concept draft by February 2018.**

**Action17: The working group to review and revise the suspended existing draft "Fundamentals in Non-Ionising Radiation" for the RHC to consider in 2018.**

Irrelevant





















Irrelevant

Item 3.4      **Review of RPS3**

**Mr Hocking**

Dr Hocking provided an update on the review of RPS3 and advised that no further comments have been received on the revised concept draft. Dr Hocking advised that they are currently waiting for the revised ICNIRP guidelines to be published around June 2018 for public comment so its exposure limits can be considered for use in the concept draft. Dr Tinker advised the Members that there has been no progress on revising the suspended draft “Fundamentals in Non-Ionising Radiation” due to resource restrictions.

The Members noted the current status of the RPS3 review.

**Action 15: Providing the Fundamental Principles as philosophy document is published, the Working Group will aim to have draft RPS3 document ready for the November 2018 RHC meeting.**

**Action 16: The Working Group will aim to have a mature draft of “Fundamentals in Non-Ionising Radiation” ready for the November 2018 RHS meeting.**

Irrelevant

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