DRAFT STANDARD
PUBLIC COMMENT

Specific Comments

Line	Subm.	Specific Comment	WG Action
9, 10	003, 056	Semicolon missing at the end of line.	Change to be made in the draft.
23-29	005	The logic here is reasonable, but why hasn't this logic also been applied to data regarding bio-effects and health effects at exposure levels ABOVE the reference levels? Surely the standard shouldn't imply that these data are complete? That would be incorrect and misleading.	To include "and inconsistent" at the end of the sentence at [27] in the draft.
24-29	058	This statement alone would support the inclusion of a precautionary approach to RFR up-front in the body of the standard. How this can be omitted on any public or occupational health and safety grounds is difficult to conceive.	No change. "concern" doesn't necessarily imply the inclusion of a precautionary approach.
39-42, 863-865	058	This statement appears to conflict with the spirit, if not the letter, of the employer's duty of care under occupational health and safety law.	Sentence at [39-42] to be deleted and replaced by: "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."
139-183	057	Section 1.1: Background Comment –move this section (to Foreword/Annex), as it does not form part of the standard.	No change. The draft follows the ARPANSA template for standards.
143	003,056, 061	Change "electromagnetic" to "radiofrequency".	Change to be made in the draft.
175-178	028	The document refers to the application of Codes of Practice. However, these are highly uncertain. At present, the only Code to have been initiated is the ACIF Code which community representatives have stated they will not endorse unless the Federal Government amends the Low Impact Determination. Even if the ACIF Code is adopted, it applies only to telecommunications infrastructure and not handsets. The draft standard must not rely on codes of practice to address matters of precaution. It must do so, itself.	The RHC will be advised if there is a need for additional codes.
176	062	Delete "communications industry" and insert "siting of mobile telephone towers"	"communications industry" to be replaced by "telecommunications industry"
180-183	028	The final draft of the TE/7 Committee was an inappropriate starting point for this standard, as it was not endorsed by that committee.	No change. The Working Group disagrees.

189	003, 056, 057	Change “adverse effects” to “adverse health effects”.	Change to be made in the draft.
206	03	Replace “guidance on health surveillance” with “a questionnaire for discovering potential problems with the placement of occupationally exposed personnel” (see lines 4530-4533).	No change.
206	057	Delete “guidance on health surveillance”, as health surveillance is not required or referred to elsewhere in this standard.	No change.
208-209	057	Delete or move, as doesn’t relate to “purpose’.	[208-209] to be deleted
235-239	057	Refers to “specific additional precautions against RF burns or shock may be required - see Section 5.1” – however, 5.1 does not provide sufficient information on this issue, and there is some inconsistency between these parts. Perhaps more specific guidance should be provided in 5.1 in relation to controls for burns and shock.	Changes made to Section 5.1 by dividing it into further subsections ie: 5.1.1 Risk Management Process 5.1.2 Control Prioritization 5.1.3 Training and Supervision 5.1.4 Medical Assessment 5.1.5 Notification of Competent Authorities 5.1.6 Assessment of Reference Levels
241-274	057	Section 1.4: Structure Add Schedules 1-5 and brief description to this section – suggest move [290-296] to this section.	[290-296] to be duplicated and placed at [266] in the draft.
256-258	062	Delete "In recognition that certain classes ……. in excess of the basic restrictions" This is not a proven fact.	No change. Not an exemption from the limits but from SAR testing.
259	003	Delete “operated by aware users and others”.	Change to be made in the draft.
278-285	056	This section outlines the difference in meaning between “should” and “must” for the purposes of the standard, and the mandatory or advisory status of the schedules and annexes. In regard to the interpretation of “should”, the text of this section advises that “…the word “should” may be assumed to summarise agreed best practice…”. Telstra requests clarification on whether “agreed” means agreed by the ARPANSA working committee, agreed by the government or regulator, agreed by general consensus in the industry, or agreed in some other sense.	[284-285] to be deleted from the draft
287	013	This sentence negates the usefulness of having a single keyword for mandatory requirements. Perhaps a table could be included into the document detailing sections/line numbers which have content regarding the RF broadcaster’s/producer’s obligations wrt RADHAZ.	[287-288] to be deleted from the draft.
290-301	057	The distinction between Schedules and Annexes is not clear. In particular, “Schedule 1 – Rationale” appears to provide background or supplementary information, not information integral to the standard – as such should be an Annex; while Annex 7 – should be a Schedule. It is recommended that the document clearly distinguish between the requirements of the standard, and background/supplementary information eg 2 separate parts, colour differentiation etc	No change.
306-	057	Section 2.1 Application (and also 5. Protection, Glossary, Schedule 5and Annex 7)	Already covered in the general comments

321		The proposal and associated arguments/rationale for an occupational exposure level set at 5 times above the public exposure limit are not acceptable or justifiable. The standard does not provide sufficient guidance on the application of the 'occupational" and "general public" exposure limits, to all groups of employees including for example - employees using mobile phones or 2-way radios, RF welder operators, maintenance workers, cleaners, "aware users" (see Schedule 5), radiocommunications and radiofrequency workers and "employees who will be occupationally exposed to RF levels in excess of non-occupational levels" and "employee in RF work" (see Annex 7). Similarly, it is not clear to which employees Annex 7 applies.	table.
307-311	056	If the definition of occupational and general public exposures is not related to potential exposure in the work place but rather with the level of control over exposure that is exercised, then perhaps the terms "controlled" and "un-controlled" would be more appropriate and less ambiguous (these terms are used in the IEEE standards and therefore have some precedence).	Same as above.
313-321	005	What is the evidential basis for the additional non-occupational safety factor of 5. Why 5, rather than 100 or any other number?	No change. Five is a practical safety factor.
319-321	062	Delete "Such considerations …… exposed population"	No change.
320-321	028	This sentence is inappropriate, given that the draft provides no greater protection for the general public than occupational workers.	No change.
337-338	057	The sentence beginning with 'Nevertheless' does not make sense, and requires further clarification.	No change.
347	003, 056	Table 1, rows 6 and 7: Replace "E, H or power flux density" with "E and/or H". Power flux density is not a reference level.	Changed to "equivalent power flux density" in the draft.
347	013	The use of and/or is confusing. Perhaps there could be a note about this below the table.	A note explaining the use of "and/or" to be inserted in the draft.
352	024	Table 6 & 7 contain a summary of tables 2, 3, 4 & 5 and should be included in this line.	No change.
381	003, 056, 061	Change "SARto" to "SAR to".	Change to be made in the draft.
385	003, 056	Change "instantaneous time averaged" to "instantaneous and time averaged".	Change to be made in the draft.
388, 397, 408, 429	034	Like to see a note under each maximum exposure level table along the following lines: Note: The levels stated here are based on the best currently available scientific data, however a precautionary approach is always recommended in these areas as outlined in Annex 6.	No change.
388	062	If the spatial peak values are to be accepted we need a substantial explanation in the Rationale as to our confidence in these figures.	Refer to general comments table.
394	003	Replace Note 1 with "The measured or calculated SAR exposure level should be averaged over any six minute period for comparison with the limits in Table 2."	To be replaced with "The measured or calculated SAR exposure level should be averaged over any six minute exposure period that may be reasonably expected

			for comparison with the limits in Table 2."
407	003	Add the following sentence, "It is recognised that it is generally not practical to measure RF fields over such a short averaging time and that an estimate can be obtained through knowledge of the temporal characteristics of each specific source."	Change to be made in the draft.
408-428	023	Table 4 'Basic Restrictions for Instantaneous Spatial Peak Current density in the Head and Trunk' should be expanded to cover the arms, hands, legs and feet (ie. the extremities). There are no current limit levels specified for the extremities. In practical cases, exposures are centred on the hands and forearms. The locations of the hands with respect to the source are precisely located. It will therefore be possible to take measurements at these locations. It would be helpful if the Table could specifically identify the induced current levels that apply.	No change. Refer to general comments table.
429, 547, 397	035	Relative to temporal peak limits: In Tables 5 and 7, ARPANSA specifies for microwave frequencies that rms values of E and H are to be time-averaged over any 1μsec period—which is quite different than "pulse width." Also, in Table 3, ARPANSA introduces a limit on "instantaneous" peak SAR in the head and the trunk, as averaged over any 1μsec period—while ICNIRP does not specify such a limit. In both cases, there is a significant modification of ICNIRP'98 but no scientific rationale.	This was too overcome the situation where there was a reference level without a corresponding basic restriction. No change.
439	061	Full stop needed at the end of the sentence.	Change to be made in the draft.
450	013	This title is confusing, as it would seem at first glance to address all the reference levels especially since line 494 talks about RF shocks. Then the technical content of section 2.5 and 2.6 negates this.	No change. Refer to the Rationale under the heading "Reference levels"
450-515	053	2.4 Reference Levels The text would benefit from inclusion of a clear statement or advice of the need (or otherwise) to measure both instantaneous E and/or H and instantaneous contact current reference levels in order to show compliance in the frequency range 3kHz to 10 MHz.	No change in the draft. Clarification will be provided in additional (to the standard) material.
450-585	023	The basic restrictions are expressed in terms of unmeasurable quantities; these are induced current densities in the human body. Section 2,4 suggests a method for estimating current density levels if the first derivative of the magnetic field can be measured. It is practical to measure this derivative using a search coil and a CRO /spectrum analyser. However, the conductivity to be used is problematical. Whilst reference books are available that estimate human tissue conductivity, there is a wide range of values given depending on tissue type. If the application of **basic restrictions** is to be practical in a case-by-case assessment of machines, a more specific instruction is needed to guide the measurement. I recommend that an additional normative section be provided that gives instructions on the procedures to be adopted to estimate induced body currents in a practical case. This section should specify the conductivity (ies) to be used and the location of measurement points with respect to the human workspace.	Refer to general comments table. Tissue characteristics table will be provided on the web.
452	003, 056	Add the following words to the end of the sentence, "to ambient electric (E) and magnetic (H) fields."	"to ambient electric and magnetic fields." to be added to the end of the sentence.
453	003, 056	Replace "the reference levels" with "the corresponding reference levels".	Change to be made in the draft.
458-	003	Replace this paragraph with the following: " The E and H reference levels have been derived from the	Change to be made in the draft.

465		basic restrictions by mathematical modelling and laboratory investigations. They are given for the condition of maximum coupling of the field to the exposed individual for all circumstances, and therefore are generally more conservative than the corresponding basic restrictions. An excellent public information resource for RF dosimetry is available from the following US Air Force web site: http://www.brooks.af.mil/AFRL/HED/hedr/dosimetry.html ".	
461	061	Close bracket.	Not relevant due to change above.
484	003, 056, 061	Insert a minus sign in front of the integral.	Change to be made in the draft.
508	061	missing "≈" ie should be: "E/H = 376.7 ohms ≈ 377 ohms".	Change to be made in the draft.
511	003	Replace "approximation" with "estimate".	Change to be made in the draft.
513	013	Is "less conservative" the right term to use. The text reads as if a "less conservative" method is the best practice. Perhaps it should read "For a more accurate assessment" rather than "less conservative"?	Change to be made in the draft.
517	003, 056	Table 6, row 1: Replace "W/m2" with "W/m²"	Change to be made in the draft.
517	034	Would like to see for Notes 5 & 6 under Table 6 and for Notes 4 & 5 under Table 7 something added along the following lines: "For personal safety, it is acceptable to use measuring devices which respond only to the E field in the near field as they will indicate a higher field than is actually present, thus erring on the side of safety".	No change.
520	013	The term "unperturbed field" is not defined in the glossary.	Term to be defined in the glossary.
529	003	Use italic f in the averaging time formula.	Change to be made in the draft.
535-546, 566-576	003	Replace Notes 6 and 7 with the following: "The ratio of the E and H reference levels in Table 6 are in accordance with plane wave conditions (ie., E/H = 377 Ohm) for frequencies above 1 MHz for occupational exposure, and above 10 MHz for public exposure. Thus in these frequency ranges, it is only necessary to show compliance with *one* component (E or H) of the field if the field impedance is 377 Ohm, since the other component will be automatically satisfied. Refer to Annex 5 for guidance on when the field impedance is likely to be 377 Ohm. Some E or H field meters are calibrated in terms of equivalent plane wave power flux density, where $S_{eq} = E^2/377 = 377H^2$ W/m². For convenience, S_{eq} is provided in Table 6 where the ratio of the E and H reference levels is 377 Ohm."	No change.
556	003	Delete the word "occupational"	No change.
578, 583, 2038, 2042	001	The keys/lines to the figures (fig 1, 2, 3, 4) are difficult to follow. perhaps stars, triangles, squares etc would be clearer.	Improvement of these will be endeavoured.
578, 583	003, 056	Figures 1 and 2: The horizontal arrowed lines showing the frequency ranges of basic restrictions need to be adjusted. The time averaged plots for occupational exposure did not print.	Improvement of these will be endeavoured.
578, 583	023	The line for "Time avg. occupational" in Fig 1. 2, 3, & 4 did not print on the graph nor does it appear on the Adobe file.	See above.
586	013	No test method for these limits is defined in AS2772.2 and no reference on how to do the test is supplied in the text.	Refer to IEEE C95.3-200X "Recommended practice for

			measurements and computations with respect to human exposure to radio frequency electromagnetic fields, 3 kHz to 300 GHz”
588-591	003	Replace this para with “Reference levels for point contact currents are provided in Table 8, in order to avoid high localised current densities at the point of contact with passively charged conductors.”	Last sentence at [591] replaced with “Reference levels are given in Table 8”.
591	013	The term “point contact” is not defined in the glossary.	Term to be defined in the glossary.
603	061	Add “over” after “at least”.	Change to be made in the draft.
611	013	No test method for these limits is defined in AS2772.2 (1988) and no reference on how to do the test is supplied in the text.	See comment for [586]
614	013	Are these limits a “should” or a “must”? Line 756 implies it is “a must”.	No change.
627-737	005	What is the evidential basis for the parameters chosen for spatial averaging ('generally acceptable' is vague - acceptable to who, and on what grounds?)	“generally acceptable” at [637] to be deleted and replaced by “recommended”.
630	003	Replace “exposure” with “SAR and current density”.	Change to be made in the draft.
633	061	Comma needed after “fields)”.	Change to be made in the draft.
636	013	Shouldn’t there be some extra material provided about averaging schemes in Annex 5 or similar? As it reads it sounds like there may, in some circumstances, be good reason to vary the scheme but no extra information is given.	No change.
639-653	023	It is acknowledged that Section 2.7 (a) provides guidance on the measurement points for measurement for reference fields. However, the draft does not treat the case of field exposures that are centred on the hands. I contend that this is an omission.	Point to be pursued with the view of developing a Code of Practice
639-653	053	2.7 Spatial Averaging text The application of the root 20 factor to E, H and S results in different field strength values. It is presumed that E^2 and H^2 is intended.	Text to be added in the draft for clarification
641	013	Perhaps “head height” should be defined for measurements where the RADHAZ tester is standing on two feet out in the open. Variation for vertically polarised fields can be significant with fairly minor changes in probe height.	Not within the scope of the Standard.
644	061	Comma needed after “machine)”.	Change to be made in the draft.
660, 669	003, 056	Change “field limits” to “reference levels”.	Change to be made in the draft.
663	003, 056	Replace “above 1 GHz up to 10 GHz” with “in the range 1 GHz to 10 GHz” for consistency with point (b).	No change.
677	003, 056	Table 10, row 3: Change the figure of 1.0 to 4.5 for consistency with the formula in the row above and for consistency with Note 1 of Table 5.	Change to be made in the draft.
688	003, 056	Section 3: None of the field quantities (J, E, H, S, I) should be bolded, as this implies that they are vector quantities.	Change to be made in the draft.
694	003	Delete “, and the basic restrictions in this Section should be met”.	Change to be made in the draft.
698-700	067	Further to the mathematical equations given, it needs to be made quite clear with plain English statement that the sum of the ratios of each relevant exposure quantity divided by the limiting value at each	No change.

		frequency must not exceed one (ie. sum component frequencies must not exceed relevant limits). [Obviously my words will need refinement and the exact words will need to be chosen carefully to make this point very clear.]	
699, 711	003, 056	Replace “added” with “summed”.	Change to be made in the draft.
723-786	013	The testing schemes detailed in these lines: The first test scheme is only really practical for a system which has 2 or may be 3 collocated antennas transmitting on a few frequencies with a fixed radiation pattern. On some sites, if this scheme was adopted verbatim, the system would never be able to be commissioned as it would be permanently undergoing RADHAZ testing stepping through the multitude of transmit scenarios. The second scheme detailed in the standard results in onerous RADHAZ boundaries that are too conservative relative to the first scheme when applied to locating boundary fences around antenna farms. Two other possible approaches are not detailed in the standard. The first involves using computational methods, to identify the worst case operational scenarios. This sounds simple. However to solve it properly, especially where the limit is changing over frequency, over a number of geographic points sufficient to define a boundary may be a computationally significant task, with the inherent difficulties of models which have simplifying assumptions. The other approach which has previously been detailed in Draft CENELEC 50166-1 Human Exposure to Electromagnetic Fields – Part 1 Low Frequency (0Hz to 10kHz) would involve simply ignoring all RF sources that did not contribute more than a certain amount to the sum detailed here (0.1 was the value used for the sum of the squares equation detailed in the CENELEC standard). This approach needs some caveats as well but at least it provides as basis for a consistent approach to testing and is not dependent on other results of modelling work and the resources to do that modelling work.	No change.
787-858	057	Section 4: Verification of compliance This part should be redrafted to refer to “risk assessment” rather than “verification of compliance”– include need for assessment/measurement, when, how, by whom (competent person). Reference to the relevant Australian Standard on RF radiation methods of measurement should be included.	Covered by changes made earlier.
802	003, 056	Replace “Section 5” with “Schedule 5”	Change to be made in the draft.
806	001	'appropriately qualified and experienced person or authority' too vague. Perhaps a qualification (degree) should be stated, or an on-line test should be developed by ARPANSA to test for competency.	Refer to the ACA
806	024	Does not identify what the appropriate training is.	See above.
807	003, 056	Replace “power levels are unchanged” with “exposure levels are not increased”.	Change to be made in the draft.
808	003	Replace “must” with “will”.	Change to be made in the draft.
810	003, 056	Replace “power and radiation levels emitted” with “exposure levels encountered”.	Changed to “….based on conditions

			leading to the highest radiation levels ….”
811	013	No mention is made of worst case soil conditions, which is important for HF transmissions.	Covered above.
815	013	Radhaz surveys are often conducted inside buildings with antennas located outside. Perhaps some brief text could be included either here or under the measurement section in Annex 5 about ARPANSA’s or the ACA’s expectations where measurements should be conducted, eg. does the RF field on the building roof need to measured?	Outside the scope of the Standard.
816, 823	057	Areas “reasonably accessible” to workers/the general public – requires clarification.	No change.
821	003	Replace “must” with “should” as this is already implied by the words “As necessary” at the start of the sentence.	No change.
824	024	Areas that are reasonably accessible by the general public must be evaluated for compliance. eg linesmen working on poles with antennas (general utilities transmitters and mobile phone micro cells) could they be given appropriate training and classed as Aware users?	No change. Covered by Aware user definition.
827-841	063	Section 4.2 permits use of type testing for most sources. It has been found that type testing is not sufficient for products with high-use doors such as home/commercial microwave ovens and some industrial products. Flatness of the cavity face and door, door alignment, and interlock spacing & functioning are critical in production, after servicing, and after damage to the oven.	No change.
827-841	056	Section 4.2: There appears to be an equivalence of meaning between “type testing” and “RF site evaluation”, where in this case “site evaluation” is different from direct evaluation of a particular site. Does this mean that direct evaluation of a particular site as in Section 4.1 Lines 802-803 is allowed without restriction, but “type” evaluation of a site is only allowed based on previous evaluation of two equivalent sites? Perhaps the title of the section could be altered to “ Type testing/RF site evaluation based on “typical” sites”. Line 829 could be altered to “Type testing of RF sources or RF site evaluation based on comparison with previously evaluated sites may be used….”. Otherwise use the term “type evaluation” and define in glossary.	No change.
830	003	Replace “similar” with “equivalent”.	No change.
831	013	3dB of what? (W/m^2 or V/m). The margins are different. Also it doesn’t seem to be consistent to talk about dBs, when all the units in the standard are not logarithmic.	No change
840	003, 056	Replace “is influenced” with “is significantly influenced”.	Change to be made in the draft.
843-847	057	Section 4.3: Records It is not clear to whom this responsibility/duty applies.	No change. This is a matter for state regulators.
846	056	Refers to "representatives of employees". This needs to refer more specifically to H&S representatives rather than, for example, Union representatives.	No change.
849	056	Replace “or and” with “and or”	Change to be made in the draft.
850	056	What is the purpose of limiting mobile and or portable transmitting equipment to an upper frequency range of 2500 MHz? New mobile/wireless technologies at higher frequencies are constantly being developed and should be admitted to this clause unless there is a fundamental physical reason not to do so.	No change. Consistent with current allocation of spectrum.

860	028	There is a need to introduce additional safety factors for general public exposure.	No change.
863, 990	048	The statement regarding minimising unnecessary or incidental RF exposure is a reasonable introduction to Section 5. However it is not mandated. This is a major weakness of a key statement and is in sharp contrast with the NZ standard, where it is mandated regarding public exposure. The NZ approach has been acceptable and workable to most parties. It is not clear why this approach cannot be followed in Australia and give the public confidence in the Standard. At 990 the following words from the NZ standard should be inserted: **[990]** "e)Minimising , as appropriate, RF exposure which is unnecessary or incidental to achievement of service objectives or process requirements, provided this can be readily achieved at modest expense".	In Section 5.3 (e) line [990] the following is to be inserted: "Minimising, as appropriate, RF 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."
863-865	056	Telstra raised a number of issues regarding the opening paragraph of Section 5 (Refer to the submission).	The opening paragraph is to be omitted.
863-865	057	A public health precautionary approach to RF radiation - Recommend this part and Annex 6 be deleted, as there inclusion only adds unnecessary text, and potential confusion about standard setting, safety factors etc.	The opening paragraph is to be omitted however Annex 6 is valuable and will remain in the document.
865	062	Delete "and can be achieved at modest expense" This was a major sticking point in TE7 voting. Modest expense is not easily defined and introduces casualness to a very important statement that should be mandated as well.	The opening paragraph is to be omitted thus "and can be achieved at modest expense" is to be deleted.
867	056	Telstra has a number of comments regarding section 5.1 (Refer to the submisssion)	Section 5.1 has changed quite substantially.
867-961	057	Section 5.1: Managing risk in occupational exposure This section should: a. Address duties of all relevant parties eg designers, suppliers, employers and employees; b. Clarify on whom duties lie – eg the employer must ensure there are policy and procedures developed and implemented etc c. Address provisions of information, compliance monitoring, induction and training, record keeping, investigation and management of accidents/over-exposures (Annex 7 part 'c' lines 4511 - 4527 cover the type of information, instruction and training that should be provided in section 5.1), and d. Refer to requirements for compliance of RF plant to federal/state/territory OHS plant regulations. This section may benefit with some sub-headings particularly those relating to the relevant duty holders (eg designers/manufacturers and employers).	Section 5.1 has changed quite substantially. No further changes.

		It is not clear how the Control Priorities (ie control hierarchy) is to be applied. It should read 'apply each of the control measures in the order listed to the extent practicable' or something to that effect so that it is consistent with OHS legislation in approach The standard should clearly state how the "limits' apply – eg "the employer must ensure that no employee is exposed to RF fields above the occupational exposure limits". Similarly, the standard needs to outline the employers duties to other persons eg contractor, visitors, and which limits apply etc.	
867-961	058	Section 5.1 of this draft standard falls short of what is required in terms of full and comprehensive guidance. For example, the section does not outline the legal duties of all-relevant parties eg., designers, suppliers, manufacturers and employers.	Section 5.1 has changed quite substantially. No further changes.
869	003	Delete "and RF generating plant"	No change.
881	003, 056	Replace "and potential" with "and are potential".	Change to be made in the draft.
882	003, 056	Delete "in accordance with Annex 5" as this deals only with the advisory reference levels and not the mandatory basic restrictions.	Change to be made in the draft.
883	003, 056	Replace "exposure limit" with "limits"	Change to be made in the draft.
897-903	003	Replace paragraph with: "Where there is a potential to exceed basic restrictions the risk of overexposure should be managed by the Control Priorities indicated below. The measures higher in the Control Priorities are usually more effective than those lower, and should be given greater consideration accordingly."	Paragraph at [897] to be replaced with: "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 appropriate procedures in place to ensure that the safe systems of work are utilised. "
906	003, 056	Replace "possible" with "practical"	"possible" to be replaced with "practicable".
915	003	Add the following words at the end of the sentence: "for viewing ports".	No change.
915	013, 056	Suggest that word "apertures" is added to the phrase "waveguide below cut-off".	No change.
917	003, 056	Explain what are "engineering methods" or delete the line.	Line at [917] to be deleted.
946	001	Remove 'untethered'.	"untethered" to be removed.
948	003, 056	Replace para with: "Workers or self-employed persons who are occupationally exposed above the public basic restrictions must be trained in safe RF work practices, and instructed in the specific control measures for local RF sources."	Para to be replaced with: "Workers who are occupationally exposed above the public basic restrictions 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."
954	003, 056	Replace "potentially exposed persons" with "persons who are occupationally exposed above basic restrictions for the public".	Change to be made in the draft.
960	024	Who is the appropriate authority?	A separate Annex is to be included listing the relevant authorities.
963-971, 1473-1483	057	Section 5.2: Pregnancy (and Schedule 1 – foetal exposure) The rationale for special treatment of pregnant employees may not justify this apparent discrimination in the standard. It is recommended that the advice of the Human Rights and Equal Opportunity Commission be sought on this matter, or refer to their Pregnancy Guidelines (http://www.hreoc.gov.au/). These guidelines state "Where medical issues are associated with a pregnancy or legitimate OHS issues arise, employers should make reasonable adjustments in the workplace to allow pregnant employees to continue to work. It is not discriminatory to accommodate an employee who is pregnant. In limited cases, an employer may need to temporarily transfer a pregnant employee." It is recommended that the standard be changed to the following or similar "A risk assessment should be undertaken to assess the likelihood of a pregnant worker being exposed above the occupational limits, and based on this assessment, accommodation/reasonable adjustment **or** temporary transfer to non-RF work should be arranged."	There is no persuasive evidence that developing tissue is at greater risk. Section 5.2 on "Pregnancy" is to be slightly amended to: "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 general public exposure. Occupationally exposed women should advise their employers when they become aware of their pregnancy. After such notification, they must not be exposed to RF fields exceeding the general public limits. Pregnancy should lead to implementation of relevant personnel policies. These include but are not limited to reasonable accommodation/adjustment (see Glossary) or temporary transfer to non-RF work. Additional guidance may be found in the Pregnancy Guidelines produced by the Human Rights & Equal Opportunity Commision (HREOC) at www.hreoc.gov.au/sex_discrimination/index.html (for more details see Annex 7). "
967-969	056	These lines should identify a single issue (informing the supervisor or employer if an RF worker becomes pregnant). Lines 969-970 need a separate sentence dealing with what exposure limits are applied to a woman who has notified her employer. Currently, the two matters are rolled together and thereby lose precision. In fact this could be a legally contentious issue and needs careful description.	Look above.
970-971	056	Refers to "appropriate personnel policies" which should be implemented. It gives no indication as to what these might be.	Look above.

982	013	What is actually meant by this in terms restricting general public access is not defined in this standard. As this standard is a regulatory document then the minimum requirements for fencing to exclude public access must be specified.	A Code of Practice will elucidate this. No change.
993	057	References "The following documents are referred to in this standard" – however, they are not. It is not clear why these particular references are listed. Regarding the NOHSC documents: National Occupational Health and Safety Commission (NOHSC), 'Risk management: preventative approach to improved work productivity' This links to an abstract of a speech by Head of the Workcover Authority's Risk Management Division, 1991. Recommend – delete reference (not necessary) or refer to journal. National Occupational Health and Safety Commission (NOHSC), 'Risk management in occupational health and safety'. This link refers to abstract only from a journal article. Recommend – delete reference (not necessary) or refer to journal reference. National Occupational Health and Safety Commission (NOHSC), 'Overview of the risk management process' This links go to specific page of the document "Plant in the Workplace — Making it Safe -A Guide to Managing Risks from Plant in the Workplace for Employers and Employees". Recommend referring to full document - http://www.nohsc.gov.au/publications/fulltext/toc/h3-58.htm National Occupational Health and Safety Commission (NOHSC), 'Risk management for manufacturers'. This links go to specific page of the document "Plant in the Workplace — Making it Safe -A Guide to Risk Management for Designers, Manufacturers, Importers, Suppliers and Installers of Plant". Recommend referring to full document - http://www.nohsc.gov.au/publications/fulltext/toc/H3-57.htm	Changes to be made in the draft.
1043	028	Limits should protect against known adverse health effects *and* provide additional protection against athermal problems that have been identified in scientific literature.	"known" to be replaced with "established" otherwise no change.
1080-1084	003, 061	Reduce font size.	Change to be made in the draft.
1094	061	Omit the "-" sign from "10 mW/cm^{-2}".	Change to be made in the draft.
1100	028	"In addition…" This sentence indicates that different people will absorb RF differently. Different responsiveness or sensitivities is a reason for applying additional precautions.	No change in the draft. A table listing tissue characteristics is to be established on the web.
1158	028	Economic considerations are not an appropriate reason for allowing public exposure to increased levels of radiation.	The first sentence of this para is to be moved to the end of the para. Also line [1161] to be rewritten as: "There are no internationally adopted standards defining limits of exposure to radiofrequency radiation. However, many countries, including Austria, Denmark, France, Greece, Germany, Ireland, Italy, Japan, Philippines, Netherlands, New

			Zealand (Standards New Zealand, 1999), Switzerland, the United Kingdom and the European Union (Council of the European Union, 1999) have standards or recommendations conforming to the 1998 guidelines of the International Non-ionising Radiation Commission (ICNIRP, 1998)"
1173	028	Protecting public health is a powerful motivation for implementing exposure levels that differ from the ICNIRP guidelines.	No change.
1253	061	The word "cell" should be "cells".	Change to be made in the draft.
1286	028	It is appropriate to implement precautions *now* rather than await the outcome of lengthy investigations suggested in this paragraph.	No change. Precautionary measures are dealt elsewhere in the document.
1298	001	Add paragraph at [2720]	The following sentence to be placed in front of the para starting at [1300]: "Epidemiological methods and the relevant studies are discussed in Annex 3
1313	048	Insert "UHF" to read "….large UHF television…". This is a matter of fact.	Changed to "large UHF and VHF television".
1314	028	It is inappropriate to consider the Motorola and Johansen studies in assessing the safety/risks of mobile phone use. The Motorola study did not provide any exposure data and was conducted by an industry, which has vested interests in finding no adverse effects. The Johansen study did not consider the amount of time spent on a mobile phone, had few heavy or long-term users in the study and did not conform to the research protocols of the WHO.	No change.
1314	062	Delete "The Motorola employee's study ……these workers. A study that does not include measurement of RF intensities at the work places considered is hardly a powerful study. From my experience with measuring ELF fields there is absolutely no substitute for measuring, particularly when the substance/process under consideration is invisible to our senses. It would also be of important interest to know what ELF fields were present for all workers. This study does not support any argument. If we are prepared to lower our standards to accept such a study then we need to reconsider many of the athermal studies that have been conveniently ignored. We must be consistent.	Section on the limitations of epidemiology to be included in Annex 3.
1329	028	The studies mentioned in this paragraph provide good reasons for reducing exposure and implementing precautions. The fact that there is 'little consistency' is not sufficient reason for dismissing studies. There are now large numbers of studies indicating adverse effects. This must be reflected in the draft.	Annex 6 has been revised.
1351	001	The word 'dysaesthesiae' to hard for lay people.	"(abnormal sensations)" to follow the word 'dysaesthesiae'.
1401	001	The document mentions that there are RF a exposure threshold for the adverse health effects of heating,	Words to be inserted here reflecting the

		electrostimulation and auditory response - but the levels and frequencies aren't clearly indicated. A rough guide (for the standard man) of the numbers would be useful for a layperson to quickly get an idea about their RF field and exposure, and understand how the basic restrictions and reference levels fit into the picture.	inclusion of the tissue characteristics table and a safety factors paper that are to be placed on the web.
1405-1414	055	Regarding this para. The uncertainty, however, in relation to the biological effects at low levels of exposure (non-thermal effects) is sufficient to warrant a cautious approach.	No change.
1430	028	Some studies (eg Gandhi, O P and Furst, C M, IEEE Transactions on Microwave Theory and Techniques 44(10) 1996) do indicate different susceptibilities within the population. Certainly community experience indicates that this is the case.	No change
1440	028	There is evidence to support the belief that children are more vulnerable to radiation than adults (ibid). The fact that children's cells are actively growing and dividing and that dividing cells are particularly vulnerable is compelling reason to provide additional protection for children. Doing so makes good common sense, particularly given that children have a lifetime of potential exposure, unlike their elders.	No change. Theory of children having greater vulnerability to RF unsubstantiated.
1475	028	There are good reasons to assume that a foetus may be more at risk than an adult (see above). Limiting exposures of pregnant women to those of the general public does not provide additional protection.	No change. See above.
1546, 1550-1560	048	Why is it necessary to refer twice to "Recent research by Adair…"? In session it was agreed that key relevant details of Adair's papers would be inserted, ie "Adair studied seven, sedentary, fit volunteers, exposed over 36% of their body for 45 mins to 450 and later 2400MHz CW RFR". It should be noted that core temperature did not rise in either study, but the sweat rate had not obtained equilibrium at 450MHz exposure after 45 mins (fig 2, 1999). This does not show the exposure was able to be coped with, because more prolonged exposure may have exhausted the sweating mechanism and then caused core temperature to rise. This should be stated.	The sentence "Recent research by Adair …..without adverse effect." in [1546-1548] to be deleted. The sentence "Recent research (Adair, 1998)…….temperature rise" in [1554-1556] to be deleted and replaced with: "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). After extensively reviewing the relevant literature, ICNIRP concluded that levels above 4 W/kg are required to overwhelm the thermoregulatory capacity of the body. Thus, the WBA SAR of 0.4 W/kg remains well supported for occupational exposure and arguably safe for the entire population."
1547	062	The frequent reference to the studies by Adair are far from convincing. 45 minutes is hardly sufficient time to terminate a test when temperatures are still rising. If it were an electric motor with that temperature response curve it would eventually fail. This is another area where it would be better to say nothing than promote dubious results.	See above.
1569	062	Delete " However it is reasonable …… conceivable hazard." It is not reasonable to hypothesise that effects will be proportional to energy transfer. There are many instances in science where the effect is not proportional to the stimulus. Rather than the following sentences which are not based on fact it would be better to leave them out altogether.	No change.
1573	061	The word "mechanism" should be "mechanisms".	No change.
1576	028	There are a number of mechanisms, which could account for adverse health effects at athermal levels of exposure (Refer to the submission for details).	No change.
1583-1588	034	This statement says nothing about where the higher SARs were measured. Was it in the head or eyes or the hands and feet? The conclusion drawn would be very different depending on where the measurements were taken. Not reasonable to say that, for instance, if the SAR in the abdomen region was 25 times higher that WBA then this is also safe for the eyes.	Reference to the Dosimetry Handbook will be made in the draft
1586-1588	062	We are having great difficulty in accepting the rational that "it then follows etc". We are particularly concerned that whole body tests using plane wave exposure can then be applied to high frequency devices located so close to the body that they are in the near field, plane wave conditions no longer exist, and that also we can increase the SAR by 25 or 50 times over select areas of the body. Where is the scientific evidence for this? We do not have a replacement clause as we do not yet accept the premise and we are receiving far to many complaints from cell phone users to believe that this philosophy is correct.	Section re-drafted
1590-1597	034	While the heat rise situation is now very well known, some new research is indicating that for a very small average heat rise (say 0.1 deg C), at cell level, some cells or parts of cells may rise in temperature by 100 times this amount. And how does the huge variation between human bodies compound this even further	This situation would not occur but in the event that it did the limits cover this

1599-1603	034	The limbs and outer layers of the body ……. once again the variation is even further compounded by the human body variation.	Covered by the standard
1605-1621	034	This section and the section above are tending to emphasise the heat rise issue, which, from the currently available data may be fair enough. However most aware people in this field and sections of the general public, due to media publicity, would expect some comment re the selected spatial average and peak exposure levels and the current situation of possible effects on the human body from non-thermal levels.	Addressed earlier in the rationale
1615	003	Replace “schlerosis” with “sclerosis”.	Change to be made in the draft
1618	003	Replace “Joyner & Anderson” with “Anderson and Joyner”.	Change to be made in the draft
1681	061	Add “as” after “provided”.	Change to be made in the draft
1778	061	Comma needed after “context”.	Change to be made in the draft
2000, 2009	024	Schedule 2 & 3, These tables contain easy to understand reference levels derived from Tables 2, 3, 4, & 5 so should be moved to Section 2. In their present location it might be difficult to locate them.	No change
2023	061	Add “≈” after “E/H”.	Change to be made in the draft
2076	061	This paragraph is too confusing, needs restructuring.	Paragraph to be re-structured
2076-2080	064	Par S5.1.2.3 includes "the antenna or other radiating structure". In the case of a common portable that is designed to be hand held or clipped to a belt and used with a speaker microphone, would it be fair to say that the entire radio including the cable to the hand mike would effectively form part of a "radiating structure" and it is unlikely that such common application would ever be assured of being more than 2.5cm from the body.	Regulatory bodies would have a similar interpretation and tests would be required
2103-2105	064	Concerning the note to table S1. Does this mean contact with bare metal? For instance would an antenna that was entirely covered in insulating material (say heat shrink vinyl) satisfy this requirement. Do you mean "not possible" or do you mean unlikely. This provision seems to rule out any kind of installation on a vehicle where a person could touch a bare metal (maybe any kind of) radiating structure, for example a VHF quarter wave whip mounted on a mudguard, or a HF whip mounted on front or rear bumper.	Note to end at “….with AS/NZS4346”
2103-2105	067	RE: Comment from Owen Duffy In regard to questions relating to the note to table S1 - clearly the prime intention of this note is to prevent exposure that may be in excess of the limits as defined through the basic restrictions. Accordingly the note could be improved by re-wording to something like: *“Fixed or vehicle mounted transmitting equipment should be installed in accordance with AS/NZS 4346 and in such a way that, during normal operation, accidental or unintentional contact with the radiating structure will not result in exposure in excess of the basic restrictions defined in Section 2 of this Standard”*.	As above
2123	061	This paragraph is too confusing, needs restructuring.	Same as in [2076]
2130	024	General Public - Mobile phones. Mobile phone compliance appears vague, users seem to comply if they don't have the mobile phone antenna less than 20cm from their body. Are mobile phones covered by this standard?	Unless it can be made sure that a mobile phone is maintained at a position 20cm from the body tests are required
2134	061	Line space is needed here to indicate a new paragraph.	Change to be made in the draft
2143	002	‘Table S2” not ‘Table 12’.	Change to be made in the draft
2143	024	Unable to find Table S2 in AS2772.2, it should be included in this standard if it is used in evaluating RF	Table S2 is contained in the draft and not

		radiation.	in AS2772.2
2159	061	Space needed in “thelowest” ie it should be: “the lowest”.	Change to be made in the draft
2166	064	Glossary: Unable to find definitions for "mobile transmitting equipment" and "portable transmitting equipment" particularly as used in Schedule 5 and references to Schedule 5.	No change
2166	064	Continuing from above: Similarly, "mean power output" and "mean output power" (both are used), "nominal mean power output", "intermittent transmission", "transmitter duty cycle". The definition called up by Note 1 to table S2 seems to say that an SSB transmitter that is on air 60 sec, off for 60 sec (therefore intermittent transmission) is deemed to have a mean power equal to its PEP, whereas a transmitter that is on continuously could be averaged over "an interval of time which is long compared to the lowest modulating frequency" (what does that mean, could I choose 1 sec, 100 sec, 6 minutes?) which may result in a mean power of more than 10dB less than the intermittent operation.	No change
2184	024	What is "appropriate training" for "aware users"?	Issue for regulatory bodies
2300-2306, 2327-2330	057	Glossary The “occupational exposure” and “public exposure” definitions are inconsistent eg referring to “exposure to radiofrequency radiation” and “all exposure to EMF”.	These definitions are to be re-drafted
2380-2381	003	Replace “measured over a small volume in space or region of the human body (eg. the finger).” with “averaged over a small mass or area in the human body”. SAR and SA are averaged over a mass, and current density is averaged over an area.	Change to be made in the draft
2413	003, 056	μ should not be bolded.	Change to be made in the draft
2432	003, 056	E, S and H should not be bolded	Change to be made in the draft so the magnitude of the vectors is indicated
2450	061	μ is used to denote electrical conductivity rather than σ.	Change to be made in the draft
2466	061	The symbol for frequency should be “*f*” not “F”.	Change to be made in the draft
2576	061	“mode-ling” should be: “modelling”.	Change to be made in the draft
2583	061	“Wm-2” should be: “Wm^{-2}”.	Change to be made in the draft
2634	048	Dr Hocking objects to the statement regarding “input from the working group”. Dr Hocking withdrew his name from being specifically associated with he section, and objects to it being now indirectly associated. He does not fully agree with the section and note that various inputs from him have been rejected. The phrase ‘input from the working group’ should be withdrawn. (Incidently, Dr Hocking does not see the point in attributing any section of the standard to individuals).	This matter has already been resolved
2634	062	Delete these lines. All other authors are listed in the References section at the end.	Change to be made in the draft
2654	062	Refer my comments to line 1314. 1 have made similar remarks during our meetings so this is one area where input from the working group was not accepted, or maybe even listened to.	This matter has already been resolved
3642	003	The word “Appendix 3” should be “Annex 3”.	Change to be made in the draft
4183-4184	001	There is no point calling upon a withdrawn standard [4183, 4184] because in 5 years time it will be very difficult to get hold of.	The mentioned Standard has not been withdrawn
4183	001	Training through what organisations?	This sentence is to be re-worded

4211	013	Going on lines in sections 2.5 and 2.6 shouldn't 'may' read 'must'?	No change
4261	013	The text should at least reference the scenario for which this statement is derived. At the beginning of the text (line 4256) it reads as if it applies to any RF source, which should be the scope of a RADHAZ survey ie. including reradiating objects that only look a little bit like an antenna and equipment like high power RF amps. The equations I believe are derived from a short wire antenna in free space. There are several textbooks and articles on EMI that would contest this statement in some cases. eg. "EMC Electromagnetic Theory of Practical design" by Chatterton, "Practical Design for Electromagnetic Compatibility" by Ficchi and perhaps most clearly "Handbook of Antennas for EMC" by Thereza MacNamara. These texts present material along lines of what the electrical size of the RF source is, geometry etc perhaps the most clear cut scenario that shows that statement in the standard is incomplete is in "Handbook of Electromagnetic Compatibility" by Reinaldo Perez. This books details studies that were undertaken trying to correlate OATS and anechoic room measurements from pieces of equipment. The net result showed that there could be up a 30 fold (3000%) variation in the field strength between the 2 measurements. Given buildings usually have some shielding properties at certain frequencies showing that E-field propagation may significantly different from ideal under real world circumstances for equipment.	No change. These issues are discussed in AS2772.2
4276	055	In relation to the discussion in Annex 6 on the precautionary principle, we see no purpose in deviating from the principle of exercising caution in situations where there are reasonable grounds for concern about a risk and there is uncertainty. We believe that manufacturers of mobile phones in particular should strive to keep exposure levels even lower than limits set in the standard.	Mobile phones by virtue of their design only transmit as much power as they need to operate.
4283	001	Add 'effects' after health.	Change to be made in the draft
4313	056	Add at the end of the para: "Several different policies promoting caution have been developed in different contexts to address concerns about public, occupational and environmental health issues in the face of scientific uncertainty. These include the Precautionary Principle, ALARA (as low as reasonably practicable) and Prudent Avoidance. They are outlined briefly below".	Change to be made in the draft
4371	056	Add after "demonstrable risk.": "Generally, government agencies have applied the policy only to new facilities, where minor modifications in design can reduce levels of public exposure. It has not been applied to require modification of existing facilities, which is generally very expensive. Defined in this way, Prudent Avoidance prescribes taking low-cost measures to reduce exposure, in the absence of any scientifically justifiable expectation that the measures would reduce risk."	To be deleted: "Prudent refers……..below the recommended limits". To be replaced by: "Generally, government agencies have applied the policy only to new facilities, where minor modifications in design can reduce levels of public exposure. It has not been applied to require modification of existing facilities, which is generally very expensive. Defined in this way, Prudent Avoidance prescribes taking low-cost measures to reduce exposure, in

			the absence of any scientifically proof that the measures would reduce risk."
4378	048	Application of the precautionary approach to RF. The Stewart Report is the leading document regarding the Precautionary Approach applied to RFR and must be fully discussed in this Annex It is a serious omission that this section does not acknowledge the Stewart Report's reasons for use of the precautionary approach and its proposals to implement this approach. The following should be added: "*The Stewart report has been the major report in the world in advocating a precautionary approach. It states:* *1.19 There are additional factors that need to be taken into account in assessing any possible health effects. Populations as a whole are not genetically homogeneous and people can vary in their susceptibility to environmental hazards. There are well-established examples in the literature of the genetic predisposition of some groups, which could influence sensitivity to disease. There could also be a dependence on age. We conclude therefore that it is not possible at present to say that exposure to RF radiation, even at levels below national guidelines, is totally without potential adverse health effects, and that the gaps in knowledge are sufficient to justify a precautionary approach (Chapter 5, paragraphs 6.35–6.42).* *1.20 In the light of the above considerations we recommend that a precautionary approach to the use of mobile phone technologies be adopted until much more detailed and scientifically robust information on any health effects becomes available (Chapter 5, paragraphs 6.35–6.42).* *Thus the Inquiry found that on balance of evidence RFR was not harmful, but it expressed reservations "therefore that it is not possible at present to say that exposure to RF radiation, even at levels below national guidelines, is totally without potential adverse health effects" (para 1.19).* *The Inquiry goes on to recommend a precautionary approach. At para 6.16 they state the precautionary approach "requires that before accepting a new development we should have positive evidence that any risks from it are acceptably low, and not simply an absence of convincing evidence that risks are unacceptably high". The latter requires extensive human/epidemiological studies to be convincing and these are scarce regarding community studies (as distinct from occupational ones) and installations* *To implement this precautionary approach the report proposes :* *1.24 We recommend that national and local government, industry and the consumer should all become actively involved in addressing concerns about possible health effects of mobile phones (paragraph 6.40).* *The report makes two specific comments about base stations (macrocells) as follows:* *1.33 We conclude that the balance of evidence indicates that there is no general risk to the health of*	Reference to the Stewart and Zmirou Reports to be made

		people living near to base stations on the basis that exposures are expected to be small fractions of guidelines. However, there can be indirect adverse effects on their well-being in some cases (paragraphs 5.264, 6.44 and 6.45). *1.42 We recommend, in relation to macrocell base stations sited within school grounds, that the beam of greatest intensity (paragraphs 4.32–4.35 and 6.63–6.68) should not fall on any part of the school grounds or buildings without agreement from the school and parents. Similar considerations should apply to macrocell base stations sited near to school grounds.* *The need for caution when exposing a population to electromagnetic fields has been recently emphasised by the report on ELF (50Hz) fields and cancer (NRPB 2001) and the subsequent paper by Schutz (Int J Cancer 2001;91; 728-35). Whilst 50Hz fields are not technically part of the RFR spectrum they are a form of non-ionising radiation and may occur as modulations in RFR signals. Research into their health effects parallels RFR and therefore the finding of a possible association with cancer and exposures at levels greatly (x250) below current safety levels reminds us that our understanding of non-ionising radiation is incomplete and emphases the common-sense of a precautionary approach for all types of non-ionising radiation including RFR".* *The Australian senate inquiry into EMF also concluded a precautionary approach was required in siting of mobile phone base stations. In the executive summary (p xix) it states:* *"In spite of this and the controversy surrounding results of the Hocking study which found a 60% increase in leukaemia in children living close to TV towers, the Committee is persuaded that a precautionary approach should be taken in siting base stations."*	
4378	062	We should be including in this section extracts from the Stewart report, where some very firm recommendations were made. Mr Lincoln will discuss this at our meeting.	As above
4380	056	Add at the start: "Prudent Avoidance and other cautionary policies regarding EMF exposure have gained popularity among many citizens, who feel that they offer extra protection against scientifically unproven risks. However, such approaches are very problematic in their application. The chief difficulty is the lack of clear evidence for hazard from chronic exposure to EMF below recommended guidelines, or any understanding of the nature of a hazard should one exist. While the weight of evidence needed to trigger a cautionary policy is undoubtedly lower than that needed to set exposure guidelines, clearly a hazard must be identified and some understanding is needed of the conditions under which it is likely to be present. Another difficulty is the ubiquity of EMF exposure in modern society, at highly variable levels and over wide frequency ranges. It is therefore difficult to create cautionary policies that have consistency and equity. For example, typical urban environments contain a multitude of radiofrequency transmitters, ranging from low power communications transmitters to very high power broadcast transmitters. It is difficult to envision a consistent and equitable cautionary policy that would minimise radiofrequency EMF	No change. These issues have been addressed.

		exposures from cellular telephone base stations given the presence of far higher-powered sources in the same urban area. Indeed, attempts to implement a cautionary policy for cellular telephone masts have typically been done on a piecemeal basis, with no attention to other (much stronger) sources of RF energy in the environment. **Implications for Guideline Limits** The above considerations suggest that a cautionary policy for EMF should be adopted only with great care and deliberation. The requirements for such a policy as outlined by the European Commission do not appear to be met in the case of either power or radio frequency EMF; however other related policies, such as Prudent Avoidance, may be justified. A principle requirement is that such policies be adopted only under the condition that scientific assessments of risk and science-based exposure limits should not be undermined by the adoption of arbitrary cautionary approaches. That would occur, for example, if limit values were lowered to levels that bear no relationship to the established hazards or have inappropriate arbitrary adjustments to the limit values to account for the extent of scientific uncertainty".	
4421-4439	057	References – it is not clear why these references are added here, and which audience they are intended for.	No change
4444	001	The title should be changed from exam to questionnaire to reflect the nature of the questions.	The word 'examination' to be replaced by 'assessment'
4450, 4458	013	Shouldn't there be a statement in this section or in the standard about who the users of this document should contact regarding issues such as who is an appropriate medical specialist, technical specialist etc.	No change
4455	057	Refers to "self administered questionnaire – example attached" – however it is not clear where the example is. Suggest change heading on p.99 to "Radiofrequency workers health questionnaire".	Page reference to be added
4470	057	Change "non-occupational limits" to "general public limits"	Change to be made in the draft
4473	057	Suitable heading required before this paragraph. If files are to be retained after termination of employment – for what time period?	See [4496-4533]
4479	024	What "trigger" would be used to determine an over-exposure?	'over-exposure' is defined as any exposure above the limits
4485	057	Reference should be made to first-aid officer in the workplace.	Sentence re-worded to: "First Aid treatment…….the nearest first aider or doctor……."
4496-4533	057	This section should be moved to Section 5 in the standard.	[4471-4527] to be moved to Section 5 under the heading "5.5 Records"
4498-4500	057	Clarify that it is relevant "OHS" (or other?) legislation.	Change to be made in the draft
4530	024	What documentation would be required to show compliance for employers of RF workers?	No change. Section 5 covers this.
4544	048	*The Australian Family Physician* reference is Hocking B Management of RFR overexposure. 2001: 30	Change to be made in the draft

		(4); 339-42. Available at <www afp.racgp.org.au>	
4550	057	Medical exam :"Disorders of the eye (except for reading glasses)" – needs rewording for clarification.. Disorder of the nervous system, and disorders of reproduction – some examples may assist interpretation.	"Medical exam" to be changed to "Medical assessment"
4551	057	Delete.	Replaced with "Figure A1Example medical assessment questionnaire"
Throughout	056	Frequency units in formulae should be standardised to one unit only (ie. either kHz, MHz or GHz, suggest MHz).	This matter has already been resolved
Throughout	056	All occurrences of the term "cautionary" should be altered to "precautionary" wherever this is in the context of a policy, practice, principle or approach. This will lead to consistency in terminology and will avoid the possible interpretation that caution is exercised when a risk is *known* to exist, while precaution is exercised when there is only the *possibility* of a risk (as is appropriate to this case).	This matter has already been resolved

Late inclusion of a submission

175-178	067	The draft ACIF code applies to licensed telecommunications carriers as defined in the *Telecommunications Act* 1997. The draft ARPANSA standard is misleading in its reference to the "communications" industry. It should be noted that a Code cannot impose obligations on parties other than participants in the section of the industry dealt with by the Code, in this case, the telecommunications industry, not the communications industry.	Change to be made in the draft