



INTERNATIONAL  
COMMITTEE *on*  
ELECTROMAGNETIC  
SAFETY

## IEEE ICES Subcommittee 2

### Committee on Terminology, Units of Measurement, and Hazard Communications

Tuesday, 11 June 2015; 1300 - 1700 h  
City of Pacific Grove Community Center (Lebeck Room)  
515 Junipero Avenue, Pacific Grove, CA 93950  
(Minutes recorded by D. Haes, Secretary)

1. CTO by Chair, R. Tell at 13:10.
2. Introduction of those in attendance
3. Modifications and approval of agenda
  - M. Ziskin moved adopt, R. Bodeman seconded; approved (**Appendix A**).
4. Review and approval of Unapproved Minutes of Pismo Beach meeting (9 September 2014) previously distributed via access to the ICES website.
  - CK Chou moved adopt, F. Colville seconded; approved (**Appendix B**).
5. Old Business:
  - Observations of the chair, R. Tell
    - R. Tell presented information relative to safety programs (**Appendix C**). The focus was on a fish barrier in Chicago which uses high current flowing through the canal, introducing a real hazard for electrocution.
    - The ONLY control to prevent serious injury and death were signs.
  - Report of RF Safety Barrier Working Group, R. Johnson.
    - R. Johnson was not present; no formal report was provided for discussion.
    - D. Haes presented a copy of the current *draft* document from the WG (**Appendix D**) and M. Wessell led the discussion.



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- R. Curtis suggested a series of example situations where the user could get an idea of what type of barrier to use in a pre-determined situation.
- A. Faraone opined that the users would not see the examples as useful due to the difficulty of browsing through the many examples to get just the right one.
- M. Meltz suggested a simple statement of just keeping workers out of the near field of the antennas.
- P. Reilly advocated a “probability approach” to risk assessment. He presented some data regarding the percentage probability of “adverse reaction”; for example, exceeding the upper tier limits will be a 1% chance of adverse reaction; in the lower tier, the probability is << 1% and drops asymptotically.
- B Jon Klauenberg disagrees that adverse reactions can occur at any percentage at SAR of 0.4 W/kg. He suggested risk analysis of static-vs-dynamic signs, as the KEY is NOT the barrier, but the instructions associated with use of the barrier.
- D. Cotton pointed out that OSHA will focus on the culpability of the site-owner with regulatory compliance, while the FCC focuses on the licensee.
- M. Wessel explained his experiences at a recent FCC site inspection where there were several levels of bureaucracy at the site including the landlord, building owner, site manager, licensees, etc.
- **ACTION ITEM:** D. Haes to convey the sensitivity of the SC2, re complexity of present document, to R. Johnson.
- Report of RF Safety Signage Working Group, M. Wessel led the discussion and presented information relative to his experiences at a recent FCC rooftop PWS installation inspection (**Appendix E and F**).
  - A. Faraone asked if ICES members can use signs supplied in the C95 standards without regards to copyright. The consensus was “YES”.



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- R. Cleveland suggested the WG review the FCC's recent Notice and Order. There are some suggested signage formats which may be useful.
- There was a discussion of WHERE to put the various levels of signs (NOTICE-CAUTION-WARNING) on a tower; e.g. at the bottom of the tower or at the actual level of the potential RF hazard. M. Wessel pointed out the wind-loading effect of adding flat signs to towers.
- R. Tell asked the SC about whether it would be appropriate for the SC to address the issue of when to use Lock-Out; Tag-out (LOTO). R. Curtis pointed out that OSHA requires LOTO at 10 mW/cm<sup>2</sup>. He suggested that licensees use the following in lieu of LOTO:
  - Direct communication (albeit there are known problems with using radios/phones on towers).
  - Training on RF Safety (about six lines of text).
  - Personal RF monitor the climber can use to verify the transmitter is de-energized.
  - In any event, the EFFECTIVENESS of the safety program must be verified or further actions would be necessary.
- B Jon Klauenberg asked how he verifies the safety program is effective. The response was site/program audits.
- R. Tell asked the SC about whether it would be appropriate for the SC to address the issue of Implanted Medical Devices (IMDs).
  - F. Colville suggested maybe TC8 would be an appropriate group to address the issue.
  - Y. Shkolnikov pointed out the difficulties of IMD interference with RF fields due to the variability of IMD devices in use due to manufacturer standards of EMI vulnerability and age of the units.
  - The SC agreed that any NEW IMDs should be designed to be immune to EMI to at least the lower tier RF exposure limits.
- R. Curtis presented a report of the Hazard Communications Working Group (minimal information/training to qualify for exposure up to upper tier); **Appendix G.**



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- R. Tell asked what the MINIMAL information needed if someone is potentially exposed above the lower tier, but with NO CHANCE to be exposed above the upper tier.
- The response was a sign indicating the hazard (risk), and what to do to avoid it. However, the person must also be “RF aware”; so a sign and the six lines of text included in the presentation.
- B Jon Klauenberg advocated that a sign is NOT enough.
- R. Cleveland pointed out the wording of the FCC’s Report and Order concerning “transient workers” and “third party workers”.
- M. Doczkat advised that the FCC requires that workers need to be informed and have control over their potential RF exposure.
- R. Weller advised that the site must have an EFFECTIVE RF safety Program; quick interviews with workers may be enough as long as audits show all have been informed. For a site using the upper tier as their RF exposure limits, even one person within the area not informed would be a violation (provided an anecdote for a like occurrence when the FCC issued a violation for ONE worker who signed an agreement to follow the rules, but claimed to the inspector he was “unaware” of RF exposure or how to control it, in spite of signing the “training” form).
- B Jon Klauenberg pointed out that LOTO may be needed in addition to signs and “RF awareness” in situations where workers may exceed the lower tier which results in shock/burn vs minor heating of the body.
- R. Tell suggested the SC should generate a document for guidance for situations where someone could be potentially exposed above the lower tier, but with NO CHANCE to be exposed above the upper tier.
- A. Faraone suggested the SC provide specific examples for each type of potential RF exposure.
  - R. Weller advised that the wording in the examples are important; with NO PRESUMPTION of compliance just because the sample was “followed”.



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- R. Cutis pointed out that audits of the RF safety Program will indicate the effectiveness.
  - M. Ziskin explained that in his experience, the main cause of accidental exposure to RF fields above the limits is due to miscommunication of the status of transmitter power levels (e.g. “on” vs “off”).
  - R. Tell asked the SC how we should get this information out; As an Annex, Recommended Practice. Etc.?
    - R. Peterson pointed out that the IEC uses guides, etc. in support of their standards.
  - **ACTION ITEM:** R. Tell challenged the SC to develop an “RF Minimal Awareness Guide”. It was suggested this come out as a joint effort with the “RF Signage” and “Minimal Awareness” WGs.
    - The guide should include sample signs and effective communication; include *specific* examples.
6. New Business:
- D. Haes again presented the current status of lack of consistent signs for static magnetic fields (**Appendix H**).
    - There was a discussion of the NEED to amend C95.2 to include low frequency signs.
    - **ACTION ITEM:** R. Tell asked P. Reilly to think about what kind of sign would be appropriate for low frequency fields. P. Reilly pointed out that the outcome of exposure above the limits may result in mild but voluntarily endurable pain; so “DANGER” or “WARNING” would not be appropriate; there may need to be two signs for mild vs severe pain.
    - M. Doczkat suggested that the probability and severity of the adverse outcome need to be considered.
7. Time and Place of Next Meeting –TBD by ADCOM.
8. Adjournment – 17:00.