

# Update on Stray and Contact Voltage Literature Review

Reviewers:

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# Scope & Vision of Review

- The literature review is intended as a summary reference supporting the IEEE “Trial Use Guide for Assessing Voltages at Publicly and Privately Accessible Locations” (IEEE-P1695).
- The assumed audience is users of the guide – mostly utility engineers, but can expect other general non-technical readers. The literature review uses a non-technical style of writing.
- We will assume that the audience has some familiarity with electrical engineering and limited basic knowledge of biology.
- This is not intended as a scholarly reference. Rather a practical summary that will provide background.
- The focus of the literature review is on biology/epidemiology in terms of human and animal effects.

# Frame of Reference for the Review

- The review assumes a bias and focus on the effects of conducted currents described in terms of nerve stimulations.
- The effects of current are relatively well understood. The difficulty is defining the voltage exposure across the body circuit, and where and how it is being measured.
- The literature review is focused on the biological effect (nerve stimulation) of conducted current on an organism (humans and animals).

# Vision of the Project Deliverables

## A Summary Paper

- It will generally address the biology/epidemiology of stray and contact voltage exposures in terms of human and animal effects.
- Important papers and findings from the review of the literature will be cited in the text.

## Abstracts in an Appendix

- The paper will also include an appendix containing abstracts of the articles that were included in the literature review. These abstracts will emphasize the important aspect of the paper as related to stray and contact voltage effects on critters and people.

# Body of Literature

We have assembled an extensive list of articles for review:

- ~200 articles classified as animal sensitivity studies
- ~20 articles classified as human sensitivity studies
- ~20 general articles and studies.

We are not yet looking to cut down this body of work. Rather the question is what might be missing?

# Standardized Review; Form & Content

- A review template has been developed.
- The team tested the template on 8 papers
  - 2 articles were reviewed by all three.
  - 2 articles selected by reviewers were reviewed

# Characterizing Exposure Study

## General Summary

*E.g. nerve stimulation models, discussions of factors affecting sensitivity, frequency and/or duration of exposure, people versus animals, etc.*

## Sensitivity to Conducted Current

## Sensitivity in Terms of Voltage Exposure

*Characteristics and importance of the exposure circuit (e.g. source impedance, contact impedance, body impedance, etc.), and why it's difficult to create a voltage exposure standard, etc.*

# Classification of Papers

- Peer-reviewed journal
- Textbook
- Invited paper at meeting
- Engineering reference guide
- Technical reference published
- Agency, public sector technical reference
- Publication by Industry
- Non-technical guide
- Trade magazine
- Meeting presentation
- Internal (not published) study
- Unknown
- Other
- Experimental study (academic, and/or lab)
- Population based /scientific
- Engineering study
- Ex post facto investigation
- “Real world”, practical application
- Other

# Classification of Papers (cont.)

- Hypothesis (proposed as explanation of phenomena)
- Theory (encompasses wider domains of inquiry and may bind many independently-derived hypotheses together in a coherent, supportive structure[1])
- Epidemiology
- Independent epidemiology (verified or disproved)
- Very large study group epidemiology
- Experimental Support
- Independent experimentation (verified or disproved)
- Consistent with “real-world” experience

# Process

- Assemble the body of work.
- Read and abstract.
  - Second reviewer?
- Identify short “reading list” of references.
- Draft a cohesive narrative summary.
- Finalize, and incorporate in “Trial Use Guide for Assessing Voltages at Publicly and Privately Accessible Locations” (IEEE-P1695).

# Document Management & Project Administration

- Open question: is Word the right software to be using? Or should it be in something like Excel? Something we can sort in, and maybe create some automated pick lists (some macros)?
- Betty has shared an Excel sorting matrix, for comments.
- We still need an IEEE ftp site for managing the files on a common directory.

# Opportunity to Participate

- We invite folks to join us and become reviewers.
- We could really use an IT savvy member to help design document management methods. It would be great if the files were searchable, cross referencing capable, and set up so abstracts flow into cohesive final deliverable.