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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### TECHNICAL COMMITTEE N° 108: SAFETY OF ELECTRONIC EQUIPMENT WITHIN THE FIELD OF AUDIO/VIDEO, INFORMATION TECHNOLOGY AND COMMUNICATION TECHNOLOGY

#### Chairman's Advisory Panel - Q.44

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TC74 established a Chairman's Advisory Panel in 1987. The purpose of the panel was to provide the opinion of experienced members of TC74 to questions of the intent of specific requirements in IEC 60950. In October 2001 TC74 merged with TC92 to form TC108. Details of the organization of the committee will be confirmed at the TC108 plenary meeting to be held in November 2002. In the interim, the Chairman's Advisory Panel established by TC74 is continuing to respond to questions about the IEC 60950 series.

The following notes are to be read in conjunction with Opinions of the Panel.

1. The Panel consists of active members of TC108, but its Opinions are those of the Panel and are not voted decisions of the IEC.
2. If it is felt that the Question arose due to lack of clarity in a Publication, the matter is brought to the attention of the appropriate group in TC108.
3. Panel Opinions are restricted to interpretation of the words of the Publication in question, as the members of the Panel recollect the original intentions of TC108.
4. The use made of Panel Opinions by the originators of Questions for Interpretation, and by others, is their own responsibility. No guarantee can be given that a subsequent amendment of the Publication will support the Opinion.

Questions related to the IEC 60950 series are welcome. Such inquiries are to be forwarded through the questioner's National Committee to the TC108 Secretary. Responses are sent directly to the questioner, are shared with TC working group members through the TC108 IEC web site and sent to the Secretary of the IEC/EE/CTL for consideration.

TC108/TC74 Chairman's Advisory Panel

**QUESTION 44**  
January 2002

**IEC 60950-1, Ed. 1, 2.10.4 Table 2L**

**Question**

The question concerns the r.m.s. value of a complex waveform consisting of a non-sinusoidal a.c. component with a d.c. offset.

When using table 2L for a minimum CREEPAGE DISTANCE, a true r.m.s. voltage measuring instrument is normally used to measure the WORKING VOLTAGE across the insulation. This is believed to give the correct value even for such a complex waveform.

If, in such a case, the r.m.s. values of the two components are measured (using an oscilloscope), how is the r.m.s. value of the WORKING VOLTAGE calculated?

**Opinion of the Panel**

Unfortunately, this question is not within the terms of reference of the Panel. The purpose of the Panel is to clarify, if necessary, the content of the standard, whereas this question is about measuring techniques.

Nevertheless the Panel considered the problem in an effort to assist the questioner, and agreed the following statements which may be helpful.

In determining the minimum CREEPAGE DISTANCE, it is the r.m.s. voltage across the CREEPAGE DISTANCE that is relevant. The voltage with respect to earth is not relevant. However, the act of connecting the measuring device must not affect the behaviour of the circuit under test, in particular neither input terminal of the device should present a low impedance to earth.

Furthermore, the following basic electrical engineering holds true.

The r.m.s. value of a complex waveform is the square root of the sum of the squares of the r.m.s. values of the individual components.

In general, neither of the solutions mentioned in the question, namely (1) adding the r.m.s. components arithmetically and (2) taking the larger of the two, is correct.