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# LOG OF MEETING
# DIRECTORATE FOR ENGINEERING SCIENCES

SUBJECT: Flexing Cord Failures

DATE OF MEETING: May 1, 2002

PLACE OF MEETING: East West Towers, Bethesda, Md

LOG ENTRY SOURCE: Doug Lee, ESEE

DATE OF LOG ENTRY: May 1, 2002

COMMISSION ATTENDEES: Doug Lee, ESEE
William King, ES
Sheela Kadambi, ESEE

NON-COMMISSION ATTENDEES:
Clive Kimblin, Eaton/Cutler-Hammer
Joe Engel, Eaton/Cutler-Hammer
Frank Tse, Leviton

SUMMARY OF MEETING:

Cutler-Hammer staff presented their findings with the flash and popping sound associated with the rupturing/flexing failure of hair-dryer cords. This work was done to show what occurs during the rupturing of a series arc. They believe that series arcing is generally considered a lower level hazard than the parallel arcing fault because of the limited energy of the load in a series arcing fault and because a series fault often opens before causing a hazard. In contrast, the parallel arcing fault has much more energy because it is only limited by the available fault current of the branch circuit.

During these tests, Cutler-Hammer was able to measure the waveforms of the voltage and current during the rupture and to analyze the gases released from the heated cord prior to final rupture. Based on the experimental data, they determined that ignition of these explosive gases by the first half cycle of the parting series arc causes the flash and popping sound.