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TITLE: Methods for Evaluation of the Cardio-respiratory Response of Rats in Large-Scale Burn Tests

TO BE PRESENTED TO: National Academy of Sciences Meeting

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ABSTRACT AND REMARKS

(THIS ABSTRACT MUST BE 100 WORDS MINIMUM. USE EXTRA PAGES IF NECESSARY.)

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Cardio-respiratory data has been collected on white rats during large-scale fire tests for the purpose of determining the physiological responses to combustion fire gases and extinguishing agents. The exposure system consisted of an open mesh wire cage containing a rat externally instrumented for electrocardiogram (ECG) and respiration (R). The electrode belt contained two ECG sensors and one R sensor, and two ground wires, one each for ECG and R. These five wires formed an umbilical to the cage ceiling plug-in connector from which a cable extended to the signal conditioner electronics and thence to a dual beam oscilloscope, magnetic tape recorder, and/or a strip chart recorder. Temperature of the cage air-space was also recorded in a range of 10°C to 100°C.

Data were recorded during exposures to fires in a simulated lavatory where the fuel used was either shredded paper or airline-type waste. In some fires, only the indicated fuel sources were allowed to burn, without extinguishment. Some were detected and extinguished by an automatic system, using CO_2, N_2, or Halon 1301 as extinguishing agents. Finally, some fires were allowed to burn and ignite typical lavatory materials.

The cardio-respiratory responses of the instrumented rat are illustrated and described. Earliest signs of toxicity are bradycardia (slow heart rate), arrhythmias, and changes in respiratory patterns, primarily a reduction in volume as a function of time.

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