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NATIONAL BUREAU OF STANDARDS REPORT

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Progress Report

"Hazardous Combustible Characteristics of Cabin Materials"

July to December 1967

by

Daniel Gross

FAA Project No. 510-001-11X

U.S. DEPARTMENT OF COMMERCE

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Progress on the model enclosure tests during this period was limited due to the additional effort required in measuring smoke and toxic gases for approximately 40 supplementary interior finish materials.

Over 50 exploratory tests were conducted in an effort to develop a suitable procedure for evaluating fire development within model enclosures. These trials were performed in a nominal 20 by 20 by 40 in. asbestos-walled chamber and variations in the following test parameters were examined:

(a) Type of heating and/or ignition source. These included open flaming using gas and solid combustible fuels, electrical radiant heating, and electrical igniters in combustible contents and in the test chamber.

(b) Size and location of the ventilation opening.

(c) Type and orientation of the wall lining material.

(d) Type and location of combustible contents.

Precise fire development behavior patterns have so far not been defined. However, a number of tests have resulted in the sudden flashover of the combustible gases released slowly by lining materials, and in one instance an explosion was produced by rapid heating of a combustible foam cushion material from an embedded electrical heater.

Temperature records have been obtained on all tests, but gas analysis and photographic coverage have been deferred. These will be included as soon as feasible, and the following types of tests are also planned:

(a) Establish suitable and reproducible test conditions with one combustible lining material.

(b) Examine effect of thermal insulation on flashover and fire growth.

(c) Relate gas concentration to occurrence of flashover and explosion, if possible.

(d) Perform tests with a variety of actual interial finish materials.

(e) Examine combined contribution of wall linings and other combustible furnishings to the development of flashover.