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## A guide to the Howard W. Emmons papers

Worcester Polytechnic Institute

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# Howard W. Emmons Papers

04/08/2010

## Howard W. Emmons Papers

MS 06

Personal Papers

### ABSTRACT

Howard Emmons, a professor of Mechanical Engineering at Harvard University for forty years, was a leader in fire research and fire safety science in the second half of the 20th Century. This collection includes his papers and reports, including reports of the Home Fire Project, and papers and reports by others in the fire safety science field.

### BIOGRAPHICAL SKETCH

Howard W. Emmons was born in Morristown, N.J. Aug. 30, 1912. He received Master of Engineering and Master of Science Degrees from Stevens Institute of Technology, in 1933 and 1935 respectively. He received his Doctor of Science degree from Harvard University in 1938. After two years at Westinghouse Electric and one at the University of Pennsylvania as Associate Professor, Emmons came to Harvard University in 1940. He became Gordon McKay Professor of Mechanical Engineering there in 1949, and in 1966 became Abbott and James Lawrence Professor of Engineering. He retired from Harvard in 1983.

Professor Emmons was married and had three children. He lived in Sudbury, MA for many years, and was chairman of the Lincoln-Sudbury School Committee (1954-1968) and a town selectman (1969-1972).

Emmons' focus throughout his career was on fire safety science, and he was on the leading edge in this field. He re-created furnished rooms in his laboratory and observed them burning. He developed mathematical models for predicting fire spread, and later the Harvard Computer Fire Code.

He chaired the National Academy of Science's Committee on Fire Research, and helped bring about the passage of the National Fire Research and Safety Act of 1968. He chaired and participated in many other boards and committees related to fire safety.

With grants from the National Science Foundation, and working with Factory Mutual Research and Engineering Corp., Emmons directed Harvard's Home Fire Project.

After Howard Emmons' retirement from Harvard, he continued to work in the Fire Safety Science field, serving on committees and as a consultant, and continuing his work on the Home Fire Project.

Howard Emmons received many awards and honors, including being named "man of the year" by the Society of Fire Protection Engineers. In 1983, the Center for Fire Research honored him at its annual conference, calling him "Mr. Fire Research."

He supported the Fire Safety Science program at Worcester Polytechnic Institute, and WPI has an annual Howard W. Emmons Distinguished Lecture, and also gives the Howard Wilson Emmons Distinguished Scholar Award.

### SCOPE AND CONTENT

There are materials in this collection from 1931 to 1998. The bulk of the collection is from the 1960s through 1980s. The largest part of the collection is Howard Emmons' own work, including his notes, notebooks and handbooks; many papers and reports he wrote; the Harvard Home Fire Project which he

directed and wrote many papers for; presentations and consultations he did; and committees he chaired and served on.

A large part of the collection is also made up of papers and reports on fire safety science written by other people. Emmons had organized many of these papers, including some of his own, by subject categories. These categories are maintained in the collection; there may be other papers which fit these categories which will be found elsewhere. The categories are: Fire Modeling, Test Methods, Radiation, Mass Fire, Pyrolysis, Sprinklers, and Extinguishants and Retardants.

Also part of the collection are photographs and slides; films related to the Home Fire Project; computer manuals, print-outs, and disks; and files of legal cases Howard Emmons worked on as a consultant.

**Container List**

Container	Folder	Date	Title
None			

**Series I: Biographical Materials**

MS 06\_0001

Personal Papers

**Container List**

Container	Folder	Date	Title
Box 1	Folder 1	1983-1998	Biographical Information and Recognition
Box 1	Folder 1	1994	Lincoln-Sudbury Regional High School - Recognition of H.W. Emmons

**Series II: Correspondence**

MS 06\_0002

Correspondence

**Container List**

Container	Folder	Date	Title
Box 1	Folder 3	1981	Correspondence with IBM re. a standard test for furnishings
Box 1	Folder 4	1981, 1985, 1986	Correspondence
Box 1	Folder 5	1985, 1986	Correspondence- New York State & New York City
Box 1	Folder 6	1991-1995	Correspondence
Box 1	Folder 7	1997	Correspondence and Information on Creare Companies

**Series III: Notebooks, Notes and Handbooks**

MS 06\_0003

Notebook

**Container List**

Container	Folder	Date	Title
Box 1	Folder 8	1931	Notebook - Howard Emmons' <i>says "K, K" on front</i>
Box 1	Folder 9	n.d.	Two Booklets <i>"Standard Conversion Tables for L &amp; N Thermocouples" and "Haskins Chromel &amp; Other Electrical Resistance Wires"</i>

Box 1	Folder 10	1959	Inspection Manual - National Fire Protection Association
Box 1	Folder 11	n.d.	Notes <i>Paper with this said "drawing of a flow-over turbine engine"</i>
Box 1	Folder 12	1986	Notebook of the Underwriters' Bureau of New England <i>"90th Anniversary Edition of "The First Fire Protection Handbook 1896-1986" [2 copies]</i>

### Series IV: Notebooks and Notes

MS 06\_0004

Notebook

#### Container List

Container	Folder	Date	Title
Box 2	Folder 1	c. 1973-1980	Notebook - Course materials
Box 2	Folder 2	1976	Notes <i>some are class materials</i>
Box 2	Folder 3	1984	Fire and Spray Interactions/Teach/T Code
Box 2	Folder 4	1984	Notes/equations - Ceiling Jet
Box 2	Folder 5	1985, 1986	Notebook - Ceiling Jet <i>notebook labeled "Helium Results"</i>
Box 2	Folder 6	1988	Notes and Graphs
Box 2	Folder 7	earlier and 1991	Notebook - Units/Constants/Properties, Tables and other materials
Box 2	Folder 8	1991-1993	Notes - Ceiling Jet Book 2

### Series V: Papers and Reports by Howard W. Emmons

MS 06\_0005

Papers, Personal

#### Container List

Container	Folder	Date	Title
Box 3	Folder 1	9/28/1937	Report - "Theory of a Straight Line Motion Mechanism & Application to Recorders"
Box 3	Folder 2	11/1938	Paper - "The Mechanism of Drop Condensation"
Box 3	Folder 3	1/1940	Paper - "The Theory & Application of Extended Surface Thermocouples"
Box 3	Folder 4	6-9/1940	Report - "Correlation of Supercharger Design & Performance Data" <i>by Emmons, B.J. Robertson &amp; Frank Lockhard</i>
Box 3	Folder 5		Paper - "Effect of Variable Viscosity on Boundary Layers, with a Discussion of Drag Measurements" <i>by Emmons &amp; J. G. Brainerd</i>
Box 3	Folder 6	c. 1943	Paper - "Natural Convection Heat Transfer Correlation"
Box 3	Folder 7	3/1944	Paper - "The Numerical Solution of Partial Differential Equations"

Box 3	Folder 8	8/1944	Paper - "Shock Waves in Aerodynamics"
Box 3	Folder 9	5/7/1946	Technical Note <i>"Flow of a Compressible Fluid past a Symmetrical Airfoil in a Wind Tunnel &amp; in Free Air"</i>
Box 3	Folder 10	c. 1946	Paper - "The Present Status of Axial Flow Compressor Design" <i>by Emmons &amp; George Ball</i>
Box 3	Folder 11	1947	Publication - Gas Dynamics Tables for Air
Box 3	Folder 12	9/1/1949	Technical Memorandum - "Transient Aerodynamic Heating"
Box 3	Folder 13	12/1949	Report - "Thermal Flame Propagation" <i>by Emmons, Harr &amp; Strong</i>
Box 3	Folder 14	6/1950	Paper - "Note on Aerodynamic Heating"
Box 3	Folder 15	6/1950	Paper - "The Laminar-Turbulent Transition in a Boundary Layer - Part I"
Box 3	Folder 16	c. 1951	G. I. Taylor's Chapter for Princeton Series - "Solid & Liquid Explosives" <i>with Emmons' and others' notes and equations</i>
Box 3	Folder 17	1950s	G. I. Taylor - "Taylor's original stuff" [this was title of envelope]
Box 3	Folder 18	1950s	G. I. Taylor - Emmons' figures and tables
Box 3	Folder 19	1950s	Papers on Detonation - with G. I. Taylor materials <i>see also photos at end of collection</i>
Box 4	Folder 1	1951-1953	Reports and Papers <i>"Flow Instabilities in Compressor Rows" &amp; "Compressor Surge &amp; Stall Propagation" and related materials</i>
Box 4	Folder 2		Paper - "Discontinuity Properties of Flames & the Measurement of Flame Speeds" <i>by R. A. Gross &amp; H. W. Emmons [1 page]</i>
Box 4	Folder 3	1953	Paper - "Compressor Surge & Stall Propagation" <i>by H. W. Emmons, C. E. Pearson &amp; H.P. Grant</i>
Box 4	Folder 4	4/1953	Paper - "The Film Combustion of Liquid Fuel"
Box 4	Folder 5	11/1953	Report - "Tabulation of the Blasius Function with Blowing & Suction" <i>by H. W. Emmons &amp; D. Leigh</i>
Box 4	Folder 6	6/1954	Paper - "Shear Flow Turbulence"
Box 4	Folder 7	7/1954	Paper - "The non-steady aerodynamic heating of a plate"
Box 4	Folder 8	11/1954	Paper - "Amplification of Waves on Thin Liquid Film"
Box 4	Folder 9	4/1955	Paper - "Dimensional Analysis of Air Knife Film Coating Machine Operation"
Box 4	Folder 10	6/1955	Technical Note - "Experiments with a Rotating-Cylinder Viscometer at High Shear Rates" <i>by J. A. Cole, R. E. Petersen &amp; H. W. Emmons [2 copies]</i>
Box 4	Folder 11	1/1956	Paper - "The film Combustion of Liquid Fuel"

Box 4	Folder 12	4/1956	Paper - "Combustion"
Box 4	Folder 13	3/10/1958	Paper - "Combustion - An Aeronautical Science"
Box 4	Folder 14	8/1958	Report - "The supersonic flow about a blunt body of revolution for gases at chemical equilibrium" <i>by F. Gravalos, I. Edelfelt &amp; H. Emmons</i>
Box 4	Folder 15	9/1958	Paper - "A Survey of Stall Propagation - Experiment & Theory" <i>by H. W. Emmons, R. E. Kronauer &amp; J. A. Rockett</i>
Box 4	Folder 16	5/1959	Paper - "Taylor instability of finite surface waves" <i>by H. W. Emmons, C. T. Chang &amp; B. C. Watson</i>
Box 4	Folder 17	11/1959	Paper - "The Stability of Luminar Flames" <i>by R. E. Petersen &amp; H. W. Emmons</i>
Box 4	Folder 18	1/1960	Paper - "Natural Convection Above Fires" <i>by M. P. Murgai &amp; H. W. Emmons</i>
Box 4	Folder 19	n.d., c. 1960s	Paper - "The Future of Applied Mechanics"
Box 4	Folder 20	4/1961	Paper - "A study of natural convection above a line fire" <i>by Shao-Lin Lee &amp; H. W. Emmons</i>
Box 4	Folder 21	8/1961	Paper - "Some Observations on Pool Burning" <i>2 copies</i>
Box 4	Folder 22	2/1962	Paper - "Poiseuille Plasma Experiment" <i>by H. W. Emmons &amp; R. I. Land</i>
Box 4	Folder 23	1962	Article - "Recent Developments in Plasma Heat Transfer" <i>2 copies</i>
Box 4	Folder 24	1963	Paper - "Plasma Heat Transfer"
Box 4	Folder 25	1/17/1963	Paper - "Can the Scientist Help the Fire Protection Engineer?"
Box 5	Folder 1	n.d.,	Paper - "Fire Storms and Conflagrations associated with Nuclear Weapon Attack"
Box 5	Folder 2	1964	Paper - "Experiments on high pressure plasmas" <i>2 copies</i>
Box 5	Folder 3	2/1964	Report - "The Theory of AC Characteristics of a DC Arc" <i>by H.W. Emmons &amp; K. Gopalakrishna</i>
Box 5	Folder 4	1965	Paper - "Magnetohydrodynamics" <i>2 copies</i>
Box 5	Folder 5	1965	Paper - "Fundamental Problems of the Free Burning Fire"
Box 5	Folder 6	8/1965	Paper - "Fire Development Theory - An Overview" <i>2 copies</i>
Box 5	Folder 7	12/1965	Paper - "The Continuum Properties of Fiber Suspensions" <i>3 copies</i>

Box 5	Folder 8	12/1965 <i>3 copies</i>	Report - "The Arc Measurement of High Temperature Gas Transport Properties"
Box 5	Folder 9	1965-1982	Appendix of Harvard Reports
Box 5	Folder 10	1966-1967	Report - "Fire Research - A Trip Report"
Box 5	Folder 11	1967 <i>by Howard W. Emmons &amp; Shuh-Jing Ying [2 copies]</i>	Paper - "The Fire Whirl"
Box 5	Folder 12	1967	2 Statements on House Bill 6637 - The Fire Research & Safety Act of 1967
Box 5	Folder 13	3/10/1967 <i>2 copies</i>	Paper - "Arc Measurement of High-Temperature Gas Transport Properties"
Box 5	Folder 14	5/1967 <i>2 copies</i>	Paper - "Fire Research Abroad"
Box 5	Folder 15	12/1969 <i>by C. C. Hwang &amp; Howard W. Emmons [2 copies]</i>	Paper - "Investigation of Helium Arcs at 10 atm Pressure"
Box 5	Folder 16	1970	Paper - "Critique of Numerical Modeling of Fluid Mechanics Phenomena"
Box 5	Folder 17	7/1970 <i>plus draft and notes</i>	Paper - "Ignition in a Boundary Layer"
Box 5	Folder 18	8/1970	Paper - "Fluid Mechanics and Combustion"
Box 5	Folder 19	8/1970 <i>by Howard W. Emmons &amp; Tom Shen [2 copies]</i>	Paper - "Fire Spread in Paper Arrays"
Box 5	Folder 20	1972 <i>by Kun Min &amp; Howard W. Emmons [2 copies]</i>	Paper - "The Drying of Porous Media"
Box 5	Folder 21	1972 <i>Volume Contraction on Cooling Hot Gas by water evaporation/rate constants for evaporating water</i>	Notes -- Calculations for Water Evaporation
Box 5	Folder 22	8/15/1974 <i>by Phani P. K. Raj &amp; Howard W. Emmons</i>	Paper - "Transpiration Drying of Porous Hygroscopic Materials"
Box 5	Folder 23	1/1975	Abstract - "The Detonation of Methane-Air Mixtures"
Box 5	Folder 24	1975 <i>by Emmons &amp; Raj</i>	Drafts of Paper - "On the Burning of a Large Flammable Vapor Cloud"
Box 6	Folder 1	Summer 1975 <i>by J. Backovsky &amp; H. W. Emmons</i>	Paper - "Layering of Fire Gases"
Box 6	Folder 2	1975 <i>"On the Burning of a Large Flammable Vapor Cloud"</i>	Drafts/other articles - re. paper by Emmons & Raj
Box 6	Folder 3	1975 <i>by J. Prahll &amp; H. W. Emmons [2 copies]</i>	Paper - "Fire Induced Flow Through an Opening"
Box 6	Folder 4	1976 <i>by Howard W. Emmons &amp; P. K. Raj</i>	Paper - "On the Burning of a Large Flammable Vapor Cloud"

Box 6	Folder 5	1976	Paper - "Combustion of Wood Charcoal" <i>by D. D. Evans &amp; H. W. Emmons [2 copies]</i>
Box 6	Folder 6	8/12/1976	Report - "The Modeling of Fires" [ <i>Home Fire Project Report #18</i>
Box 6	Folder 7	n.d., c. 1978	Paper - "The Prediction of Fires in Buildings"
Box 6	Folder 8	n.d., c. 1978	Paper - "Fire"
Box 6	Folder 9	n.d.	Paper & Notes - "The Analysis of a Tragedy" <i>Beverly Hills Supper Club</i>
Box 6	Folder 10	10/1980	Paper - "Diffusion Flame Data & Interpretation for Burning in Hot Vitiated Air"
Box 6	Folder 11	1980	Paper - "The Growth of Fire Science" <i>2 copies</i>
Box 6	Folder 12	c. 1980	Paper - "The Parts of a Building Fire" -draft
Box 6	Folder 13	1980	Paper - "Scientific Progress on Fire"
Box 6	Folder 14	n.d., c. 1980	Report <i>"Note on the temperature of the surface of an object heated by heat flux &amp; cooled by convection and radiation"</i>
Box 6	Folder 15	n.d., c. 1980s	Notes - Characteristics and Function of Variables
Box 6	Folder 16	1981	Paper - "The Calculation of a Fire in a Large Building"
Box 6	Folder 17	1981	Paper - "Spontaneous Ignition of Styrene-Butadiene Rubber" <i>2 copies</i>
Box 6	Folder 18	12/1981	Papers - "Code Models" <i>flow through vent/heating of thick &amp; thin targets - 4 short Papers</i>
Box 6	Folder 19	1982	Report - "The Ignition & Burning of Hot Layer Gases" <i>Home Fire Project No. 51 [2 copies &amp; notes]</i>
Box 6	Folder 20	3/1982	Paper - "The Computer Fire Codes & Required New Data"
Box 6	Folder 21	8/20/1982	Manuscript - "Fire Detectors for Public Fire Safety"
Box 7	Folder 1	12/1982	Paper - "The Science of Wood Combustion" <i>by Howard W. Emmons &amp; Arvind Atreya [2 copies]</i>
Box 7	Folder 2	1982 & 1983	Correspondence - with John Lyons, National Bureau of Standards & Comtex Science Corp. <i>re. electronic version of "The Two Layer Fire Model"</i>
Box 7	Folder 3	1983	Paper - "The Further History of Fire Science"
Box 7	Folder 4	8/30/1983	Paper & Calculations - "Fire Growth at the MGM"
Box 7	Folder 5	1984-1992	Calculations -MGM Fire
Box 7	Folder 6	1984	Paper - "The Further History of Fire Science"



Box 7	Folder 7	1985	Manuscript -- "Vent Flows" <i>and related notes and correspondence</i>
Box 7	Folder 8	1985	Paper - "The Needed Fire Science" <i>2 copies</i>
Box 7	Folder 9	9/1986	Paper - "Analysing Far Field Effects" <i>includes drafts &amp; 2 copies</i>
Box 7	Folder 10	c. 1987	Paper - "Experiments with a Fire Math Model" <i>includes notes &amp; related material</i>
Box 7	Folder 11	c. 1987	Formulation - "Application of fractional Effective Dose Model to Smoke from Materials" <i>for Gordon Hartzell's paper</i>
Box 7	Folder 12	1987	Paper - "Wood Ignition and Pyrolysis" <i>by Arvind Atreya &amp; Howard W. Emmons</i>
Box 7	Folder 13	1987	"Why Fire Model? The MGM Fire & Toxicity Testing" <i>3 copies</i>
Box 7	Folder 14	3/16/1987	Paper - "The Flow of Gases Through Vents" aka "Vent Flows" <i>Home Fire Project Technical Report No. 75</i>
Box 7	Folder 15	1988	Paper - "Phenomena of a Comprehensive Fire Model" -2nd draft
Box 7	Folder 16	10/3/1988	Paper - "Window Glass Breakage by Fire" <i>Home Fire Technical Report No. 77</i>
Box 8	Folder 1	c. 1989	Paper - "Progress in Fire Modeling" <i>2 copies</i>
Box 8	Folder 2	2/21/1989	Paper - "Toxic Hazard & Fire Science" <i>Home Fire Project Technical Report No. 79</i>
Box 8	Folder 3	1989	Paper - "The Transient Ceiling Jet" <i>written draft, typed copy &amp; some computations</i>
Box 8	Folder 4	1989	Notes - "Ceiling Jet" <i>notes, graphs, computer program</i>
Box 8	Folder 5	1989	Notes - "Ceiling Jet"
Box 8	Folder 7	10/1990	Notes - Comparison of Wall-Fire Models <i>Folder 7: Notes - Comparison of Wall-Fire Models - 10/1990</i>
Box 8	Folder 8	3/1991	Paper - "The Ceiling Jet in Fires"
Box 8	Folder 9	1993	Draft - "Elementary Mechanics & Fluid Motions like Taylor Columns" <i>by J. Bush, H. Stone &amp; H. W. Emmons - with notes &amp; correspondence</i>
Box 8	Folder 10	c. 1993	Paper - "Elementary Mechanics & Fluid Motions like Taylor Columns" <i>by J. Bush, H. Stone &amp; H. W. Emmons</i>

Box 8	Folder 12	3/15/1996 <i>and related materials</i>	Paper - "A Universal Orifice Flow Formula"
Box 8	Folder 13	3/23/1996	Notes - New Fuel A-21, clipped to paper "Fluid Mechanics & Combustion" [1971]
Box 8	Folder 14	1996	Script - For television program on MGM Fire
Box 8	Folder 15	c. 1997	Paper - "Fire Safety Science in the Twenty First Century"

**Series VI: Presentations by Howard W. Emmons -  
Transparencies and Notes**

MS 06\_0006

Transparency, Slide

**Container List**

Container	Folder	Date	Title
Box 9	Folder 1	10/4/1972	Presentation - "Fire Research"
Box 9	Folder 2	c. 1977	Transparencies and notes - Colloquium Talk - Fire Safety Engineering
Box 9	Folder 3	1979	Transparencies - Computer Fire Code IV
Box 9	Folder 4	c. 1983, 1985	Transparencies - Harvard Fire Models & ISO Algorithm validation
Box 9	Folder 5	1987	Transparencies and notes <i>"Experiments with a Math Model," "Making FIRST more user friendly"</i>
Box 9	Folder 6	n.d.	Transparencies -Multiroom Flow Distribution View Graphs
Box 9	Folder 7	n.d.	Transparencies and notes - Regimes of flow through a vent
Box 9	Folder 8	n.d.	Transparencies and slide for presentations <i>Fabric time and weight to ignition and burning of plexiglass</i>
Box 9	Folder 9	n.d.	Transparencies - ceiling jets
Box 9	Folder 10	n.d.	Transparencies - "Ceiling Jet in Fire"
Box 9	Folder 11	n.d.	Transparencies and notes - "What we Know and Don't Know about Ceiling Jets"
Box 9	Folder 12	n.d.	Transparencies - Heat Transfer in Ceiling Jet
Box 9	Folder 13	1/15/1992	Paper for Presentation and Transparencies - "Enclosure Fire Modeling"
Box 10	Folder 1	4/29/1992	Transparencies and notes - "Fire Science and the New Fire Protection Engineering"
Box 10	Folder 2	c. 1992	Transparencies - "Fire Science history and future needs"
Box 10	Folder 3	c. 1994	Transparencies - "Outline of a Comprehensive Fire Performance Code"
Box 10	Folder 4	4/4/1994	Transparencies - "The New Fire Engineering"
Box 10	Folder 5	4/1997	Transparencies - "Fire Science in the 21st Century"

## Container List

Container	Folder	Date	Title
Box 10	Folder 1	c. 1940s	Consultation - Carrier Corporation <i>"Elementary Theory &amp; Design of Centrifugal Refrigeration Compressors" [2 copies]</i>
Box 10	Folder 2	2/10/1945	Consultation - Elliott Company <i>"The Theoretical Flow through Backward Leading Impellers of Centrifugal Compressors"</i>
Box 10	Folder 3	10/1973	Consultation - Ontario Council on Graduate Studies, Mechanical Engineering
Box 10	Folder 4	1976	Consultation - Standardized Nuclear Unit Power Plant System (SNUPPS) <i>Fire in Nuclear Plants</i>
Box 10	Folder 5	1976-1981	Consultation - Stevens Institute of Technology, Mechanical Engineering Group
Box 10	Folder 6	1977-1979	Consultation - Stone & Webster Engineering
Box 10	Folder 7	1981-1986	Consultation & Board Member - Technology Management Systems, Inc.
Box 10	Folder 8	1983	Consultation - American Academy of Arts & Sciences re. Auditorium Fire Safety
Box 10	Folder 9	1985	Consultation - Society of the Plastics Industry, Inc. re. State of Maine <i>toxicity testing of building materials</i>
Box 10	Folder 10	1985, 1986	Consultation - Sherman Larrison Bergsman, Inc. - Problems for CR Challenge
Box 10	Folder 11	1987 & 1988	Consultation - Haemonetics Corp.
Box 10	Folder 12	1988	Consultation - Thermo Electron - "Fire Genie"
Box 11	Folder 1	1967-1968	Consultation - Assessment of FM Research Program & Materials <i>re. patent for Dual Needle Sprinkler Head [Emmons one of inventors]</i>
Box 11	Folder 2	1970-1973	Consultation - Report: "The Use of Modern Mathematical Models in the Factory Mutual System" <i>and correspondence</i>
Box 11	Folder 3	1976-1986	Project Correspondence
Box 11	Folder 4	1985-1990	Consultation - Math Modeling notes, graphs, equations
Box 11	Folder 5	1982-1987	Consultation - "Prediction of Fire in Buildings" for FMRC grant <i>to National Bureau of Standards</i>
Box 12	Folder 1	3/1987	Computer Disk and printed pages - Disk says "MMASBANK"
Box 12	Folder 2	1988 & 1989	Grant Reports - "Prediction of Fire in Buildings" - NIST for Factory Mutual
Box 12	Folder 3	1990-1992	Grant Reports - "Prediction of Fire in Buildings" - NIST for Factory Mutual
Box 12	Folder 4	1993 & 1994	Extension Grant Proposal - "Prediction of Fire in Buildings" - NIST for Factory Mutual

Box 12	Folder 5	5/12/1995	Consultation - Cummins Engine Co. Inc. --Relation of vortex motion & combustion
Box 12	Folder 6	5/1995	Review - for National Research Council - National Research Council

## Series IIX: Home Fire Project

MS 06\_0008

Personal Papers

### Container List

Container	Folder	Date	Title
Box 13	Folder 1	1973	Notes - Home Fire Project - Full Scale Fire Test by Howard W. Emmons
Box 13	Folder 2	11/1982	Final Report - "Home Fire Project: 1972-1982" <i>this is report number 56</i>
Box 13	Folder 3	1971-1974	Technical Reports - Numbers 1-10 1: <i>"Natural Convective Flow through an Opening" by Howard W. Emmons - 12/1973</i> 2: <i>"The Value Destruction of a Home by Fire" by Neville Fowkes &amp; Richard Land - 1/1975</i> 3: <i>"Dynamics of Pyrolysis of Cellulosic Materials" by Kun Min -- 2/1975</i> 4: <i>"Fire in an Enclosure with Windows - Temperature Measurements" by Phani P. K. Raj - 2/1973</i> 5: <i>"Fire Spread in Paper Arrays" by Howard W. Emmons &amp; Tom Shen - 1970</i> 5A: <i>"The Fire Whirl: Theory and Experiment" by Robert Mayle -- 2/1973</i> 6: <i>"A Theoretical and Experimental Study of Nonpropagating Free-Burning Fires" by James A. Block, n.d.</i> 7: <i>"Fluid Mechanics and Combustion" by Howard W. Emmons -- 1970</i> 8: <i>"The Drying of Porous Media" by Kun Min &amp; Howard W. Emmons -- 1972</i> 9: <i>"Heat Transfer in Fire" by H. W. Emmons -- 5/1973</i> 10: <i>"Thermal Degradation and Spontaneous Ignition of Paper Sheets in Air by Irradiation" by Ubhayakar K. Shivadev &amp; Howard W. Emmons -- 1974</i>
Box 13	Folder 4	1974-1977	Technical Reports - Numbers 11-20 [missing number 15] 11: <i>"Fire and Fire Protection" by Howard W. Emmons - 7/1974</i> 12: <i>"Fire Induced Flow Through an Opening" by J. Prahl &amp; H. W. Emmons -1975</i> 13: <i>"Combustion of Wood Charcoal" by D. D. Evans &amp; H. W. Emmons -1975</i> 14: <i>"Density of Wood Charcoal" by D. D. Evans - c. 1975</i> 16: <i>"Flow through the Doorway" by Lloyd N. Trefethen - 3/1976</i> 17: <i>"Layering of Fire Gases" by J. Backovsky &amp; H. W. Emmons - Summer 1975</i> 18: <i>"The Modeling of Fires" by H. W. Emmons - 8/12/1976</i> 19: <i>"The Spread over Vertical Fuel Surfaces under the Influence of Externally Applied Thermal Radiation" by A. C. Fernandez-Pello - 1/1977</i> 20: <i>"Computer Fire Code (II)" by H. W. Emmons - 1/1977</i>
Box 13	Folder 5	1977 & 1978	Technical Reports - Numbers 21-29 [missing number 30] 21: <i>"The Home Fire - Viewed as a Scientific System" by Howard W. Emmons, n.d.</i> 22: <i>"Effects of Water on Wood Charcoal Combustion," "Wood Charcoal Combustion and the Effects of Water Application," "Analytical Modeling of The Effects of Water Application on Burning Wood Charcoal Surfaces" by Phiroz M. Bhagat - 1980-1982</i> 23: <i>"Catalytic Sensor for the Measurement of Heat of Combustion of Smoke" By Kun Min - 8/1977</i> 24: <i>"Test Burns of Mattress and Bedclothes" by R. I. Land - 8/1977</i> 25: <i>"Computer Fire Code III" and "Computer Fire Code III Appendix and Fortran Listing for Fire Code III" by H. W. Emmons, H. E. Mütler &amp; L. N. Trefethen - 1/1978</i>

- 26: "A Note on Minimizing the Unknowns for Computation of a Large System of Equations" by H. W. Emmons - 8/1978  
 27: "Downward Flame Spread Under the Influence of Externally Applied Thermal Radiation" by A. C. Fernandez-Pello - 2/1977  
 28: "Upward Laminar Flame Spread Under the Influence of Externally Applied Thermal Radiation" by A. C. Fernandez-Pello - 5/1977  
 29: "A Theoretical Model for the Upward Laminar Spread of Flames Over Vertical Fuel Surfaces" by A. C. Fernandez-Pello -1978

Box 14	Folder 1	1977-1980	Technical Reports - Numbers 31-40
			<p>31: "The Prediction of Fires in Buildings" by Howard W. Emmons - c. 1978          32: "Vapor-phase Thermal Analysis of Pyrolysis Products from Cellulosic Materials" by Kun Min - 1977          33: "Fire Characteristics under the Influence of External Radiation" by Tein-Mo Shih - 8/1978          34: "The Physical Basis for the Harvard Computer Fire Code" by Henri E. Mitler - 10/1978          35: "The Status of Fire Modeling in the United States" by H. W. Emmons, C. D. MacArthur, R. Pape - c. 1978          36: "Scientific Progress on Fire" by Howard W. Emmons - 1980          37: "Users' Guide for the Harvard Computer Fire Code" by Henri E. Mitler - 4/1979          38: "Fire" by Howard W. Emmons - n.d.          39: "Design and Use of Simple Gas Chromatograph" by E. Lincoln - 1/1979          40: Emmons' note says "Computer Tape, CFC IV"</p>
Box 14	Folder 2	1979-1982	Technical Reports - Numbers 41-50 [missing Number 42]
			<p>41: "The Theory of Boundary Layer Burning with Radiation" by J. Backovsky - 10/1979          43: "Fire Ventilation Reconsidered" by Richard Land - 3/1980          44: "Heat Conduction Calculations for Zone Fire Modeling" by H. W. Emmons -10/1980          45: "Documentation for CFC V, the Fifth Harvard Computer Fire Code" by H. E. Mitler &amp; H. W. Emmons - 10/1981          46: "Comparison between Theory and Experiment for a Burning Room" by Henri E. Mitler - 5/1981          47: "Finding Minimal Feedback Vertex Sets" by John D Ramsdell - 4/1981          48: "Juggle User's Guide" by John D. Ramsdell - 8/1981          49: "The Ingestion of Flames and Fire Gases into a Hole in an Aircraft Cabin for Small Tilt Angles and Low Wind Speeds" by Howard W. Emmons - 10/1981          50: "The Two Layer Fire Model" by Howard W. Emmons - 2/1982</p>
Box 14	Folder 3	1982	Technical Reports - Numbers 51-55
			<p>51: "The Ignition and Burning of Hot Layer Gases" by Howard W. Emmons -2/1982          52: "The Ingestion of Flames and Fire Gases into a Hole in an Aircraft Cabin for Tilt Angles and Wind Speed" by Howard W. Emmons - 6/1982          53: "Transient Horizontal Flame Spread Tests on Cellular Plastics - Experimental Results" - Volumes I, II, and III by Seng-Chuan Tan - 12/1982          54: "Home Fire Project LSI-11 Laboratory Data Acquisition System" by Seng-Chuan Tan - 6/1982          55: "The Time-Dependent Ceiling-Jet in a Corridor" by Henri E. Mitler - 12/1982</p>
Box 15	Folder 1	1982-1984	Technical Reports - Numbers 56-60 [missing number 60]
			<p>56: "The Home Fire Project: 1972-1982 - Final Report" - 1982          57: "Computer Modeling of Aircraft Cabin Fires: Final Report, June 1981- Dec. 31, 1982, FAA Project - 3/1983          58: "Computer Fire Code VI" by J. B. Gahm - 7/1983          59: "Pyrolysis, Ignition and Fire spread on Horizontal Surfaces of Wood" By A. Atreya - 3/1984</p>
Box 15	Folder 2	1982-1984	Technical Reports - Numbers 61-70
			<p>61: "The Analysis of a Tragedy" by Howard W. Emmons - 1983          62: "The Calculation of a Fire in a Large Building" by H. W. Emmons - 1982</p>

- 63: *"The Prediction of Fire Growth in Buildings - An Introduction to Fire Phenomena"* by Howard W. Emmons - 8/1984
- 64: *"The Further History of Fire Science"* by Howard W. Emmons - 10/1983
- 65: *"Note on the Solvability of Math. Models of Fire"* by Howard W. Emmons - 8/1984
- 66: *"The Needed Fire Science"* by Howard W. Emmons - 3/1985
- 67: *"Fire Modeling for Toxic Gas Control"* by Howard W. Emmons - 3/1985
- 68: *"The Science of Fire - The New Fire Safety Engineering"* by Howard W. Emmons - 10/1984
- 69: *"Diffusion Flame Energy Transfers"* by Craig Beyler - 1/1985
- 70: *"Vent Flows"* by Howard W. Emmons - 6/1985

Box 15	Folder 3	1985-1989	Technical Reports - Numbers 71-80
			71: <i>"Fire Detectors for Public Fire Safety"</i> by Howard W. Emmons - 10/1985
			72: <i>"Fire Safety of Buildings and Building Occupants"</i> by Howard W. Emmons - 1/1986
			73: <i>"Why Fire Model? The MGM Fire and Toxicity Testing"</i> by Howard W. Emmons - 7/1986
			74: <i>"The Transient Ceiling Jet"</i> by Howard W. Emmons - 8/26/1986
			75: <i>"The Flow of Gases Thru Vents"</i> by Howard W. Emmons - 3/16/1987
			76: <i>"Experiments with a Fire Math Model"</i> by Howard W. Emmons - 3/1/1988
			77: <i>"Window Glass Breakage by Fire"</i> by Howard W. Emmons - 10/3/1988
			78: <i>"The Use of Fire Test Data in Fire Models"</i> by Howard W. Emmons - 2/1989
			79: <i>"Toxic Hazard and Fire Science"</i> by Howard W. Emmons - 2/21/1989
			80: <i>"Heat Conduction in Fires"</i> by Howard W. Emmons - 4/29/1989
Box 16	Folder 3	1995-1997	Home Fire Project Technical Report Listing - Numbers 1 through 97
Box 16	Folder 1	1990-1995	Technical Reports - Numbers 81-90
			81: <i>"Progress in Fire Modeling"</i> by Howard W. Emmons - 5/1/1990
			82: <i>"The Ceiling Jet in Fires"</i> by Howard W. Emmons - 10/1990
			83: <i>"Strategies for Performance Codes in the U. S."</i> by Howard W. Emmons - 3/9/1991
			84: <i>"Fire Safety Science - The Promise of a Better Future"</i> by Howard W. Emmons - 8/17/1989
			85: <i>"Progress Report on the Ceiling Jet in Fire"</i> by Howard W. Emmons - 9/12/1992
			86: <i>"Future Developments in Fire Safety"</i> by Howard W. Emmons - 4/28/1993 --- <i>"Fire Safety Science in the Twenty First Century"</i> by Howard W. Emmons - n.d. [this was with other reports. Emmons' note says "see reports 86, 84, 83]
			87: <i>"Progress with the Ceiling Jet"</i> by Howard W. Emmons - 10/2/1993
			88: <i>"The Distributio of Fire Gases Throughout a Multiconnected Building"</i> by Howard W. Emmons - 11/6/1994
			89: <i>"Transient Ceiling Jets"</i> by Howard W. Emmons - 6/1/1995
			90: <i>"Fire Science for Firemen 1 "</i> by Howard W. Emmons - 6/16/1995
Box 16	Folder 2	1995-1997	Technical Reports - Numbers 91-98
			91: <i>"Fire in a High Rise Building"</i> by Howard W. Emmons - 7/27/1995
			92: <i>"Fire Science for Firemen 2"</i> by Howard W. Emmons - 8/14/1995
			93: <i>"Fire Science for Firemen 3"</i> by Howard W. Emmons - 10/7/1995
			94: <i>"Fire Science for Firemen 4"</i> by Howard W. Emmons - 12/1/1995
			95: <i>"Fire Science for Firemen 5"</i> by Howard W. Emmons - 4/26/1996
			96: <i>"Fire Science for Firemen 6"</i> by Howard W. Emmons - 6/18/1996
			97: <i>"Fire Modeling in the 21st Century"</i> by Howard W. Emmons - 1/18/1997
			98: <i>"Dimensional Analysis of Film Condensation of Vapors"</i> by Howard W. Emmons - 11/20/1997

**Series IX: Committees Howard W Emmons served on**

MS 06\_0009

Personal Papers

**Container List**

<b>Container</b>	<b>Folder</b>	<b>Date</b>	<b>Title</b>
Box 16	Folder 4	1956	Committee on Fire Research - "Fire Research: First Correlation Conference"
Box 16	Folder 5	1959	Committee on Fire Research - "A Proposed Fire Research Program"
Box 16	Folder 6	1961	Committee on Fire Research - "A Study of Fire Problems" - Woods Hole
Box 16	Folder 7	1961	Committee on Fire Research - "Study Results - A Study of Fire Problems - Woods Hole Study <i>Howard Emmons General Chairman of 1961 conference</i>
Box 17	Folder 1	1961	Committee on Fire Research - Final Report - "A Study of Fire Problems"
Box 17	Folder 2	11/30/1962	Committee on Fire Research - Comments on Study of Fire Problems Conference at Woods Hole
Box 17	Folder 3	1962	Committee on Fire Research - Final Report 1959-1962
Box 17	Folder 4	1967	Committee on Fire Research - Report written by H. W. Emmons
Box 17	Folder 5	10/1968	Committee on Fire Research - Symposium on Needs of the Fire Services
Box 17	Folder 6	1969	Committee on Fire Research - "A Proposed National Fire Research Program" <i>Howard Emmons, Chair</i>
Box 17	Folder 7	c.1970	Committee on Fire Research - "Events Leading Up to Present in Fire Research"
Box 17	Folder 8	3/25/1970	Committee on Fire Research - "Some Observations on the Education of Firefighters" by Howard Emmons
Box 17	Folder 9	4/1970	Committee on Fire Research - Symposium on Training & Education in the Fire Services
Box 17	Folder 10	6/1971	Committee on Fire Research - Symposium on employment of Air Operations in the Fire Services
Box 17	Folder 11	1968 & 1981	Evaluation Committees - Test Methods [1981-Stanford Conference on Complex Turbulent Flows]
Box 17	Folder 12	6/8/1962	Space Science & Technology Panel - Correspondence
Box 17	Folder 13	1/22/1968	Space Science & Technology Panel - "A Proposal for Planetary Engineering" by Howard Emmons
Box 17	Folder 14	12/16/1968	Space Science & Technology Panel - Report: "New Dimensions for the Next Decade in Space"
Box 17	Folder 15	c. 1970	Space Science & Technology Panel - "Statement on Space Program" by Howard Emmons
Box 17	Folder 16	9/1969	Space Task Group Report to the President -- "Post-Apollo Space Program: Directions for the Future"
Box 17	Folder 17	2/1970	President's Science Advisory Committee - "The Next Decade in Space"
Box 17	Folder 18	8/30/1972	National Academy of Sciences Ad Hoc Fire Panel Report <i>for National Bureau of Standards [Howard Emmons Chair]</i>
Box 18	Folder 1	1974	Massachusetts Commission on Nuclear Safety
Box 18	Folder 2	1970s	Committee on Fire & Smoke Resistant Materials for Commercial Aircraft Interiors <i>Aircraft: Civil &amp; Military - Fire Safety Aspects of Polymeric Materials</i>

Box 18	Folder 3	9/1990	Committee on Fire & Smoke Resistant Materials for Commercial Aircraft Interiors <i>Aircraft Material Fire Test Handbook, FAA</i>
Box 18	Folder 4	c. 1990s	Committee on Fire & Smoke Resistant Materials for Commercial Aircraft Interiors <i>"FAA Fire Safety Mission" by Thomas E. McSweeney [2 copies]</i>
Box 19	Folder 1	1991-1995	Committee on Fire & Smoke Resistant Materials for Commercial Aircraft Interiors <i>National Research Council/National Academy of Sciences - Guidelines</i>
Box 19	Folder 2	c. 1993	Committee on Fire & Smoke Resistant Materials for Commercial Aircraft Interiors <i>Papers by FAA and others</i>
Box 19	Folder 3	1992-1994	Committee on Fire & Smoke Resistant Materials for Commercial Aircraft Interiors <i>Conference 11/1994, preparation and reports</i>
Box 19	Folder 4	1993 & 1994	Committee on Fire & Smoke Resistant Materials for Commercial Aircraft Interiors
Box 19	Folder 6	10/13/1995	Committee on Fire & Smoke Resistant Materials for Commercial Aircraft Interiors <i>"Fire and Smoke Resistant Materials: Improving Aircraft Safety" [draft]</i>
Box 19	Folder 5	11/8-10/1994	Committee on Fire & Smoke Resistant Materials for Commercial Aircraft Interiors <i>International Conference on Fire &amp; Smoke Resistant Materials</i>
Box 19	Folder 7	1994 & 1995	Committee on Fire & Smoke Resistant Materials for Commercial Aircraft Interiors <i>Howard Emmons' writing and comments for "Fire and Smoke Resistant Materials" publication, writings of others</i>
Box 20	Folder 1	1995	Committee on Fire & Smoke Resistant Materials for Commercial Aircraft Interiors <i>"Fire &amp; Smoke Resistant Materials" [draft]</i>
Box 20	Folder 2	1995	Committee on Fire & Smoke Resistant Materials for Commercial Aircraft Interiors <i>"Fire &amp; Smoke Resistant Materials" - draft, incomplete, with reviewers' comments and responses</i>
Box 20	Folder 4	1995	Committee on Fire & Smoke Resistant Materials for Commercial Aircraft Interiors <i>Final Publication: Fire &amp; Smoke-Resistant Interior Materials for Commercial Transport Aircraft</i>
Box 20	Folder 3	1981-1985	Ad Hoc Mathematical Fire Modeling Group
Box 20	Folder 5	1988	Massachusetts Governor's Commission on Fire Safety, Combustion, Toxicity & Combustibility
Box 20	Folder 6	1984	University of Akron - Center for Fire & Hazardous Materials Research - Advisory Committee
Box 20	Folder 7	1984 & 1985	Fire Technology - Editorial Review Board
Box 20	Folder 8	1998	Fire Safety Board of Advisors/WPI Firesafety Studies
Box 20	Folder 9	1989-1995	Correspondence/papers re. WPI's Fire Protection Engineering Program
Box 21	Folder 1	1946-1949	American Physical Society - Committee on Fluid Dynamics <i>Howard W. Emmons was first Secretary/Treasurer - Early records</i>
Box 21	Folder 2	1980s	American Physical Society - Division of Fluid Dynamics
Box 21	Folder 3	11/1997	American Physical Society - Division of Fluid Dynamics <i>"Origin of Fluid Dynamics Division - presentation by Howard W. Emmons [also history from 1970s &amp; 1980s]</i>



Box 21	Folder 4	1980-1990	Combustion Institute
Box 21	Folder 5	1971-1978	American Society of Mechanical Engineers <i>Correspondence &amp; honoring Howard W. Emmons</i>
Box 21	Folder 6	4/1976	UJNR (United States/Japan Cooperative Program on Natural Resources) Panel on Fire Research & Safety <i>First Joint Meeting - Minutes</i>
Box 21	Folder 7	4/7-8/1976	UJNR Panel on Fire Research & Safety <i>First Joint Meeting - Research Programs &amp; Fire Research Facilities</i>
Box 21	Folder 8	n.d., probably 4/1976	UJNR Panel on Fire Research & Safety <i>Probably First Joint Meeting - Smoke Control</i>
Box 21	Folder 9	n.d., probably 4/1976	UJNR Panel on Fire Research & Safety <i>Probably First Joint Meeting - Fire Protection &amp; Detection</i>
Box 21	Folder 10	10/19-22/1976	UJNR Panel on Fire Research & Safety <i>2nd Joint Meeting - Theme: Human Behavior</i>
Box 22	Folder 1	10/1976	UJNR Panel on Fire Research & Safety <i>2nd Joint Meeting - General Reports</i>
Box 22	Folder 2	10/1976	UJNR Panel on Fire Research & Safety <i>2nd Joint Meeting - Theme: Toxicity</i>
Box 22	Folder 3	10/1976	UJNR Panel on Fire Research & Safety <i>2nd Joint Meeting - Theme: Smoke Control</i>
Box 22	Folder 4	10/1976	UJNR Panel on Fire Research & Safety <i>2nd Joint Meeting - Theme: Modeling of Fire</i>
Box 22	Folder 5	10/1976	UJNR Panel on Fire Research & Safety <i>2nd Joint Meeting - Theme: Building Systems</i>
Box 22	Folder 6	10/1976	UJNR Panel on Fire Research & Safety <i>2nd Joint Meeting - Theme: Fire Detection &amp; Smoke Properties</i>
Box 22	Folder 7	3/13-17/1978	UJNR Panel on Fire Research & Safety <i>3rd Joint Meeting - Theme: Human Behavior in Fires</i>
Box 22	Folder 8	3/1978	UJNR Panel on Fire Research & Safety <i>3rd Joint Meeting - Theme: Building Systems</i>
Box 23	Folder 1	3/1978	UJNR Panel on Fire Research & Safety <i>3rd Joint Meeting - Theme: Smoke Properties &amp; Detection</i>
Box 23	Folder 2	3/1978	UJNR Panel on Fire Research & Safety <i>3rd Joint Meeting - Theme: Fire Modeling</i>
Box 23	Folder 3	3/1978	UJNR Panel on Fire Research & Safety <i>3rd Joint Meeting - Theme: Toxicity</i>

Box 23	Folder 4	2/5-9/1979	UJNR Panel on Fire Research & Safety <i>4th Joint Meeting - Resolutions</i>
Box 23	Folder 5	2/1979	UJNR Panel on Fire Research & Safety <i>4th Joint Meeting - Theme: Building Systems &amp; Smoke Control</i>
Box 23	Folder 6	2/1979	UJNR Panel on Fire Research & Safety <i>4th Joint Meeting - Theme: Fire &amp; Smoke Retardants</i>
Box 23	Folder 7	2/1979	UJNR Panel on Fire Research & Safety <i>4th Joint Meeting - Theme: Human Behavior</i>
Box 23	Folder 8	2/1979	UJNR Panel on Fire Research & Safety <i>4th Joint Meeting - Theme: Fire Investigation Technique</i>
Box 24	Folder 1	2/1979	UJNR Panel on Fire Research & Safety <i>4th Joint Meeting -Theme: Toxicity of Fire Gas</i>
Box 24	Folder 2	2/1979	UJNR Panel on Fire Research & Safety <i>4th Joint Meeting -Theme: Fire Modeling</i>
Box 24	Folder 3	2/1979	UJNR Panel on Fire Research & Safety <i>4th Joint Meeting -Theme: Fire Detection and Smoke Properties</i>
Box 24	Folder 4	10/15-24/1980	UJNR Panel on Fire Research & Safety <i>5th Joint Meeting</i>
Box 24	Folder 5	5/10-14/1982	UJNR Panel on Fire Research & Safety <i>6th Joint Meeting - Resolutions &amp; General Information</i>
Box 24	Folder 6	5/1982	UJNR Panel on Fire Research & Safety <i>6th Joint Meeting - Theme: Fire Investigation Techniques</i>
Box 24	Folder 7	5/1982	UJNR Panel on Fire Research & Safety <i>6th Joint Meeting - Theme: Sprinklers</i>
Box 24	Folder 8	5/1982	UJNR Panel on Fire Research & Safety <i>6th Joint Meeting - Theme: Fire Detection</i>
Box 24	Folder 9	5/1982	UJNR Panel on Fire Research & Safety <i>6th Joint Meeting - Theme: Fire &amp; Smoke Retardants</i>
Box 24	Folder 10	5/1982	UJNR Panel on Fire Research & Safety <i>6th Joint Meeting - Theme: Toxicity</i>
Box 24	Folder 11	5/1982	UJNR Panel on Fire Research & Safety <i>6th Joint Meeting - Theme: Building Systems &amp; Smoke Control</i>
Box 24	Folder 12	5/1982	UJNR Panel on Fire Research & Safety <i>6th Joint Meeting - Theme: Human Behavior</i>
Box 25	Folder 1	5/1982	UJNR Panel on Fire Research & Safety <i>6th Joint Meeting - Theme: Modeling of Fire [includes Emmons' paper "The Computer Fire Codes and Required New Data"]</i>

Box 25	Folder 2	10/1983 <i>7th Joint Meeting</i>	UJNR Panel on Fire Research & Safety
Box 25	Folder 3	c. 1983 <i>probably 7th Joint Meeting - "An Example of Human Behavior in a Hotel Fire" by Soichiro Okishio, Takashi Handa &amp; Kuno Kawagoe</i>	UJNR Panel on Fire Research & Safety
Box 25	Folder 4	c. 1983 <i>probably 7th Joint Meeting - "Analysis of the Fire Protection Cost Index" by H. Nakamura &amp; Y. Yashiro</i>	UJNR Panel on Fire Research & Safety
Box 25	Folder 5	c. 1983 <i>probably 7th Joint Meeting - "The Models to be developed in Fire Safety Design Project" by Takeyashi Tanaka</i>	UJNR Panel on Fire Research & Safety
Box 25	Folder 6	10/1983 <i>7th Joint Meeting - "Fire Spread Research in the U.S." - report by Howard W. Emmons</i>	UJNR Panel on Fire Research & Safety
Box 25	Folder 7	10/1983 <i>7th Joint Meeting - Theme: Materials Fire Properties &amp; Test Methods</i>	UJNR Panel on Fire Research & Safety
Box 25	Folder 8	10/1983 <i>7th Joint Meeting - Theme: Measurement Methods</i>	UJNR Panel on Fire Research & Safety
Box 25	Folder 9	10/1983 <i>7th Joint Meeting - Theme: Combustion Toxicity</i>	UJNR Panel on Fire Research & Safety
Box 25	Folder 10	10/1983 <i>7th Joint Meeting - Theme: Fire Hazard/Risk Management Methods</i>	UJNR Panel on Fire Research & Safety
Box 25	Folder 11	5/4-8/1987 <i>9th Joint Meeting</i>	UJNR Panel on Fire Research & Safety
Box 26	Folder 1	6/9-10/1988 <i>10th Joint Meeting</i>	UJNR Panel on Fire Research & Safety
Box 26	Folder 2	10/19-24/1989 <i>11th Joint Meeting - Papers, program, correspondence</i>	UJNR Panel on Fire Research & Safety
Box 26	Folder 3	10/27-11/2/1992 <i>12th Joint Meeting</i>	UJNR Panel on Fire Research & Safety
Box 26	Folder 4	1996 <i>13th Joint Meeting - 2 papers</i>	UJNR Panel on Fire Research & Safety
Box 26	Folder 5	5/28-6/3/1998 <i>14th Joint Meeting</i>	UJNR Panel on Fire Research & Safety
Box 26	Folder 6	1998 <i>14th Joint Meeting - papers</i>	UJNR Panel on Fire Research & Safety
Box 26	Folder 7	1998 <i>14th Joint Meeting - papers</i>	UJNR Panel on Fire Research & Safety

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**Series X: Conferences, Symposiums, Workshops**  
**Howard W. Emmons participated**

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Personal Papers

**Container List**

<b>Container</b>	<b>Folder</b>	<b>Date</b>	<b>Title</b>
Box 27	Folder 1	10/1984 <i>Tianjin, China</i>	Symposium on Combustion - Abstracts of contributed papers
Box 27	Folder 2	2/12-14/1990 <i>NIST - program</i>	Fourth CB Workshop on Fire Modeling
Box 27	Folder 3	5/1990 <i>"Recent Advances in Flame Retardancy of Polymeric Materials"</i>	Papers - for Special Conference
Box 27	Folder 4	1/16/1991 <i>by H. W. Emmons, and related Materials for Conference on Firesafety Design in the 21st Century</i>	Abstract - "Strategies for Performance Codes in the U.S."
Box 27	Folder 5	10/1993	Papers - Annual Conference on Fire Research - National Institute of Standards & Technology
Box 27	Folder 6	10/7-9/1993	'93 Asian Fire Seminar
Box 27	Folder 7	5/1996	7th Annual BCC (Business Communications Company) Conference on Flame Retardancy
Box 27	Folder 8	6/20-21/1996 <i>Society of Fire Protection Engineers &amp; WPI Center for Fire Safety Studies</i>	Technical Symposium: Computer Applications in Fire Protection Engineering
Box 27	Folder 9	3/1997	Fifth International Symposium on Fire Safety Science
Box 27	Folder 10	11/11-14/1997	International Conference on Fire Research for Fire Investigation

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**Series XI: Papers and reports on Fire Modeling**

MS 06\_0011

Personal Papers

**Container List**

<b>Container</b>	<b>Folder</b>	<b>Date</b>	<b>Title</b>
Box 28	Folder 1	1930s <i>by Hugh L. Dryden &amp; George C. Hill and Emmons' notes on Wind Flows Folder labeled "DuPont Plaza"</i>	Paper- "Wind Pressure on a model of the Empire State Building"
Box 28	Folder 2	2/1961 <i>by William Squire &amp; Connie Foster</i>	Report - "A Mathematical Study of the Mechanism of Wood Burning"
Box 28	Folder 3	1969 <i>by P. C. Bowes</i>	Paper - "Thermal Ignition in Two-Component Systems, Theoretical Model"
Box 28	Folder 4	8/1971 <i>by Billy T. Lee</i>	Report - "Modeling the Dynamic Behavior of Building Fires"

Box 28	Folder 5	c. 1972	Paper - "Modeling Fires" by Patrick J. Pagni
Box 28	Folder 6	1973 <i>by Marian Visich, Jr.</i>	Paper - "Consideration of Fire Development in an Enclosed Space"
Box 28	Folder 7	1973 <i>by J. De Ris</i>	Paper - "Modeling Techniques for Prediction of Fires"
Box 28	Folder 8	c. 1959- 1974 <i>includes Emmons' published questions in Thomas paper</i>	Papers - by G. I. Taylor, H. C. Hottel & P. H. Thomas, and extensive notes by H. W. Emmons
Box 28	Folder 9	1975 <i>by Edwin E. Smith &amp; Michael H. Clark, with comments by H. W. Emmons</i>	Paper - "Model of the Developing Fire in a Compartment"
Box 28	Folder 10	6/1977 <i>by C. T. Crowe, M. P. Sharma, D. E. Stock</i>	Paper - "The Particle-Source-In Cell (PSI-CELL) Model for Gas-Droplet Flows"
Box 28	Folder 11	6/1977	Graphs - "Curves by Fire Code IV - Composition - notes of Howard W. Emmons
Box 28	Folder 12	8/1977 <i>IITRI Report - Prepared by Ronald Pape</i>	Report - "Computer Simulation of Full Scale Room Fire Experiments"
Box 28	Folder 13	8/1977 <i>Home Fire Project Tech. Report No. 25 by H. W. Emmons, H. E. Mitler &amp; L. N. Trefethen</i>	Report - "Computer Fire Code III - Appendix & Fortran Listing for Fire Code III"
Box 28	Folder 14	6/1978 <i>by E. N. Tangren, W. S. Sargent &amp; E. E. Zukoski</i>	Report - "Hydraulic & Numerical Modeling of Room Fires"
Box 28	Folder 15	7/15/1978 <i>"UNDSAFE-II - A Computer Code for Buoyant Turbulent Flow in an Enclosure with Thermal Radiation"</i>	Report by V. K. Liu & K. T. Yang
Box 28	Folder 16	1978 <i>by H. W. Emmons, C. D. MacArthur &amp; R. Paper</i>	Paper - "The Status of Fire Modeling in the United States"
Box 28	Folder 17	1978 <i>by A. C. Fernandez-Pello</i>	Paper - "A Theoretical Model for the Upward Laminar Spread of Flames over vertical fuel surfaces"
Box 28	Folder 18	1978 <i>by Leif Abrahamsson, Bengt Hagglund, Krister Janzon, Stockholm</i>	Report - "HSLAB - An Interactive Program for Onedimensional Heat Flow Problems"
Box 28	Folder 19	1980-1985 <i>these were all together in Emmons' papers</i>	Papers by Robert Brady Williamson - fire modeling/wood char/concrete & mortars
Box 29	Folder 1	c. early 1980s <i>by James Quintiere &amp; T. Tanaka [2 copies]</i>	Paper - "Some Analysis of the FAA Post Crash Fire Scenario"
Box 29	Folder 2	1981 <i>by Phani K. Raj</i>	Paper - "Models for Cryogenic Liquid Spill Behavior on Land & Water"
Box 29	Folder 3	5/1981 <i>"Estimating Room Temperatures and the Likelihood of Flashover using Fire Test Data Correlations"</i>	Paper by B. J. McCaffery, J. G. Quintiere & M. F. Harkleroad

Box 29	Folder 4	7/1981	Paper - "Stochastic Modelling of Fire Growth" <i>by Dr. G. Ramachandran</i>
Box 29	Folder 5	7/1981	Report - "Fire Spread Analysis of Buildings" <i>by D. G. Elms &amp; A. H. Buchanan, Building Research Assoc. of New Zealand</i>
Box 29	Folder 6	7/1981	Report - "Survey of Fire Modeling Efforts with Application to Transportation Vehicles" <i>by William T. Hathaway</i>
Box 29	Folder 7	7/1981	Tests & Data - "Experimental Enclosure Fires for Enclosure Fire Model Verification" <i>by Lawrence Livermore Lab et. al.</i>
Box 29	Folder 8	8/1981	"Modeling of the NBS Mattress Tests with the Harvard Fire Code" <i>by John A. Rocket</i>
Box 29	Folder 9	10/1981	Report - "Documentation for CFC V, Fifth Harvard Fire Code" <i>by H. E. Mütler &amp; H. W. Emmons</i>
Box 29	Folder 10	10/1981	Report - "A Computational Model for Subsonic Compressible Flow in Diffusers" <i>by R. E. Childs, J. H. Ferziger &amp; S. J. Kline</i>
Box 29	Folder 11	9/1982	Paper - "A Mathematical Model for Estimating Available Safe Egress Time in Fires" <i>by Leonard Y. Cooper</i>
Box 29	Folder 12	6/18/1982	Paper - "Numerical Modeling of One-Dimensional Enclosed Homogeneous & Heterogeneous Deflagrations"
Box 29	Folder 13	8/1982	aper - "A Concept for Estimating Available Safe Egress Time in Fires" <i>Pby Leonard Y. Cooper</i>
Box 29	Folder 13	8/1982	Paper - "A Concept for Estimating Available Safe Egress Time in Fires" <i>by Leonard Y. Cooper</i>
Box 29	Folder 14	12/1982	Thesis - "Mathematical Model of a Ventilation Controlled Compartment Fire" <i>by James M. Sauer</i>
Box 29	Folder 15	4/1983	Report - "A Review of Compartment Fire Models" by Walter W. Jones <i>by Walter W. Jones</i>
Box 29	Folder 16		Notes - Comments and Corrections to Mark 5
Box 29	Folder 17	6/1983	Paper - "A Simple Correlation for Predicting Temperature in a Room Fire" <i>by James Quintiere</i>
Box 29	Folder 18	8/1983	Report - "A Model of a Multiroom Fire Spread" <i>by Takeyoshi Tanaka</i>
Box 29	Folder 19	9/2/1983	Paper - "Analysis of the Forced Ventilation in Containership Holds" <i>by Howard K. Baum &amp; John A. Rockett</i>
Box 30	Folder 1	12/1983	Report - "Computer Fire Code VI - Volume 1" <i>by J. B. Gahm</i>
Box 30	Folder 2	12/1983	Report - "Computer Fire Code VI - Volume 2" <i>by J. B. Gahm</i>

Box 30	Folder 3	c. 1983	Paper - "Deterministic Modeling of Unconfined Turbulent Diffusion Flames" <i>by Yuji Hasemi &amp; Tazo Tokunaga</i>
Box 30	Folder 4	1983	Paper - "A Concept for Estimating Available Safe Egress Time in Fires" <i>by Leonard Y. Cooper</i>
Box 30	Folder 5	5/1984	Report - "Modeling of Aircraft Cabin Fires" <i>by Michael A. Delichatsios</i>
Box 30	Folder 6	5/1984	Paper by Leonard Y. Cooper <i>"The Need &amp; Availability of Test Methods for Measuring the Smoke Leakage Characteristics of Door Assemblies"</i>
Box 30	Folder 7		Early Calculations - "Old Deli - MGM Fire"
Box 30	Folder 8		New Calculations - "MGM Fire" by Emmons
Box 30	Folder 9	6/1984	Paper - "Premixed Combustion" <i>by P. A. Libby, S. Sivasegaram &amp; J. H. Whitelaw, Imperial College of Science &amp; Technology, London</i>
Box 30	Folder 10	7/10/1984	est Data - LLNL 1983/1984 Model Test Data <i>from Lawrence Livermore Laboratory - Forced Ventilation Data</i>
Box 30	Folder 11	8/1984	Letter & Computer Program - in Pascal from Forensic Engineering
Box 30	Folder 12	9/1984	Report - "Modeling of Aircraft Cabin Fires" <i>by M. A. Delichatsios</i>
Box 30	Folder 13	1984	Report - "Bench-Scale Methods for Prediction of Full-Scale Fire Behavior of Furnishings and Wall Lin" <i>by Vytenis Babrauskas</i>
Box 30	Folder 14	c. 1984	Paper - "Math Model of a Fire in a Compartment having Combustible Walls and Ceiling" <i>by Edwin E. Smith</i>
Box 30	Folder 15	c. 1984	Paper - "The Buoyant-Plume-Driven Adiabatic Ceiling Temperature Revisited" <i>by Leonard Y. Cooper &amp; Anne Woodhouse</i>

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## Series XII: Papers, Reports and Computer Software Guides on Fire Modeling

MS 06\_0012

Personal Papers

### Container List

Container	Folder	Date	Title
Box 31	Folder 1	3/28/1985-5/2/1985	Notes - Stability Analysis - by Emmons
Box 31	Folder 2	n.d., c. 1985	Paper - "Refinement of a Multiroom Fire Spread Model" <i>by T. Tanaka &amp; K. Nakamura [2 copies]</i>
Box 31	Folder 3	7/1985	Paper - "Heat Transport in Fire Compartment Prediction and Experiment with Small Scale Model" <i>by Tokiyoshi Yamada</i>
Box 31	Folder 4	9/1985	Report - "Data Sources for Parameters Used in Predictive Modeling of Fire Growth & Smoke Spread" <i>by Daniel Gross, National Bureau of Standards</i>

Box 31	Folder 5	10/1985 <i>by H. E. Mitler</i>	Report - "Comparison of Several Compartment Fire Models: An Interim Report"
Box 31	Folder 6	10/3/1985	Computer Program - FAST - Source Code
Box 31	Folder 7	10/1985 <i>by Leonard Y. Cooper, John A. Rockett, Henri E. Mitler &amp; David W. Stroup</i>	Report - "A Program for the Development of a Benchmark Compartment Fire Computer Code"
Box 31	Folder 8	11/1985	Report by David W. Stroup <i>"The Establishment of a Catalog of Compartment Fire Model Algorithms and Associated Computer Subroutines"</i>
Box 31	Folder 9	n.d., c. 1985 <i>by Howard W. Emmons</i>	Notes-Predicted Flow of Water from a Tube - computations, graphs, etc.
Box 31	Folder 10	n.d.	Notes - H. W. Emmons
Box 31	Folder 11	3/1986	Report by L. M. Pietrzak & G. A. Johanson <i>"A Physically Based Fire Suppression Computer Simulation for Post-Flashover Compartment Fires"</i>
Box 31	Folder 12	4/1986 <i>by Harold E. Nelson</i>	Report - "'Fireform' - A Computerized Collection of Convenient Fire Safety Computations"
Box 31	Folder 13	5/1986 <i>by John A. Rockett &amp; Masahiro Monta</i>	Report - "The NBS/Harvard Mark VI Multi-Room Fire Simulation"
Box 31	Folder 14	8/1986 <i>by K. D. Steckler, H. R. Baum &amp; J. G. Quintiere</i>	Paper - "Salt Water Modeling of Fire Induced Flows in Multicompartment Enclosures"
Box 31	Folder 15	12/13/1986 <i>by L. Y. Cooper, J. A. Rockett, H. E. Mitler &amp; D. W. Stroup</i>	Paper - "A Program for the Development of a Benchmark Compartment Fire Model Computer Code"
Box 31	Folder 16	n.d., c. 1987 <i>by Kazuhito Nakamura</i>	Paper - "Predicting Capability of a Multiroom Fire Model"
Box 31	Folder 17	9/1986 <i>by Henri Mitler &amp; John Rockett</i>	Guide - "Users' Guide to FIRST, a Comprehensive Single-Room Fire Model"
Box 31	Folder 18	1987 <i>by Frederick W. Mowrer &amp; Robert Brady Williamson</i>	Paper - "Room Fire Modeling with a Computer-Aided Design Framework"
Box 31	Folder 19	1987 <i>by Howard W. Emmons</i>	Paper - "Analyzing Far Field Effects"
Box 31	Folder 20	1987 <i>by Richard W. Bukowski</i>	Paper - "A Summary of the Assumptions and Limitations in Hazard I"
Box 31	Folder 21	1/1987 <i>"A Plan for the Development of the Generic Framework and Associated Computer Software for a Consolidated Compartment Fire Model Computer Code"</i>	Paper by Glenn P. Forney & Leonard Y. Cooper
Box 32	Folder 1	8/1987 <i>by David W. Stroup</i>	Report - "A Catalog of Compartment Fire Model Algorithms & Associate Computer Subroutines"



Box 32	Folder 2	8/1987	Report - WPI Qualifying Project Report - "Monte Carlo Fire Simulation" <i>by Warren E. Blaisdell - 5/1987</i>
Box 32	Folder 3	7/1987	Guide - "Hazard I - Vol. 1: Fire Hazard Assessment Method" <i>by R. W. Bukowski, W. W. Jones, B. M. Levin, C. L. Forney, S. W. Stiefel, V. Babrauskas, E. Braun &amp; A. J. Fowell, NBS</i>
Box 32	Folder 4	7/1987	Guide - "Hazard I - Vol. 2: Representative Example Case Documentation" <i>by R. W. Bukowski &amp; A. J. Shibe, NBS</i>
Box 32	Folder 5	n.d, c. 7/1987	Guide - "Hazard I - Getting Started" <i>by Richard W. Bukowski</i>
Box 32	Folder 6	7/1987	Guide - "Hazard I. Vol. 3: Data Base Listing" <i>by R. W. Bukowski &amp; E. Braun, NBS</i>
Box 33	Folder 1	7/1987	Report - "Comparisons of NBS/Harvard VI Simulations & Full-Scale, Multi-Room Fire Test Data" <i>by John A. Rockett, Masahiro Morita &amp; Leonard Y. Cooper</i>
Box 33	Folder 2	8/1987	Thesis - WPI Thesis by Douglas K. Beller <i>"Alternate Computer Models of Fire Convection Phenomena for the Harvard Computer Fire Code"</i>
Box 33	Folder 3	9/1987	Guide - "Users' Guide to FIRST, a Comprehensive Single-Room Fire Model" <i>by Henri E. Mitler &amp; John A. Rockett</i>
Box 33	Folder 4	11/1987	Paper - "Computer Model of a Smoldering Cigarette" <i>by H. E. Mitler &amp; W. D. Davis</i>
Box 33	Folder 5	11/1987	Paper - "A Computer Model of Smoke Movement by Air Conditioning Systems (SMACS)" <i>by John H. Klotz</i>
Box 33	Folder 6	1987 & 1988	Correspondence - re. Hazard 1 Computer Program <i>H. W. Emmons, Doug Walton, Richard Bukowski</i>
Box 33	Folder 7	c. 1987-1989	Letters - to colleagues re. FIRST program <i>from H. W. Emmons</i>
Box 33	Folder 8	1988	Paper - "Two-Dimensional Modeling of Flame Propagation in Fuel Stream Arrangements" <i>by R. H. Rangel &amp; W. A. Sirignano</i>
Box 33	Folder 9	12/1987	Report - "Algorithm for the Mass-Loss Rate of Burning Wall" <i>by Henri E. Mitler [2 copies]</i>
Box 33	Folder 10	n.d., c. 1988	Paper - "Plume Analysis above Finite Size Fire Sources" <i>by A. K. Gupta, Surendra Kumar &amp; Bani Singh</i>
Box 33	Folder 11	1988	Paper - "The Fractional Effective Dose Model for Assessment of Toxic Hazards in Fires" <i>by Gordon E. Hartzell &amp; Howard W. Emmons</i>
Box 33	Folder 12	3/1988	Computer Data - Cathedral Hills Data Summary, University of California Fire Research Laboratory
Box 33	Folder 13	6/6/1988	Memo - re. Radiation Modeling of Large Scale Fires <i>from J. de Ris, Factory Mutual</i>

Box 33	Folder 14	8/26/1988	Memo - "Compatibility of Tewarson data and FIRST" <i>from Craig Beyler to H. Emmons, H. Mitler, J. Rockett, J. Barnett, P. Sherman, A. Tewarson</i>
Box 33	Folder 15	9/1988	Evaluation - "Hazard I - Results of a User Evaluation of the Prototype Software" <i>by T. W. Bukowski, and letter to H. W. Emmons</i>
Box 33	Folder 16	1/1989	Paper - "Counterflow Spray Combustion Modeling" <i>by G. Continillo &amp; W. Sirignano</i>
Box 33	Folder 17	1989	Paper - "An Evaluation of the Point-Source Approximation in Spray Calculations" <i>by R. H. Rangel &amp; W. A. Sirignano</i>
Box 33	Folder 18	1989	Papers by Emmons and related materials <i>"Use of Fire Test Data in Fire Models," "Introduction to the Phenomena of a Comprehensive Fire Model," "Comprehensive Building Fire Model"</i>
Box 34	Folder 1	c. 1989	Computer Programs - and related materials - Harvard Mark VI, FIRST
Box 34	Folder 2	5/29/1989	Report - "Using the Harvard/NIST MARK VI Fire Simulation" <i>by John A. Rockett</i>
Box 34	Folder 3	12/14/1989	Paper - "Modeling the Flow-Assisted Flame Spread along Conveyor Belt Surfaces" <i>by C. C. Hwang, C. D. Litton, F. J. Perzak &amp; C. P. Lazzara</i>
Box 34	Folder 4	c. 1989/1990	Report - WPI/Harvard Version 2 - Appendices B-D
Box 34	Folder 5	1/1990	Paper - "Fire Hazard Prediction - Hazard I and its role in fire codes and standards" <i>by Richard W. Bukowski</i>
Box 34	Folder 6	n.d., c. 1990	Paper - "Mathematical Modeling of Enclosure Fires" <i>by Henri E. Mitler</i>
Box 34	Folder 7	1990	Paper - "Scale Modeling of fires with Emphasis on Room Flashover Phenomenon" <i>by S. Jolly &amp; K. Saito</i>
Box 34	Folder 8	1990	Paper - "Numerical Modeling of a Vaporizing Multicomponent Droplet" <i>by C. M. Megardis &amp; W. A. Sirignano</i>
Box 34	Folder 9	7/1990	Paper - "Prediction of a Liquid Jet in a Gaseous Crossflow" <i>by F. Tsau, S. Eighobashi &amp; W. A. Sirignano</i>
Box 34	Folder 10	8/1990	Report - "Development of the WPI/Harvard Version 2 Computer Fire Model" <i>[draft] by David B. Satterfield - M. S. Thesis</i>
Box 34	Folder 11	8/1990	Letter & Summary - Consolidated Compartment Fire Model (CCFM.VENTS)
Box 34	Folder 12	7/1990	Report - "Consolidated Compartment Fire Model (CCFM) Computer Code - Part I: Physical Basis" <i>by Leonard Y. Cooper &amp; Glenn P. Forney [plus disk]</i>
Box 34	Folder 13	7/1990	Report - "CCFM Computer Code - Part II: Software Reference Guide" <i>by Glenn P. Forney &amp; Leonard Y. Cooper</i>
Box 34	Folder 14	7/1990	Report - "CCFM Computer Code - Part III: Catalog of Algorithms & Subroutines" <i>ed. by Leonard Y. Cooper &amp; Glenn P. Forney</i>

Box 35	Folder 1	7/1990	Guide - "CCFM Computer Code - Part IV: User Reference Guide" <i>by Glenn P. Forney, Leonard Y. Cooper &amp; William F. Moss</i>
Box 35	Folder 2	8/1990	Guide - "WPI/Fire Version 2 - User's Guide" <i>prepared by David B. Satterfield &amp; Jonathan R. Barnett</i>
Box 35	Folder 3	1/1991	Paper - "Three-Dimensional Droplet Interacts in Dense Sprays" <i>by I. Kim, S. E. Elghobashi &amp; W. A. Sirignano</i>
Box 35	Folder 4	12/12/1991	Correspondence - Hazard I Users Group, NIST
Box 35	Folder 5	1991	Paper - "Reconstruction of Fire Whirls Using Scale Models" <i>by S. Soma &amp; K. Saito</i>
Box 35	Folder 6	1991	Paper - "Use of numerical simulation computer codes to fire problems in nuclear power plants in Fin" <i>by O. Keski-Rahkonen, E. Eloranta &amp; R. Huhtanen</i>
Box 35	Folder 7	1995 or after	Presentation - "Fire Models in the 21st Century" <i>by H. W. Emmons</i>

### Series XIII: Papers and Reports on Test Methods

MS 06\_0013

Personal Papers

#### Container List

Container	Folder	Date	Title
Box 35	Folder 8	7/31/1956	Report by G. P. deLhery & W. L. Derksen, Naval Material Lab <i>"The Relative Spectral Energy Distribution of the Naval Material Laboratory Carbon-Arc Source of Intense Thermal Radiation"</i>
Box 35	Folder 9	4/1959	Report by S.B. Martin, U.S. Naval Radiological Defense Laboratory
Box 35	Folder 10	1/7/1960	Report - "Radiant Heat Sources Employed in Thermal Radiation Studies" <i>by Jefferson A. Carter, N. Y. Naval Shipyard</i>
Box 35	Folder 11	6/15/1961	Report - "Investigation of the Thermodynamic Properties of the Combex-ADL Natural Gas Burner" <i>prepared by Arthur D. Little, Inc.</i>
Box 35	Folder 12	8/31/1961	Paper - "A Burner with an Electrical Discharge Superimposed on the Combustion Flame" <i>by David L. Richardson &amp; Bela Karlovitz</i>
Box 35	Folder 13	4/1966	Paper - "Calorimeter for Determining Radiation & Convection in Small-Scale Combustion" <i>by R. J. McCarter &amp; A. Broido</i>
Box 35	Folder 14	n.d., c. 1969	Paper - "Apparatus for Rate Studies of Vapor Producing Reactions" <i>by R. J. McCarter</i>
Box 35	Folder 15	2/1969	Paper - "Smoke & Gases Produced by Burning Aircraft Interior Materials" <i>by D. Gross, I.J. Loftus, t. G. Lee &amp; V. E. Gray</i>
Box 35	Folder 16	8/1970	Proposal - "A New Approach to Development of Installation Standards for Fire Detectors" <i>by Gunnar Heskestad &amp; Cheng Yao, Factory Mutual Corp.</i>

Box 35	Folder 17	11/1972 <i>by J. deRis</i>	Paper - "Modeling Techniques for Prediction of Fires"
Box 35	Folder 18	12/18/1972 <i>by Reinhard Sidor &amp; William K. Burgess</i>	Paper - "BFD/Harvard Carbon Monoxide-Oxygen Sampler Program - Progress Report"
Box 35	Folder 19	1/1973 <i>"The Smoke Density Chamber Method for Evaluating the Potential Smoke Generation of Building Materials"</i>	Technical Note by T. G. Lee, NBS
Box 35	Folder 20	8/22/1973 <i>by James Quintiere &amp; Clayton Huggett, NBS</i>	Paper - "An Evaluation of Flame Spread Test Methods for Floor Covering Materials"
Box 35	Folder 21	4/1975 <i>by W. D. Woolley &amp; S. A. Ames, Building Research Establishment</i>	Paper - "The Explosion Risk of Stored Foam Rubber"
Box 35	Folder 22	n.d., c.1974 <i>by J. A Rockett, NBS</i>	Paper - "Mathematical Modeling of Radiant Panel Test Methods"
Box 35	Folder 23	8.1975 <i>"A Theoretical Analysis of the ASTM E-119 Standard Fire Test of Building Construction &amp; Materials"</i>	Report by A. Murty Kanury & Donald J. Holve
Box 35	Folder 24	9/1975 <i>by James G. Quintiere &amp; James W. Raines</i>	Report - "Thermal & Flow Characteristics of the ASTM E84 Tunnel Test Method"
Box 35	Folder 25	10/1975 <i>by Irwin A. Benjamin, Center for Fire Research</i>	Paper - "Problems in the Correlation of Small & Large Scale Tests"
Box 35	Folder 26	10/1975 <i>"The Application &amp; Interpretation of a Test Method to Determine the Hazard of Floor Covering Fire Spread in Building Corridors"</i>	Paper by James Quintiere
Box 35	Folder 27	10/1975 <i>"Characterization of the Stanford Research Institute Large-Scale Heat-Release- Rate Calorimeter"</i>	Report by Stanley B. Martin
Box 35	Folder 28	12/1975 <i>by Irwin A. Benjamin &amp; Howard Adams, Center for Fire Research</i>	Report - "Proposed Criteria for use of the Critical Radiant Flux Test Method"
Box 35	Folder 29	9/1976 <i>"Research &amp; Development for a Laboratory-Scale Flammability Test Method for Cellular Plastics"</i>	Report by Archibald Tewarson & Francesco Tamanini
Box 35	Folder 30	8/1977 <i>by William J. Parker, NBS</i>	Technical Note - "An Investigation of the Fire Environment in the ASTM E84 Tunnel Test"
Box 36	Folder 1	10/1977 <i>by Archibald Tewarson &amp; Russell F. Pion</i>	Report - "A Laboratory-Scale Test Method for the Measurement of Flammability Parameters"
Box 36	Folder 2	1/1978 <i>by George F. Carrier, Francis E. Fendell &amp; Phillip S. Feldman</i>	Report - "Wind-Aided Flame Spread Along a Horizontal Fuel Slab - I. Without Radiative Transfer"
Box 36	Folder 3	n.d., c. 1979 <i>"A Simplified Theory for Generalizing Results from a Radiant Panel Rate of Flame Spread Apparatus" [draft]</i>	Paper by James Quintiere
Box 36	Folder 4	12/1979 <i>by Dan Bluhme &amp; Ryszard Getka</i>	Report - "Rate of Heat Release Test-Calibration, Sensitivity & Time Constants of 150 RHR Apparatus"

Box 36	Folder 5	11/1980	Paper by James Quintiere <i>"A Simplified Theory for Generalizing Results from a Radiant Panel Rate of Flame Spread Apparatus" [final]</i>
Box 36	Folder 6	9/1981	Report - "Reduced-Scale Modeling of Mobile-Home Fires: A Progress Report" <i>by David P. Klein</i>
Box 36	Folder 7	3/1982	Report - "Calculations of the Heat Release Rate by Oxygen Consumption for Various Applications" <i>by W. J. Parker</i>
Box 36	Folder 8	6/1982	Report by B. C. Levin, A. J. Fowell, M. M. Birky, M. Paabo, A. Stolte and D. Malek <i>"Further Development of a Test Method for the Assessment of the Acute Inhalation Toxicity of Combustion Products"</i>
Box 36	Folder 9	3/4/1983	Correspondence - on Proposed Bench-Scale Material Flammability Test <i>from I. de Ris to R. Friedman, Factory Mutual System</i>
Box 36	Folder 10	4/1983	Report - "A Room Fire Screening Test Procedure" <i>by Fred L. Fisher, Frederick W. Mowrer &amp; Robert Brady Williamson</i>
Box 36	Folder 11	11/1984	Report - "New Concepts for Measuring Flame Spread Properties" <i>by J. G. Quintiere &amp; I. Harkleroad</i>
Box 36	Folder 12	11/1987	Report - "Fire Safety Inspection & Testing of Air Moving Systems" <i>by John H. Klote</i>

## Series XIV: Papers, Reports and Data on Properties

MS 06\_0014

Personal Papers

### Container List

Container	Folder	Date	Title
Box 37	Folder 1	1931-1982	Data - Steam & Water, Gases, Fuels, Freon
Box 37	Folder 2	1940s-1980s	Data - Various materials - Insulating materials, plastics, gases & flammability
Box 37	Folder 3	5/1966	Papers <i>by T. Wakamatsu, Atsushi Saima &amp; T. G. Lee 1962-1975 Bulletin - "Combustion of Hydrocarbons - Property Tables - Tables for Adiabatic Gas Temperature &amp; Equilibrium Composition of Six Hydrocarbons" by Steffenson, Agnew &amp; Olson, Purdue University</i>
Box 37	Folder 4		Data - Propane
Box 37	Folder 5	n.d.	Data - Propylene, Butane, Ethane, Isbutane
Box 37	Folder 6	11/1974	Publication - Current Work on Behavior of Materials at Elevated Temperatures <i>Reports for 1974 ASME Meeting</i>
Box 37	Folder 7	6/1977	Paper - "Influence of External Heat Flux on Polymer Flammability" by A. Tewarson
Box 37	Folder 8	1980	Paper - "Potential Fire Hazard of a Furnished Compartment" by E. E. Smith
Box 37	Folder 9	11/1980	Report - "Physico-Chemical & Combustion/Pyrolysis Properties of Polymeric Materials" By A. Tewarson <i>Folder 9: Report - "Physico-Chemical &amp; Combustion/Pyrolysis Properties of Polymeric Materials" By A. Tewarson</i>

Box 37	Folder 10	1/1982	Report - "Analysis of Full-Scale Timber Fire Tests in a Simulated Mine Gallery" by A. Tewarson
Box 37	Folder 11	4/1982	Report - "Quantification of fire Properties of Fuels & Interaction with Fire Environment"

*By A. Tewarson*

## Series XV: Papers and Reports on Radiation

MS 06\_0015

Personal Papers

### Container List

Container	Folder	Date	Title
Box 37	Folder 12	c. 1955	Paper - "Activation Energies in High Temperature Combustion" by John B. Fenn & Hartwell F. Calcote
Box 37	Folder 13	1957	Paper - "Brandoverslag door straling" by Lie Tiam Tjoan
Box 37	Folder 14	6/1961	Paper - "Radiative Transfer in Combustion Chambers" by H. C. Hottel
Box 37	Folder 15	1961	Paper - "Some Problems in Radiative Transport" by H. C. Hottel [draft]
Box 37	Folder 16	8/1963	Paper - "The Ignition of Thin Sheets by Radiation from Nuclear Weapons" by H. C. Hottel
Box 37	Folder 17	n.d.	Paper - "Effect of Radiant Heat on Cellular Polyethers" by K. T. Paul
Box 37	Folder 18	8/1974	Report - "Radiative Transfer of Multi-Dimensional Flow Geometries" by S. C. Traugott
Box 37	Folder 19	2/1975	Report - "Radiative Heat Transfer from Products of Combustion in Building Corridor Fires" <i>by K. Bromberg &amp; J. G. Quintiere</i>
Box 38	Folder 1	7 & 8/1976	Correspondence - re. radiative heat transfer from ceiling layer to differential surface <i>from J. de Ris to A. T. Modak &amp; from A. T. Modak to M. K. Mathews</i>
Box 38	Folder 2	8/1976	Paper - "Scaling of Radiative Characteristics of Turbulent Diffusion Flames" <i>by G. H. Markstein</i>
Box 38	Folder 3	n.d., c.1977	Paper - "Infrared Mean Absorption Coefficients of Luminous Flames & Smoke" <i>by G. L. Hubbard &amp; C. L. Tien</i>
Box 38	Folder 4	1977	Paper by P. Durbetski & C. Thom-Anderson <i>"Effect of Heat Flux Level &amp; Exposure Time to a Radiant Heat Source on the Thermal Radiative Properties of Cellulosic &amp; Thermoplastic Materials"</i>
Box 38	Folder 5	8/1977	Paper - "Radiation Augmented Fires Within Enclosures" <i>by A. T. Modak &amp; M. K. Mathews</i>
Box 38	Folder 6	8/1977	Paper by J. D. Felske & C. L. Tien <i>"The Use of the Milne-Eddington Absorption Coefficient for Radiative Heat Transfer in Combustion Systems"</i>
Box 38	Folder 7	11/1977	Paper - "Intermediate-Scale & Full-Scale Studies of Fire Smoke Layers" <i>by G. H. Markstein</i>
Box 38	Folder 8	11/29/1977	Correspondence - "Determination of Radiation Properties of Elevated Pressure Wall Fires" <i>from R. L. Alpert, Factory Mutual System</i>
Box 38	Folder 9	1977	Papers by A. C. Fernandez-Pello <i>"Downward Flame Spread Under the Influence of Externally Applied Radiation" &amp; "Upward Laminar Flame</i>

*Spread Under to Influence of Externally Applied Thermal Radiation"*

Box 38	Folder 10	c. 1977	Paper - "The heat radiation from petroleum fires" <i>by Bengt Hagglund</i>
Box 38	Folder 11	1978	Paper - "Radiation from Burning Hydrocarbon Clouds" <i>by James A. Fay, Gary J. Desgroseilliers &amp; David H. Lewis, Jr.</i>
Box 38	Folder 13	8/1978	Paper - "Radiation from Smoke Layers" <i>by L. Orloff, A. T. Modak &amp; G. H. Markstein</i>
Box 38	Folder 14	12/1979	Paper - "Influence of oxygen depletion on the radiative properties of PMMA Flames" <i>by Giulio Santo &amp; Francesco Taminini, Factory Mutual</i>
Box 38	Folder 15	c. 1980	Paper - "Scanning-Radiometer Measurements of the Radiance Distribution in PMMA Pool Fires" <i>by George H. Markstein, Factory Mutual</i>
Box 38	Folder 16	3/1982	Report - "Flame Heights, Flame Radiation & Flame Spread" <i>by Patrick J. Pagni</i>
Box 38	Folder 17	11/1984	Report - "Radiant Emission & Absorption by Laminar Ethylene & Propylene Diffusion Flames" <i>by G. H. Markstein &amp; J. de Ris</i>
Box 38	Folder 18	1988	Paper - "Numerical Study on Interactions of Turbulent Convection & Radiation in Compartment Fires" <i>by Toru Fusegi &amp; Bakhtier Farouk</i>
Box 38	Folder 19	c. 1990	Paper - "Long-Range Research Plan for Fire Suppression" <i>no author given</i>
Box 38	Folder 20	1990	Paper - "Methods to Characterize Heat Release Rate Data" <i>by Frederick W. Mowrer &amp; Robert Brady Williamson</i>
Box 38	Folder 21	1991	Paper - "Heat Transfer Regimes in Microstructures" <i>by M. I. Flik, B. I. Choi, &amp; K. E. Goodson</i>
Box 38	Folder 22	1961-1964	Reports - "A Model Study of the Interaction Effects of Mass Fires" <i>Reports 1, 2, &amp; 3</i> <i>- 1 &amp; 2 by A. A. Putnam &amp; C. F. Speich</i> <i>- 3 by I. M. Grinberg &amp; A. A. Putnam</i>

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**Series XVI: Papers and Reports on Mass Fire,**

MS 06\_0016

Personal Papers

**Container List**

<b>Container</b>	<b>Folder</b>	<b>Date</b>	<b>Title</b>
Box 38	Folder 23	2/10/1966	Report - "The Use of Models for the Investigation of Fire Spread" <i>by Lester Eggleston, Andrew J. Pryor, W. D. Weatherford, Jr. &amp; Calvin H. Yuill</i>
Box 38	Folder 24	10/19/1967	Report - "Urban Mass Fire Scaling Considerations" <i>by W. J. Parker</i>

Box 39	Folder 1	3/1968	Report - "Mass Fire Life Hazard" <i>by A. J. Pryor, F. A. Fear &amp; R. J. Wheeler</i>
Box 39	Folder 2	7/10/1968	Report - "An Experimental Test of Mass Fire Scaling Principles" <i>by W. J. Parker, R. C. Corlett, B. T. Lee</i>
Box 39	Folder 3	1969	Report - "Project Flambeau...An Investigation of Mass Fire" (1964-1967) <i>Final Report Vols. 1, 2, 3.</i> <i>Vol. 1 by Clive Countryman,</i> <i>Vol. 2 Catalog by Thomas Palmer,</i> <i>Vol. 3 Appendixes by Theodore Storey &amp; others</i>
Box 39	Folder 4	1969	Report - "Mass Fire Scaling with small electrically heated models" <i>by B. T. Lee</i>
Box 39	Folder 5	2/1970	Report - "Non-Gray Thermal Radiation from a Flame above a pool of Liquid Natural Gas" <i>by David C. Wilcox</i>

## Series XVII: Papers and Reports on Pyrolysis

MS 06\_0017

Personal Papers

### Container List

Container	Folder	Date	Title
Box 39	Folder 6	7/12/1951	Report - "Equilibrium Composition & Thermodynamic Properties of Combustion Gases Part 3" <i>by William s. McEwan &amp; Daniel B. Lovett, U. S. Navy</i>
Box 39	Folder 7	1956 & n.d.	Papers - re. textiles and combustibility <i>Papers - re. textiles and combustibility</i>
Box 39	Folder 8	1958/1963	Report - "Theories of the Combustion of Wood and Its Control" <i>by F. L. Browne</i>
Box 39	Folder 9	7/1959	Report - "High Temperature Behavior of Teflon" <i>by Tunis Wentink, Jr.</i>
Box 39	Folder 10	c. 1962-1971	Papers - 5 papers re. moisture and/or heat transfer in wood
Box 39	Folder 11	1965	Report - "Some Research Pertaining to the Problem of Predicting the Burning Rate of Cellulosic Fuels" <i>by P. L. Blackshear, Jr., K. A. Murty &amp; N. Murayama</i>
Box 39	Folder 12	n.d., c. 1965	Report by K. Akita & M. Kase <i>"Determination of Kinetic Parameters for Pyrolysis of Cellulose &amp; Cellulose Treated with Ammonium Phosphate by Differential Thermal Analysis and Thermal Gravimetric Analysis"</i>
Box 39	Folder 13	1-3/1968	Papers - 3 Papers from Fluid Dynamic Laboratory by G. Drennan, R. Matula, R. Bright <i>"Pyrolysis of Tetrafluoroethylene," "Thermal Decomposition of Perfluoropropene" &amp; "Gas Chromatographic Separation of Low Molecular Weight Fluorocarbons"</i>
Box 39	Folder 14	2/1968	Paper - "Thermal Decomposition Products of Polyvinyl Chloride" <i>by Yoshio Touchiya &amp; Kikuo Sumi</i>



Box 39	Folder 15	4/1968	Paper - "High Temperature Moisture Relations to Grand Fir" <i>by M. D. Strickler, &amp; letter from Strickler</i>
Box 39	Folder 16	8/1968	Paper - "Study on Smoke Generation from Building Materials" <i>by Fumiharu Saito</i>
Box 39	Folder 17	12/1968	Report - "The High Temperature Pyrolysis of Simple Organic Molecules & the Formation of O2" <i>by A. R. Fairbairn</i>
Box 39	Folder 18	1968	Paper - "Thermodestruction & Thermooxidative Destruction of Polyurethanes" <i>by O. G. Tarakanov, V. A. Orlov &amp; V. K. Beljakov - U.S.S.R.</i>
Box 40	Folder 1	5/1969	Paper - "Structural Design & Thermal Properties of Polymers" <i>by G. F. D'Alelio</i>
Box 40	Folder 2	8/1969	Report - "Pyrolysis Products of Untreated & Flame Retardant Treated a-cellulose & levoglucosan" <i>by Frank A. Wodley</i>
Box 40	Folder 3	1969-1971	Reports - re. decomposition of PVC & phenol-formaldehyde resins <i>from Fire Research Station, Hertfordshire</i>
Box 40	Folder 4	1970s	Reports - re. Insulating Board <i>5 papers</i>
Box 40	Folder 5	1/1970	Paper - "Elevated Temperature Tensile & Creep Properties of Some Structural & Prestressing Steels" <i>by T. Z. Harmathy &amp; W. W. Stanzak</i>
Box 40	Folder 6	1970	Papers - 2 papers re. cellulose by A. Broido & M. Weinstein <i>"Thermogravimetric Analysis of Ammonia-Swelled Cellulose" &amp; "Pyrolysis-Crystallinity Relationships in Cellulose"</i>
Box 40	Folder 7	1971	Paper - "Influence of Temperature & Time upon Pyrolysis of Untreated & Fire Retardant Treated Wood" <i>by K. M. Knudson &amp; R. B. Williamson</i>
Box 40	Folder 8	10/1974	Paper - "Char Yield on Pyrolysis of Cellulose" <i>by A. Broido &amp; Maxine A. Nelson</i>
Box 40	Folder 9	2/1974 & 1/1975	Papers - by K. N. Palmer, W. Taylor & T. Paul, Building Research Establishment <i>"Fire hazards of plastics in Furniture &amp; Furnishings: characteristics of the burning" and "...ignition studies"</i>
Box 40	Folder 10	1975 & 1976	Reports & Papers - Flame/Combustion & Excess Pyrolyzate Production by Cellular Plastics <i>Fire Research Group, UC Berkeley</i>
Box 40	Folder 11	1975-1979	Reports - re. flammability and plastics for Factory Mutual Research Corp. <i>by Archibald Tewarson and others</i>
Box 41	Folder 1	c. 1976	Paper - "Excess Pyrolyzate" <i>by P. J. Pagni &amp; T. M. Shih</i>
Box 41	Folder 2	c. 1976	Report - "Flammability Testing of Polymers" <i>by A. Murty Kanury, Norman J. Alvares, Stanley B. Martin</i>
Box 41	Folder 3	1977	Paper - "Vapor-phase Thermal Analysis of Pyrolysis Products from Cellulosic Materials" <i>by Kun Min</i>

Box 41	Folder 4	11/1986	Papers by Douglas A. Olson <i>"Absorptivity of OCF Fiberboard for Solar Radiation" &amp; "Emissivity of OCF Fiberboard to Thermal Radiation"</i>
Box 41	Folder 5	n.d., c. 1986	Papers - "Comparisons of Completeness of Combustion for Alcohol & Alkane Laminar Wall Fires" <i>by S. F. Malary &amp; J. K. Awad</i>
Box 41	Folder 6	2/23/1987	Report - "Isothermal Degradation of untreated & fire retardant treated cellulose at 350 Degrees C" <i>by A. E. Lipska</i>
Box 41	Folder 7	1989	Manuscripts - "Combustion Properties of Pure & Fire Retarded Cellulose" <i>3 parts, by Abdelkader Frendi &amp; Merwin Sibulkin &amp; Yi Chen &amp; Sant Tewari</i>
Box 41	Folder 8	6/1991	Report by Leonard Y. Cooper <i>"Applications of the Generalized Global Equivalence Ratio Model (GGERM) for Predicting the Generation Rate &amp; Distribution of Products of Combustion in Two-Layer Fire Environments - Methane &amp; Hexanes"</i>

### Series XIX: Papers and Reports on Sprinklers

MS 06\_0018

Personal Papers

#### Container List

Container	Folder	Date	Title
Box 41	Folder 9	1960-1976	Papers & Reports
Box 41	Folder 10	1977-1978	Papers & Reports
Box 42	Folder 1	1980-1981	Papers & Reports
Box 42	Folder 2	1982-1985	Papers & Reports
Box 42	Folder 3	1986-1991	Papers & Reports

### Series XIX: Papers and Reports on Extinguishants and Retardants

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Personal Papers

#### Container List

Container	Folder	Date	Title
Box 43	Folder 1	1960-1962	Papers & Reports
Box 43	Folder 2	1963 - 1969	Papers & Reports
Box 43	Folder 3	1971-1985	Papers & Reports

### Series XX: Papers, Reports & Memoranda by others (not Howard Emmons)

MS 06\_0020

Personal Papers

#### Container List

Container	Folder	Date	Title
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Box 44	Folder 1	published 1919 <i>by H. F. Coward, A.W. Carpenter &amp; W. Payman</i>	Paper - "Dilution Limits of Inflammability of Gaseous Mixtures"
Box 44	Folder 2	12/1936 <i>by John B. Wilbur, MIT</i>	Paper - "The Mechanical Solution of Simultaneous Equations"
Box 44	Folder 3	3/1942 <i>by Andrew Vazsonyi</i>	Report - "Design of a Nozzle Producing Uniform Supersonic Airflow"
Box 44	Folder 4	1940-1950 <i>includes two notes to Howard Emmons &amp; Emmons' lecture notes</i>	Papers - on Relaxation Methods
Box 44	Folder 5	1946 & 1947 <i>"Heat Capacity Lag in Gas Dynamics"</i> <i>"Heat Capacity Lag Measurements in Various Gases"</i>	Papers by Arthur Kantrowitz and by Paul W. Huber & A.Kantrowitz
Box 44	Folder 6	reprinted 1947 <i>book in German and typed pages in English</i>	Book - The General Principles of Wave Mechanics by W. Pauli
Box 44	Folder 7	3 & 6/1947, 1956 <i>"Flame Velocities of Gases &amp; Vapors by the Bunsen Burner Method"</i> <i>"Flame Propagation Rates at Reduced Pressures"</i>	Papers by W. C. Johnston, Westinghouse Electric, plus letter from author
Box 44	Folder 8	6/1947 <i>by George H. Markstein &amp; Michael L. Polanyi - 6/1947</i>	Report - "Flame Propagation - Critical Review of Existing Theories"
Box 44	Folder 9	1948-1953 <i>6 volumes - by J. O. Hirschfelder &amp; Others</i>	Reports - "The Theory of Flame Propagation"
Box 44	Folder 10	1950 & 1951 <i>by G. A. E. Godsave</i>	Memoranda - "The Combustion of Drops in a Fuel Spray" & "A Note on Radiation Heat Transfer"
Box 45	Folder 1	1950-1952 <i>5 parts [5 reports] by G. A. E. Godsave, National Gas Turbine Est., England</i>	Reports - "The Burning of Single Drops of Fuel"
Box 45	Folder 2	2/1951 <i>by J. E. C. Topps</i>	Memorandum - "An Experimental Study of the Evaporation & Combustion of Falling Droplets"
Box 45	Folder 3	4/1951 <i>by W. Gohrbandt, England</i>	Memorandum - "The Evaporation of Spheres in a Hot Air Stream"
Box 45	Folder 4	1952 <i>by A. B. Spalding</i>	Paper - "Experiments on the Burning & Extinction of Liquid Fuel Spheres"
Box 45	Folder 5	c. 1953 <i>by Beryl Edward Clotfetter</i>	Report - "Experimental Studies of Transport Phenomena in Highly Ionized Gases"
Box 45	Folder 6	1953 <i>by Miss E. M. Shakeshaft &amp; Mrs. B. F. W. Rogowski</i>	Publication - "References to Scientific Literature on Fire - Part VII 1953, Library Bibliography"
Box 45	Folder 7	7/1953 <i>by J. B. Rosen</i>	Report - "Theory of Laminar Flame Stability"

Box 45	Folder 8	c. 1954	Paper - "The Effects of Chemical and Physical Parameters on the Burning Rate of a Liquid Droplet" <i>by Henry Wise, Jack Lorell &amp; Bernard J. Wood</i>
Box 45	Folder 9	1954	Paper by D. B. Spalding <i>"The Calculation of Mass Transfer Rates in Absorption, Vaporization, Condensation &amp; Combustion Processes"</i>
Box 45	Folder 10	1954 & 1955	Reports by G. Klein <i>"Equations of a Simple Flame Solved by Successive Approximations to the Solution of an Integral Equation" - 3 papers</i>
Box 45	Folder 11	1/1956	Report - "An Experimental Investigation of Impact & Shock Wave Break-Up of Liquid Drops" <i>by A. R. Hanson, F. G. Domich &amp; H. S. Adams</i>
Box 45	Folder 12	c. 1956	Paper - "Flame Temperatures of Limit Mixtures" <i>by M. G. Zabetakis, S. Lambiris &amp; G. S. Scott</i>
Box 45	Folder 13	5/1956	Paper - "Some Limiting Oxygen Concentrations for Diffusion Flames in Air Diluted with Nitrogen" <i>by R. F. Simmons H. G. Wolfhard</i>
Box 45	Folder 14	10/1956	Paper by R. M. Fristrom & A. A. Westenberg <i>"Flame Zone Studies IV - Microstructure &amp; Material Transport in a Laminar Propane-Air Flame Front"</i>
Box 45	Folder 15	1956	Paper - "Dynamics of a dissociating gas - Part I Equilibrium Flow" <i>by M. J. Lighthill</i>
Box 45	Folder 16	12/20/1956	Report - "The Combustion of Droplets. Influence of Forced Convection" <i>by C.S. Tarifa &amp; G. Millan, Instituto Nacional de Teenica Aeronautica</i>
Box 45	Folder 17	6/1957	Paper - "Apparent emission intensities from a turbulent flame composed of wrinkled Laminar flames" <i>by F. Williams &amp; A. E. Fuhs</i>
Box 45	Folder 18	6/1957	Technical Note - "A Theory of Flame Propagation Limits due to Heat Loss" <i>by E. Mayer</i>
Box 45	Folder 19	9/1957	Report - "Non-Stationary Combustion Studies" <i>by D. Bitondo, N. Thomas &amp; D. Perper</i>
Box 46	Folder 1	10/14/1957	Report by Edwin S. Campbell & Robert M. Fistram <i>"Reaction Kinetics, Thermodynamics &amp; Transport in the Hydrogen-Bromine System: A Survey of Properties for Flame Studies"</i>
Box 46	Folder 2	10/18/1957	Paper - "Study of the Mechanism of Flame Extinguishment by Aluminum Chloride" <i>by Joseph B. Levy &amp; Raymond Friedman</i>
Box 46	Folder 3	1/1958	Report by D. B. Spalding & M. D. Samain <i>"The analogue solution of temperature distribution and extinction in an idealised cylindrical flame"</i>
Box 46	Folder 4	2/24/1958	Report by A. B. Miller, A. Capella & A. B. Spalding <i>"Research on Study of the Turbulent Flame Properties of Elementary Combustion Chamber Flow Patterns" [2 copies]</i>
Box 46	Folder 5	3/1958	Report - "Flame Studies in a Flat Flame Burner" <i>by William T. Biedler, III &amp; H. E. Hoelscher</i>

Box 46	Folder 6	1958	Paper by D. B. Spalding <i>"Approximate solutions of transient &amp; two-dimensional flame phenomena: constant-enthalpy flames"</i>
Box 46	Folder 7	1958	Paper - "Production and Measurement of Single Drops, Sprays & Solid Suspensions" <i>by James A. Browning</i>
Box 46	Folder 8	1958 & 1959	Reports by Combustion Group - Instituto Nacional de Technica Aeronautica <i>"Homogeneous Combustion &amp; Characteristics of Laminar Flames"</i> <i>"Heterogeneous Combustion &amp; Combustion of Monopropellant Droplets &amp; "Fuel Sprays"</i>
Box 46	Folder 9	1/31/ 1959	Report - "Distribution of Radicals in Laminar Flames" <i>Parts 1 &amp; 2, by G. Millan &amp; I. DaRiva, Instituto Nacional de Technica Aeronautica</i>
Box 46	Folder 10	1959 & 1960	Reports by Joseph O. Hirschfelder & others University of Wisconsin <i>"Value of Diffusion Coefficients which produce constant enthalpy in flames &amp; detonations" &amp; "The Propagation of A-B-C Flames"</i>
Box 46	Folder 11	7/25/19	Paper - "Theory of flame-front stability" <i>by Wiktor Eckhaus</i>
Box 46	Folder 12	9/26/1960	Paper - "Recent Developments of Fire Research" <i>by D. I. Lawson</i>
Box 46	Folder 13	1960	Papers by D. C. Drucker, R. S. Rivlin and B. Sternberg <i>"Plasticity"</i> <i>"Some Topics in Finite Elasticity"</i> <i>"On Some Recent Developments in the Linear Theory of Elasticity"</i>
Box 46	Folder 14	1960	Papers by L. W. Morland & E. H. Lee, and by E.H. Lee <i>"Stress Analysis for Linear Viscoelastic Materials with Temperature Variation"</i> <i>"Viscoelastic Stress Analysis"</i>
Box 46	Folder 15	2/1962	Paper - "The Burning Rate of Liquid Fuels from Open Trays by Natural Convection" <i>by D. B. Spalding</i>
Box 46	Folder 16	c. 1962	Paper - "Flame Heights & Burning Rates of Liquid Fuels in Open Tanks" <i>by Sami Atallah</i>
Box 47	Folder 1	6/1/1964	Report - "Effect of Moisture on Surface Flammability of Coated & Uncoated Cellulosic Materials" <i>by T. G. Lee, J. J. Loftus &amp; D. Gross</i>
Box 47	Folder 2	6/1965	Report - "Investigation of the High Pressure Helium Arc Plasma by Microwave Cavity Techniques" <i>by William T. Maloney</i>
Box 47	Folder 3	9/1965	Report - "Nonequilibrium Anomalies in the Development of Diffusion Flames" <i>by P. M. Chung, F. E. Fendell &amp; J. F. Holt</i>
Box 47	Folder 4	1/1966	Paper - "Thin-flame theory for a fuel droplet in slow viscous flow" <i>by Francis E. Fendell, Maureen L. Sprankle &amp; David S. Dodson</i>
Box 47	Folder 5	12/1966	Report by Richard Shao-lin Lee <i>"Turbulent Natural Convection Plume above a Finite Circular Source of Mass Momentum &amp; Buoyancy"</i>

Box 47	Folder 6	1/1967	Paper by Walter K. Tang <i>"Effect of Inorganic Salts on Pyrolysis of Wood, Alpha-Cellulose &amp; Lignin Determined by Dynamic Thermogravimetry"</i>
Box 47	Folder 7	6/1967	Paper - "Investigation of a Turbulent Radial Wall Jet" <i>by M. Poreh, Y. G. Tsuei &amp; J. E. Cermak</i>
Box 47	Folder 8	1967	Bulletin - "Thermophysical Properties of Bark of Shortleaf, Longleaf & Red Pine" <i>by William E. Reifsnyder, Lee P. Herrington &amp; Karl W. Spalt</i>
Box 47	Folder 9	9/15/1968	Report by L. H. Back <i>"Conservation Equations of a Viscous, Heat-Conducting Fluid in Curvilinear Orthogonal Coordinates"</i>
Box 47	Folder 10	12/1968	Paper - "Flammability & Fire Resistance of Textiles" <i>by R. Bruce Leblanc</i>
Box 47	Folder 11	1969	Paper by K. E. Torrance, Orloff & J. A. Rockett <i>"Numerical Study of Natural Convection in an Enclosure with localized heating from below - creeping flow to the onset of laminar instability"</i>
Box 47	Folder 12	3/19/1970	Paper - "A rapidly varied flow phenomenon in a two-layer flow" <i>by D. L. Wilkinson &amp; I.R. Wood</i>
Box 47	Folder 13	6/1970	Paper - "A Correlation of Field Observations of Plume Rise" <i>by James A. Fay, Marcel Escudier, David P. Hoult</i>
Box 47	Folder 14	1970	Articles - 5 articles from Combustion Science & Technology <i>"Some Considerations re. problem of wood-burning" by A. M. Kanury &amp; P. L. Blackshear, Jr. "Influence of Free Convection on Ignition of Vertical Cellulosic Panels by Thermal Radiation" by N. Alvares, P. Blackshear, Jr. &amp; A. M. Kanury "On the Combustion of Wood - I &amp; II" by P. Blackshear, Jr. &amp; A. M. Kanury "Duct Fires" by John de Ris</i>
Box 47	Folder 15	4/1971	Report - "Scaled Room Flashover" <i>by Thomas E. Waterman</i>
Box 47	Folder 16	2/2/1972	Correspondence by C. Yao, Factory Mutual System <i>"Comments on Rack Storage - Relative Performance of 1/2 inch &amp; 17/32 inch Orifice Sprinklers"</i>
Box 47	Folder 17	5/1972	Report - "An Asymptotic Analysis of Unsteady Diffusion Flames for Large Activation Energies" <i>by A. Linan &amp; A. Crespo</i>
Box 47	Folder 18	5/1973	Paper - "The role of dynamic pressure in generating fire wind" <i>by R. K. Smith, B. R. Morton &amp; L. M. Leslie</i>
Box 47	Folder 19	5/1973	Paper - "Dynamics of timber fires in mines" <i>by Dr. A Whillier, South Africa</i>
Box 47	Folder 20	10/1973	Report - "The Effect of Strain on Diffusion Flames" <i>by George F. Carrier, Francis E. Fendell &amp; Frank E. Marble</i>
Box 47	Folder 21	1973 & c. 1988	Papers - 2 papers on flame spread & interior finish materials <i>"Contribution of interior finish materials to fire growth in a room" by J. B. Fang &amp; D. Gross "Flame Spread Evaluation for Thin Interior Finish Materials" by F. Mowrer &amp; R. B. Williamson</i>

Box 47	Folder 22	1,3,4/1974 & c. 1975	Notes <i>3 Technical Notes re. Turbulent Jets, by R. A. Antonia, R. W. Bilger &amp; R. E. Beck, "A Note on Favre Averaging in Variable Density Flows" by R. W. Bilger</i>
Box 47	Folder 23	1974	Paper - "The Burning of Vertical Wooden Slabs" <i>by Hsiang-Cheng Kung</i>
Box 48	Folder 1	5/28/1974	Report by I. N. Einhorn, M. M. Birky, M. L. Grunnet, S. C. packham, J. H. Petajan, J. D. Seader <i>"The Physiological &amp; Toxicological Aspects of Smoke Produced during Combustion of Polymeric Materials"</i>
Box 48	Folder 2	7/1974	Report - "Fire Drainage: A New Approach to Fire Safety" <i>by T. Z. Harmathy</i>
Box 48	Folder 3	8/1974	Report by Donald N. Chi <i>"Mathematical Study of a Propagating Flame &amp; Its Induced Aerodynamics in a Coal Mine Passageway"</i>
Box 48	Folder 4	9/1974	Paper - "Toward an Understanding of Fire-Scar Formation: Field Observation & Laboratory Simulation" <i>by A. Malcolm Gill</i>
Box 48	Folder 5		Papers - 2 Papers on Buildings <i>"A Probabilistic Approach to Structural Fire Safety" by T. T. Lie "Fire Resistance of Reinforced Concrete Columns" by T. T. Lie &amp; Dr. E. Allen</i>
Box 48	Folder 6	1974	Paper - "Empirical Method for Calculating Fire Resistance of Protected Steel Columns" <i>by T. T. Lie &amp; W. W. Stanzak</i>
Box 48	Folder 7	2/6/1975	Report - "Understanding Hostile Fire" <i>Society of Fire Protection Engineers- draft</i>
Box 48	Folder 8	3/31/1975	Report - "Firebrand Investigation" - Aerospace Report <i>by A. Muraszew &amp; J. B. Fedee, Aerospace Corp. for USDA Fire Service</i>
Box 48	Folder 9	1975	Paper - "Turbulent Ceiling-Jet Induced by Large Scale Fires" <i>by R. L. Alpert</i>
Box 48	Folder 10	n.d., c. 1975	Paper - "Reverse Stratified Flow in Duct Fires: A Two-Dimensional Approach" <i>by C. C. Hwang, R. F. Chaiken, J. M. Singer &amp; D. N. H. Chi</i>
Box 48	Folder 11	c. 1975	Paper - "Behavior of Fire in Compartments" <i>by Raymond Friedman</i>
Box 48	Folder 13	3/1976	Paper - "The Response of buildings to accidental explosions" <i>by R. J. Mainstone</i>
Box 48	Folder 14	4/12/1976	Paper by B. T. Zinn, E A. Powell, R. A. Cassanova & C. P. Bankston <i>"Investigation of Smoke Particulates Generated during the Thermal Degradation of Natural and Synthetic Materials"</i>
Box 48	Folder 15	5 & 8/1976	Paper - "Design of Buildings for Fire Safety" <i>by T. Z. Harmathy</i>
Box 48	Folder 16	8/1976	Paper - "Buoyant Diffusion Flames" <i>by J. de Ris</i>

Box 48	Folder 17	1976 <i>by T. Maxworthy</i>	Paper - "Some experimental studies of vortex rings"
Box 48	Folder 18	8/1977 <i>by J. W. Rowen &amp; J. W. Lyons</i>	Paper - "The Importance of Externally Imposed Heat Flux on the Burning Behavior of Materials"
Box 48	Folder 19	10/7/1977 <i>by L. Hubbard &amp; C. L. Tien</i>	Paper - "Infrared Mean Absorption Coefficients of Luminous Flames & Smoke"
Box 48	Folder 20	1975-1978 <i>by professors at Case Western Reserve University</i>	Reports & Papers - Flame spread/combustion
Box 49	Folder 1	7/1977 <i>by Ben T. Zinn</i>	Proposal - "Investigation of the Properties of the Combustion Products Generated by Building Fires"
Box 49	Folder 2	1977 & 1978	Papers - 4 papers on Cable Tray Fires by L. W. Hunter
Box 49	Folder 3	1977-1979 <i>"Relationship between Fire Resistance &amp; Fire Tolerance"</i> <i>"Effect of the Nature of Fuel on the Characteristics of Fully Developed Compartment Fires"</i> <i>"Building Design &amp; Fire Hazard"</i>	Reports - re. buildings - by T. Z. Harmathy
Box 49	Folder 4	7/14/1978 <i>by Jack Kracklauer</i>	Proposal - "Quantitative Smoke Measurement in ICBO Room Test Procedure"
Box 49	Folder 5	1978 <i>by C. C. Ndubizu &amp; P. Durbetaki</i>	Paper - "Modeling Radiative Ignition of Fabrics in Air"
Box 49	Folder 6	1978 <i>by J. G. Quintiere, B. J. McCaffery &amp; W. Rinkinen</i>	Paper - "Visualization of Room Fire Induced Smoke Movement & Flow in a Corridor"
Box 49	Folder 7	4/1979 <i>by Andrej Macek</i>	Paper - "Flammability Limits" A Re-Examination"
Box 49	Folder 8	1979 <i>"Development of Recommended Test Method for Toxicological Assessment of Combustion Products"</i>	Report by M. M. Birky et. al., with tables & appendices
Box 49	Folder 9	1979 <i>by Robert F. Chaiken, Joseph M. Singer &amp; Calvin K. Lee</i>	Paper - "Model Coal Tunnel Fires in Ventilation Flow"
Box 49	Folder 10	1979 <i>by T. T. Lie</i>	Paper - "Safety Factors for Fire Loads"
Box 49	Folder 11	3/6/1980 <i>by Phiroz M. Bhagat</i>	Paper - "Extinguishment of Burning Wood Charcoal Surfaces"
Box 49	Folder 12	3/11/1980 <i>from J. de Ris to L. Orloff, Factory Mutual System</i>	Correspondence - "Gas Sampling Probes"
Box 49	Folder 13	3/1980 <i>by Richard Land</i>	Paper - "Fire ventilation Reconsidered"
Box 49	Folder 14	4/14/1980 <i>draft by E. e. Zukoski, Toshi Kubota &amp; Baki Cetegen</i>	Paper - "Entrainment in Fire Plumes"



Box 49	Folder 15	11/21/1980	Report by Dr. John L. Bryan <i>"An Examination &amp; Analysis of the Dynamics of the Human Behavior in the MGM Grand Hotel Fire"</i>
Box 49	Folder 16	1980	Papers - "Collected Papers - Fire Research 1954-1974 Vol. II" <i>by Philip H. Thomas</i>
Box 50	Folder 1	1980	Paper by M. Faghri & E. R. G. Eckert <i>"Moisture Migration Caused by Periodic Temperature Fluctuations in an Unsaturated Porous Medium"</i>
Box 50	Folder 2	1980	Paper by E.R. G. Eckert & M. Faghri <i>"A General Analysis of Moisture Migration caused by Temperature Differences in an Unsaturated Porous Medium"</i>
Box 50	Folder 3	1980	Papers - Human Fatalities <i>2 papers by Walter G. Bert &amp; Byron M. Halpin</i>
Box 50	Folder 4	1980	Paper - "Some Overlooked Aspects of the Severity of Compartment Fires" <i>by T. Z. Harmathy</i>
Box 50	Folder 5	1981	Paper - "The Fire Resistance Test & Its Relation to Real-World Fires" <i>by T. Z. Harmathy</i>
Box 50	Folder 6	1981	Paper - "Comparisons among Various Theories for Turbulent, Reacting, & Planar Mixing Layers" <i>by S. F. Parker &amp; W. A. Sirignano</i>
Box 50	Folder 7	1981	Paper - "Theory of Laminar Flames" <i>by J. D. Buckmaster &amp; G. S. S. Ludford</i>
Box 50	Folder 8	2/12/1981	Paper - "The viscous spreading of plane and axisymmetric gravity currents" <i>by Didden &amp; T. Maxworthy</i>
Box 50	Folder 9	4/14/1981	Paper by L. Y. Cooper, M. Harkleroad, J. Quintiere & W. Rinkinen <i>"An Experimental Study of Upper Hot Layer Stratification in Full-Scale Multi-Room Fire Scenarios"</i>
Box 50	Folder 10	12/1981	Report - "An Investigation of Fire Impingement on a Horizontal Ceiling" <i>by Z. You &amp; G. M. Faeth</i>
Box 50	Folder 11	2/8/1982	Paper - "Finding Minimal Feedback Vertex Sets" <i>by John D. Ramsdell</i>
Box 50	Folder 12	3/6/1982	Paper by Dr. John L. Bryan <i>"An Examination &amp; Analysis of the Dynamics of the Human Behavior in the Westchase Hilton Hotel Fire"</i>
Box 50	Folder 13	4/1982	Reports by Francesco Tamanini, and by Bela Karlovitz & Bernard Lewis <i>"Evaluation of Ignition &amp; Burning of Hydrogen in Containment of Grand Gulf Nuclear Power Station"</i> <i>"Report on Study of Hydrogen Control in the Grand Gulf Nuclear Station"</i>
Box 50	Folder 14	7/1982	Report by James G. Quintiere <i>"An Assessment of Correlations Between Laboratory and Full-Scale Experiments for the FAA Aircraft Fire Safety Program" [Parts 1, 2, 4 &amp; 5]</i>
Box 50	Folder 15	8/1982	Paper - "Transport of Firebrands by Line Thermals" <i>by F. A. Albini, USDA Fire Service</i>

Box 50	Folder 16	1982 <i>by Hiroshi Tsuh</i>	Paper - "Counterflow Diffusion Flames"
Box 50	Folder 17	1982 <i>by Phiroz M. Bhagat</i>	Paper - "Analytical Modeling of the Effects of Water Application on Burning Wood Charcoal Surfaces"
Box 50	Folder 18	1982 <i>by T. Z. Harmody</i>	Paper - "The Delphi Method - A Complement to Research"
Box 50	Folder 19	1/1983 <i>by Seng Chuan Tan</i>	Thesis - "A Study of Transient Horizontal Fire Spread over Cellular Plastics"
Box 50	Folder 20	6/1983 <i>by Leonard Y. Cooper</i>	Paper - "On the Significance of a Wall Effect in Enclosures with Growing Fires"
Box 50	Folder 21	7/25/1983 <i>by Daniel T. Valentine &amp; Timothy W. Kao</i>	Paper - "Gravity current upstream of a buoyant influx in an open-channel flow: a Numerical study"
Box 50	Folder 22	10/1983 <i>"Preliminary Report on a Model to describe the Flow in the Ceiling Layer of a Two Layer Fire Model"</i>	Paper by E. E. Zukoski & T. Kubota
Box 50	Folder 23	10/24-28/1983 <i>by I. Nakaya, T. Tanaka, M. Yoshida</i>	Paper - "A Measurement of Doorway Flow Induced by Propane Fire"
Box 50	Folder 24	11/1983 <i>by Fred L. Fisher, Frederick W. Mowrer &amp; Robert Brady Williamson</i>	Paper - "A Room Fire Screening Test Procedure"
Box 50	Folder 25	12/1983 <i>"A Buoyant Source in the Lower of Two, Homogeneous, Stably Stratified Layers - A Problem of Fire in an Enclosure"</i>	Report by Leonard Y. Cooper
Box 50	Folder 26	1983 <i>"Some Experimental Aspects of Turbulent Diffusion Flames &amp; Buoyant Plumes from Fire Sources against a Wall and in a Corner of Walls"</i>	Paper by Yuji Hasemi & Tazo Tokunaga
Box 50	Folder 27	1983 <i>by T. A. McMahon &amp; J. T. Bonner, from On Size &amp; Life</i>	Chapter - "The Physics of Dimensions"
Box 50	Folder 28	1983 <i>"Thermal Response of Unconfined Ceilings Above Growing Fires and the Importance of Convective Heat Transfer"</i>	Paper by L. Y. Cooper & D. W. Stroup
Box 50	Folder 29	c. 1983 <i>by Patrick J. Pagni</i>	Paper - "Materials Fire Properties & Test Methods"
Box 50	Folder 30	1/1984 <i>"A Research Study on the Potential Contribution of Carpets &amp; Rugs to Toxic Emissions Hazards in Building Fires"</i>	Report by Arthur F. Grand et. al.
Box 51	Folder 1	3/1984 <i>by K. D. Steckler, H. R. Baum &amp; J. G. Quintiere</i>	Paper - "Fire Induced Flows through Room Openings - Flow Coefficients"

Box 51	Folder 2	1984	Paper - "Ignition & Burning of a Layer of Incomplete Combustion Products" <i>by C. L. Beyler</i>
Box 51	Folder 3	1984	Paper by Leonard Y. Cooper <i>"The Thermal Response of Aircraft Cabin Ceiling Materials during a Post-Crash External Fuel Spill, Fire Scenario"</i>
Box 51	Folder 4	1984	Paper - "Prediction of Corridor Smoke Filling by Zone Models" <i>by Walter W. Jones &amp; James G. Quintiere</i>
Box 51	Folder 5	1984	Paper - "Smoke Movement in Rooms of Fire Involvement & Adjacent Spaces" <i>by Leonard Y. Cooper</i>
Box 51	Folder 6	2/1985	Report - "An Experimental Study of Negatively Buoyant Flows Generated in Enclosure Fires" <i>by Y. Jaluria &amp; D. Goldman</i>
Box 51	Folder 7	9/19/1985	Paper - "Wall Flames and Implications for Upward Flame Spread" <i>by James Quintiere &amp; Margaret Harkleroad &amp; Yuji Hasemi</i>
Box 51	Folder 8	10/1985	Paper - "Microbursts: a hazard for aircraft" <i>by P. F. Linden &amp; J. E. Simpson</i>
Box 51	Folder 9	11/1985	Abstract - "A PDF Method for Calculating Major Species Concentrations in Turbulent Fires" <i>by M. A. Delichatsios &amp; M. K. Mathews</i>
Box 51	Folder 10	1985	Paper - "Effect of opposing buoyancy on the flow in free and wall jets" <i>by Daniel Goldman &amp; Yogesh Jaluria</i>
Box 51	Folder 11	c. 1985	Paper - "Major Species Production by Solid Fuels in a Two Layer Compartment Fire Environment" <i>by C. L. Beyler</i>
Box 51	Folder 12	3/1986	Manuscript - "Experimental Study of Thermally Generated Reverse Stratified Layers in a Fire Tunnel" <i>by C. C. Hwang &amp; J. D. Wargo</i>
Box 51	Folder 13	3/1986	Paper - "Experimental Study of Thermally Generated Reverse Stratified Layers in a Fire Tunnel" <i>by C. C. Hwang &amp; J. D. Wargo</i>
Box 51	Folder 14	9/1986	Paper - "Estimating room temperatures from fires along walls and in corners" <i>by Frederick W. Mowrer &amp; Robert Brady Williamson</i>
Box 51	Folder 15	1986	Paper - "Microscales of turbulence & heat transfer correlations" <i>by Vedat S. Arpaci</i>
Box 51	Folder 17	7/23/1987	Paper - "The Application of Flame Spread Theory to Predict Material Performance" <i>by J. G. Quintiere</i>
Box 51	Folder 18	1987	Paper - "Droplet Vaporization Model for Spray Combustion Calculations" <i>by B. Abramzon &amp; W. A. Sirignano</i>
Box 51	Folder 19	1987	Paper - "Experimental Augmentation of Turbulent Flames Through Free Radicals Delivered In Situ" <i>by Alberto Schirmer, Jack Green &amp; Kumar Ramoahalli</i>
Box 51	Folder 20	1987-1989	Papers & reports - Prevention of Electrical Fires

Box 51	Folder 21	4/1988 <i>by John H. Klote</i>	Paper - "An Analysis of the Influence of Piston Effect on Elevator Smoke Control"
Box 51	Folder 22	5/1988 <i>"Calculating Flows Through Vertical Vents in Zone Fire Models under Conditions of Arbitrary Cross-Vent Pressure Difference"</i>	Paper by L.Y. Coope
Box 51	Folder 23	12/8/1988 <i>by James G. Quintiere</i>	Paper - "Scaling Applications in Fire Research"
Box 51	Folder 24	1988 <i>by B. M. Cetegen &amp; W. A. Sirignano</i>	Paper - "Study of Molecular Mixing and a Finite Rate Chemical Reaction in a Mixing Layer"
Box 51	Folder 25	1988 <i>"Unsteady Flame Propagation in a Spray with Transient Droplet Vaporization" by R. H. Rangel &amp; W. A. Sirignano "Numerical Study of Multicomponent Fuel Spray Flame Propagation in a Spherical Closed Volume" by G. Continillo &amp; W. A. Sirignano</i>	Papers - 2 papers on flame propagation
Box 51	Folder 26	1/1989 <i>by C. H. Chiang, M. S. Raju &amp; W. A. Sirignano</i>	Paper - "Numerical Analysis of Convecting, Vaporizing Fuel Droplet with Variable Properties"
Box 51	Folder 27	4/1989 <i>by George N. Walton</i>	Report - "AIRNET - A Computer Program for Building Airflow Network Modeling"
Box 51	Folder 28	6/1989 <i>by M. D. Smooke &amp; V. Giovangigli</i>	Report - "Extinction of Tubular Premixed Laminar Flames with Complex Chemistry"
Box 51	Folder 29	7/1989 <i>by James G. Quintiere</i>	Paper - "Fundamentals of Enclosure Fire 'Zone' Models"
Box 51	Folder 30	10/1989 <i>"Estimating the Environment &amp; the Response of Sprinkler Links in Compartment Fires with Draft Curtains and Fusible Link-Actuated Ceiling Vents -Theory"</i>	Paper by Leonard Y. Cooper
Box 51	Folder 31	11/1989 <i>by E. E. Zukoski, J. H. Morehart, T. Kubota &amp; S. J. Toner</i>	Paper - "Species Production & Heat Release Rates in Two-Layered Natural Gas Fires"
Box 51	Folder 32	1989 <i>Drafts 0, 1, &amp; 2, by Ed Zukoski</i>	Outline - Fire Plume Model
Box 51	Folder 33	1989 <i>by Marco Rasi</i>	Thesis - "Mixing in Density-Stratified Conjugate Flows"
Box 51	Folder 34	n.d., c. 1989 <i>by L. Zhou &amp; A. C. Fernandez-Pello</i>	Paper - "Concurrent Turbulent Flame Spread"
Box 52	Folder 1	5/1990 <i>by R. H. Rangel &amp; W. A. Sirignano</i>	Paper - "The linear & nonlinear shear instability of a fluid sheet"
Box 52	Folder 2	7/1990 <i>by T. H. Chen, M. E. Post &amp; L. P. Goss</i>	Paper - "Numerical & Experimental Assessments of the Thermal Response of a Thin Filament"
Box 52	Folder 3	7/1990 <i>"Comparison between experimental measurements &amp; numerical calculations of the heptane-air diffusion flames"</i>	Paper by M. Bui & K. Seshadri

Box 52	Folder 4	7/1990	Paper - "Monochromatic Absorption of Luminous Flames" <i>by Ahmet Selamet and Vedat S. Arpaci</i>
Box 52	Folder 5	8/1990	Paper - "Lag Times Associated with Fire Detection & Suppression" <i>by Frederick W. Mowrer</i>
Box 52	Folder 6	1990	Paper - "Study of Mixing & Reaction in the field of a Vortex" <i>by B. M. Cetegen and W. A. Sirignano</i>
Box 52	Folder 7	c. 1990	Paper - "Use of Small-Scale Test Data in Hazard Analysis" <i>by Harold E. Nelson &amp; Eric W. Forssell</i>
Box 52	Folder 8	1990 & 1991	Papers by J. P. Delplanque, R. H. Rangel & W. A. Sirignano <i>"Liquid-Waste Incineration in a Parallel-Stream Configuration: Parametric Studies"</i> <i>"Liquid Waste Incineration in a Parallel-Stream Configuration: Effect of Auxiliary Fuel"</i>
Box 52	Folder 9	1/1991	Paper - "Ignition Delay of a Gas Mixture Above a Liquid Fuel Pool" <i>by D. N. Schiller &amp; W.A. Sirignano</i>
Box 52	Folder 10	1/1991	Paper - "Vaporization and Combustion of Metal Slurry Droplets" <i>by R. Bhatia &amp; W. A. Sirignano</i>
Box 52	Folder 11	2/1991	Paper - "A Study of the Early History of Soot Formation in Various Hydrocarbon Diffusion Flames" <i>by K. Saito, A. S. Gordon, F. A. Williams &amp; W. F. Stickle</i>
Box 52	Folder 12	4/10/1991	Notes - "Comparison of 2-D Computations & Experiments on Gravity Currents" <i>"Comparison of 2-D Computations &amp; Experiments on Gravity Currents" by R. G. Rehm</i>
Box 52	Folder 13	6/1991	Paper - "The Role of Laminar-Turbulent Transition in Gas Turbine Engines" <i>by Robert Edward Mayle</i>
Box 52	Folder 14	1991	Paper by A. Ito, K. Saito & T. Inamura <i>"Holographic Interferometry Temperature Measurements in Liquids for Pool Fires Supported on Water"</i>
Box 52	Folder 15	1991	Paper - "Measuring Rate of Heat Release by Oxygen Consumption" <i>by Marc L. Janssens</i>
Box 52	Folder 16	1991	Paper - "A Study of Flame Spread over Alcohols using Holographic Interferometry" <i>by A. Ito, D. Masuda &amp; K. Saito</i>
Box 52	Folder 17	1991	Paper - "Buoyancy-Driven Turbulent & Diffusion Flames" <i>by Vedat S. Arpaci &amp; Ahmet Selamet</i>
Box 52	Folder 18	c. 1991	Paper - "Gaseous Product Emissions from Fires" <i>by A. Tewarson</i>
Box 52	Folder 19	c. 1991	Paper - "Fire-Induced Reverse Stratified Flow in a Mine Heading" <i>by V. B. Apte &amp; J. H. Kent &amp; A. R. Green</i>
Box 52	Folder 20	1992	Request for Comments, Underwriters Lab, includes Emmons' comments <i>for First Edition of "Standard for Fire Test for Heat &amp; Visible Smoke Release..."</i>
Box 52	Folder 21	1992	Paper - "Flow through a Horizontal Vent in an Enclosure Fire" <i>by Q. Tan &amp; Y. Jaluna</i>

Box 52	Folder 22	1992	Paper - "Formulation of the Statistical Equations of Turbulent Flows with Variable Density" <i>by Alexandre J. A. Favre</i>
Box 52	Folder 23	10/1992	Paper - "Development of Composite Heat Release Rate Curves for Multiple Burning Items" <i>by Arthur J. Parker</i>
Box 52	Folder 24	1992	Paper by S. Venkatesh & K. Saito <i>"Estimates on the effect of chlorine on the global soot production rates in Laminar hydrocarbon-air diffusion flames"</i>
Box 52	Folder 25	1993	Publication - Encyclopedia of Fluid Mechanics -Supplement 1- "Applied Mathematics in Fluid Dynamics" <i>ed. by Nicholas P. Cheremisinoff</i>
Box 52	Folder 26	c. 1993	Paper - "Effects of Viscosity on Gravity Currents in the Inertial Regime" <i>by W. R. Chan, T. Kubota &amp; E. E. Zukoski</i>
Box 52	Folder 27	11/24/1993	Paper - "Simulation of Smoke Plumes from Large Pool Fires" <i>by H. R. Baum, K. B. McGrath &amp; R. G. Rehm, &amp; Emmons' review</i>
Box 52	Folder 28	1993	Papers - 3 papers on incineration by Thomas B. Shen <i>"Burning Stabilization in a Rotary Kiln Incinerator"</i> <i>"Incineration Systems"</i> <i>"Burning of Multisized Element Fuel Assembly with Interactions in Rotary Incinerator"</i>
Box 52	Folder 29	1994	Proposal - "Numerical Simulation & Experimental Study of Smoke in Uncontrolled Fire" <i>by Shuh-Jing Ying</i>
Box 52	Folder 30	1994	Paper - "Smoke Movement Driven by a Fire under a Ceiling" <i>by Graham Atkinson &amp; Gabriel Rooney - 2 drafts</i>
Box 52	Folder 31	c. 1994	Paper - "Flow of Smoke & Hot Gases due to a Fire in Open Vertical Shafts" <i>by A.P. Mercier &amp; Y. Jaluria</i>
Box 52	Folder 32	1995	Dissertation Abstract by Yongsheng Yang, U. of Arizona <i>"Free-Radicals Augmentation and large Eddy Probability- Density Simulation for High-Speed Turbulent Combusting Jets"</i>
Box 52	Folder 33	c. 1995	Paper - "Fire Growth: An Overview" <i>by J. G. Quintiere</i>
Box 53	Folder 1	Summer 1995	Report -- "Modern Solid Waste Incineration - A Combustion Application" <i>by Thomas B. C. Shen</i>
Box 53	Folder 2	8/1995	Paper - "Combined Buoyancy & Pressure-Driven Flow through a Shallow, Horizontal, Circular Vent" <i>by L. Y. Cooper</i>
Box 53	Folder 3	1995	Paper - "Flow of Smoke & Hot Gases Across Horizontal Vents in Room Fires" <i>by Y. Jaluria, W. K. S. Chiu &amp; S. H. K. Lee</i>
Box 53	Folder 4	1995	Paper - "Compartment Fire Experiments: Comparison with Models" <i>by N. A. Dembsey, I. J. Pagni &amp; R. B. Williamson</i>
Box 53	Folder 5	1995	Paper - "Wall fires and the approach to flashover in an enclosure" <i>by Henri E. Mitler &amp; Kenneth D. Steckler</i>

Box 53	Folder 6	1995	Paper by Barbara C. Levin <i>"New research avenues in toxicology: 7-gas N-gas, toxicant suppressants, &amp; genetic toxicology"</i>
Box 53	Folder 7	1995-1998	Papers - re. erosion and sediments by Wilbert Lick & others
Box 53	Folder 8	c. 1996	Article - "Thermonuclear Flame Theory" <i>by Robert Neil Cherdack</i>
Box 53	Folder 9	1996	Thesis by Robert Neil Cherdac <i>"A Study of Thermonuclear Deflagration Waves in Magnetically Confined Deuterium-Tritium Plasmas"</i>
Box 53	Folder 10	7/1996	Paper - "Flame Heights in Wall Fires: Effects of Width, Confinement & Pyrolysis Length" <i>draft, by Mickael Coutin, Gilles Kolb, Jean-Michel Most</i>
Box 53	Folder 12	8/1996	Memorandum by Robert G. Deissler, for NASA <i>"Turbulent Fluid Motion V - Fourier Analysis, the Spectral Form of the Continuum Equations, &amp; Homogeneous Turbulence"</i>
Box 53	Folder 13	12/1996	Paper- "A Practical CFD Simulating Model of Gaussian Plume Dispersion for Toxic & Explosive Species" <i>by Dee H. Wong</i>
Box 53	Folder 14	1996	Papers - Hydrodynamic model/vertical water entry - basilisk lizard <i>by J. W. Glasheen &amp; T. A. McMahon</i>
Box 53	Folder 15	6/1/1996 & 5/18/1997	Papers - "A Steady-Flow Fusion Burner" & "Beyond Fusion Ignition" <i>by Robert A. Gross</i>
Box 53	Folder 16	1997	Paper - "Experimental Study of the Exchange Flow through a Horizontal Ceiling Vent in Atrium Fires" <i>by Tokiyoshi Yamada</i>
Box 53	Folder 17	c. 1997	Paper - "Using Risk Models in Regulation: A Regulatory Effectiveness Analysis" <i>by Vincent Brannigan &amp; Carol Smidts</i>
Box 54	Folder 1	11/1997	Papers - 2 papers on flows associated with flames on inclined surfaces & 2 photocopies of photographs <i>by D. D. Drysdale</i>
Box 54	Folder 2	12/1997	Paper - "Modeling of Aspirated Thermocouples (suction pyrometers) for Fire Research" <i>by Linda G. Blevins &amp; William M. Pitts</i>
Box 54	Folder 3	1986-1993	Papers/articles - on Superfluid/Helium II <i>by Russell Donnelly &amp; others</i>
Box 54	Folder 4	c. 1997	Paper - "Computational Studies on Cyclone Gasifiers & Combustors" <i>by A. Kumar, I. J. Paul &amp; H. S. Mukunda</i>
Box 54	Folder 5	c.1997	Paper by Lynda Brahmi, Thomas Vietoris & Pierre Joulain <i>"The Effect of Parietal Fuel Injection on the Geometry of a Low Velocity Laminar Diffusion Flame"</i>
Box 54	Folder 6	c. 1997	Paper - "The Optics of Small Diffusion Flames in Microgravity" <i>by Fred Carleton, Derek Dunn-Rankin &amp; Felix Weinberg</i>
Box 54	Folder 7	1/1998	Paper by O. A. Beg, H. S. Takhar, V. Prasad <i>"Thermoconvective Flow in a Saturated, Isotropic, Homogeneous Porous Medium using Brinkman's Model: Numerical Study"</i>

Box 54	Folder 8	c. 1998	Paper by Thomas Vietoris, Pierre Joulain & Jose Torero <i>"Experimental Observations on the Geometry &amp; Stability of a Laminar Diffusion Flame in Micro-Gravity"</i>
Box 54	Folder 9	5/1998	Report - Panel for Building & Fire Research Assessment of NIST Programs
Box 54	Folder 10	8/1998	Paper-"Nonlinear & Interactive Effects in the sorption of Hydrophobic Organic Chemicals by Sediments" <i>by Rich Jepson &amp; Wilbert Lick</i>
Box 54	Folder 11	8/1998	Paper by N. L. Smith, N. P. Megalos, G. J. Nathan, D. K.k kZhang & J. P. Smart <i>"The Rose of Fuel Rich Clusters in Flame Stabilization and Nox Emission Reduction with Precessing Jet P. F. Flames"</i>

## Series XXI: National Bureau of Standards

MS 06\_0021

Personal Papers

National Institute of Standards and Technology Publications and Projects

### Container List

Container	Folder	Date	Title
Box 54	Folder 12	1982	Publication --National Bureau of Standards - Fire Research Publications
Box 54	Folder 13	9/1982	Publication -- National Bureau of Standards - Special Publication 639 <i>Fire Research &amp; Safety, with paper by H. Emmons, p. 236, "The Computer Fire Code"</i>
Box 54	Folder 14	1993	Projects -- National Institute of Standards & Technology <i>Building and Fire Research Projects Laboratory</i>
Box 54	Folder 15	1993	Projects -- National Institute of Standards & Technology <i>Building and Fire Research Laboratory In-House Projects and Grants</i>
Box 55	Folder 1	1993	Publication -- National Institute of Standards & Technology <i>National Institute of Standards &amp; Technology 1993 Annual Conference on Fire Research Book of Abstracts</i>
Box 55	Folder 2	1995 - 8/1995	Projects -- National Institute of Standards & Technology <i>Building and Fire Research Laboratory Project Summaries</i>
Box 55	Folder 3	1996 - 10/28-31/1996	Publication -- National Institute of Standards & Technology <i>Annual Conference on Fire Research: Book of Abstracts</i>

## Series XXII: Photographs of People

MS 06\_0022

Photographic Print

### Container List

Container	Folder	Date	Title
Box 55	Folder 4	9/1966	Photograph, Kyoto, Japan <i>IUGG-IUTAM Symposium on boundary layers and turbulence including geophysical applications [group photograph]</i>



**Series XXIV: Print Photographs of Fire-related subjects, 1950s-1994**

MS 06\_0023

Photographic Print

**Container List**

Container	Folder	Date	Title
Box 55	Folder 6	1950's <i>were with G. I. Taylor materials</i>	Photographs - Spinning Detonation
Box 55	Folder 7	c. 1950s	Photographs - these were with 1950s materials 1951-53...[Flow instabilities in compressors, etc.]
Box 55	Folder 8	c. 1965 <i>not labeled, but found with 1965 report by H. W. Emmons: "The Arc Measurement of High Temperature Gas Transport Properties"</i>	Photographs
Box 55	Folder 9	c. 1973-1980 <i>photocopies are with notebook materials</i>	Photographs - from Notebook Folder - course materials, includes information on properties
Box 55	Folder 10	1983	Photographs - Fire Growth at the MGM
Box 55	Folder 11	8/1986 <i>by Steckler, Baum &amp; Quintiere</i>	Photographs - "Salt Water Modeling of Fire Induced Flows in Multicompartment Enclosures"
Box 55	Folder 12	1994 <i>by Atkinson &amp; Rooney</i>	Photograph - sent with paper "Smoke Driven by a Fire under a Ceiling"

**Series XXIV: Photographic Slides of Fire-related subjects**

MS 06\_0024

Photographic Print

**Container List**

Container	Folder	Date	Title
Box 55	Folder 13	c. 1982/1983	Slides - from Slide Box 1 [arbitrary number] - box said "Emmons/Mitler 'good'"
Box 55	Folder 14	c. 1982/1983	Slides - from Slide Box 2 [these may go with Slide Box 1]
Box 55	Folder 15	n.d.	Slides - C J Jump [Emmons' label] - from Slide Box 3
Box 55	Folder 16	n.d.	Slides - Natural Convection & Burning Ceiling [Emmons' titles] from Slide Box 3
Box 55	Folder 17	n.d. <i>Folder 17: Slides - MGM [Emmons' label]- from Slide Box 3</i>	Slides - MGM [Emmons' label]- from Slide Box 3
Box 55	Folder 18	n.d.	Slides - Jokes [Emmons' label] - from Slide Box 3
Box 55	Folder 19	n.d.	Slides - Vent Flow [Emmons' label] & The Home Fire [Emmons' label] -from Slide Box 4

Box 55	Folder 20	n.d.	Slides - no title - graphs & equations/2 photographs of Jarrah Forest - from Slide Box 4
Box 55	Folder 21	1991-1993	Slides - from notebook labeled "Ceiling Jet - Book 2" from Slide Box 5
Box 55	Folder 22	c. 1975-1993	Slides - from notebook labeled "Ceiling Jet - Book 2" from Slide Box 5

**Series XXV: Films**

MS 06\_0025

Film

**Container List**

Container	Folder	Date	Title
Box 56	Folder 1	1974	Film - 16 mm, 7" reel - Home Fire Project <i>"1974 Full-Scale Fire Test - Harvard FMRC"</i>
Box 56	Folder 2		Film - 16 mm, 7" reel - Home Fire Project
Box 56	Folder 3		Film - 16 mm, 7" reel - Home Fire Project

**Series XXVI: Computer Print-Outs (not listed)**

MS 06\_0026

Personal Papers

**Container List**

Container	Folder	Date	Title
Box 57			Computer Print-Outs

**Series XXVII: Computer Disks 5"**

MS 06\_0027

Personal Papers

**Container List**

Container	Folder	Date	Title
Box 58			

**Series XXIX: Computer Handbooks**

MS 06\_0028

Book

**Container List**

Container	Folder	Date	Title
Box 59	Folder 1		NIST Handbook 146 - 2 handbooks in case <i>Reference Guide for Hazard I</i> <i>Technical Reference Guide &amp; Example Cases</i>
Box 59	Folder 2		FPETOOL VER. 3.2 Handbook

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**Series XXIX: Legal Cases**

MS 06\_0029

Personal Papers

**Container List**

<b>Container</b>	<b>Folder</b>	<b>Date</b>	<b>Title</b>
Box 60		1964-1975	Legal Cases
Box 61		1975-1984	Legal Cases
Box 62		1984-1991	Legal Cases

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**Series XXX: Legal - Sandra K. Thornhill vs. Ronnie's Truck Stop**

MS 06\_0030

Personal Papers

**Container List**

<b>Container</b>	<b>Folder</b>	<b>Date</b>	<b>Title</b>
None			

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**Series XXXI: Legal - Cathedral Hill Hotel Fire**

MS 06\_0031

Personal Papers

**Container List**

<b>Container</b>	<b>Folder</b>	<b>Date</b>	<b>Title</b>
None			

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**Series XXXII: Legal - Nawn vs. State Industries**

Ms 06\_0032

Personal Papers

**Container List**

<b>Container</b>	<b>Folder</b>	<b>Date</b>	<b>Title</b>
None			

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