

Robert Malanga, P.E.

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SUMMARY OF QUALIFICATIONS:

Fire protection engineering and risk management professional specializing in the analysis of *fires, explosions* and *industrial* as well as related *property/life safety risks*. Solid depth and breadth of experience in diverse elements of *fire protection engineering; forensic fire, explosion and arson assessment; failure analysis of fire sprinkler, suppression and protection systems; master planning, risk assessment and code/standard evaluation*.

Seasoned and experienced in the design, implementation and evaluation of *fire protection, life safety* and *allied building systems*. Adept in applying *relevant scientific principles* to *industrial, commercial, public* and *private applications*. Over 25 years experience involving *fire protection engineering, forensic and consulting engineering, corporate risk management and emergency response*.

President and founder of **FIRE & RISK ENGINEERING**, a private fire protection engineering and risk management consulting firm. Formerly served in the capacity of **Manager, Corporate Loss Prevention** for Union Camp Corporation (now International Paper) and **Manager of Fire Safety** for the New York City Transit Authority, as well as **Fire Protection Engineer/Project Manager** for a worldwide fire protection engineering consulting firm.

Experience includes responsibility for over 900 industrial facilities including: *integrated pulp/paper mills, chemical/ petrochemical plants, manufacturing, power-production facilities* and *surface/rapid transit system infrastructure*.

AREAS OF EXPERTISE:

Forensic Fire/Explosion Analysis and Litigation Support: Investigation and reconstruction of *major, complex and multiple/mass casualty fire and explosion incidents*. Analysis and identification of relevant fire spread and development parameters. Evaluation of fire protection and related building systems performance. Assessment of regulatory issues and responsibility. *Qualified and respected expert testimony*.

Project experience includes: *World Trade Center Explosion (1993, New York, NY), The Station Nightclub Fire (2003, West Warwick, RI), Happyland Social Club Fire (1990, Bronx, NY), One New York Plaza Explosion (2001, New York, NY), Brooklyn Navy Yard Fire (1985, Brooklyn, NY), O'Brien-Newark Cogeneration Plant Fire (1992, Newark, NJ), Miami International Airport Jet Fuel Facility Fire (2010, Miami, FL), Stapleton Airport Jet Fuel Tank Farm Fire (1990, Denver, CO) and Swissair Flight 111 Fire/Crash (1998, Nova Scotia, CAN)*.

Fire Protection and Life Safety Systems: Planning, evaluation, design, specification, implementation, coordination and performance analysis of fire protection and life safety systems, including: *sprinkler, public and private water supply, fire suppression, detection/alarm, communication, life safety, egress, smoke management* and *building related*.

Evaluation and Management of Risk: Assessment and mitigation of loss exposures due to *fire, explosion, equipment failure, process upset* and *interdependency*. Qualitative and quantitative *fire hazard analyses* and *emergency response planning assessments*. Risk appraisal of facilities, infrastructure, contracts and designs.

Codes, Standards, Regulations and Master Planning: Resolution of regulatory, code and insurability issues (including Highly Protected Risk). Interpretation and application assessment of *fire and building codes, standards and regulations*. Development and implementation of *strategic risk reduction programs* for *fire, loss control, and process/system safety*.

EDUCATION AND LICENSES:

M.S. Degree, Technology Management, Stevens Institute of Technology, 1999

B.S. Degree, Fire Protection Engineering, University of Maryland, 1987

A.A.S. Degree, Electronics Engineering, County College of Morris, 1983

National Fire Academy, US-FEMA - Adjunct Instructor: Chemistry of Hazardous Materials

Municipal/Industrial Fire Services - Municipal/industrial emergency operations; Incident Command/Incident Management Systems; Hazardous Materials.

Licensed Professional Engineer: New York (071178), New Jersey (GE36370), WI (28164), NCEES National (26769)

BUSINESS EXPERIENCE:

FIRE & RISK ENGINEERING (Robert Malanga, P.E., LLC) 1998 to present
Professional consulting firm specializing in fire/explosion analysis, fire protection, life safety and risk management.

President and founder of private consulting firm providing *fire protection engineering, forensic analysis of fires, explosions* and related incidents, determination and evaluation of *fire spread, behavior* and *development*, performance analysis of *fire protection systems, fire/life safety consulting, property loss* and *risk assessment, code application* and *interpretation*.

UNION CAMP CORPORATION (now INTERNATIONAL PAPER) 1996 to 1999
International Fortune 200 manufacturer of pulp and paper, chemicals, building materials, flavors and fragrances.

Manager of Corporate Loss Prevention - Responsible for protecting over \$10 billion in assets against property, direct profit and market share losses from *fire, explosion* and *machinery/process breakdown*. Supervised investigation of *major fires* and *explosions*. Executed worldwide *Fire Protection Engineering/Loss Control Program*.

Originated *Corporate Loss Prevention, Assessment* and *Audit programs*; allocated engineering resources; defined and negotiated *acceptable levels of risk* and performed *business continuity/interdependency evaluation* for over 220 new and existing facilities, mergers and acquisitions.

ROLF JENSEN & ASSOCIATES, INC. 1988 to 1996
Worldwide fire protection, building code and risk evaluation consulting engineering firm.

Consulting Fire Protection Engineer/Project Manager - Executed all aspects of management and *fire protection engineering* for a wide range of high profile projects in all major occupancy classifications, including: *design, specification, evaluation, hazards analysis, incident reconstruction* and *master planning*. Led investigation of *major fires* and *explosions*. Coordinated key engineering/special assignment teams and budgets for construction projects of more than \$200 million.

NEW YORK CITY TRANSIT AUTHORITY 1987 to 1988
Public transportation agency with equipment fleet of 12,000 vehicles and 700 facilities.

Manager of Fire Safety (a) - Administered *Fire Safety Program* for the overall New York City Transit System. Developed and integrated authority-wide *fire safety policies* and *programs*. Formulated *protection criteria* for new and existing facilities as well as capital upgrades. Led investigation of *major fires* and *explosions*.

Coordinated with City, State and Federal regulatory agencies, including Public and National Transportation Safety Boards (PTSB and NTSB). Championed development and implementation of *ultra-high speed flame detection and gaseous extinguishing system* throughout the Transit System to protect railroad personnel from *incendiary attacks/fire bombings*, which has saved several lives.

PROFESSIONAL AFFILIATIONS:

National Academy of Forensic Engineers (NAFE) - Active Senior Member; *Board Certified Diplomate* in *Forensic Engineering*, a Council of Engineering & Scientific Specialty Board (CESB) Member.

National Society of Professional Engineers (NSPE) - Active Member.

Society of Fire Protection Engineers (SFPE) - Active Professional Member, *Past President* and *Director*.

National Committees: *Engineering Registration* and *Fire Service*.

National Fire Protection Association (NFPA) - Active Member.

Technical/Correlating Committees: *Boiler Combustion System Hazards, Electrical Equipment in Chemical Atmospheres, Exposure Fire Protection, National Fire Alarm Code/Public Fire Reporting Systems, Electric Generating Plants, Fixed Guideway Transit Systems, and General Storage*.

American Society for Testing and Materials (ASTM) - Active Member.

Technical Committees: *E5 Fire Standards* and *E58/E30 Forensic Sciences/Engineering*.

International Association of Arson Investigators (IAAI) - Active Member.

Code Administration and Enforcement Certifications and Licenses:

New Jersey Uniform Construction Code: Construction Official; Fire/Building Subcode Official; Fire, Electrical and Building High-Rise/High Hazard (HHS) and Mechanical certifications.

New Jersey Uniform Fire Code: Fire Official.

SELECTED TECHNICAL PAPERS, PUBLICATIONS AND SPEECHES:

1993 World Trade Center Bombing - Lessons Learned

Presented: American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) 2002 Winter Meeting, Atlantic City Convention Center, January 2002 and New York SFPE Chapter Meeting, March 2002.

Systems Development to Protect Subway Token Booths from Incendiary Attack

Presented: SFPE Engineering Seminar, San Antonio, Texas, May 1990; and NY Metropolitan Area SFPE Chapter meeting, September 1990.

Published: SFPE *Journal of Fire Protection Engineering*, Volume 3, No. 4, October- December 1991.

Lightweight Wood Trusses in Fire Resistant Construction

Presented: NFPA Annual Meeting, New Orleans, LA, May 1992; and New Jersey SFPE Chapter Meeting, September, 1992.

Published: *Fire Technology* (formerly the *NFPA Quarterly*), Volume 31, No. 1, First Quarter 1995.

Generation of Hydrogen Fluoride (and Other Corrosive Gases) in Conjunction with Halogenated Fire Extinguishing Systems: A Risk Assessment

Presented: New Jersey SFPE Chapter meeting, November 1997.

The Effect of Surface Tension Reducers on the Cooling Properties of Water When Used to Protect Steel Storage Tanks

Research: University of Maryland, May 1987.

Advantages and Disadvantages of Common Types of Smoke Detection Systems

Presented: New York Interagency Engineering Council Technical Seminar Manhattan Community College, New York, NY, May 1995.

Implementing a Fire/Security System in a Centralized Environment

Published: *Security Technology and Design*, Volume 5, No. 4, May 1995.

Use of Peer-to-Peer Fire Alarm Network for Centralized Monitoring at Integrated Industrial Complexes

Published: *Consulting/Specifying Engineer*, Volume 23, No. 7, June 1998.

Union Camp Corporation -

Corporate Fire Brigade Leadership Training Course, Course Developer/Lead Instructor, 1996-1999

Corporate Fire Brigade and Property Conservation Manual, Developer/Author/Editor, 1996-1999

Corporate Fire Protection Guidelines:

- *Inspection, Testing and Maintenance of Water-Based Fire Suppression Systems, 1998*
- *Clean Agent Fire Extinguishing Systems, 1997*
- *Existing Halogenated Fire Suppression Systems, 1997*
- *Fire Protection and Firefighting for Lumber Drying Kilns, 1997*
- *Emulsifiers and Wetting Agents for Flammable Liquid Firefighting, 1997*
- *Clean Agent Fire Suppression Systems Using Halogenated Agents, 1997*

New York City Transit Authority -

Systemwide Policy/Instructions:

- *Storage, Handling and Use of Flammable and Combustible Liquids, 1987*
- *Storage, Handling and Use of Flammable, Compressed and Liquefied Gases, 1988*