



THE FIRE PROTECTION RESEARCH FOUNDATION

March-April 2009

Symposia

New Strategies for Dust Explosion Hazard and Control

May 13, 14,
Baltimore, MD

This symposium will highlight updates in best industry practices for management of the dust explosion hazard.

Keynotes from CSB, OSHA and NASFM will describe federal and state legislative initiatives; an update on the latest changes in NFPA standards will be presented. A one day seminar on dust explosion hazard prevention and control will also be offered on May 12 as an adjunct event.

Visit [our website](#) to register.

Inside the Foundation

As a result of the Foundation's year long exploration of the issues facing fire safety in the next twenty five years (see New Reports), the Foundation's Research Advisory Committee has

New Projects

Profile of Current Residential Power Consumption

The tables used by NFPA 70 Article 220 were established more than three decades ago, and the power consumption requirements of current residential occupancies are changing with emerging changing power sources, LED lighting, wireless technologies, increased use of consumer electronics, etc. The load calculation methodology of article 220 needs to be reviewed and confirmed, and developing a profile of typical residential power consumption would provide this important information. This Phase I project will review the applicable scientific literature, historical and current code requirements, and establish preliminary baseline information on residential electrical consumption based on available utility data and other means not involving actual field measurements.

Quantitative Evaluation of Fire & EMS Mobilization Times and Identification of Key Factors Affecting Performance

This study will develop a clear statistical picture of actual fire emergency and EMS call processing and turnout times for a variety of emergency types across a large representative population of fire departments. Additionally, the study will identify the most significant factors that affect variation in call processing and turnout times in those departments. These results will provide an objective basis for further development of NFPA standards as well as contribute critical information for chiefs and city managers tasked with optimum deployment of emergency response facilities and emergency response units.

Developing Test Specifications and Procedures for Measuring the Impact of Portable Fire Extinguisher Agents on Cultural Resource Collections

Conservators are well versed in the effects of water on collections, but little data is available on the effects of other extinguishants to guide them in selecting a portable fire extinguisher that will extinguish a small fire quickly while causing the least damage to other exposed materials. Most research focuses on fire damage, but mechanical and chemical effects from accidental or malicious releases, overspray, thermal decomposition products, and exposure to water and/or high heat and humidity also are serious concerns. Currently there is no standard test method to evaluate these effects. The overall goal of this project is to develop standard specifications and procedures for conducting tests under normal and fire conditions to measure the immediate and short term chemical and mechanical impacts of portable fire extinguisher agents listed for type A and/or C hazards on materials found in cultural resource collections in a museum environment.

Research Planning

endorsed a research strategy for the Foundation which will focus on the following seven key areas:

- Assessing the hazards of changing building furnishings, storage contents, and configurations
- Developing performance criteria for advanced fire detection and suppression systems
- Determining performance issues for advanced firefighting equipment and tactics to ensure that they meet the real needs of first responders
- Evaluating the effectiveness of fire and electrical safety systems as they age in place
- Developing guidance on the fire and electrical safety infrastructure needed for alternative fuels and energy sources
- Analyzing fire safety strategies for the growing aging and disabled population
- Developing fire protection strategies within the context of environmental considerations

Contact the Foundation

epeterson@nfpa.org for more information or to participate in Foundation programs

[Foundation Website](#)

Dust Explosion Hazard Thresholds

On January 12th in Atlanta, GA, the Foundation sponsored a research planning session to explore the development of a project to establish the technical basis for quantitative criteria for determining that a compartment is a “dust explosion hazard” that can be incorporated into NFPA 654 and other relevant safety codes and standards. As a result, we are developing a Phase I project which will consist of a literature review including explosion scenario definition, development of a strawman hazard assessment methodology, and proposed validation plan. To participate, contact kalmand@nfpa.org

HVLS Fans and Sprinkler Operation, Phase II

The Foundation has recently completed a Phase I study on this topic which consisted of a series of small and large scale tests designed to explore the impact of HVLS fans on the operation of ESFR sprinklers in protecting rack storage of Class A commodity. Phase II is under development, which will consist of a study of airflows generated by the fans as well as additional full scale tests to explore critical fan location and storage and ceiling height variables. To participate, contact kalmand@nfpa.org

New Reports available on the [Foundation's website](#)

Fire Protection and Safety: the Next Twenty Five Years

On November 17 and 18, 2008, approximately 130 fire protection and safety professionals gathered in Washington, DC for a unique meeting in celebration of the Foundation’s 25th anniversary. Nationally recognized keynote speakers challenged the leadership of the fire protection community in attendance on the emerging demographic, technological, and environmental issues facing us. This White Paper Report documents and summarizes the conference findings as well as pre- and post- conference input on the topic.

HVLS Fans and Sprinkler Operation Phase 1 Research Program – Final Report

High volume low speed (HVLS) fans are in increasing use in storage and manufacturing facilities. However, the interaction of these fans and automatic sprinkler operation is unknown. In order to inform spacing and other installation requirements in NFPA 13, Standard for the Installation of Automatic Sprinklers, the Foundation initiated a research program. This report documents Phase I of this program which includes a literature review and small and large scale testing with a focus on ESFR sprinklers and rack storage.

Fire Fighting Tactics Under Wind Driven Conditions

This report documents the results of a project designed to provide real-scale data to guide the development of appropriate tactical options for use under wind driven conditions. The goal is to improve the safety of fire fighters and building occupants by enabling a better understanding of wind driven firefighting tactics, including structural ventilation and suppression.

Clean Agent Suppression of Energized Electrical Equipment Fires

This report documents a Foundation study which sought to define the anticipated hazards for applications involving Class C fires (energized electrical equipment) that normally require protection by clean agent fire extinguishing systems, and develop a proposed test protocol that will provide the scientific basis for determining the minimum extinguishing concentrations required to protect typical energized electrical equipment using clean agent extinguishing systems.

Validation Database for Evaluating Vapor Dispersion Models for Safety Analysis of LNG Facilities and Guide

In 2006 the Foundation completed a research project to develop a Model Evaluation Protocol



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(MEP), which contained a structure for complete model evaluation of LNG dispersion models. (The report of this project can be found on the Foundation's website). Validation is a key part of model evaluation. This document (available from the Foundation as an Excel spreadsheet on CD) is an LNG Model Validation Database which contains test results in the form of tabulated concentration data against which model output can be compared, and temperature data where available. Information on a range of test configurations (datasets for field and wind tunnel trials - including release conditions, meteorological data, etc.) to permit model set-up and simulation is also included.

A Guide to the LNG Model Validation Database provides much useful background and should be read in conjunction with it. The Guide is available on the Foundation's website.

LNG Source Term Models for Hazard Analysis: A Review of the State-of-the-Art and an Approach to Model Assessment

This report extends the computer model evaluation protocol (MEP) developed in previous Foundation sponsored work to available LNG release/liquid spread/evaporation modeling approaches (limited to land releases) for both simple and complex spill configurations. This project, jointly funded by the UK Health and Safety Executive (HSE) and the Foundation, provides a state-of-the-art review of source term models which predict the early development of a release of LNG and an approach for assessing the adequacy of such models. The main focus is on models of pool spread and vaporization.