THE
FIRE PROTECTION
RESEARCH FOUNDATION

The Fire Protection Research Foundation

..... an introduction

THE FIRE PROTECTION RESEARCH FOUNDATION

What is It?

- Since 1982,The Foundation has conducted consortium projects for code writers, fire safety professionals, corporate and public managers, and the international regulatory community
- Unique structure for public/private collaboration on research
- Independent nonprofit whose mission is to provide practical, usable data on fire and building safety

THE FIRE PROTECTION RESEARCH FOUNDATION

How does it operate?

- Benchmarking – state of the art symposia
- Agenda Setting – research planning in emerging areas
- Research Programs – research projects to meet the needs of NFPA Committees and others
- Projects range from small literature search type studies to major fire testing programs

THE FIRE PROTECTION RESEARCH FOUNDATION

Research Programs and Partners

- The Foundation has carried out a broad range of collaborative research programs on such subjects as fire protection system performance, fire risk assessment methods, flammable liquids protection, fire fighter protective clothing, and many others
- Research partners have included private corporations, federal and state government agencies, research and testing laboratories, NFPA and other not-for-profit organizations, regulatory authorities, and others

THE
FIRE PROTECTION
RESEARCH FOUNDATION

Resource to Technical Committees

- Short term technical questions
- Integrating new technology
- Request for a new standard.
- Long term regulatory challenges

THE FIRE PROTECTION RESEARCH FOUNDATION

Research Process

- Research Projects Initiation:
  - Need for research identified by technical committee, organizations/associations, manufacturers, end user groups, other affected interests
- Core Planning Meeting:
  - Outline goals, scope, tasks, schedule
  - Develop preliminary work plan
  - Determine likely funding sources and secure sponsors

THE FIRE PROTECTION RESEARCH FOUNDATION

Research Process (cont'd.)

- Technical Advisory Committee:
  - Principal sponsors, code enforcers, code writers, technical experts, NFPA committee liaison
  - Determines technical objectives of the project and general approach
- Research Testing/Analysis Performed:
  - Technical Director appointed as appropriate
  - Oversight and collaboration provided by TAC members
  - TAC members receive early access to program results
- Research Reports Published:
  - Progress and final reports published and available to all

THE FIRE PROTECTION RESEARCH FOUNDATION

Foundation Activities Related to Fire Protection Systems

- New Fire Detection and Alarm Research Council
- Bridging the gap symposia on suppression and detection
- Research programs

THE FIRE PROTECTION RESEARCH FOUNDATION

Fire Detection and Alarm Research Council

- **Mission -** To advance the implementation of detection and alarm system technology through research and communication programs, closely tied to the needs of NFPA Technical Committees.

- **Activities -** research planning, symposia planning, participation in TACs for research projects

THE FIRE PROTECTION RESEARCH FOUNDATION

Developing Research Projects – Detection

- Human behavior studies – high frequency alarms
- Roadway tunnel fire detection systems
- Detector performance in deep profiled ceilings
- Visual signaling effectiveness in high ceiling spaces
- Smoke and heat signatures – today's residential furnishings – impact on detector test profiles

THE FIRE PROTECTION RESEARCH FOUNDATION

Developing Projects - Fire Suppression Systems

- Database of fire test reports
- Hazardous materials storage protection – oxidizers, combustible liquids, retail solid shelf storage
- Resource to NFPA 2001 for studies on enclosure loads

THE
FIRE PROTECTION
RESEARCH FOUNDATION

Emerging Issues

New materials and systems are entering the built environment every day. With them come unique challenges for the codes and standards that regulate safety.

THE
FIRE PROTECTION
RESEARCH FOUNDATION

Emerging Issues

- How do we integrate the increased focus on security into today's approaches to fire safety design?
- How can we ensure the safety of our highway infrastructure (for example refueling stations, fuel cells storage, and emergency response) as we introduce alternative vehicle fuels?
- How do we design our buildings to provide fire safety measures appropriate to the aging U.S. population?

THE FIRE PROTECTION RESEARCH FOUNDATION

Detection System Performance in Roadway Tunnels

THE
FIRE PROTECTION
RESEARCH FOUNDATION

Project Goals

- Investigate the performance attributes of current fire detection technologies for roadway tunnel protection;
- Develop performance criteria for fire and smoke detection systems in roadway tunnel applications;
- Help optimize the technical specifications and installation requirements for this application.

Project Plan

- Develop appropriate design fire scenarios and test protocols for evaluating performance of road tunnel detectors;
- Conduct full-scale tunnel fire tests to document the performance of currently available fire detection technologies under challenging tunnel fire scenarios;
- Analyze technical data and conduct computational modeling to help understand and optimize the technical specifications and installation requirements for application of fire detection technologies in road tunnels;

Project Plan, cont'd

- Evaluate environmental effects in real tunnel environments on system performance;
- Benchmark full scale fire research scenarios against data from demonstration fire tests;
- Provide technical data to standards and code writers for the development of guidelines for application of fire detection technologies in road tunnels.

THE FIRE PROTECTION RESEARCH FOUNDATION

Potential Sponsors

- Federal Highway Administration
- New Jersey, Virginia, Washington State and Quebec Province DOTs,
- Port Authority of NY/NJ
- National Research Council of Canada
- Detection System Manufacturers

THE FIRE PROTECTION RESEARCH FOUNDATION

Safety Issues in the Hydrogen Economy

- **Background**
  As the development of hydrogen technology reaches the commercial stage, the safety community is exploring the issues surrounding the physical infrastructure which is and will be constructed to support the widespread use of this technology. The NFPA publishes several codes and standards that directly or as surrogates address the use, handling, and storage of hydrogen.

Research Planning

- On January 25, 2004, the Foundation convened a research agenda planning workshop designed to define a research agenda and roadmap for hydrogen safety. Members of key NPFA Technical Committees, the fire service, research community, government agencies, and those commercially involved in hydrogen technology were in attendance.

Research Priorities

- **Assembling** the safety requirements currently under development for hydrogen in a variety of storage and occupancy situations into a user friendly document.
- **Stationary Fuel Cell Siting** - appropriate spatial separation of hydrogen fuel used for stationary fuel cell systems in equipment enclosures.
- **Vehicle Refueling Stations** – appropriate siting distances, fire separations, and other protection features for stations for vehicle refueling with hydrogen and other fuels.

THE FIRE PROTECTION RESEARCH FOUNDATION

Research Priorities

- **Metal Hydride Storage Safety** – appropriate safety precautions for metal hydrides in a variety of storage configurations and occupancies
- **Safety of Enclosed Parking Structures** – determination of appropriate LFL criteria; assessment of leak rates, and appropriate mitigation/venting strategies
- **Fire Service and AHJ Education** – to include a regulatory guide, compendium of case studies of installations, and guidance on acceptable risk assessment tools and techniques.

THE FIRE PROTECTION RESEARCH FOUNDATION

Current Foundation Initiatives

- **Stationary Fuel Cell Siting** – appropriate spatial separation requirements for hydrogen storage for fuel cells in non combustible cabinets – application for remote (eg cell phone towers) locations
- **Vehicle Refueling Stations** – fire safety requirements

THE
FIRE PROTECTION
RESEARCH FOUNDATION

Why work with the Foundation?

- Unique structure for collaboration with diverse parties
- Cost sharing
- Independent, well recognized resource
- In touch with needs of the NFPA Committee structure/implementation routes
- Wide network for communication of results

THE
FIRE PROTECTION
RESEARCH FOUNDATION

The Fire Protection Research Foundation

..... questions?