



# RESEARCH FOUNDATION

## RESEARCH FOR THE NFPA MISSION

### PROJECT SUMMARY

## Fire Fighter Flammable Refrigerants Training

2 February 2017; subject to update

**Background:** Nearly every person in the U.S. spends time around cooling appliances such as refrigerators and air conditioners. The current refrigerants are now being phased out due to their effect on global warming through the Kigali Agreement and other international agreements signed by the U.S. and almost all other countries in the world. The optimum replacements are flammable refrigerants including hydrocarbons, introducing significant wide-scale risk. The nearly 1.2 million firefighters will soon be addressing this emerging hazard.

Environmental policy is causing a shift from the current refrigerants used in appliances to a new class that pose fire hazard to occupants and emergency responders. The goal of this 2-year project is to enhance firefighter safety and reduce potential injury by providing free training on the hazards from appliances with flammable refrigerants.

**Research Goal:** This project seeks to enhance firefighter safety and reduce potential injury by providing free training on the hazards from appliances with flammable refrigerants. This project will document the information about flammable refrigerants technologies and the hazards to emergency responders. This project will develop interactive training modules and a dissemination program to transfer the knowledge to the U.S. fire service.

### **Project Tasks:**

#### *Phase 1: Background and Start-up Phase*

**Task 1: Identify/Appoint Panel.** A panel of fire service and subject matter experts will be appointed to provide input on the project work plan and feedback throughout the project, as well as guide and support throughout dissemination.

**Task 2: Kick-off Meeting.** A kick-off meeting with the advisory panel and project team will be conducted to clarify the work plan and address scoping and similar project details.

#### *Phase 2: Content Development*

**Task 3: Literature Review & Hazard Assessment.** Information about the technologies and properties of flammable refrigerants will be gathered and reviewed to perform a hazard assessment. This will include technology types and basic operating principles, characteristics of flammable refrigerants, types of occupancies where these systems are found, flammability hazards, and other critical features.

**Task 4: Stakeholder Workshop.** A workshop of at least two dozen subject matter experts and key stakeholders will be conducted to evaluate the baseline information established in the hazard assessment and literature review and guide the full-scale demonstrative test plan.

**Task 5: Full-Scale Demonstrative Tests.** A series of full-scale demonstrative tests will be planned and implemented to provide pictures, videos, and information to support the training developed in task 6 (content packaging). These demonstrative tests will also provide data to inform fire fighter best practices and situational awareness as applicable.

*Phase 3: Packaging & Dissemination*

Task 6: Content Packaging. Information and data (pictures, videos, etc.) gathered and produced from previous tasks will be packaged into multiple training deliverables including: flammable refrigerants safety best practices; 3D learning simulations with engaging graphics, animations, and safety scenarios; a 20 minute classroom module; a 20 minute self-paced online course module; and a fire service educational video series.

Task 7: Reporting and Dissemination. A final report for the literature review & hazard assessment (task 1) and stakeholder workshop (task 2) will be publically available online. The training materials (task 6) will be made widely available to the fire service. A recognized public relation marketing vendor will be contracted to utilize online and print media to advertise the availability of free flammable refrigerant training materials developed through this project to the U.S. fire service community. A free open-registration webinar will be provided at the completion of the project.

**Implementation and Schedule:** This is a two year project scheduled to be complete by September 2019. The project is funded by a DHS/FEMA Assistance to Firefighters Grant (AFG) Program. This research project will be conducted under the auspices of the Research Foundation in accordance with Foundation Policies and will be guided by a Project Technical Panel who will provide input to the project, recommend contractor selection, review periodic reports of progress and research results, and review the final project report.



**Intellectual Property:** The Research Foundation will retain rights to the project deliverables including the final report which will be published on the Foundation website.