



THE FIRE PROTECTION RESEARCH FOUNDATION

“EVALUATION OF WATER ADDITIVES FOR FIRE CONTROL AND VAPOR MITIGATION: PHASE II”

PROJECT SUMMARY

3 January 2014

Background: Various water additives are available in today’s marketplace that claim to have advantageous performance characteristics for fire control and vapor mitigation. Of particular interest are additives that report to provide superior fire suppression capabilities through emulsification or encapsulation. However, a scientific assessment of these various additives is lacking, and the fire protection community would benefit from the development of a methodology to evaluate the effectiveness of various available water additives for fire control and vapor mitigation.

A Phase I project was completed in June 2013 to develop a test plan for this topic, and [the final report is available on-line](#). This Phase I report provides a comprehensive review of the literature, identifies key performance characteristics, reviews candidate test agents, and provides the details of a test plan for subsequent implementation as a future phase of this overall effort. Specifically, the test plan deliverable in the Phase I project describes a full evaluation methodology of water additives used for Class B applications involving two and three dimensional liquid fuel fires, such as those found in power plants and similar facilities.

The implementation of this test plan is the focus of this Phase II project. It’s noted that the Phase I effort also addressed Class A coal fire applications, but this topic is reserved for a future study and not included in the scope of this proposed Phase II effort, which will only address Class B applications involving two and three dimensional liquid fuel fires.

Research Goal: The overall goal of this project is to provide a repeatable and reproducible evaluation methodology of the performance characteristics of water additives used in fixed fire protection systems for fire control and vapor mitigation, as compared to a baseline of water-only performance for Class B applications involving two and three dimensional liquid fuel fires.

Affected NFPA Documents: This project directly relates to the requirements of NFPA 18A, *Standard on Water Additive for Fire Control and Vapor Mitigation* (2007 edition), and NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection* (2012 edition). This is also related to application oriented documents that address these types of Class B hazards involving two and three dimensional liquid fuel fires, such as NFPA 850, *Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations* (2010 edition).

Project Scope and Tasks: A Project Technical Panel of subject matter experts (in accordance with Foundation Policies) will be established by the Foundation to provide guidance during the study. This Phase II project is an implementation of the Phase I project test plan addressed in [Appendix C of the Phase I Report](#), and involves the following tasks:

- 1) **Task 1 – Update of Detailed Test Plan:** Review and update the detailed test plan established in Phase I of the project based on the direct and in-kind resources available, with review by the Project Technical Panel. This includes clarification of testing details such as protocol, sequence, facility, water additives to be evaluated, timetable, and other applicable considerations. This will focus on providing an evaluation methodology that is repeatable and reproducible, with the intent of allowing the end-user to consider various performance characteristics of water additives used in fixed systems for two and three dimensional liquid fuel fires.
- 2) **Task 2 – Test Preparation:** Clarify and coordinate all logistical details required for successful implementation of the detailed test plan, according to the project timetable and prior to full implementation of the plan. Coordinate the design and construction of the test apparatus at the test-site facility, and obtain all water additives to be evaluated.
- 3) **Task 3 –Test Plan Implementation:** Implement the test plan and collect all test data for subsequent analysis.
- 4) **Task 4 – Analysis of Results:** Analyze the test results to prescribe a repeatable and reproducible method for evaluating the performance characteristics of water additives used in fixed systems, as compared to a baseline of water-only performance for Class B applications involving two and three dimensional liquid fuel fires.
- 5) **Task 5 – Final Report:** Summarize all information collected throughout the project in a final written report, with review by the Project Technical Panel. The final report will be broadly disseminated through the Foundation’s venues for information exchange and circualted interested parties including the applicable NFPA Technical Committees.

Implementation: This research program will be conducted under the auspices of the Fire Protection Research Foundation in accordance with Foundation Policies and will be guided by a Project Technical Panel who will provide input to the project, review periodic reports of progress and research results, and review the final project report. The project contractor will prepare the following deliverables: a detailed updated work plan (task 1) and draft & final project report.

Schedule and Costs:

Tasks 1 & 2: Test Plan Update & Preparation:	Three months after project initiation
Task 3: Test Plan Implementation:	Nine months after project initiation
Tasks 4 & 5: Analysis & Final Report:	Twelve months after project initiation