

Impact of Different Hose Stream Applications during Fire Suppression

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August 6, 2014

Importance of Researching Fireground Tactics

How are Tactics Chosen on the Fireground?

Decisions based on habits learned from training

Training based on a set of standard operating procedures (SOPs)

SOPs vary from entity to entity - different people have different opinions

More difficult to rely solely on experience today

Firefighters need to know the science behind tactics

Research bridges the gap between understanding how the fire behaves in its environment and how the fire environment will change when a specific tactic is implemented

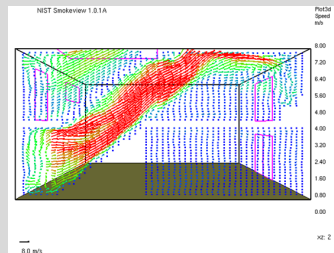
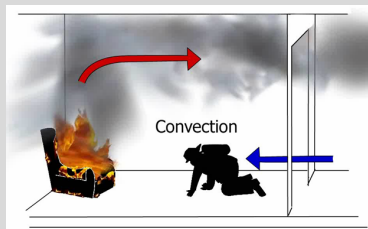


Changing the Flow Path

Smoke and heat from a fire travel the path of least resistance

Anyone in the flow path is exposed to hazardous conditions from the increased flow of heat and smoke

Paths can be altered through opening and closing windows and doors in the structure



Hose Streams

What is a Hose Stream?

Stream of water or extinguishing agent discharged from a hose during fire suppression

Choice of stream dependent upon many factors

Streams vary in numerous ways

Many opinions throughout fire service about the “best” stream



Different Hose Streams Considered

Different Application Patterns Considered

Experimental Setup and Results

Overview of Experiments - Test Structures

Conducted in two structures located at the Delaware County (DelCo) Emergency Training Services Training Center

Single Story



Two Story



Overview of Experiments - Types of Experiments

Cold Flow Tests



Overview of Experiments - Types of Experiments

Cold Flow Tests



Hose Tests



Overview of Experiments - Types of Experiments

Cold Flow Tests



Hose Tests



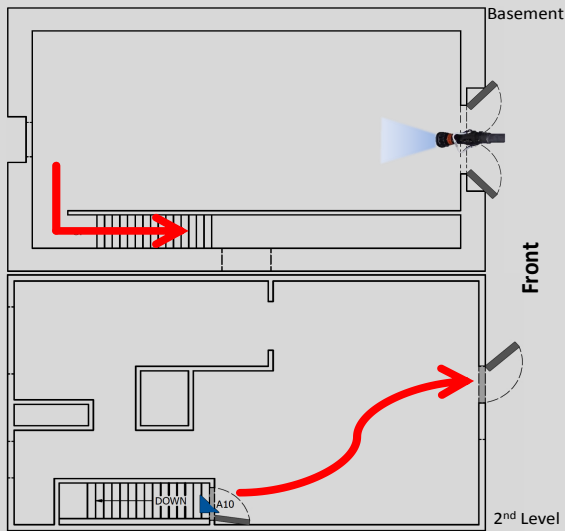
Fire Tests



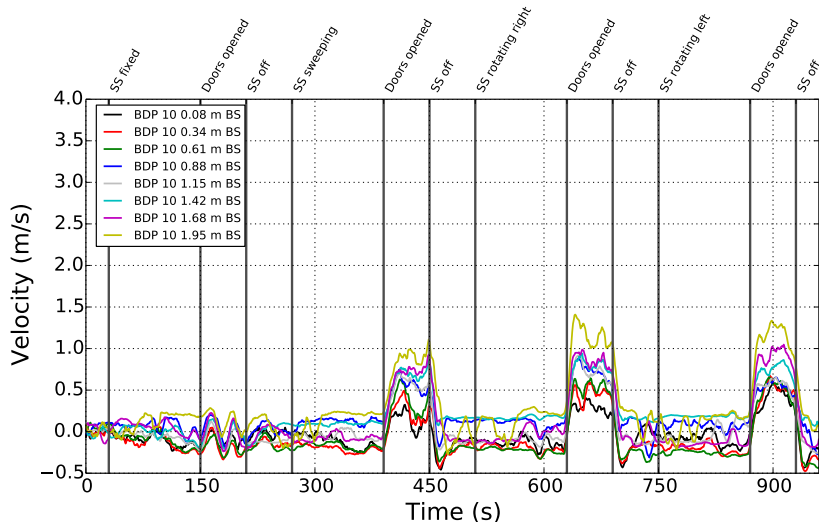
Two Story Structure Hose Test



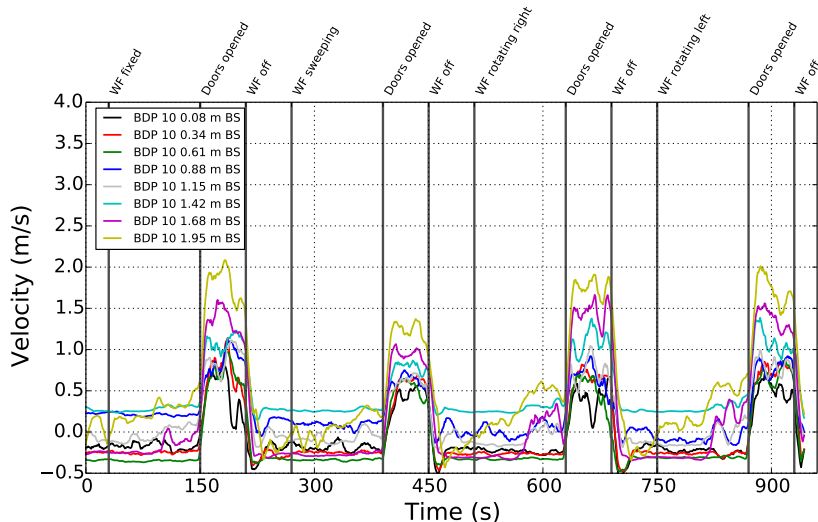
Two Story - Hose Test Setup



Two Story - Hose Test Results - Straight Stream

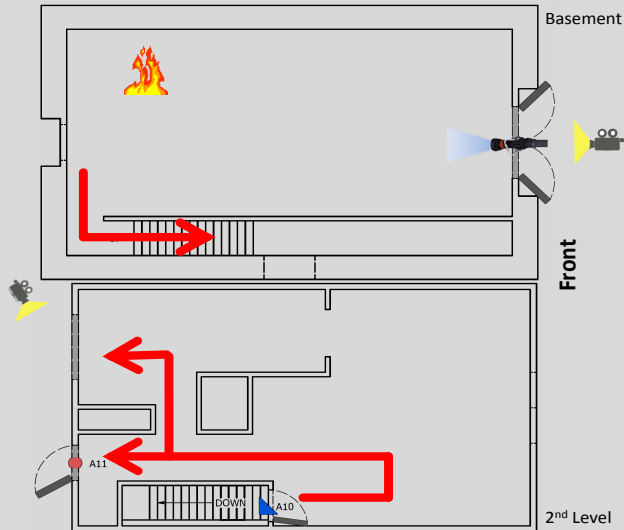


Two Story - Hose Test Results - Wide Fog



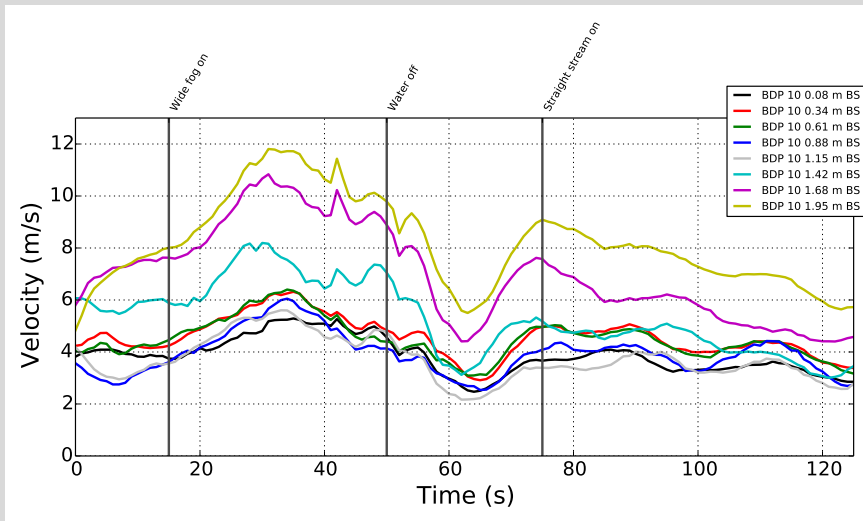
Two Story Structure Fire Test

Two Story - Fire Test Setup

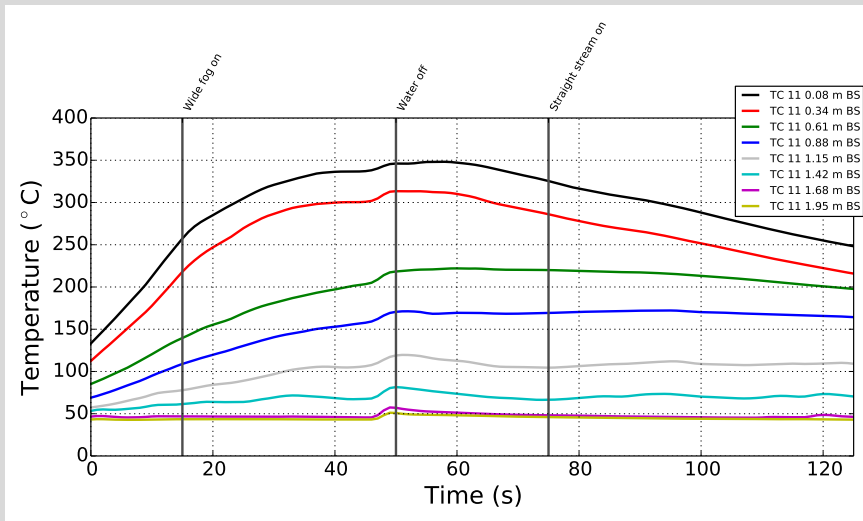


Two Story - Fire Test Video

Two Story - Fire Test Results - Stairwell Door

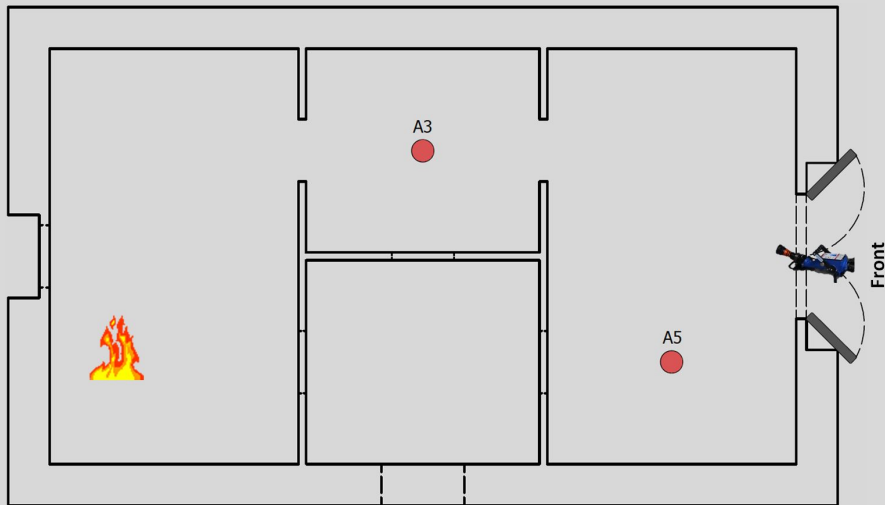


Two Story - Fire Test Results - 2nd Level Rear Door

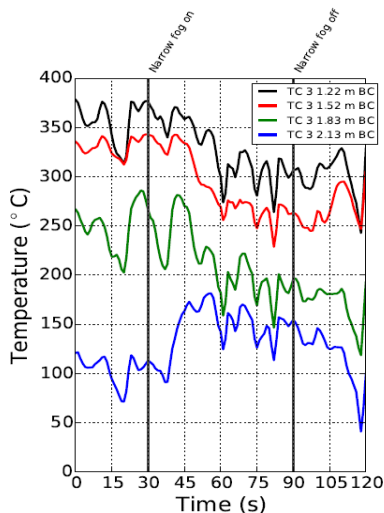
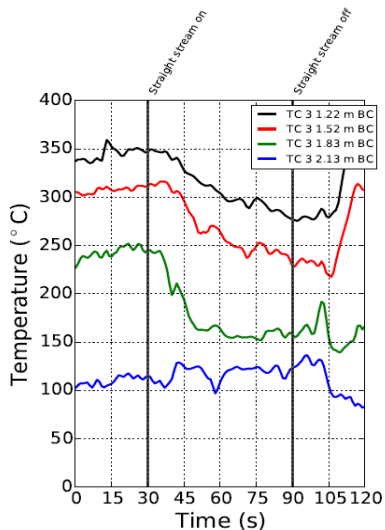


Single Story Structure Fire Test

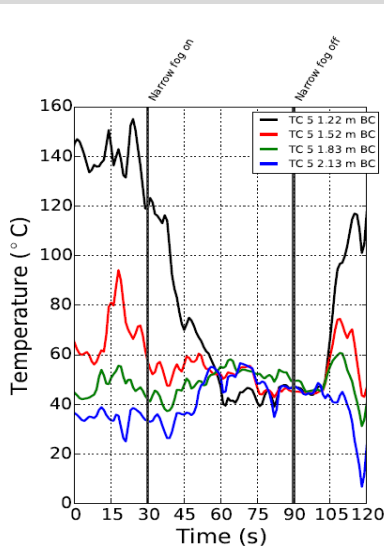
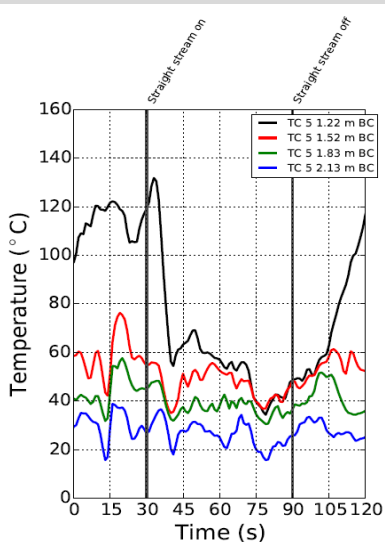
Single Story - Fire Test Setup



Single Story - Fire Test Results - Middle Room



Single Story - Fire Test Results - Front Room



Conclusions

Application patterns have the potential to affect movement of gases

Straight stream does least amount of mixing of gases

Straight stream decreased hazard of flow path

Wide fog increased hazardous conditions in stairwell by increasing the velocities by as much as 50% in the flow path

Acknowledgments

Gavin Horn

Dan Madrzykowski

Roy McLane

Craig Weinschenk

Kris Overholt

Keith Stakes

SURF Directors

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Questions?