



Sprinkler Protection for Cloud Ceilings

BACKGROUND:

Cloud ceilings are ceiling panels that sit beneath the structural ceiling of a room or space and are seen increasingly in commercial and industrial buildings. “Cloud” panels range in area from discrete ceiling panels with large spaces in between, to close-to-full-room-area contiguous coverage with small gaps at the perimeter wall location. NFPA 13 does not have definitive guidance on automatic sprinkler installation requirements for these ceilings and in some conditions requires sprinklers at both the structural ceiling and cloud ceiling panel elevations. Recent NFPA 13 change proposals were rejected based on a lack of validation of modeling results.

RESEARCH OBJECTIVE AND SCOPE: to obtain an understanding of how cloud ceiling panels impact sprinkler actuation thresholds with an overall goal to provide the technical basis for sprinkler installation requirements.

A primary focus of the project is determination of sprinkler installation requirements for large contiguous “clouds” with a specific objective of determining the maximum separation distance between the wall and cloud edge at which structural ceiling sprinklers are not necessary/effective.

PROJECT TASKS:

- 1.** Literature and Modeling Data Review and Gap Analysis: a review of relevant previous modeling and model validation studies, including modeling specific to this topic which was submitted as part of recent code change proposals to NFPA 13;
- 2.** Modeling/Evaluation Plan: in conjunction with the Project Technical Panel and consistent with available project resources, development and implementation of a CFD modeling and/or fire test plan based on priority gaps identified in Task 1. Options may include: determination of appropriate bounds of application of existing modeling results and, as necessary, validation (by test) of selected configurations; modeling of additional contiguous cloud ceiling scenarios (geometry and ignition scenarios) and validation; or a more comprehensive modeling program to explore various cloud ceiling configurations including those with greater degrees of openness.
- 3.** Recommendations for appropriate sprinkler installation criteria for cloud ceilings within the limits of the above modeling/validation program and recommendations for needed additional studies.

Schedule – completion June 2013