



RESEARCH FOUNDATION

RESEARCH FOR THE NFPA MISSION

STUDENT PROJECT PROSPECTUS

Review of Deflagration Relief Vent Exclusion Zone

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Background: NFPA 68: Standard on Explosion Protection by Deflagration Venting provides an equation for the calculation of the personnel exclusion zone surrounding a deflagration relief vent (explosion vent). However, there has been incidents where persons located beyond the exclusion zone boundary, derived from the NFPA 68 relation, were severely burned from the vent discharge. Review of the research used as the basis of the relation calls into question the adequacy of the relation. Furthermore, the research used to support the design guidance for deflagration flame diverters used in conjunction with deflagration relief vents (explosion vents) is limited to vessels of relatively small size and might not be applicable to larger vessels such as dust collectors.

Research Goal: The objective of the research is to provide a thorough basis for the criteria in NFPA 68 regarding the extent and shape of the personnel exclusion zone surrounding deflagration relief vents (explosion vents) and a broader technical basis for the design of deflagration flame diverters used to manage vented deflagrations.

Project Tasks: This project is comprised of the following tasks:

- Identify the incidents where the exclusion zones established by NFPA 68 are both adequate and inadequate.
- Conduct a thorough literature review to provide a technical basis for the current limits of exclusion zones and design guidance for deflagration flame diverters.
- Identify the gaps in the existing calculation of personnel exclusion zone and limitations in the usage of deflagration flame diverters.
- Provide recommendations for the need for future computational and experimental research studies.
- Complete and submit a final report based on findings from all the above tasks.

How this information will be used:

NFPA 68 is the design standard that is referenced in NFPA 61, 484, 652, 654, 655 and 664. This research will directly impact all of these standards.