



RESEARCH FOUNDATION

RESEARCH FOR THE NFPA MISSION

PROJECT SUMMARY

Safe Quantity of Open Medical Gas Storage in a Smoke Compartment

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Background: NFPA 99, Health Care Facilities Code, allows a volume of up to 300 ft³ of medical gases (normally oxygen) to be stored outside of a dedicated storage enclosure. This is typically considered to be up to 12 E-sized cylinders. Those which are “in-use” or “available for immediate use” do not need to be considered in determining the volume. If these are also considered, the actual volume of gas in cylinders in the open can quite well exceed 300 ft³. The reasoning for the maximum of 300 ft³ does not seem to be based on any specific research. Further, what counts towards this volume and how to count it is not clear. To add confusion, many facilities keep these cylinders separated under designations of “empty” “partial” and “full.” A hazard analysis and risk assessment is needed to clarify and determine the appropriate allowance for a volume of medical gas allowed outside of storage within a smoke compartment.

Research Goal: The goal of this project is to determine the safe quantity of open medical gas storage in a smoke compartment through a literature review. The information collected through this research will provide information to the NFPA 99 Technical Committee on Medical Equipment.

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

Task 1: Literature Review. Analyze the current requirements of NFPA 99 and any available management practices relating to storage of medical gases.

Task 2: Hazard Assessment. Identify the failure rates and specific hazards posed by cylinders outside of a storage enclosure and conduct a hazard assessment.

Task 3: Establish Guidance. Based on the hazard assessment, provide guidance on a safe, allowable volume of medical gas that should be allowed to be kept outside of the storage location in a health care facility smoke compartment.

Task 4: Packaging and Reporting. Compile the information from the above tasks and document knowledge gaps in a final report.

Implementation: This six-month 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 of industry stakeholders who will provide input to the project, review periodic reports of progress and research results, and review the final project report.

About the Fire Protection Research Foundation

The [Fire Protection Research Foundation](#) plans, manages, and communicates research on a broad range of fire safety issues in collaboration with scientists and laboratories around the world. The Foundation is an affiliate of NFPA.



About the National Fire Protection Association (NFPA)

Founded in 1896, NFPA is a global, nonprofit organization devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards. The association delivers information and knowledge through more than 300 consensus codes and standards, research, training, education, outreach and advocacy; and by partnering with others who share an interest in furthering the NFPA mission. [All NFPA codes and standards can be viewed online for free.](#) NFPA's [membership](#) totals more than 65,000 individuals around the world.

