



U. S. Chemical Safety and Hazard Investigation Board RECOMMENDATION STATUS CHANGE SUMMARY

Report:	Fatal Liquid Nitrogen Release at Foundation Food Group
Recommendation Number:	2021-03-I-GA-R9
Date Issued:	December 11, 2023
Recipient:	Compressed Gas Association (CGA)
New Status:	Open – Awaiting Response or Evaluation/Approval of Response
Date of Status Change:	Not Applicable – Initial Status

Recommendation Text:

Develop a comprehensive standard for the safe storage, handling, and use of liquid nitrogen in stationary applications, comparable to the guidance presented in CGA G-6.5 Standard for Small Stationary Insulated Carbon Dioxide Systems. At a minimum, the standard should include:

- a) requirements for and guidance on the location, the maintenance, and the functional testing of atmospheric monitoring devices;*
- b) requirements for visible and audible alarm indication distinct from the building's fire alarm system and at a continuously attended location;*
- c) guidance on the sizing, design, function, periodic maintenance and testing, and location of room and emergency ventilation systems; and,*
- d) requirements for and guidance on the location of emergency shutdown devices including E-stops.*

Board Status Change Decision:

A. Rationale for Recommendation

On January 28, 2021, liquid nitrogen overflowed from an immersion freezer located inside Plant 4 at the Foundation Food Group (FFG) facility in Gainesville, GA. The release occurred while two maintenance employees were troubleshooting the equipment. Once the liquid nitrogen was released, it quickly vaporized and accumulated inside the room in which the equipment was located, creating an oxygen deficient atmosphere.

The two maintenance employees were asphyxiated. Upon discovering the two maintenance employees, an emergency response was initiated which included attempts by other employees to rescue the two maintenance employees and to isolate the freezer from its liquid nitrogen source. During these activities, four additional employees of FFG were asphyxiated. Additionally, three more FFG employees and one firefighter were seriously injured, presenting with symptoms of asphyxia. The incident resulted in an estimated \$1.95 million in damage.

The U.S. Chemical Safety and Hazard Investigation Board (CSB) investigated the incident and found several safety issues including faulty equipment design, inadequate precautions for using

liquid nitrogen, the lack of atmospheric monitoring and alarms, inadequate emergency preparedness, a lack of a safety management system, and a lack of regulatory coverage for cryogenic asphyxiants. As a result of these findings, the CSB issued two recommendations to the Compressed Gas Association (CGA). This status change summary addresses **CSB Recommendation No. 2021-03-I-GA-R9**.