



U. S. Chemical Safety and Hazard Investigation Board

RECOMMENDATIONS STATUS CHANGE

SUMMARY

Report:	Airgas (Air Liquide) Facility Fatal Explosion
Recommendation Number:	2016-04-I-FL-R5
Date Issued:	March 17, 2017
Recipient:	ACD LLC
New Status:	Closed – Acceptable Action
Date of Status Change:	March 5, 2018

Recommendation Text:

Provide effective warning about nitrous oxide decomposition hazards

Modify nitrous oxide pump product literature to include warnings about nitrous oxide decomposition hazards, illustrated by examples from historical incidents, and refer users to this CSB investigation report for additional information.

Board Status Change Decision:

A. Rationale for Recommendation

On August 28, 2016, a nitrous oxide trailer truck exploded at the Airgas manufacturing facility in Cantonment, Florida. The explosion killed the only Airgas employee present and heavily damaged the facility, halting nitrous oxide manufacturing at Cantonment indefinitely. The CSB determined that the most probable immediate cause of the incident was, during the initial loading of a trailer truck, a pump heated nitrous oxide above its safe operating limits. Exceeding these critical safety limits appears to have started a nitrous oxide decomposition reaction that propagated from the pump into the trailer truck, causing the explosion. At the time of the incident, the Cantonment facility was using a pump manufactured by ACD LLC (ACD). ACD product literature provided few details about pump hazards related to nitrous oxide service. As a result, the CSB made a recommendation to ACD to update its product literature to include warnings about nitrous oxide decomposition.

B. Response to the Recommendation

An e-mail dated July 17, 2017, from ACD informed the CSB that they implemented the ACD-CSB agreed upon warnings in all of their nitrous oxide pump operating manuals as well as a label on all of the pumps that they sell. In an e-mail dated January 25, 2018, ACD informed the CSB that that their commercial proposals and all online and printed sales literature were updated with the ACD-CSB agreed upon warnings. Additionally, ACD provided five examples of their literature with the added warnings.

C. Board Analysis and Decision

As a result of the above information, the Board voted to change the status of CSB Recommendation No. **2016-04-I-FL-R5** to: **“Closed – Acceptable Action.”**