



U. S. Chemical Safety and Hazard Investigation Board

RECOMMENDATION STATUS CHANGE

SUMMARY

Report:	CAI/Arnel Chemical Plant Explosion
Recommendation Number:	2007-03-I-MA-R11
Date Issued:	May 13, 2008
Recipient:	International Code Council (ICC)
New Status:	Open – Acceptable Response or Alternate Response
Date of Status Change:	September 16, 2026

Recommendation Text:

Revise the International Fire Code: Chapter 20: - Specifically include "printing inks" in the definition of "organic coating." - Define equipment specifically discussed in the standard, such as open and closed kettles. - Require heated tanks and vessels containing flammable and combustible liquids to have equipment to prevent overheating, such as: devices to stop the heating process if the temperature exceeds the safe operating limits; devices to stop the heating process if the flammable vapor control equipment malfunctions (e.g., building ventilation system or heated tank vent); and a heating medium that is unable to heat the tank above safe operating temperatures. Chapters 20, 27, and 34: -Define "open", "closed", and "sealed and vented" process tanks. -Define "non-listed" process tanks. -Prohibit heating flammable and combustible liquids above their flashpoints in tanks inside buildings unless the tanks are sealed and vented to the building exterior.

Board Status Change Decision:

A. Rationale for Recommendation

On November 22, 2006, a powerful explosion and fire occurred at the CAI/Arnel ink and paint products manufacturing facility in Danvers, Massachusetts. CAI Inc. (CAI) manufactured solvent-based inks and stored alcohols, heptane, other solvents, pigments, resin, and nitrocellulose in its Danvers facility. The immediate cause of the incident was that a steam valve on a mix tank heater had been inadvertently left open overnight, heating the material in the mix tank and releasing highly flammable vapor. The investigation concluded that a flammable vapor cloud within the building ignited and completely destroyed the ink and paint manufacturing facility. The fire department ordered an evacuation of more than 300 residents within a half mile radius of the facility. Nearby homes and businesses were extensively damaged, many beyond repair.

The International Fire Code (IFC) is a model fire code adopted by many state and local jurisdictions that provides criteria for the safe storage, use and handling of hazardous materials. Specific chapters under the IFC apply to operations similar to those that took place at the CAI/Arnel facility. The CSB investigation found that the IFC did not specifically include ink manufacturing under the relevant section and did not clearly define certain terms which could potentially lead to misinterpretation. The IFC does not prohibit the indoor heating of flammable

and combustible liquids above their flashpoints or require that when the indoor heating occurs, that vessels be vented to the outdoors. As a result of these findings, the CSB issued one recommendation to the International Code Council (ICC). This status change summary addresses CSB Recommendation No. 2007-03-I-MA-R11.

B. Response to the Recommendation

ICC has notified the CSB that language intended to meet the recommendation has been approved for the 2027 Edition of the International Fire Code (IFC 2027). IFC 2027 is expected to be published in the fall/winter of 2027. Once the code is published the CSB can evaluate this recommendation for closure.

C. Board Analysis and Decision

Based upon the information above, the Board voted to change the status of CSB Recommendation No. 2007-03-I-MA-R11 to: “Open – Acceptable Response or Alternate Response.”