



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

Report:	Kuraray Pasadena Release and Fire
Recommendation Number:	2018-03-I-TX-R10
Date Issued:	December 16, 2022
Recipient:	Kuraray America, Inc.
New Status:	Open – Awaiting Response or Evaluation/Approval of Response
Date of Status Change:	Not Applicable – Initial Status

Recommendation Text:

Improve the EVAL Plant's safety management system by 1) controlling when chilled liquid is circulated through the heat exchanger during startup; 2) enhancing recognition of liquid ethylene accumulation and response to low-temperature conditions inside an EVAL Reactor through alarms, written procedures, and operator training; 3) implementing a system to manage abnormal operating conditions effectively by, at a minimum, including appropriate technical representation, performing a hazard analysis of temporary or troubleshooting operations, and providing management oversight of any abnormal condition; 4) updating the written startup procedures to include guidance on the appropriate operator actions to take in response to process alarms; 5) using control system guidance to aid operator response to abnormal or upset conditions to keep the process within the safe operating limits; and 6) removing the physical and procedural controls used at the EVAL Plant to restrict board operators from accessing or using the emergency open valve, and updating the written procedures and operator training to provide guidance on when to open the emergency open valve.

Board Status Change Decision:

A. Rationale for Recommendation

On the morning of May 19, 2018, the pressure relief devices of a reactor used to make ethylene and vinyl alcohol copolymer (EVAL) activated and discharged ethylene into the air through horizontally oriented discharge piping. The resulting flammable vapor cloud found a heat source and ignited. The fire burned for approximately three minutes until enough ethylene was released to reduce the pressure inside of the reactor to allow the pressure relief valve to close. Kuraray America, Inc. reported releasing 2,347 pounds of ethylene. Several workers sustained injuries resulting from the fire as well as from trying to escape the fire. 21 injured workers were transported to off-site medical facilities for treatment. Additionally, two workers were life-flighted from the Kuraray facility.

The U.S. Chemical Safety and Hazard Investigation Board (CSB) investigated the incident and found several safety issues including failures in pressure-relief system discharge design, excluding non-essential personnel during transient operations, and weakly implemented process safety management system elements. As a result of these findings, the CSB issued twelve

recommendations to Kuraray America, Inc. This status change summary addresses **CSB Recommendation No. 2018-03-I-TX-R10**.