



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

Report:	Kuraray Pasadena Release and Fire
Recommendation Number:	2018-03-I-TX-R3
Date Issued:	December 21, 2022
Recipient:	Kuraray America, Inc.
New Status:	Closed – Acceptable Action
Date of Status Change:	November 18, 2024

Recommendation Text:

Develop and implement a system requiring a periodic evaluation of the adequacy and effectiveness of any safeguard used to mitigate or otherwise lower the risk of process safety hazards. This safeguard protection analysis should be based on the requirements of Cal/OSHA's Process Safety Management for Petroleum Refineries regulations or an appropriate equivalent.

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 the reactor to allow the pressure relief valve to close. Kuraray American, Inc. (Kuraray) reported releasing 2,347 pounds of ethylene. Several workers sustained injuries resulting from the fire as well as from trying to escape the fire. Twenty-one 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. This status change summary addresses CSB Recommendation No. 2018-03-I-TX-R3.

B. Response to the Recommendation

Kuraray notified the CSB that the company has implemented an improved system that utilizes Layer of Protection Analysis (LOPA) methodology to analyze the adequacy and effectiveness of safeguards used to mitigate or otherwise lower the risk of process safety hazards. The safeguard effectiveness and adequacy are reviewed every five years under the new system. This analysis initiated a safety-instrumented systems (SIS) project for implementation in 2024. The project

was completed during Kuraray's May 2024 turnaround. Upon review of the relevant documentation provided, the CSB concluded that Kuraray's actions satisfy all elements of the recommendation.

C. Board Analysis and Decision

Based upon the information above, the Board voted to change CSB Recommendation No. 2018-03-I-TX-R3 to: "Closed – Acceptable Action."