



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

Report:	Tesoro Anacortes Refinery Fatal Explosion and Fire
Recommendation Number:	2010-08-I-WA-R1
Date Issued:	May 1, 2014
Recipient:	Environmental Protection Agency
New Status:	Closed – Acceptable Alternative Action
Date of Status Change:	March 4, 2025

Recommendation Text:

Revise the Chemical Accident Prevention Provisions under 40 CFR Part 68 to require the documented use of inherently safer systems analysis and the hierarchy of controls to the greatest extent feasible when facilities are establishing safeguards for identified process hazards. The goal shall be to reduce the risk of major accidents to the greatest extent practicable, to be interpreted as equivalent to as low as reasonably practicable (ALARP). Include requirements for inherently safer systems analysis to be automatically triggered for all management of change, incident investigation, and process hazard analysis reviews and recommendations, prior to the construction of a new process, process unit rebuilds, significant process repairs, and in the development of corrective actions.

Board Status Change Decision:

A. Rationale for Recommendation

On April 2, 2010, a catastrophic heat exchanger rupture at the Tesoro Anacortes refinery fatally injured seven workers. The U.S. Chemical Safety Board's (CSB) investigated the incident and found that the heat exchanger rupture was caused by high temperature hydrogen attack (HTHA), a damage mechanism that occurs when carbon steel equipment is exposed to hydrogen at high temperatures and pressures. The CSB further determined that a key causal factor of the incident was Tesoro's failure to implement more effective safeguards to prevent the heat exchanger failure, such as employing inherently safer materials that are resistant to HTHA. The CSB also found that although good industry practice guidance makes clear that inherently safer technology (IST) is the most preferred and often the most effective safety precaution in the hierarchy of controls to prevent major incidents, the U.S. Environmental Protection Agency (EPA) did not enforce it through its Risk Management Program (RMP) rule, or under the General Duty Clause. As a result of these findings, the CSB issued four recommendations to the EPA. This status change summary addresses CSB Recommendation No. 2010-08-I-WA-R1.

B. Response to the Recommendation

The final RMP rule was published in the Federal Register on March 11, 2024 (89 FR 17622)¹ and became effective on May 10, 2024. A majority of the new requirements take effect in March 2027. Updated requirements under 40 CFR § 68.67(c)(9) and (h) require owners and operators of Program 3 facilities to perform process hazard analyses (PHA) that address safer technology and alternative risk management measures, including inherently safer technology and design, to eliminate or reduce risk from process hazards. Program 3 facilities with hydrofluoric acid (HF) alkylation processes or those that are within one mile of each other or those with a specific accident history, must also conduct a determination of the practicability of the inherently safer technologies and designs that were considered, and then implement at least one passive measure or an inherently safer technology or design. As such, while the updated language does not require inherently safer systems analysis to be automatically triggered for all management of change and incident investigations, it does trigger such a review for PHAs in Program 3 facilities in the petroleum refining and chemical manufacturing sectors. These improvements ultimately help to achieve greater risk reduction at RMP covered Program 3 facilities.

C. Board Analysis and Decision

Based on these updated requirements of the EPA's newly revised RMP rule, the Board voted to change CSB Recommendation No. 2010-08-I-WA-R1 to: "Closed – Acceptable Alternative Action."

¹ <https://www.federalregister.gov/documents/2024/03/11/2024-04458/accidental-release-prevention-requirements-risk-management-programs-under-the-clean-air-act-safer> (accessed July 9, 2024).