



U. S. Chemical Safety and Hazard Investigation Board

RECOMMENDATION STATUS CHANGE SUMMARY

Report:	TS USA Motlen Salt Eruption
Recommendation Number:	2024-01-I-TN-R2
Date Issued:	May 30, 2025
Recipient:	TS USA
New Status:	Open – Awaiting Response or Evaluation/Approval of Response
Date of Status Change:	Not Applicable – Initial Status

Recommendation Text:

Develop a safety management system that incorporates industry guidance and includes, but is not limited to:

- a. A hazard analysis program for assessing the nitriding process. The program shall incorporate industry guidance, such as the Center for Chemical Process Safety's (CCPS) Guidelines for Risk-Based Process Safety, the National Fire Protection Association's (NFPA) Standard for Ovens and Furnaces, and ASM International's Handbook. The program shall apply to new and existing parts, assess parts for accumulation hazards and sealed cavities, and include non-routine tasks such as reprocessing unsatisfactory parts.*
- b. Written operating procedures for the nitriding process. The procedures shall be based on the information gathered from the hazard analysis program. The procedures shall incorporate industry guidance, such as the Center for Chemical Process Safety's (CCPS) Guidelines for Risk-Based Process Safety and the CCPS's Guidelines for Writing Effective Operating and Maintenance Procedures.*
- c. A training program, including written materials, for the employees involved in the nitriding process. This program shall be based on the nitriding facility's operating procedures and other relevant information from the hazard analysis program. The program shall incorporate industry guidance, such as the Center for Chemical Process Safety's (CCPS) Guidelines for Risk-Based Process Safety.*
- d. An incident investigation program. This program shall include requirements for performing causal analysis, producing written reports, and communicating findings and corrective actions throughout the entire TS USA organization. The program shall incorporate industry guidance, such as the Center for Chemical Process Safety's (CCPS) Guidelines for Risk-Based Process Safety and the CCPS's Guidelines for Investigating Process Safety Incidents.*

Board Status Change Decision:

A. Rationale for Recommendation

On May 30, 2024, molten sodium hydroxide and sodium nitrate erupted from an oxidizing salt bath when a part being processed exploded at the TS USA facility in Chattanooga, Tennessee. Unbeknownst to plant personnel water was trapped in the hollow part which rapidly expanded upon contacting the molten material resulting in the explosion. One employee was fatally injured as a result of this incident. \$1.3 million in property damage was reported, and the facility was shut down for approximately eight months.

The U.S. Chemical Safety and Hazard Investigation Board (CSB) investigated the incident and found several safety issues including those associated with the lack of an effective safety management system specially regarding hazard analysis, operating procedures, and training. Deficiencies in learning from past incidents and corporate engagement in safety were also identified. As a result of these findings, the CSB issued three recommendations to TS USA. This status change summary addresses CSB Recommendation No. 2024-01-I-TN-R2.