

**U.S. Chemical Safety and
Hazard Investigation Board**

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U.S. Environmental Protection Agency
EPA Docket Center
EPA-HQ-OECA-2022-0981 Docket
Mail Code 28221T
1200 Pennsylvania Avenue NW
Washington, DC 20460
(and via Federal eRulemaking Portal: <https://www.regulations.gov/>)

Dear Sir or Madam:

The U.S. Chemical Safety and Hazard Investigation Board (CSB) strongly supports the Environmental Protection Agency's (EPA) National Enforcement and Compliance Initiative (NECI): *Reducing Risks of Accidental Releases at Industrial and Chemical Facilities*.

The CSB's mission is to *drive chemical safety excellence through independent investigations to protect communities, workers, and the environment*. Because of the CSB's experience in investigating incidents involving the release or potential release of highly toxic hydrofluoric acid (HF) – and concerns about the potentially catastrophic consequences of an HF release – the CSB urges the EPA to retain the initiative: *Reducing Risks of Accidental Releases at Industrial and Chemical Facilities* for the FY 2024 cycle, and in particular, to prioritize inspections of fluid catalytic cracking (FCC) units in refineries that operate HF alkylation units.

During the 2019 fire and explosions at the [Philadelphia Energy Solutions \(PES\) Refinery](#),¹ which the CSB investigated, more than 5,000 pounds of highly toxic HF were released into the air. Fortunately, due in part to favorable wind conditions, the surrounding community was not adversely affected by the HF release. However, if the HF had traveled beyond the refinery boundary, there could have been significant offsite impacts to the surrounding community.

In addition, the CSB's investigations of both the 2015 [ExxonMobil Torrance Refinery Explosion](#)² and the 2018 [Husky Energy Superior Refinery Explosion and Fire](#)³ addressed "near miss" incidents in which a release of HF could have occurred. Both incidents sent explosion debris throughout the refineries that potentially could have punctured HF

¹ <https://www.csb.gov/philadelphia-energy-solutions-pes-refinery-fire-and-explosions/>

² <https://www.csb.gov/exxonmobil-torrance-refinery-explosion-/>

³ <https://www.csb.gov/husky-energy-superior-refinery-explosion-and-fire/>

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alkylation units at the facilities. Both incidents adversely affected their surrounding communities. Members of the Superior community were ordered to evacuate, partly because of concern about a potential HF release, and in Torrance, FCC catalyst drifted and spread throughout the nearby community. While no HF was released during these two events, they raised significant concerns about the possibility of a catastrophic HF release and the potential impact of a release of HF on the surrounding communities.

As a result of these incidents, the CSB issued two recommendations to the EPA that are currently open and awaiting implementation. From the Philadelphia Energy Solutions (PES) Refinery Fire and Explosions investigation, **CSB Recommendation No. 2019-04-I-PA-R1**, states:

Develop a program that prioritizes and emphasizes inspections of refinery HF alkylation units, for example under EPA's National Compliance Initiative called Reducing Risks of Accidental Releases at Industrial and Chemical Facilities. As part of this program, verify that HF alkylation units are complying with API RP 751 Safe Operation of Hydrofluoric Acid Alkylation Units, including but not limited to the implementation of a special emphasis inspection program to inspect all individual carbon steel piping components and welds to identify areas of accelerated corrosion; the protection of safety-critical safeguards and associated control system components, including but not limited to wiring and cabling for control systems and primary and backup power supplies, from fire and explosion hazards including radiant heat and flying projectiles (per recommendation 2019-04-I-PA-R4); and the installation of remotely-operated emergency isolation valves on the inlet(s) and outlet(s) of all hydrofluoric acid containing vessels, and hydrocarbon containing vessels meeting defined threshold quantities (per recommendation 2019-04-I-PA-R4).

From the Husky Energy Superior Refinery Explosion and Fire investigation, **CSB Recommendation No. 2018-02-I-WI-R12**, states:

Develop a program that prioritizes and emphasizes inspections of FCC units in refineries that operate HF alkylation units (for example, under EPA's National Compliance Initiative called Reducing Risks of Accidental Releases at Industrial and Chemical Facilities). As part of this program, verify FCC unit safeguards that prevent explosions during transient operation (including startup, shutdown, standby, and emergency procedures). At a minimum the program will verify the following specific safeguards:

- a) Implementation of the reactor steam barrier, or a similar inert gas flow, to maintain an inert barrier at an elevated pressure between the main column (containing hydrocarbon) and the regenerator (containing air);*
- b) Purging the main column with a non-condensable gas as needed to prevent a dangerous accumulation of oxygen in the main column overhead receiver;*

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- c) *Monitoring to ensure that there is a sufficient non-condensable gas purge of the main column to prevent a dangerous accumulation of oxygen in the main column overhead receiver (either through direct measurement of the oxygen concentration and/or through engineering calculation);*
- d) *Monitoring of critical operating parameters for flows, pressures, pressure differences, and catalyst levels;*
- e) *Documentation of consequences of deviating from the transient operation safe operating parameters and of predetermined corrective actions; and*
- f) *Inclusion of the above items in the appropriate FCC operator training curricula.*

This recommendation is in addition to the recommendations to EPA relating to hydrofluoric acid outlined in the CSB's report on the 2019 fire and explosions at the Philadelphia Energy Solutions refinery. In that report, the CSB recommended (1) that the EPA prioritize inspections of refinery HF alkylation units to ensure units are complying with API good practice guidance, (2) to require petroleum refineries with HF alkylation units to evaluate inherently safer technology, and (3) to initiate prioritization and, as applicable, risk evaluation of HF under the Toxic Substances Control Act.

Based upon the information above, the CSB strongly supports the EPA's NECI program initiative to reduce accidental releases at industrial and chemical facilities and urges the EPA to place additional emphasis on FCC units in refineries that operate HF alkylation units as set forth in CSB Recommendations No. 2019-04-I-PA-R1 and No. 2018-02-I-WI-R12. The CSB also encourages the EPA to continue work toward the successful implementation of all open recommendations previously issued by the CSB.

If you have any questions regarding our comments, or if we may be of further assistance, please contact Charles B. Barbee, Director of Recommendations, at (202) 261-7621 or via e-mail at charles.barbee@csb.gov.

Sincerely,



Steve Owens
Chairperson



Sylvia E. Johnson, Ph.D.
Board Member



Catherine J.K. Sandoval
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cc: Michael Regan, Administrator, EPA
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Stephen J. Klejst, Executive Director - Investigations & Recommendations, CSB