



# U. S. Chemical Safety and Hazard Investigation Board

## RECOMMENDATIONS STATUS CHANGE

### SUMMARY

<b>Report:</b>	ExxonMobil Torrance Refinery Electrostatic Precipitator Explosion
<b>Recommendation Number(s):</b>	2015-02-I-CA-R7
<b>Date Issued:</b>	May 3, 2017
<b>Recipient:</b>	Torrance Refining Company LLC
<b>New Status:</b>	Closed-Acceptable Action
<b>Date of Status Change:</b>	May 29, 2018

#### Recommendation Text(s):

*Require identification of all safety critical equipment and consequence of failure for each mode of operation and ensure safety-critical devices can successfully function when needed. Develop and implement a policy that requires the Torrance refinery to:*

- (1) Specify each safety-critical device's safety function;*
- (2) Identify the consequences of failure of each safety-critical device;*
- (3) Specify the testing strategy used to verify whether the safety-critical device can function as intended to perform its requires safety function; and*
- (4) Maintain target availability (e.g. safe operating life) for each safety-critical device through inspection and maintenance.*

*Require that items (1) through (4) above consider each mode of operation, including but not limited to normal operation, start up, shut down, and "Safe Park" modes of operation.*

#### Board Status Change Decision:

##### A. Rationale for Recommendation

On February 18, 2015, an explosion occurred in the ExxonMobil Torrance, California refinery's Electrostatic Precipitator (ESP); a pollution control device in the fluid catalytic cracking (FCC) unit that removes catalyst particles using charged plates that produce sparks during normal operation. The incident occurred when ExxonMobil was attempting to isolate equipment for maintenance while the unit was idle. Preparations for the maintenance activity caused a pressure deviation that allowed hydrocarbons to backflow through the process and ignite in the ESP.

The CSB identified several process safety design weaknesses in the Torrance refinery FCC unit at the time of the incident. As a result, the CSB made four recommendations to Torrance Refining Company LLC. This recommendation is specific to the identification of all safety critical equipment and the consequences of their failure.

## B. Response to the Recommendation

Torrance Refining Company LLC (TORC) stated that the Torrance Refinery conducted a review of the FCC safety critical devices and implemented the following:

- Identification of all safety critical equipment;
- Consequences of failure for each mode of operation;
- Evaluated and established parameters, limits, and associated equipment to ensure an appropriate steam-induced pressure barrier for FCC Emergency Shutdown and Safe Park procedures;
- Updated Emergency Shutdown and Safe Park procedures to address the loss of catalyst seal, loss of steam barrier, and failure of the ESP to de-energize; and
- Evaluated additional isolation facilities between the main molom and the flu gas system.

TORC also formed a cross-functional team of local and ExxonMobil circuit experts developed an FCC Safe Park procedure and updated the FCC Normal Shutdown, Emergency Shutdown, and Start-up procedures for the Torrance Refinery. The Torrance Refinery reviewed areas of higher risk or with a higher vulnerability through an independent risk assessment to ensure that adequate layers of protection were in place during Safe Park mode and other operation modes.

## C. Board Analysis and Decision

As the above changes meet the requirements of the recommendation, the Board voted to change the status of CSB Recommendation No. 2015-02-I-CA-R7 to: **“Closed-Acceptable Action.”**