Agenda

- Summary of Last Refinery Committee Meeting
- Staff Meetings with Stakeholders
- Proposed Rule Concepts
- Next Steps
Summary of Last Refinery Committee Meeting

• Held on September 22, 2018 in Wilmington
• Key items discussed:
  q Status update of PR 1410
  q Regulatory and Memorandum Of Understanding (MOU) approach
  q Potential earthquake risk
  q Dispersion and water mitigation testing
  q Assessment of additional hydrogen fluoride (HF)/modified HF (MHF) testing
  q Emergency preparedness and treatment of HF
• Refinery Committee directed staff to:
  q Proceed with mitigation and allow refineries to demonstrate safety through a performance standard or a potential phase-out of MHF
  q Initiate rulemaking with a public hearing in May 2019 or pivot to MOU
Staff Meetings with Stakeholders

Torrance Refining Company (TORC)
- SCAQMD staff
  - November 1, 2018
- SCAQMD staff
  - November 9, 2018

Valero Wilmington Refinery (Valero)
- SCAQMD staff
  - November 7, 2018
Proposed Rule (PR) 1410 Concepts

HYDROGEN FLUORIDE STORAGE AND USE AT PETROLEUM REFINERIES
<table>
<thead>
<tr>
<th>Overview of Structure of PR 1410</th>
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<tr>
<td><strong>Purpose</strong></td>
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<tr>
<td>• Establishes the purpose and objectives for proposed rule</td>
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<td><strong>Applicability</strong></td>
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<td>• Identifies sources affected by proposed rule</td>
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<td><strong>Definitions</strong></td>
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<td>• Provides definitions of key terms used in the proposed rule</td>
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<td><strong>Requirements</strong></td>
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<td>• Specifies requirements for mitigation measures, performance standard, phase-out, compliance plans, and notification</td>
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<tr>
<td><strong>Recordkeeping</strong></td>
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<td>• Lists the types and specifications of records which must be maintained by affected facilities</td>
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PR 1410 Purpose and Applicability

• Purpose
  q Reduce the potential consequences from an accidental release of HF or MHF used and stored at refineries

• Applicability
  q Applies to petroleum refineries that store and use HF or MHF in their alkylation unit
    o Torrance Refining Company
    o Valero Refinery at Wilmington
PR 1410 Key Definitions

• Consequential Accidental Release
  q Any accidental release that has the potential for off-site exposure to HF or MHF that could lead to irreversible or other serious, long-lasting adverse health effects occurring

• Hydrogen Fluoride
  q Anhydrous, aqueous or modified hydrogen fluoride used in refinery alkylation operation

• Modified Hydrogen Fluoride
  q A mixture of hydrogen fluoride and a minimum of 8 percent by weight sulfolane
PR 1410 Proposed Requirements

Requirements consist of the following elements:

- Mitigation Measures
- Performance Standard
- Failure to achieve performance standard
  - Phase out of HF or MHF
  - Compliance Plans for Phase-Out
- Notification Requirements
General Approach

Phase-Out
MHF
MHF

Pass
Fail
Continue Using MHF

2021
Long-Term Mitigation

Performance Standard - MHF Modeling and Potential Testing

2019
Rule Adoption
Short-Term Mitigation
MHF Phase-Out Compliance Plan

2023
Phase-Out MHF

Phase-Out MHF

2029
Mitigation
PR 1410 Proposed Mitigation

- Consists of short-term (initial) and long-term (enhanced) mitigation
- Initial mitigation can be implemented within 12 months by upgrading existing mitigation and adding basic mitigation
- Enhanced mitigation can be implemented in 24 months and requires design, planning, and construction
- Implementation of short-term and long-term mitigation measures expected to overlap
Key Elements of Proposed Mitigation

- Backup water on-site
- Backup power
- Multiple layers of water spray curtains
- Fixed and aim-and-shoot water cannons
- Fire monitors

- Enhanced barrier in alkylation unit
- Integrated water mitigation
- Large water volume
- Mandatory acid evacuation at an established threshold

- More point sensors
- Open-path monitors around key MHF process areas
- More surveillance cameras
- Control room screen upgrade

- More passive measures
- Automatic activation of pump deluge, water cannon and water spray curtain upon detection
Fast Detection (Short-Term Mitigation)

- At a minimum, 3 point sensors per each MHF process
  - Detection ranges from 0 ppm to 20 ppm
  - Installed in all areas with potential release points
- Install open-path monitors at more than one elevation
  - Alkylation unit
  - Fresh MHF storage area
  - MHF loading/unloading zone
  - Fenceline (property boundary)
- More surveillance cameras and upgrade of control room screen
  - No more than 3 camera feeds per screen
  - “Eye in the sky” camera over alkylation unit
Other Short-Term Mitigation

- Blast-resistant barrier for key MHF process unit (e.g., settler)
- Additive concentration monitoring
  - Minimum of 8.0 wt.% acid settler & 15.0 wt.% fresh acid storage at any given time
  - Monitor concentration level two times a day
- Pressure level monitoring
  - Acid settler
  - Fresh acid storage
- HF sensitive paint
- Acid evacuation system
- Emergency isolation block valve
- Seismic upgrades, if applicable
Rapid Deployment (Long-Term Mitigation)

01. WATER FOR PUMPS
   - Automatic water deluge if HF detected above an established threshold by 2 or more point sensors

02. WATER FOR FRESH ACID STORAGE
   - Automatic water spray curtain if HF detected above an established threshold by open-path monitor

03. WATER FOR MHF LOADING/UNLOADING ZONE
   - Automatic water spray curtain if HF detected above an established threshold by open-path monitor

04. WATER AT ALKYLATION UNIT
   - Automatic water cannons and water spray curtains if HF detected above an established threshold by open-path monitor
Enhanced Safety (Long-Term Mitigation)

• Facility-specific steel enclosure around alkylation unit
• Point sensors, open-path monitor, water cannons (fixed) and water spray curtain inside enclosure
  q Automatic activation of both water cannons and water spray curtain upon detection above an established threshold (xx ppm HF)
  q Additional water spray curtain outside the enclosure
  q Capability to manually activate water system
• Mandatory acid evacuation transfer at threshold of HF along the perimeter of alkylation unit
Redundancy (Long-Term Mitigation)

- Water cannons in the enclosure
  - Fixed position close to settler to minimize response time
- Water cannons outside enclosure
  - “Aim-and-shoot” type water monitors for additional water mitigation
- Water spray curtains
  - Multiple layers in and outside enclosure
  - High water-to-HF volume ratio (e.g., 60 to 1)
- Large amounts of water storage and water delivery on-site
- Backup power
Performance Standard
Importance of the Performance Standard

• Purpose of a performance standard is to establish a measurable target that mitigation measures can be tested against to ensure protection of public health in the event of a consequential release

• Performance standard will provide more information on the efficacy of mitigation measures and possible deficiencies such as:
  o Response time
  o Ability to target a release in a specific location
  o Sufficient mitigation to address a certain size release
  o Redundancy to address potential outages or other unexpected events
Key Elements of Performance Standard

- **Release Scenario**
  - Establishes the key parameters for the release such as:
    - Rate of release
    - Location of release
    - Unit parameters (temperature, pressure)

- **Performance Standard**
  - Establishes a standard that has to be met when HF or MHF is released

- **Demonstration**
  - Establishes the conditions that are allowed for the demonstration of the performance standard
Defining the Release Scenario

- Objective is to establish a realistic but consequential release
- Definition of the release scenario is to ensure the demonstration of the performance standard is meaningful and consistent

<table>
<thead>
<tr>
<th>Release Scenario</th>
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<tr>
<td>- Parameters of release:</td>
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<tr>
<td>- Orifice size</td>
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<tr>
<td>- Release rate</td>
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<tr>
<td>- Quantity of release</td>
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<tr>
<td>- Release duration</td>
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<tr>
<td>- Operating conditions – temperature and pressure</td>
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<tr>
<td>- External conditions – temperature, wind conditions, and humidity</td>
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Establishing the Performance Standard

- Provides standard operator must achieve when using mitigation
- Must be health protective

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<tr>
<th>AIHA** Emergency Response Planning Guidelines</th>
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<tr>
<td>Lethal</td>
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<tr>
<td>Serious effect</td>
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<tr>
<td>Irritant</td>
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Performance Standard*:

- Could take several forms such as:
  - Concentration limit at a specific location for a specific duration of time
  - Specific characteristic of HF or MHF such as does not flash atomize

* Original Rule 1410 required ≤ 20 ppm for five minutes and 120 ppm for one minute at or outside facility boundary

** American Industrial Hygiene Association
Demonstration of Performance Standard

- Establishes the criteria of how the performance standard is demonstrated
  - Testing and/or computer modeling
- Conditions for the demonstration – type of and efficacy of specific mitigation that will be allowed
  - Testing (laboratory and/or field)
  - Modeling (e.g., SLAB, DEGADIS, CANARY)
- Conditions for demonstration such as:
  - Operating conditions (temperature and pressure)
  - Assumptions for efficacy of mitigation measures
  - Affect of additive
Potential Phase-Out Schedule
General Approach

- Rule Adoption
- Short-Term Mitigation
- MHF Phase-Out Compliance Plan
- Performance Standard - MHF Modeling and Potential Testing
- Long-Term Mitigation
- Continue Using MHF
- MHF Phase-Out Compliance Plan
- Phase-Out MHF
PR 1410 – Phase-Out Schedule

Short-term Phase-out Schedule
- Comply with short-term mitigation requirements
- If elect not to install long-term mitigation, phase out MHF on or before January 1, 2023

Long-term Phase-out Schedule
- Comply with short-term and long-term mitigation requirements
- If performance standard cannot be met, phase out MHF on or before January 1, 2029
Compliance Plans for Phase-Out
PR 1410 – Compliance Plans

• Notify the SCAQMD which compliance pathway will be pursued
  q Short-term mitigation/phase-out; or
  q Short-term and long-term mitigation/performance standard
• Compliance plan is needed for both options
  q Description of approach to phase-out HF/MHF including the selected alkylation technology
  q Schedule with key dates and milestones
Notification
PR 1410 – Notification

• All HF sensors and open-path monitors shall be electronically linked to SCAQMD, local city, and county fire departments

• An electronic alarm shall be transmitted to SCAQMD in real-time when HF is detected at:
  q xx ppm or greater concentration by point sensor; OR
  q xx ppm-m or greater concentration by open-path monitor

• Report the reason for the alarm to the SCAQMD within one hour (testing, false alarm, etc.)

• Alerts to the community using community alert system when HF is detected along the perimeter of the alkylation unit at:
  q xx ppm-m by open-path monitor; AND
  q xx ppm by two or more point sensors
PR 1410 – Notification (con’t)

• Report to SCAQMD any release that results in exposed person(s) requiring medical treatment, evacuation of facility premises, or HF release beyond the facility boundary within one hour of the time of incident:
  q Name of facility and specific location of point sensor and/or open path monitor
  q Cause and extent of the release
  q Specific location of the release
  q Any and all subsequent actions taken to mitigate the release
  q Name of other agencies notified of the release and time of notification

• A follow-up written report within 10 business days of release
Recordkeeping
PR 1410 – Recordkeeping

• All records shall be kept at the facility for a minimum of five years and made available with one week upon request:
  q Written mitigation procedures
  q Notification of a HF/MHF release report
  q Video surveillance recordings
  q Records of alarms, HF/MHF releases, concentration and amount of releases, and subsequent actions to mitigate

• Records shall be kept in the format approved by the Executive Officer to demonstrate compliance with the provisions of the rule
Next Steps
## Schedule

<table>
<thead>
<tr>
<th>Activity</th>
<th>Current Target Date</th>
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| Report to Governing Board on Status of Addressing HF Usage | December 7, 2018  
February 1, 2019 |
| Release Rule Language and CEQA NOP/IS         | TBD                            |
| Working Group Meetings                        | Ongoing                       |
| Stakeholder Meetings                          | Ongoing                       |
| Refinery Committee Meeting                    | TBD                            |
| Governing Board Meeting                       | May 3, 2019                   |
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