

Industry Learning & Outreach

Quarterly Webinar

September 19, 2017

**AFPM & API
ADVANCING
PROCESS SAFETY**



 **AFPM**
American
Fuel & Petrochemical
Manufacturers

energy **API.**

Slide 1

DW2

Can we get a different picture? Thinking of something that shows multiple people, diversity, process safety focus.

Daniel Wilczynski, 6/6/2017

Purpose of Industry Learning & Outreach Quarterly Webinars

- To support broad adoption of RP-754 (2nd Edition) throughout the Refining and Petrochemical industries
- To ensure consistency in Tier 1 and 2 metrics reporting in order to establish credibility and validity
- To share learnings regarding the effective implementation of Tier 1-4 lagging/leading metrics
- To communicate changes or improvements in other aspects of the Advancing Process Safety programs

Today's Agenda

1. 2016 PSE Submittal Summary
2. Updated Learnings from PS Site Assessments
3. Newly Published Documents
4. Q & A

2016 PSE Submittal Summary

Overall decrease in PSEs & PSE Rate in 2016.

Tier 1s	2015	2016
Refining PSEs/Rate	164 / .1038	102 / .0627
Petrochemical PSEs/Rate	80 / .0931	66 / .0625

Tier 2s	2015	2016
Refining PSEs/Rate	326 / .2063	281 / .1726
Petrochemical PSEs/Rate	127 / .2115	148 / .1413*

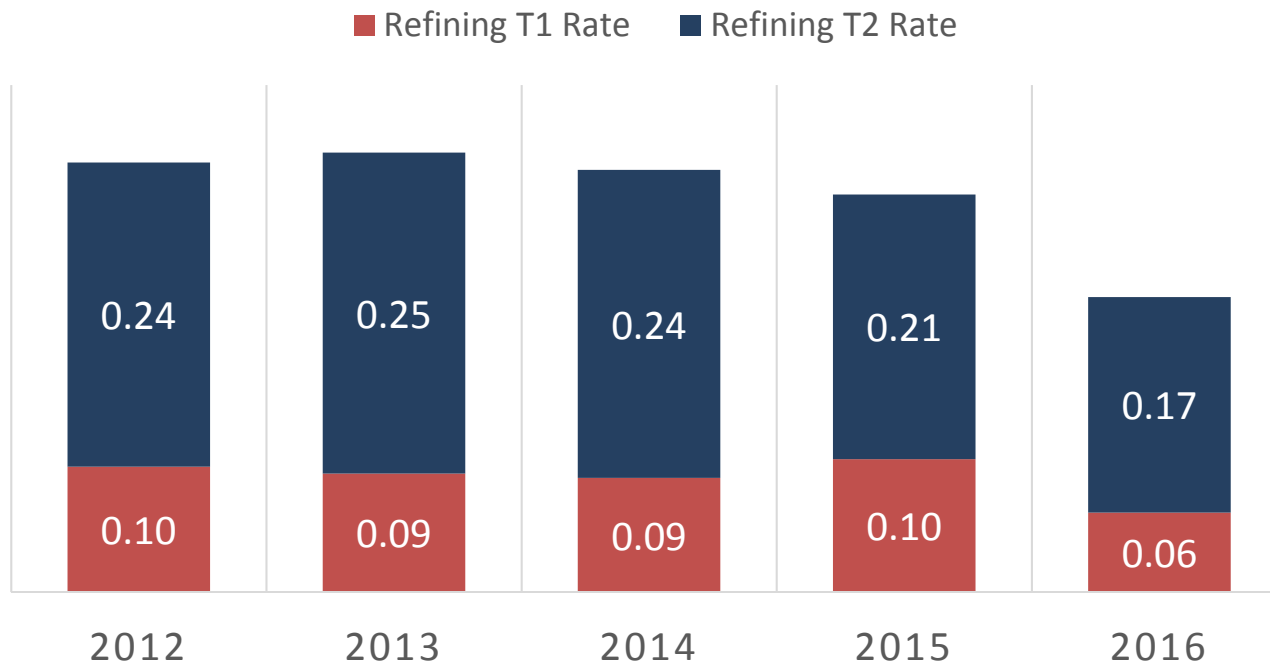
*Petro workforce hours increased from 171MM to 211MM

API RP 754 Data Analysis Update

We should not draw a sweeping conclusion about why the number of PSEs in refineries dropped between 2015 and 2016

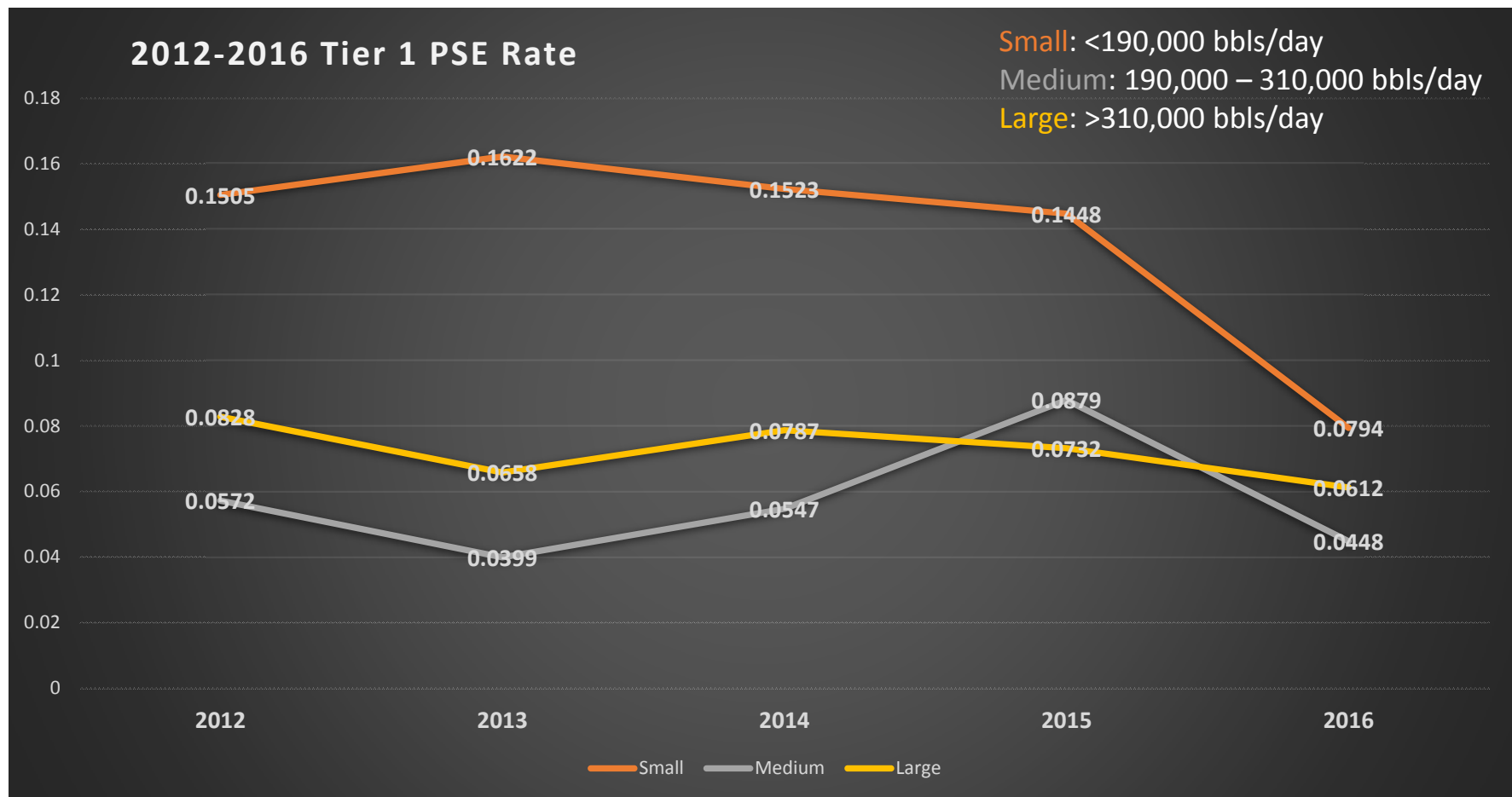
- Based on review of participation, the drop was not influenced by different sites/companies participating between the two years

REFINING INDUSTRY RATE



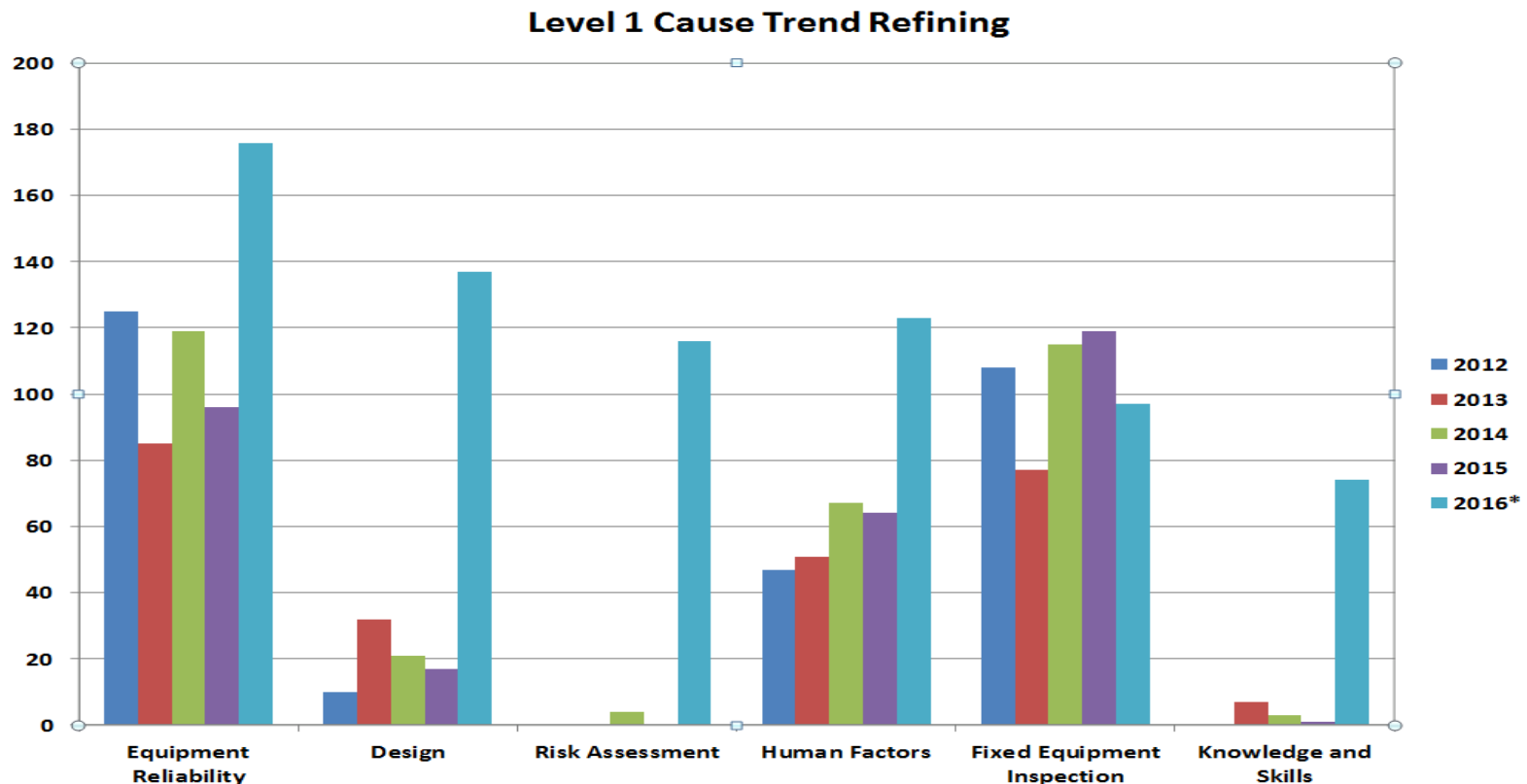
API RP 754 Data Analysis Update

- The most significant decrease occurred with the **small** facilities



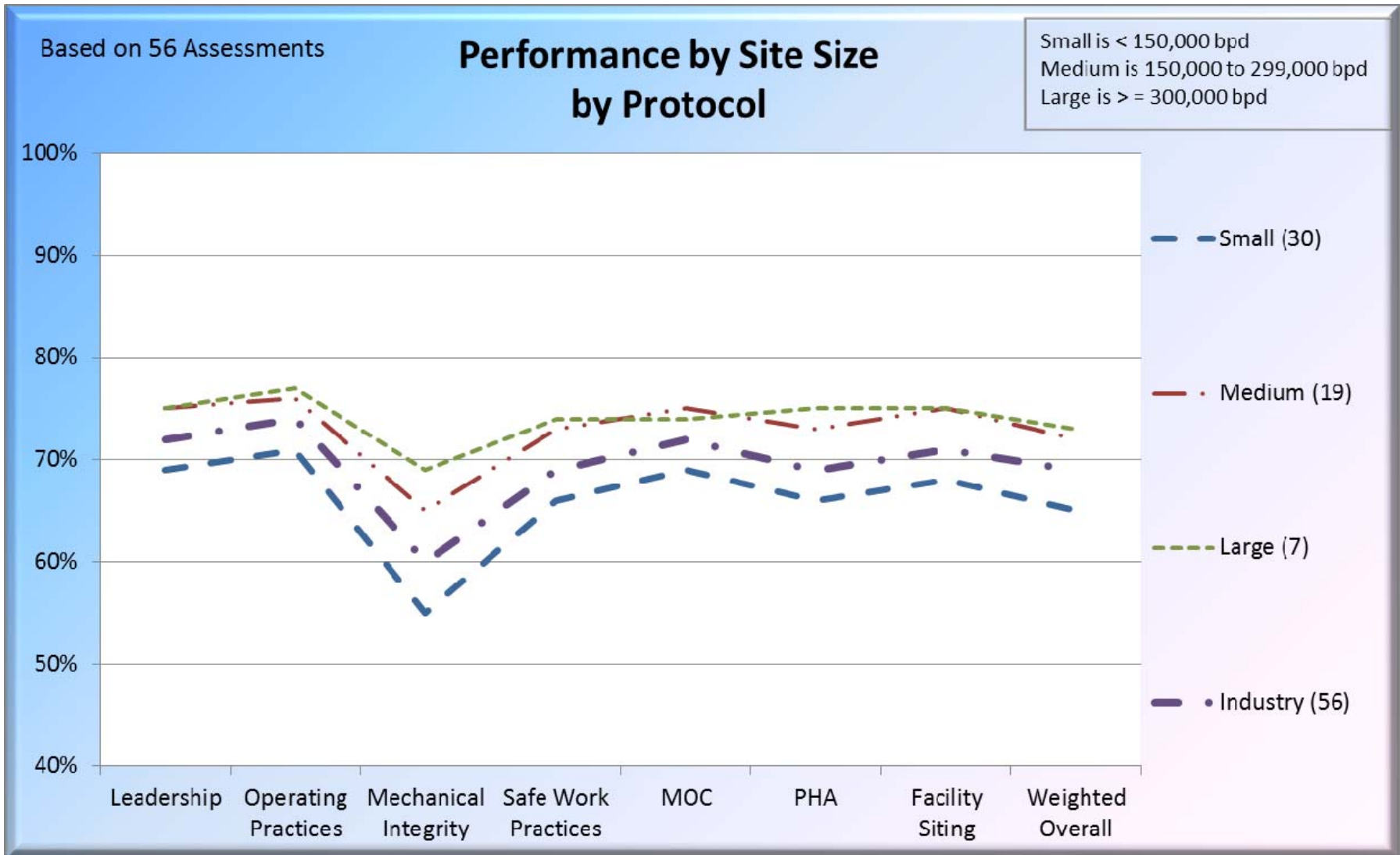
API RP 754 Data Analysis Update

- Previously, deep dive participants made judgement calls when identifying event causes.
- 2016 was the first year **companies supplied causes**
 - We cannot trend 2016 with previous years
 - Future trending will be more accurate



*Beginning in 2016 sites participants input their own cause values.

Updated Learnings from PS Site Assessments



Updated Learnings from PS Site Assessments

Leadership - Opportunities

- Process safety leadership training
- Understanding of risk profile and effective methods of managing risk.
- Methods to ensure adequate resources (including capital) for process safety.
- Contractor safety issues that impact process safety.
- Implementation/utilization of 'element champion' roles.
- Succession planning for critical process safety positions

Updated Learnings from PS Site Assessments

Operating Practices - Opportunities

Alarm Management

- Not fully leveraging alarm management metrics to drive improvements. Most have established metrics such as alarms/hour and alarm flood conditions. But gaps noted have included
 - Site supts/managers are not routinely reviewing performance metrics
 - Lack of a formal process to evaluate indicators then develop improvement plans to address things like bad actors
 - Sites have not necessarily had mature "bad actor" resolution programs to identify and resolve instrumentation issues
 - Console operators are not aware of alarm metrics and what actions are being considered by site management

Safety critical device bypasses

- Mitigation plans are often vague lacking the level of detail needed to clearly define steps being taken to manage the risk while these devices are out of service. Examples
 - Not clear who is responsible for alternate monitoring
 - Most plans do not include trigger points (e.g. when level reaches 80%....) that would require additional precautions to be taken
 - Sites are still not elevating approval of these bypasses over time

Updated Learnings from PS Site Assessments

Mechanical Integrity - Opportunities

- Smaller sites/companies are lagging
- Create a generic API Recommended Practice for a comprehensive inspector training program on fixed equipment mechanical integrity (FEMI)
- Improve Industry's understanding of:
 - Breadth and depth of the entire FEMI program -resources needed for a higher quality FEMI program.
 - Promote the implementation of all API Standards on Inspection Practices
 - Produce generic templates for:
 - Damage Mechanism Reviews (DMR)
 - Corrosion Control Documents (CCD)
 - Integrity Operating Windows (IOW)

Updated Learnings from PS Site Assessments

Mechanical Integrity - Opportunities

- Need to produce a road map (block diagram) showing how all sites can integrate and complete the related work processes for:
 - Collecting all the DMR information into a comprehensive CCD (API 584 1st ed. & 970 *pending*)
 - Producing a comprehensive set of IOW's from the DMR/CCD (API 584)
 - Downloading all the DMR/CCD/IOW information into a comprehensive set of individual inspection plans for each piece of equipment/piping circuit (API 580)
- All sites need to complete the higher risk - special emphasis inspection programs (SEIP) for piping:
 - Injection Point identification and implementation
 - Mixing Point identification and implementation
 - Deadleg identification and implementation
 - Critical Check Valve identification and implementation
 - Buried Piping identification and implementation
 - Corrosion under Insulation (CUI)

Updated Learnings from PS Site Assessments

Safe Work Practices - Opportunities

Level of detailed guidance/depth in site's safe work procedures can be improved. The following are examples:

- Quality of safe work permit auditing
 - Sites do permit audits, but do not effectively translate that data and lesson learned into continuous improvement programs
- Simultaneous operations are not consistently evaluated
- Hazard recognition tools (JSA's) not used or superficial
- Exclusion zones procedures not established
 - Formal procedures are not consistently developed
 - Sites use battery limits as basis for Exclusion Zones vs. referring to blast zones

Learnings from PS Site Assessments

MOC Opportunities

- MOOC weak across industry.
 - Data shows MOOC not viewed as fundamental cause.
 - Not doing thorough risk review seen as a cause for poor MOC quality.
 - Is a Poor design, poor hazard recognition due to poor MOC execution or is it a lack of competency or succession planning (MOOC)?
 - MOC process seems to be used to ensure right role are participating vs. MOOC should be included to ensure right role has right competency/qualification.
- MOC & PSSR audit scores are low. Most processes look at execution vs. feeder processes (e.g., competency of MOC team).
- Notification of affected personnel outside of operations (e.g., craft personnel).
- Update of PSI (e.g., P&ID redlines) and other post startup action items in a timely manner.

Learnings from PS Site Assessments

PHA - Opportunities

- **Written PHA procedure**
 - PHA consideration of transient modes of operation (lowest scoring question on average)
 - Communication of results to personnel (second lowest)
 - Team composition, facilitator qualification, scope definition, methodology selection
- **Management oversight – site procedure does not clearly define review/approval?**
 - Managers may not review PHA content other than recommendations
 - QA/QC is an opportunity – review of quality/content/etc.– this is very different from just reviewing recommendations.
 - Is leadership knowledgeable of the risks as identified by the teams?
 - Oversight trickles down to other components – team composition, facilitator qualification, scope definition, methodology selection
 - Management oversight sets the tone for importance of PHA process
- **Integration of Process Safety Elements**
 - PHA can be a silo – scan and store
 - Communication with MI program
 - Process Safety Information
 - Training of employees on administrative safeguards and hazards of the unit
 - Feed into emergency response plan

Learnings from PS Site Assessments

Facility Siting - Opportunities

- **Permanent buildings**
 - Not always included in facility siting management system (permanent building procedure) beyond simply being included in Facility Siting Study. Changes in population, changes in hazards affecting buildings, construction of new buildings, etc.
 - Consideration of all hazards impacting buildings – explosion , fire, thermal radiation, and toxic Defined hierarchy of potential mitigation measures and demonstrated progress toward completion of mitigation plan
- **Portable buildings**
 - Control of occupancy (lowest scoring question on average)
 - Variance in auditing from no audit process to very rigorous (second lowest)
 - Managing change (third lowest) – changes to personnel, process, modifying building, etc.
 - Essential vs. non-essential determination and consideration of necessity to occupy buildings near process hazards
 - Portable building occupants informed of hazards?
- **Tents**
 - Control of use and occupancy of tents

Newly Published Documents

- AFPM Process Safety Event Statistics for the Petroleum Refining & Petrochemical Industries (July 2017)
- Bulletin: Hazards of Flooding Tank Floating Roofs
- Hazard Identification: Maintenance/Operations Turnover and Verification After Maintenance
- Practice Sharing Document: Energy Isolation Procedure

2017 Webinar Dates

- February 28 – 10:00 am Eastern (Complete)
- June 6 – 11:00 am Eastern (Complete)
- September 19 – 11:00 am Eastern (Complete)
- December 5 – 11:00 am Eastern
 - Event Discussions/Sharing
 - Interpretations

Questions? / Discussion!