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1 GENERAL

1.1 Purpose
The purpose of this document is to provide guidance to refining and petrochemical companies on the collection and reporting of process safety events suitable for nationwide public reporting as defined in the American Petroleum Institute (API) Recommended Practice (RP)754, Process Safety Performance Indicators for the Refining and Petrochemical Industries.

Disclaimer: This document does not preempt any federal, state or local laws regulating process safety. Therefore, nothing contained in this document is intended to alter or determine a Company’s compliance responsibilities set forth in the OSHA’s Occupational Safety and Health Act of 1970 and/or the OSHA standards themselves, or any other legal or regulatory requirement concerning process safety. The use of the term or concept “process safety” contained in OSHA regulatory requirements, or as the term may be used in other legal or regulatory contexts. In the event of conflict between this document and any OSHA or other legal requirements, the OSHA or other legal requirements should be fully implemented.

1.2 Objective
The objective of this survey is to collect information on Tier 1 and Tier 2 Process Safety Events (PSEs) as defined in API RP 754 in order to drive performance improvement.

1.3 Applicability
While this survey was developed for the refining and petrochemical industries, it may also be applicable to other industries with operating systems and processes where loss of containment has the potential to cause harm. Applicability is not limited to those facilities covered by the OSHA Process Safety Management Standard, 29 CFR 1910.119 or similar national and international regulations.

At colocated facilities (e.g. industrial park), this recommended practice applies individually to the companies that own and operate the processes and not to the site as a whole.

Events associated with the following activities fall outside the scope of RP 754 and shall not be included in data collection or reporting efforts:

a) releases from pipeline transfer operations occurring outside the process or storage facility fence line;

b) marine transport operations, except when the vessel is connected to the process for the purposes of feedstock or product transfer;

c) truck or rail operations, except when the truck or rail car is connected to the process for the purposes of feedstock or product transfer, or if the truck or rail car is being used for on site storage;

d) vacuum truck operations, except on-site truck loading or discharging operations, or use of the vacuum truck transfer pump;

e) routine emissions that are allowable under permit or regulation;
f) office, shop and warehouse building events (e.g. office fires, spills, personnel injury or illness, etc.);

g) personal safety events (e.g. slips, trips, falls) that are not directly associated with on-site response to a loss of primary containment (LOPC) event;

h) LOPC events from ancillary equipment not connected to the process (e.g. small sample containers);

i) quality assurance (QA), quality control (QC) and research and development (R&D) laboratories (pilot plants are included);

j) retail service stations; and

k) on-site fueling operations of mobile and stationary equipment (e.g. pick-up trucks, diesel generators, and heavy equipment).
2 DEFINITIONS

For the purposes of this survey, the following definitions apply:

2.1 acids/bases, moderate
Substances with pH $\geq 1$ and $< 2$, or pH $> 11.5$ and $\leq 12.5$, or more precisely, substances that cause full thickness destruction of intact skin tissue within an observation period up to 14 days starting after the exposure time of 60 minutes or less, but greater than three minutes, consistent with Globally Harmonized System of Classification and Labeling of Chemicals (GHS) Skin Corrosion Category 1B.¹

2.2 acids/bases, strong
Substances with pH $< 1$ or $> 12.5$, or more precisely, substances that cause full thickness destruction of intact skin tissue within an observation period up to 60 minutes starting after the exposure time of three minutes or less, consistent with GHS Skin Corrosion Category 1A.²

2.3 Company
When designated with a capital C or “the Company”, refers to the operating Company in the refining and petrochemical industries, its divisions or its consolidated affiliates.

2.4 containment, primary
A tank, vessel, pipe, truck, rail car or equipment intended to serve as the primary container or used for processing or transfer of material.

2.5 containment, secondary
Exists to contain or control a release from primary containment. Secondary containment systems include, but are not limited to tank dikes, curbing around process equipment, drainage collection systems, the outer wall of double walled tanks, etc.

2.6 contractor and subcontractor
Any individual not on the Company payroll, whose exposure hours, injuries and illnesses occur on site.

2.7 days away from work injury
Work-related injuries that result in the employee being away from work for at least one calendar day after the day of the injury as determined by a physician or other licensed health professional. This is an abridged version of the definition used to report days away from work injuries for OSHA.

2.8 deflagration vent
An opening in a vessel or duct that prevents failure of the vessel or duct due to overpressure. The opening is covered by a pressure-relieving cover (e.g. rupture disk, explosion disk or hatch).

http://www.unece.org/trans/danger/publi/ghs/ghs_rev00/00files_e.html

² Ibid.
2.9 destructive device
A flare, scrubber, incinerator, quench drum or other similar device used to mitigate the potential consequences of a pressure relief device (PRD) release.

2.10 direct cost
Cost of repairs or replacement, cleanup, material disposal, environmental remediation and emergency response. Direct cost does not include indirect costs, such as business opportunity, business interruption and feedstock/product losses, loss of profits due to equipment outages, costs of obtaining or operating temporary facilities, or costs of obtaining replacement products to meet customer demand. Direct cost does not include the cost of the failed component leading to LOPC, if the component is not further damaged by the fire or explosion.

2.11 employee
Any individual on the Company payroll whose exposure hours, injuries, and illnesses are routinely tracked by the Company. Individuals not on the Company payroll, but providing services under direct company supervision are also included (e.g. government sponsored interns, secondees, etc.).

2.12 explosion
A release of energy that causes a pressure discontinuity or blast wave (e.g. detonations, deflagrations and rapid releases of high pressure caused by rupture of equipment or piping).

2.13 facility
The buildings, containers or equipment that contain a process.

2.14 fire
Any combustion resulting from a LOPC, regardless of the presence of flame. This includes smoldering, charring, smoking, singeing, scorching, carbonizing or the evidence that any of these have occurred.

2.15 flammable gas
Any material that is a gas at 35 °C (95 °F) or less and 101.3 kPa (14.7 psi) of pressure and is ignitable when in a mixture of 13 % or less by volume with air, or has a flammable range of at least 12 % as measured at 101.3 kPa (14.7 psi).

2.16 hospital admission
Formal acceptance by a hospital or other inpatient health care facility of a patient who is to be provided with room, board, and medical service in an area of the hospital or facility where patients generally reside at least overnight. Treatment in the hospital emergency room or an overnight stay in the emergency room would not by itself qualify as a "hospital admission."

2.17 loss of primary containment
LOPC
An unplanned or uncontrolled release of any material from primary containment, including non-toxic and non-flammable materials (e.g. steam, hot condensate, nitrogen, compressed CO₂ or compressed air).
2.18 major construction
Large scale investments with specific, one-time project organizations created for design, engineering and construction of new or significant expansion to existing process facilities.

2.19 material
Substance with the potential to cause harm due to its chemical (e.g. flammable, toxic, corrosive, reactive, asphyxiate) or physical (e.g. thermal, pressure) properties.

2.20 office building
Buildings intended to house office workers (e.g. administrative or engineering building, affiliate office complex, etc.).

2.21 officially declared
A declaration by a recognized community official (e.g. fire, police, civil defense, emergency management) or delegate (e.g. Company official) authorized to order the community action (e.g. shelter-in-place, evacuation).

2.22 pressure relief device
PRD
A device designed to open and relieve excess pressure (e.g. safety valve, thermal relief, rupture disk, rupture pin, deflagration vent, pressure/vacuum vents, etc.).

2.23 process
Production, distribution, storage, utilities, or pilot plant facilities used in the manufacture of petrochemical and petroleum refining products. This includes process equipment (e.g. reactors, vessels, piping, furnaces, boilers, pumps, compressors, exchangers, cooling towers, refrigeration systems, etc.), storage tanks, ancillary support areas (e.g. boiler houses and waste water treatment plants), on-site remediation facilities and distribution piping under control of the Company.

2.24 process safety
A disciplined framework for managing the integrity of hazardous operating systems and processes by applying good design principles, engineering, and operating and maintenance practices.

2.25 Process safety event
PSE
An unplanned or uncontrolled LOPC of any material including non-toxic and non-flammable materials (e.g. steam, hot condensate, nitrogen, compressed CO₂ or compressed air) from a process, or an undesired event or condition that, under slightly different circumstances, could have resulted in a LOPC of a material.

2.26 public receptors
Offsite residences, institutions (e.g. schools, hospitals), industrial, commercial, and office buildings, parks or recreational areas where members of the public could potentially be exposed to toxic concentrations, radiant heat, or overpressure, as a result of a LOPC.
2.27 **recordable injury**
A work-related injury that results in any of the following: death, days away from work, restricted work or transfer to another job, medical treatment beyond first aid, loss of consciousness or a significant injury diagnosed by a physician or other licensed health professional. This is an abridged version of the definition used to report days away from work injuries for OSHA.³

2.28 **third-party**
Any individual other than an employee, contractor or subcontractor of the Company [e.g., visitors, non-contracted delivery drivers (e.g. UPS, U.S. Mail, Federal Express), residents, etc.].

2.29 **tolling operation**
A company with specialized equipment that processes raw materials or semi-finished goods for another company.

2.30 **total work hours**
Total employee, contractor, and subcontractor hours worked minus the hours associated with major construction projects. This is the same number typically used to calculate occupational injury and illness rates.

2.31 **United Nations Dangerous Goods**
**UNDG**
A classification system used to evaluate the potential hazards of various chemicals when released, which is used by most international countries as part of the product labeling or shipping information. In the United States, these hazard categories are defined in U.S. Department of Transportation (DOT) regulations 49 CFR 173.2a, and listed in 49 CFR 172, Subpart B.

2.32 **unsafe location**
An atmospheric pressure relief device discharge point or downstream destructive device (e.g. flare, scrubber) discharge point that results in a potential hazard, such as the formation of flammable mixtures at grade level or on elevated work structures, presence of toxic or corrosive materials at grade or on elevated work structures, or ignition of relief streams at the point of emission as specified in API 521 Section 6.3.4.3.

3 REPORTABLE PROCESS SAFETY EVENT

A reportable PSE is an unplanned or uncontrolled LOPC of any material including non-toxic and non-flammable materials (e.g., steam, hot condensate, nitrogen, compressed CO2 or compressed air) from a process that meets the definitions for Tier 1 or Tier 2 Indicators below.

3.1 Tier 1 Indicator Definition and Consequences

A Tier 1 Process Safety Event (T-1 PSE) is a loss of primary containment (LOPC) with the greatest consequence as defined by API RP 754. A T-1 PSE is an unplanned or uncontrolled release of any material, including non-toxic and non-flammable materials (e.g. steam, hot condensate, nitrogen, compressed CO2 or compressed air), from a process that results in one or more of the consequences listed below:

Note: Non-toxic and non-flammable materials (e.g., steam, hot water, nitrogen, compressed CO2 or compressed air) have no threshold quantities and are only included in this definition as a result of their potential to result in one of the other consequences.

— an employee, contractor or subcontractor “days away from work” injury and/or fatality;
— a hospital admission and/or fatality of a third-party;
— an officially declared community evacuation or community shelter-in-place;
— a fire or explosion resulting in greater than or equal to $25,000 of direct cost to the Company;
— a pressure relief device (PRD) discharge to atmosphere whether directly or via a downstream destructive device that results in one or more of the following four consequences:
  — liquid carryover;
  — discharge to a potentially unsafe location;
  — an on-site shelter-in-place;
  — public protective measures (e.g. road closure);
and a PRD discharge quantity greater than the threshold quantities in Table 14; or
— a release of material greater than the threshold quantities described in Table 1 in any one-hour period.

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4 See Appendix A, Material Release Threshold Quantities
3.2 Tier 2 Indicator Definition and Consequences

A Tier 2 Process Safety Event (T-2 PSE) is a LOPC with lesser consequence. A T-2 PSE is an unplanned or uncontrolled release of any material, including non-toxic and non-flammable materials (e.g. steam, hot condensate, nitrogen, compressed CO₂ or compressed air), from a process that results in one or more of the consequences listed below and is not reported in Tier 1:

Note: Non-toxic and non-flammable materials (e.g. steam, hot water, nitrogen, compressed CO₂ or compressed air) have no threshold quantities and are only included in this definition as a result of their potential to result in one of the other consequences.

— an employee, contractor or subcontractor recordable injury;
— a fire or explosion resulting in greater than or equal to $2,500 of direct cost to the Company;
— a PRD discharge to atmosphere whether directly or via a downstream destructive device that results in one or more of the following four consequences:
  — liquid carryover;
  — discharge to a potentially unsafe location;
  — an on-site shelter-in-place;
  — public protective measures (e.g. road closure);
and a PRD discharge quantity greater than the threshold quantity in Table 2⁵;
— a release of material greater than the threshold quantities described in Table 2 in any one-hour period.

3.3 Calculation of a PSE Rate

The Tier 1 PSE Rate shall be calculated as follows:

\[
\text{Tier 1 PSE Rate} = \frac{\text{Total Tier 1 PSE Count}}{\text{Total Work Hours}} \times 200,000
\]

The Tier 2 PSE Rate shall be calculated as follows:

\[
\text{Tier 2 PSE Rate} = \frac{\text{Total Tier 2 PSE Count}}{\text{Total Work Hours}} \times 200,000
\]

Total work hours include employees and contractors.

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⁵ See Appendix A, Material Release Threshold Quantities
4 REPORTING TO API

During the first quarter of each calendar year, participating companies will be asked to submit data for the previous calendar year. The annual report will provide the information contained in Appendix B of this document.

A Process Safety Performance (PSP) summary report will be issued annually by API. It will present aggregate industry data that will reflect the total number of events separated by refining and petrochemical facilities, and by US data and international data, if applicable. The report will also contain a brief explanation of the data and its overall meaning.
REFERENCES

For complete information on Tier 1 and Tier 2 Process Safety Indicator Definitions and examples of PSEs:


For API webinars on RP 754 and Frequently Asked Questions (FAQS):

http://www.api.org/ehs/health/webinars.cfm

For more information on chemical listings:


UNECE, ECE/TRANS/202, Vol. I and II (“ADR 2009”), *European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR).*7


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### APPENDIX A

**MATIERAL THRESHOLD QUANTITIES**

<table>
<thead>
<tr>
<th>Threshold Release Category</th>
<th>Material Hazard Classification&lt;sup&gt;a,c,d&lt;/sup&gt;</th>
<th>Threshold Quantity (outdoor release)</th>
<th>Threshold Quantity (indoor release)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TIH Zone A Materials</td>
<td>5 kg (11 lb)</td>
<td>2.5 kg (5.5 lb)</td>
</tr>
<tr>
<td>2</td>
<td>TIH Zone B Materials</td>
<td>25 kg (55 lb)</td>
<td>12.5 kg (27.5 lb)</td>
</tr>
<tr>
<td>3</td>
<td>TIH Zone C Materials</td>
<td>100 kg (220 lb)</td>
<td>50 kg (110 lb)</td>
</tr>
<tr>
<td>4</td>
<td>TIH Zone D Materials</td>
<td>200 kg (440 lb)</td>
<td>100 kg (220 lb)</td>
</tr>
<tr>
<td>5</td>
<td>Flammable Gases</td>
<td>500 kg (1100 lb)</td>
<td>250 kg (550 lb)</td>
</tr>
<tr>
<td>6</td>
<td>Liquids with Initial Boiling Point ≤ 35 °C (95 °F) and Flash Point &lt; 23 °C (73 °F) or Other Packing Group I Materials excluding strong acids/bases</td>
<td>1000 kg (2200 lb) or 7 bbl</td>
<td>500 kg (1100 lb) or 3.5 bbl</td>
</tr>
<tr>
<td>7</td>
<td>Liquids with Flash Point ≥ 23 °C (73 °F) and ≤ 60 °C (140 °F) or Liquids with Flash Point &gt; 60 °C (140 °F) released at a temperature at or above Flash Point or strong acids/bases or Other Packing Group III Materials</td>
<td>2000 kg (4400 lb) or 14 bbl</td>
<td>1000 kg (2200 lb) or 7 bbl</td>
</tr>
</tbody>
</table>

It is recognized that threshold quantities given in kg and lb or in lb and bbl are not exactly equivalent. Companies should select one of the pair and use it consistently for all recordkeeping activities.

<sup>a</sup> Many materials exhibit more than one hazard. Correct placement in Hazard Zone or Packing Group shall follow the rules of DOT 49 CFR 173.2a or UN Recommendations on the Transportation of Dangerous Goods, Section 2. See Annex B.

<sup>b</sup> A structure composed of four complete (floor to ceiling) walls, floor, and roof.

<sup>c</sup> For solutions not listed on the UNDG, the anhydrous component shall determine the TIH zone or Packing Group classification. The threshold quantity of the solution shall be back calculated based on the threshold quantity of the dry component weight.

<sup>d</sup> For mixtures where the UNDG classification is unknown, the fraction of threshold quantity release for each component may be calculated. If the sum of the fractions is equal to or greater than 100 %, the mixture exceeds the threshold quantity. Where there are clear and independent toxic and flammable consequences associated with the mixture, the toxic and flammable hazards are calculated independently. See Annex A, Examples 28, 29, and 30.
### Table 2—Tier 2 Material Release Threshold Quantities

<table>
<thead>
<tr>
<th>Threshold Release Category</th>
<th>Material Hazard Classification&lt;sup&gt;a,c,d&lt;/sup&gt;</th>
<th>Threshold Quantity (outdoor release)</th>
<th>Threshold Quantity (indoor&lt;sup&gt;b&lt;/sup&gt; release)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TIH Zone A Materials</td>
<td>0.5 kg (1.1 lb)</td>
<td>0.25 kg (0.55 lb)</td>
</tr>
<tr>
<td>2</td>
<td>TIH Zone B Materials</td>
<td>2.5 kg (5.5 lb)</td>
<td>1.2 kg (2.8 lb)</td>
</tr>
<tr>
<td>3</td>
<td>TIH Zone C Materials</td>
<td>10 kg (22 lb)</td>
<td>5 kg (11 lb)</td>
</tr>
<tr>
<td>4</td>
<td>TIH Zone D Materials</td>
<td>20 kg (44 lb)</td>
<td>10 kg (22 lb)</td>
</tr>
<tr>
<td>5</td>
<td>Flammable Gases or Liquids with Initial Boiling Point $\leq$ 35 °C (95 °F) and Flash Point $&lt; 23 , ^\circ\text{C}$ (73 °F) or Other Packing Group I Materials excluding strong acids/bases</td>
<td>50 kg (110 lb)</td>
<td>25 kg (55 lb)</td>
</tr>
<tr>
<td>6</td>
<td>Liquids with a Initial Boiling Point $&gt; 35 , ^\circ\text{C}$ (95 °F) and Flash Point $\leq 60 , ^\circ\text{C}$ (140 °F) or Liquids with Flash Point $&gt; 60 , ^\circ\text{C}$ (140 °F) released at or above Flash Point; or Other Packing Group II and III Materials excluding moderate acids/bases or Strong acids and bases</td>
<td>100 kg (220 lb)</td>
<td>50 kg (110 lb) or 1 bbl</td>
</tr>
<tr>
<td>7</td>
<td>Liquids with Flash Point $&gt; 60 , ^\circ\text{C}$ (140 °F) released at a temperature below Flash Point or Moderate acids/bases</td>
<td>1000 kg (2200 lb)</td>
<td>500 kg (1100 lb) or 10 bbl</td>
</tr>
</tbody>
</table>

In order to simplify determination of reporting thresholds for Tier 2, Categories 6 and 7 in Tier 1 have been combined into one category in Tier 2 (Category 6). The simplification is intended to provide less complicated requirements for those events with lesser consequences. It is recognized that threshold quantities given in kg and lb or in lb and bbl are not exactly equivalent. Companies should select one of the pair and use it consistently for all recordkeeping activities.

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**Notes:**

- **a** Many materials exhibit more than one hazard. Correct placement in Hazard Zone or Packing Group shall follow the rules of DOT 49 CFR 173.2a or UN Recommendations on the Transportation of Dangerous Goods, Section 2. See Annex B.
- **b** A structure composed of four complete (floor to ceiling) walls, floor and roof.
- **c** For solutions not listed on the UNDG, the anhydrous component shall determine the TIH zone or Packing Group classification. The threshold quantity of the solution shall be back calculated based on the threshold quantity of the dry component weight.
- **d** For mixtures where the UNDG classification is unknown, the fraction of threshold quantity release for each component may be calculated. If the sum of the fractions is equal to or greater than 100 %, the mixture exceeds the threshold quantity. Where there are clear and independent toxic and flammable consequences associated with the mixture, the toxic and flammable hazards are calculated independently. See Annex A, Examples 28, 29, and 30.
APPENDIX B

PSE DATA CAPTURE INFORMATION

1. Site Information - The following information shall be captured for each site:
   a) type of facility (NAICS or equivalent international code);
   b) corporate name;
   c) company name (if different);
   d) site location/name (country, state/province, city, site name);
   e) site identifier(s) (unique number(s) assigned by data collection groups);
   f) total work hours:
      1) total hours worked by employees, and
      2) total hours worked by contractors and subcontractors.

2. Tier 1 PSE Information - The following information shall be captured for each Tier 1 PSE:
   a) site identifier;
   b) Tier 1 PSE consequences/ triggers,
      each Tier 1 PSE will have one or more of the following consequences (check all that apply):
      1) an employee, contractor, or subcontractor "days away from work" injury and/or fatality:
         i) number of employee days away from work injuries,
         ii) number of employee fatalities,
         iii) number of contractor or subcontractors days away from work injuries,
         iv) number of contractor or subcontractor fatalities;
      2) a third party (non-employees/contractor, community members) hospital admission and/or fatality:
         i) number of third-party hospital admissions,
         ii) number of third-party fatalities;
      3) an officially declared community evacuation or community shelter-in-place;
      4) a fire or explosion causing $25,000 or more in direct cost:
         i) fire,
         ii) explosion;
      5) a pressure relief device discharge to atmosphere whether directly or via a downstream destructive device (check one):
         i) PRD directly to atmosphere,
         ii) PRD to atmosphere via a downstream destructive device;
      that results in one or more of the following four consequences (check all that apply):
         i) contained liquid carryover,
         ii) discharged to an unsafe location,
         iii) resulted in an on-site shelter-in-place,
         iv) resulted in public protective measures (e.g., road closure);
      and a PRD discharge quantity greater than the threshold quantities in Table 1.
   6) an acute release of flammable, toxic, or corrosive chemicals from primary containment (check one):
      i) Tier 1 (Table 1) Threshold Release Category 1,
      ii) Tier 1 (Table 1) Threshold Release Category 2,
      iii) Tier 1 (Table 1) Threshold Release Category 3,
      iv) Tier 1 (Table 1) Threshold Release Category 4,
      v) Tier 1 (Table 1) Threshold Release Category 5,
      vi) Tier 1 (Table 1) Threshold Release Category 6,
      vii) Tier 1 (Table 1) Threshold Release Category 7.
   release location (check one):
      i) outdoor release,
      ii) indoor release.

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Since a Tier 1 Process Safety Event can result in one or more consequences, the total count of consequences will be equal to or greater than the total count of Tier 2 PSEs.
3. Tier 2 PSE Information - The following information shall be captured for each Tier 2 PSE:
   a) site identifier;
   b) Tier 2 PSE consequences/triggers,
      each Tier 2 PSE will have one or more of the following consequences (check all that apply):
      1) an employee, contractor, or subcontractor recordable injury:
         i) number of employee recordable injuries,
         ii) number of contractor or subcontractor recordable injuries;
      2) a fire or explosion causing $2,500 or more in direct cost:
         i) fire,
         ii) explosion;
      3) a pressure relief device discharge to atmosphere whether directly or via a
downstream destructive device (check one):
         i) PRD directly to atmosphere,
         ii) PRD to atmosphere via a downstream destructive device;
      that results in one or more of the following four consequences (check all that apply):
         i) contained liquid carryover,
         ii) discharged to an unsafe location,
         iii) resulted in an on-site shelter-in-place,
         iv) resulted in public protective measures (e.g. road closure);
      and a PRD discharge quantity greater than the threshold quantities in Table 2;
      4) an acute release of flammable, combustible, toxic, or corrosive chemicals from
primary containment (check one):
         i) Tier 2 (Table 2) Threshold Release Category 1,
         ii) Tier 2 (Table 2) Threshold Release Category 2,
         iii) Tier 2 (Table 2) Threshold Release Category 3,
         iv) Tier 2 (Table 2) Threshold Release Category 4,
         v) Tier 2 (Table 2) Threshold Release Category 5,
         vi) Tier 2 (Table 2) Threshold Release Category 6,
         vii) Tier 2 (Table 2) Threshold Release Category 7.
release location (check one):
         i) outdoor release,
         ii) indoor release.

4. PSE Related Information - The following information is useful in data analysis and shall be captured for each Tier 1 and Tier 2 PSE:
   a) Type of process:
      1) Refining Processes (check one):
         i) HF alkylation,
         ii) sulfuric alkylation
         iii) bitumen/resid/asphalt,
         iv) calcining,
         v) coking,
         vi) crude,
         vii) desulfurization,
         viii) fcc,
         ix) gas treating (H2S absorbers and amine systems),
         x) hydrogen,
         xi) hydrotreating/hydrocracking,
         xii) isom,
         xiii) marine/jetty,
         xiv) reforming,
         xv) sulfur recovery,
         xvi) tank farm/offsites,
         xvii) utilities/steam plant/cogeneration,
         xviii) vapor recovery/light ends,
         xix) wastewater,
         xx) other;
2) Petrochemical and Other Processes—not an appropriate aggregation due to the wide variety of petrochemical and other processes.

b) Date and time of event.

c) Mode of operation (check one):
   i) start-up,
   ii) planned shutdown,
   iii) emergency shutdown,
   iv) normal,
   v) upset,
   vi) turnaround,
   vii) routine maintenance,
   viii) temporary,
   ix) other.

d) Point of release (check one):
   i) pump,
   ii) compressor,
   iii) blower/fan,
   iv) pressure vessel (drum, tower, pressurized storage),
   v) filter/coalescer,
   vi) furnace,
   vii) boiler,
   viii) heat exchanger,
   ix) cooling tower,
   x) piping system (piping, gaskets, site glasses, expansion joints, tubing, valves),
   xi) reactor,
   xii) atmospheric tank,
   xiii) flare/relief system,
   xiv) other.

e) Type of material released (check one):
   i) flammable,
   ii) combustible,
   iii) toxic,
   iv) corrosive,
   v) utilities (e.g. air, water, steam, nitrogen, etc.)
   vi) other.

f) Comments.
APPENDIX C
DECISION LOGIC TREE

An unplanned or uncontrolled release of any material, including non-toxic and non-flammable materials (e.g., steam, hot condensate, nitrogen, compressed CO2, or compressed air) from a process that results in one or more of the consequences listed below:

- An employee, contractor or subcontractor "days away from work" injury and/or fatality;
- A hospital admission and/or fatality of a third-party;
- Not a Tier 1 or Tier 2 PSE;
- Tier 1 PSE;
- Tier 2 PSE;
- A fire or explosion resulting in greater than or equal to $25,000 of direct cost to the Company;
- A pressure relief device (PRD) discharge to atmosphere whether directly or via a downstream destructive device that results in one or more of the following four consequences:
  - Liquid carryover; or
  - Discharge to a potentially unsafe location; or
  - An on-site shelter-in-place; or
  - Public protective measures (e.g., road closure); and a PRD discharge quantity greater than the threshold quantities Table 2;
- A release of material greater than the threshold quantities described in Table 2 in any one-hour period;
- A company may choose to record a Tier 3 other LOPC.

NOTES:

10 API Recommended Practice 754
If you have question regarding this survey or would like to participate, please contact:

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