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Proposal on the Process Safety Metric reporting in Annual Responsible Care Key Performance Indicators (KPI) Submission

Background

The Process Safety Harmonization Taskforce of the Responsible Care Leadership Group (RCLG) has recommended that International Council of Chemical Associations (ICCA) to adopt a **process safety event rate metric** to the annual Key Performance Indicators (KPI) Submission by Responsible Care signatories to its respective country association.

The proposal for process safety event reporting will enable broad-based global reporting of process safety performance across the chemical and petrochemical industries. It will provide a roadmap for regions, associations and companies who are currently not tracking process safety performance to recognize the benefits that tracking and reporting will bring and for those who are already gathering process safety data, to be aligned globally and focused on continuous improvement in process safety performance.

Data to be reported

For the purposes of this KPI reporting, signatories are requested to report additional data on **Total Number of Process Safety Events (PSE)**

Pilot reporting in 2018 (for 2017 data)

SCIC will embark on a pilot reporting on the additional data on the total number of PSE in the annual KPI reporting exercise in 2018 (for 2017 data).

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Criteria on the determination of Process Safety Event (PSE)

For the purposes of this KPI reporting, a process safety event has occurred when:

1) A chemical substance or a chemical process is directly involved; **AND**	√
2) The incident occurred in production, distribution, storage, utility, pilot plant within the site boundaries of company's facility; **AND**	√
3) There was a release of material or energy (e.g. fire, explosion, implosion) from a process unit; **AND**	√
4) **One or more** of the following **Reporting Thresholds** have been met:	
a) Safety / Injury Injury resulting in a Recordable, Lost Time Accident or Fatality; or Hospital admission of anyone on or off site; **OR**	√
b) Direct Damage Cost A fire, explosion or clean up necessary to avoid/remediate environmental damage resulting in a direct cost equal to or greater than $2,500 USDs; **OR**	√
c) Shelter in Place / Evacuation • An officially declared shelter in place (on or off site); **OR** • An officially declared evacuation (on or off site); **OR** • A precautionary off site shelter in place or evacuation **OR**	√
d) Threshold Release • The material released meets the release thresholds contained in the API RP-754 standard – refer to **Table 1.**	√

**refer to the next section on detailed guidelines on identifying a PSE*
About API RP 754: http://www.api.org/oil-and-natural-gas/health-and-safety/process-safety/process-safety-standards/rp-754

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Detailed Guidelines on Identifying a Process Safety Event

A. Chemical Involvement
When a chemical substance or chemical process is directly involved

A chemical or chemical process must have been directly involved in the event or incident. For this purpose, the term "process" is used broadly to include the equipment and technology needed for petrochemical production, including reactors, tanks, piping, boilers, cooling towers, refrigeration systems, etc. An incident with no direct chemical or process involvement, e.g., an office building fire, even if the office building is on a plant site, is not reportable.

B. Location
The incident occurred in production, distribution, storage, utility, pilot plant within the site boundaries of company's facility

The incident occurs in production, distribution, storage (including active storage areas such as warehouses – see FAQ section), utilities or pilot plants of a facility reporting metrics under these definitions. This includes tank farms, ancillary support areas (e.g., boiler houses and waste water treatment plants) and distribution piping under control of the site. All reportable incidents occurring at a location will be reported by the company that is responsible for operating that location. This applies to incidents that may occur in contractor work areas as well as other incidents. At tolling operations and multi-party sites, the company that operates the unit where the incident initiated should record the incident and count it in their reporting.

C. Release of Material
There was a release of material or energy (e.g. fire, explosion, implosion) from a process unit

Release of Material – an unplanned or uncontrolled release of any material, including non-toxic and non-flammable materials (e.g. steam, hot water, nitrogen, compressed CO2 or compressed air), from a process that results in consequences that exceed one or more of the 4 Reporting Thresholds listed in this document.

A release to a flare or scrubber is still considered to be within the primary containment as long as the mitigation system (e.g. scrubber, flare) is operated under normal conditions without any release above the thresholds defined for normal operation. A release to a secondary containment (e.g. waste water treatment or dike) will qualify as a process safety event because the substance is leaving the primary process system.

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D. Thresholds

One or more of the following Reporting Thresholds must be met for reportable process safety events.

1. Safety / Injury

Injury resulting in a Recordable, Lost Time Accident or Fatality; or Hospital admission of anyone on or off site;

Recordable injuries are work-related injuries 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.

Lost time injuries and fatalities that occur as a result of process related loss of primary containment, fire, or explosion are those that fit into one of the following categories:

- Employee (Lost time and/or Fatality)
- Contractor and Subcontractor (Lost time and/or Fatality)
- Third Party (Injury/illness resulting in Hospital Admission or Fatality)

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."

Examples of injury or fatality cases that would be reportable include a burn injury resulting from steam released during cleaning; a physical injury from a cap blown off by pressure during a pressure test; or a chemical burn from a spill while taking a sample. Examples of injuries or fatality cases that would not be reportable include a fall from an elevated work station while performing maintenance; a burn from a fire in a laboratory or office building; or injuries from an excavation cave-in. None of these cases are directly due to the release of energy or material from the process.

2. Direct Damage Cost

A fire, explosion or clean up necessary to avoid/remediate environmental damage resulting in a direct cost equal to or greater than $2,500 USDs

Costs to be considered for this threshold should be those costs directly attributed to the fire and/or explosion, such as the replacement value of equipment lost, structures lost, cost of repairs, environmental cleanup (on and off site), emergency response and/or fines. Direct cost does not include indirect costs, such as business opportunity losses, loss of profits due to equipment outages, cost of obtaining or operating temporary facilities or cost of obtaining replacement products to meet customer demand (product losses).

3. Shelter in Place / Evacuation

An officially declared shelter in place or evacuation either on or off site OR a precautionary shelter in place or evacuation off site

For the purposes of this reporting, an officially declared shelter in place or evacuation, on or off site, OR a precautionary shelter in place or evacuation is declared off site would trigger this threshold

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).

Precautionary Declaration - A precautionary public response is a measure taken from an abundance of caution and issued by a recognized community official or delegate whom has reasonably determined that such an evacuation or shelter in place was necessary to protect the public health and safety.

Shelter in Place – is the use of a structure and its indoor atmosphere to temporarily separate individuals from a hazardous outdoor atmosphere

Evacuation – the act or process of removing persons from a place for reasons of safety or protection

4. Threshold Release

*An **acute release** that exceeds the threshold as stipulated in the API 754 standard for Tier II process safety release thresholds in **Table 1** (measured in amount released during **one hour**)*

Acute Release – A release of flammable, combustible, or toxic chemicals from the primary containment (i.e., vessel or pipe) greater than the chemical release threshold quantities is described in Table 1 - API 754 standard for Tier II process safety release thresholds

Pressure Relief Device: Acute Releases, defined above, **include** releases to a properly designed and operating pressure relief device if a quantity is released greater than or equal to the threshold quantities in Table 1 - API 754 standard for Tier II process safety release thresholds, that results in one or more of the following four consequences:

1. Rainout;
2. Discharge to a potentially unsafe location;
3. A n on-site shelter-in-place or on-site evacuation, excluding precautionary on-site shelter-in-place or on-site evacuation;
4. Public protective measures (e.g., road closure) including precautionary public protective measures.

Releases to a properly designed and operating pressure relief device (such as a flare, scrubber, etc.) **do not** have to be reported if they do not meet one of the four criteria above.

1 Hour Rule
For the purpose of the reporting under this metric, release thresholds are established for materials over a one-hour time frame. If the release amount of a material reaches or exceeds the reporting threshold in a 1-hour time period or less, it is reportable. Typically, acute releases occur in 1-hour or less. If the duration of the release cannot be determined, the duration should be assumed to be 1 hour.

Primary Containment – A tank, vessel, pipe, rail car or equipment intended to serve as the primary container or used for the transfer of the material. Primary containers may be designed with secondary containment systems to contain and control the release. Secondary containment systems include, but are not limited to, tank dikes, curbing around process equipment, drainage collection systems into segregated oily drain systems, the outer wall of double walled tanks, etc.

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Table 1 – API RP 754 Tier II Classification Table

Threshold Release Category	Material Hazard Classification [a,c,d,e,f]	Threshold Quantity (outdoor release)	Threshold Quantity (indoor[b] release)
T2-1	TIH Zone A Materials	≥ 0.5 kg (1.1 lb)	≥ 0.25 kg (0.55 lb)
T2-2	TIH Zone B Materials	≥ 2.5 kg (5.5 lb)	≥ 1.25 kg (2.75 lb)
T2-3	TIH Zone C Materials	≥ 10 kg (22 lb)	≥ 5 kg (11 lb)
T2-4	TIH Zone D Materials	≥ 20 kg (44 lb)	≥ 10 kg (22 lb)
T2-5	Flammable Gases **OR** Liquids with Normal Boiling Point ≤ 35 °C (95 °F) and Flash Point < 23 °C (73 °F) **OR** Other Packing Group I Materials (excluding acids/bases)	≥ 50 kg (110 lb)	≥ 25 kg (55 lb)
T2-6	Liquids with Normal Boiling Point > 35 °C (95 °F) and Flash Point < 23 °C (73°F) **OR** Other Packing Group II Materials (excluding acids/bases)	≥ 100 kg (220 lb) or ≥ 0.7 bbl	≥ 50 kg (110 lb) or ≥ 0.35 bbl
T2-7	Liquids with Flash Point ≥ 23 °C (73 °F) and ≤ 60 °C (140 °F) **OR** Liquids with Flash Point > 60 °C (140 °F) released at a temperature at or above Flash Point **OR** strong acids/bases (see definition Refer to draft RP 754 document) **OR** UNDG Class 2, Division 2.2 (non-flammable, non-toxic gases) excluding air **OR** Other Packing Group III Materials	≥ 200 kg (440 lb) or ≥ 1.4 bbl	≥ 100 kg (220 lb) or ≥ 0.7 bbl
T2-8	Liquids with Flash Point > 60 °C (140 °F) and ≤ 93 °C (200 °F) released at a temperature below Flash Point **OR** Moderate acids/bases	≥ 1000 kg (2200 lb) or ≥ 7 bbl	≥ 500 kg (1100 lb) or ≥ 3.5 bbl

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Note:
A copy of the list of chemicals can be found on the CCPS website:
Step 1: CCPS web site - http://www.aiche.org/ccps/knowledgebase/measurement.aspx
Step 2: download the Process Safety Incident Evaluation Tool
Step 3: search "Chemical List and View Chemical Details

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