**Draft – October 1, 2015**

**Process Safety Taskforce Final Recommendations to Responsible Care® Leadership Group**

**For Decision**

**Background**

The Responsible Care® initiative began in 1985 and as the chemical industry’s commitment to continuous performance improvements. Process Safety has been a pillar of Responsible Care since its inception, and many regional approaches to tracking and reporting process safety performance have developed over the 30 years of Responsible Care implementation, yet no globally harmonized system had been put into place. In 2012, in the wake of several high profile process safety events, the International Council of Chemical Associations (ICCA) Board of Directors directed the Responsible Care Leadership Group (RCLG) to develop a recommendation for a globally harmonized process safety performance reporting by no later than 2015.

Throughout 2013 and 2014, a Taskforce comprised of multinational companies and RCLG associations, chaired by Dr. Peter Schmelzer, Head of Health, Safety and Environmental Protection Bayer HealthCare AG, worked to develop a globally harmonized ICCA approach to process safety performance reporting. A list of Taskforce members can be found in Appendix A. During the same timeframe, the American Petroleum Institute (API) also initiated a process to update its Recommend Practice 754 (RP-754) – Leading and Lagging Process Safety Metric Standard. RP-754 is broadly used in the petrochemical sector and in the Americas region to track process safety performance. To optimize global adoption of a unified standard, the RCLG Taskforce strived to achieve full harmonization of its recommendation with the revised API RP 754 metric, expected to be finalized in mid-2015.

**Executive Summary**

After more than 2 years of discussion, research, debate and feasibility assessment, the Process Safety Harmonization Taskforce recommends that ICCA adopt a process safety event rate metric. The adoption of this metric would require each RCLG association to collect the number of process safety events experienced by their members on an annual basis, as well as total number of worker hours (employees and contractors) experienced by their members each year. The process safety event rate is the ratio of events to hours. The Taskforce also recommends that reporting of these data points to the RCLG be phased in over the next 3 years, allowing regions with the desire and ability to report immediately to do so, while also allowing additional time to companies and organizations that are developing the ability to track these data for the first time.

The criteria that determine whether a process-related event qualifies as a process safety event are based on a loss of primary containment of a chemical or a release of energy triggering thresholds any one of four impact areas: 1) safety/human health consequences; 2) direct cost due to damage from incident; 3) community impact; and 4) chemical release quantity. See Appendix B flow chart showing reporting triggers. These four impact areas in the recommended ICCA process safety event definition are identical to the impact areas in the RP-754 Tier II incident standard. The thresholds for reporting are also identical in all areas with the exception of the chemical release quantity thresholds. To address this difference, the ICCA process safety event definition will allow companies the use of either the GHS-based reporting thresholds developed by ICCA for the chemical release criteria, or the UN Dangerous Goods (UNDG)-based reporting thresholds used in the RP-754 standard for Tier II incidents. The Taskforce believes that the two systems, though different, are comparably robust in the universe of chemicals covered and the severity of incidents captured by reporting. While there will be relatively little difference in the numbers of events captured and reported using the two different threshold approaches, there may be differences that would be most clearly seen at the company level based on raw material and product use; hence the Taskforce cautions companies not to compare their results with companies that use a different chemical release threshold approach. Regardless, under the RCLG proposal, companies can choose the chemical release thresholds by which they report in to their national and regional associations. If associations are interested in translating results based on one reporting approach to another, the RCLG will provide a translation table. However, given the complexity of this exercise and the need to access raw incident data, the Taskforce does not believe that this adds value and recommends against it.

The Taskforce believes that this 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 that are currently not tracking process safety performance recognize the benefits that tracking and reporting will bring. For regions, associations and companies that are already experienced in gathering process safety data, this recommendation allows for broader global alignment and focus on continuous improvement in process safety performance. The systems that are built to improve process safety performance are informed by robust process safety event data, and this is the major objective of this initiative.

**Data to be reported by RCLG Associations to RCLG**

On an annual basis, RCLG Associations will be asked to report two data points into ICCA using the RCLG KPI Reporting Website on the schedule provided above.

1. Total Member Company Worker Hours for Association (employee and contractor)

2. Total Number of Process Safety Events

ICCA will use the above two data points to report process safety performance in the form of Process Safety Event Rate (PSER), normalized per 100 employees where an employee works 2,000 hours a year.

(Total Events / Total Hours) x 200,000 = PSER

**Recommended Reporting Schedule**

The Taskforce recommends a phased-in approach for reporting process safety event rate. Such a schedule will allow more experienced companies and associations to report in the next several years, while allowing other companies and associations to begin reporting by 2019. RCLG Associations would be asked to report the two process safety event rate data points annually to the ICCA through the RCLG KPI metrics reporting system: <http://kpi.responsiblecare.eu> If you do not know your association’s username and password, please contact the RCLG.

The proposed schedule for process safety event rate reporting by RCLG associations is as follows:

**April 2015** RCLG considers Taskforce proposal

**June 2015** ICCA Board of Directors considers RCLG final recommendation

**July 2015** RCLG releases detailed reporting guidance document for associations and member companies

**2016 RCLG Reporting** RCLG initiates process safety reporting pilot program through association volunteers

**2017-2018 RCLG Reporting** **Optional** process safety data reporting by RCLG Associations

**2019 Reporting** RCLG includes process safety as a **mandatory** metric in the KPI reporting program

**Appendix A – List of RCLG Taskforce Members**

|  |  |
| --- | --- |
| **Name** | **Affiliation** |
| Peter Schmelzer | Bayer, CEFIC - Chairman |
|  |  |
| Americo Diniz Carvalho Neto | Braskem |
| Bradford Johnson | American Chemistry Council |
| David Cummings | DuPont |
| Debra Phillips | American Chemistry Council |
| Hans Schwarz | BASF |
| Kathryn Walton | Plastics and Chemicals Industries Association |
| Kazuyuki Akita | Japanese Chemical Industry Association |
| Kelly Keim | ExxonMobil Chemical Company, API Representative |
| Kenan Stevick | Dow |
| Kiyokazu Murata | Japanese Chemical Industry Association |
| Larry Bowler | SABIC |
| Lorna Young | Chemical Industry Association of Canada |
| Louisa Nara | Center for Chemical Process Safety |
| Luiz Shizuo Harayashiki | Associação Brasileira da Indústria Química |
| Masatoshi Kumamoto | Japanese Chemical Industry Association |
| Milton Lacerda | Petrobras |
| Phil Scott | Chemical Industries Association |
| Piet Knijff | DSM, European Process Safety Centre |
| Scott Donaldson and Eamon Chandler | Shell |
| Scott Wallace | Olin Corporation |
| Shakeel Kadri | Air Products and Chemicals, Inc. |

**Appendix B – Overview of ICCA Process Safety Event Criteria as a Flow Chart**

**NO: Does not meet the criteria for a Process Safety Event**

**Start**

**NO**

**NO**

**NO**

**Was a chemical substance or a chemical process directly involved?**

**YES**

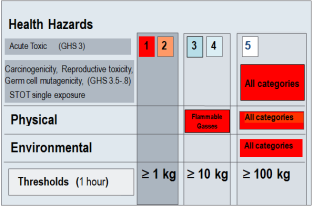
**YES**

**Release of material, fire, explosion or implosion from/at a chemical process unit?**

**Incident in production, distribution, storage, utilities, pilot plants within a company’s facility?**

**YES**

**NO**



**Substance Release Thresholds met?**

**Recordable employee injury**

**or**

**hospital admission of people on or off site?**

**Damage**≥ **$2,500  
direct cost  
to company?**

**Officially declared shelter in place or evacuation?**

**NO**

**NO**

**NO**

**ICCA or API 754 Tier II chemical release thresholds exceeded?**

**YES**

**YES**

**YES**

**YES**

**Yes: Reportable as a Process Safety Event**

**Appendix C - Key Criteria for Reporting Process Safety Events to RCLG**

**Total Worker Hours**

RCLG Associations should report the total number of employee hours worked for each member company in that association and the total number of contractor, including subcontractor, hours worked for each member company as a combined, single number. For the purposes of this guidance document, each association should refer to their local and regional definitions for employee and contractor. The goal for reporting total hours is to include all individuals who are involved with chemical manufacturing.

**Process Safety Event**

For the purposes of this ICCA Reporting, a process safety event has occurred when:

1. When 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:
   1. **Safety / Injury**
      * Injury resulting in a Recordable, Lost Time Accident or Fatality; or Hospital admission of anyone on or off site; **OR**
   2. **Direct Damage Costs**
      * 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**
   3. **Shelter in Place / Evacuation**
      * An officially declared shelter in place (on or off site); **OR**
      * An officially declared evacuation (on or off site); **OR**
   4. **Threshold Release**
      * The material released meets one of the GHS thresholds in **Table 1**. (measured in amount released during **one hour**)
      * As an alternative, companies can choose to use the release thresholds contained in the API RP-754 standard

**Note – Individuals who would like to view the API RP-754 Standard may download that standard at -** [**http://www.api.org/environment-health-and-safety/process-safety/process-safety-standards/standard-rp-754**](http://www.api.org/environment-health-and-safety/process-safety/process-safety-standards/standard-rp-754)

**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 passive storage areas), 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.

***D. 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;*  
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, 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.

***3. Shelter in Place / Evacuation***

*An officially declared shelter in place* ***or*** *an officially declared evacuation either on or off site*

For the purposes of this reporting, only an officially declared shelter in place or evacuation, on or off site, is to be considered for this criteria. Precautionary decisions and announcements are not to be counted towards this trigger.

**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).

**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 one of the GHS thresholds in* ***Table 1*** *or in the API 754 standard for Tier II process safety release thresholds (measured in amount released during* ***one hour****)*

As mentioned in the Executive Summary, the ICCA process safety event definition allows use of either GHS-based reporting thresholds developed by ICCA for the chemical release criteria, or the UN Dangerous Goods (UNDG)-based reporting thresholds used in the RP-754 standard for Tier II incidents. The GHS thresholds are listed in **Table 1.** It is intended for companies to decide which table to use and to allow companies the option to use one system globally.

**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** *and in the API 754 standard for Tier II process safety release thresholds***.** These releases **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,** *or and in the API 754 standard for Tier II process safety release thresholds,* that results in one or more of the following three consequences:

1. Liquid carryover;
2. Discharge to a potentially unsafe location;
3. An on or off site shelter-in-place or evacuation.

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 three criteria above.

Individuals who would like to view the API RP-754 Standard may download that standard at - [**http://www.api.org/environment-health-and-safety/process-safety/process-safety-standards/standard-rp-754**](http://www.api.org/environment-health-and-safety/process-safety/process-safety-standards/standard-rp-754)**.**

**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.

**Table 1 – GHS Classification System**

**Health Hazards**



Acute Toxic (GHS 3)

**1**

**2**

**3**

**4**

**5**

Carcinogenicity, Reproductive toxicity,   
Germ cell mutagenicity, (GHS 3.5-.8)

**All categories**

STOT single exposure

**Flammable Gases**

**Physical Hazards**

**All categories**

**All categories**

**Environmental Hazards**



**Release Thresholds**

**(During 1 hour timeframe)**

≥ **1 kg**

≥ **10 kg**

≥ **100 kg**

**Appendix D – Severity Table: Using A Severity Weighting System is Encouraged for All Associations**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Event Incident Categories** | | | | |
| **Severity Level** | **Safety/Human Health** | **Direct Cost from Fire or Explosion** | **Material Release Within 1-Hr Period** | **Community Impact** | **Environmental Impact**  **[off-site]** |
| **Level 4**  **1 point** | * Injury requiring treatment beyond first aid to an employee, contractor, or subcontractor.   (Meets local regulations) | * Resulting in Direct Damage Cost of   **$2.5 K ≤ $25 K** | * Release volume between   **1x ≤ TQ < 40x** | * Officially declared shelter-in-place or officially declared evacuation (on or off site)   **≤ 3 hours** | * Acute Environmental Remediation Cost   **$2.5 K ≤ $25 K** |
| **Level 3**  **3 points** | * Days Away From Work injury to an employee, contractor, or subcontractor, or * Injury requiring treatment beyond first aid to a third party   (Meets local regulations) | * Resulting in Direct Damage Cost of   **$25 K ≤ $250 K** | * Release volume between   **40x ≤ TQ < 160x** | * Officially declared shelter-in-place or officially declared evacuation (on or off site)   **3 hours ≥ 12 hours** | * Acute Environmental Remediation Cost   **$25 K ≤ $250 K**  OR   * Small-scale injury or death of aquatic or land-based wildlife. |
| **Level 2**  **9 points** | * A fatality of an employee, contractor, or subcontractor, or * A hospital admission of a third party      (Meets local regulations) | * Resulting in Direct Damage Cost of   **$250 K ≤ $25 M** | * Release volume between   **160x ≤ TQ < 640x** | * Officially declared shelter-in-place or officially declared evacuation (on or off site)   **12 hours ≥ 24 hours** | * Acute Environmental Remediation Cost   **$250 K ≤ $25 MM**  OR   * Medium-scale injury or death of aquatic or land-based wildlife. |
| **Level 1**  **27 points** | * Multiple fatalities of employees, contractors, or subcontractors, or * multiple hospital admission of third parties, or * A fatality of a third party   (Meets local regulations) | * Resulting in Direct Damage Costs of   **≥ $25 MM** | * Release volume   **≥ 640x TQ** | * Officially declared shelter-in-place or officially declared evacuation (on or off site)   **≥ 24 hours** | * Acute Environmental Remediation Cost   **≤ $25 MM**  OR   * Large-scale injury or death of aquatic or land-based wildlife. |

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# Severity weighting can provide additional useful information about process safety events that may help drive performance improvement. Appendix D is the RCLG methodology for calculating a severity weight for process safety events. Using Appendix D, a severity weight for each process safety event may be calculated by summing the points associated with each consequence category. The ICCA strongly encourages the use of a severity weighting system as the use of such a system increases the ability to communicate performance and is an easier way for our stakeholders to understand process safety events.

# NOTE – If you are using the API RP 754 Tier II Process Safety Metric Threshold Table, please use the API RP 754 Process Safety Severity Table

# Rate Adjusted Metrics

Utilizing the severity table described above, there are a variety of rate-based metrics which can be generated. These include:

**Process Safety Total Incident Rate (PSTIR):** Total event incidents x 200,000 \_\_\_

Total employee & contractor work hours

**Process Safety Incident Severity Rate (PSISR)** (i.e., severity-weighted Process Safety incident rate formula):

Total severity score for all events incidents x 200,000\_\_\_

**PSISR** = Total employee, contractor & subcontractor work hours

In determining this rate, 1 point is assigned for each Level 4 incident attribute, 3 points for each Level 3 attribute, 9 points for each Level 2 attributes, and 27 points for each Level 1 attributes. Theoretically, a process safety event could be assigned a minimum of 1 point (i.e., the incident meets the attributes of a Level 4 incident in only one category) or a maximum of 135 points (i.e., the incident meets the attributes of a Level 1 incident in each of the five categories.)

**PS Level “X\*” incident rate:** Total Severity Level “X\*” PS incidents x 200,000

Total employee, contractor & subcontractor work hours

Where X\* can be the total count of Severity Level 4, 3, 2, or 1 incidents. The severity level of an incident is the maximum severity rating of the four consequence categories.