Performance Metrics Guidance Document

Responsible Care Performance Metrics guidance document for GPCA member companies

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This Guideline document was developed by the Responsible Care Performance Metrics Subcommittee. At the time of publication of this Guide, the Subcommittee had the following membership:

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Their technical insights, experiences, and suggestions were essential to the development of this Guide.

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1. Introduction

Continuous improvement and reporting performance is a fundamental element of the GPCA Responsible Care initiative. In alignment with ICCA Global Charter, GPCA's guiding principles define the vision for petrochemical and chemical manufacturers in region as follows:

"Safeguarding people and the environment by continuously improving our environmental, health and safety performance; the security of our facilities, processes and technologies; and by driving continuous improvement in chemical product safety and stewardship throughout the supply chain"

Strategy

To achieve this vision GPCA has taken a proactive approach to understanding Environment, Health Safety and Security (EHS&S) issues in the region by introducing a common set of performance metrics for all member companies. This process will continue to facilitate shared learning and identify organizations that are leaders in specific aspects of EHS&S performance. The intent is to:

- Keep the reporting program simple by building on commonly reported performance metrics for the chemical industry
- Where applicable, align with global trade associations
- Use data for benchmarking and cascade to the International Council of Chemicals Association (ICCA), identifying areas for improvement and best practice sharing
- Realize value added benefits and industry performance improvements over time

Implementation

GPCA through the Performance Metrics Subcommittee and Responsible Care Committee will provide expertise in analyzing the data and consolidated results, as well as provide guidance to member companies so that improvements can be realized. Reporting is mandatory for full GPCA member companies.

GPCA will ensure the performance data is appropriately managed in order to protect the reputation of its member companies.

The following list of Performance Metrics shall be used by all the Manufacturing and Logistic Service Provider categories for annual reporting purpose:

Occupational safety	Manufacturers	LSPs
Fatal cases – Employees	√	√
Lost time injury frequency rate – Employees	√	√
Total recordable incident rate – Employees	√	√
Fatal cases – Contractors	√	√
Lost time injury frequency rate – Contractors	√	√
Total recordable incident rate – Contractors	√	√

Process safety		
Process safety incidents	√	
Process Safety Total Incident Rate (PSTIR)	√	
Process Safety Total Incident Severity Rate (PSTISR)	√	

Emissions / Discharges to environment		
Hazardous waste for disposal	√	√
Non-hazardous waste for disposal	√	√
Quantity of waste water discharged to environment	√	√
Waste Water discharged to environment – Chemical oxygen demand	√	
Sulfur oxides (SOx)	√	
Nitrogen oxides (NOx)	√	
Total Green House Gas (GHG) emissions	√	
Carbon dioxide (CO_2) intensity	√	√

Resource utilization		
Use of energy (Tons of fuel oil Equivalent (TOE))	√	
Specific energy consumption	√	
Process water consumption	√	√
Total fuel consumption		√
Electrical consumption		√

Product distribution		
Number of distribution incidents	√	
Tons of cargo moved		√
KM driven loaded		√
KM driven un-loaded		√
Loss of product		√
Rollovers		√
Incidents requiring the involvement of government authorities		√

2. Annual PM data submission

When a member company is submitting its annual PM data, the GPCA Responsible Care IT Platform shall be utilized. The web application can be accessed via website/portal using the following information:

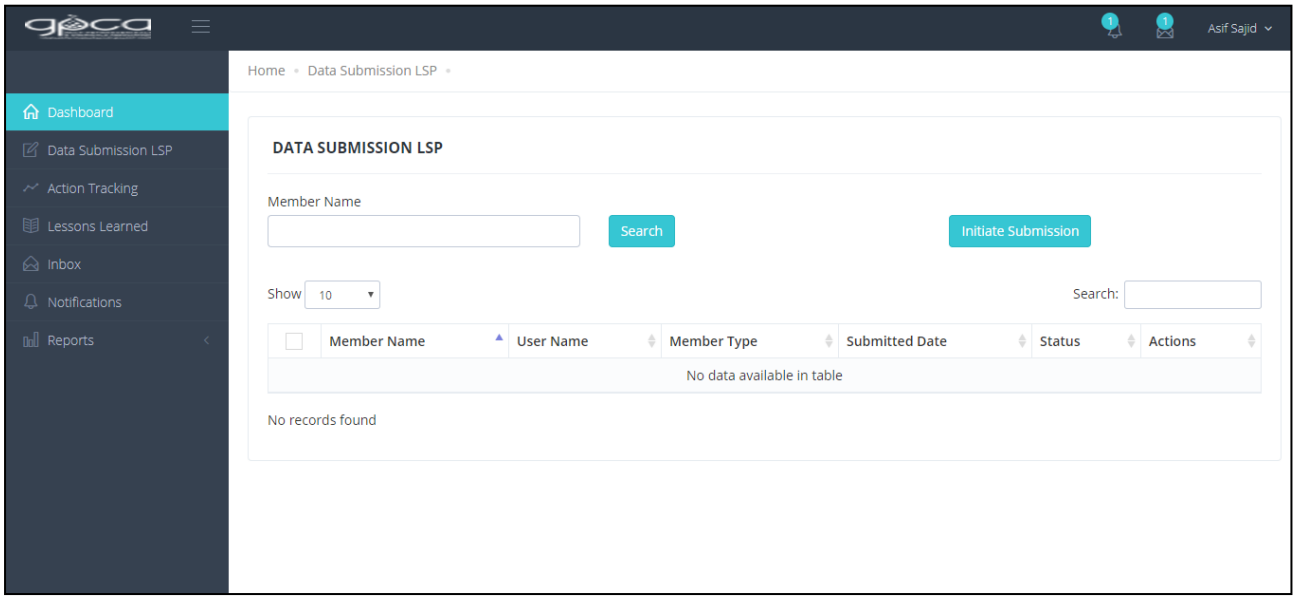
- ✓ URL: http://www.gpcacommittees.com/login.aspx
- ✓ Login ID
- ✓ Password

Main page – Login page

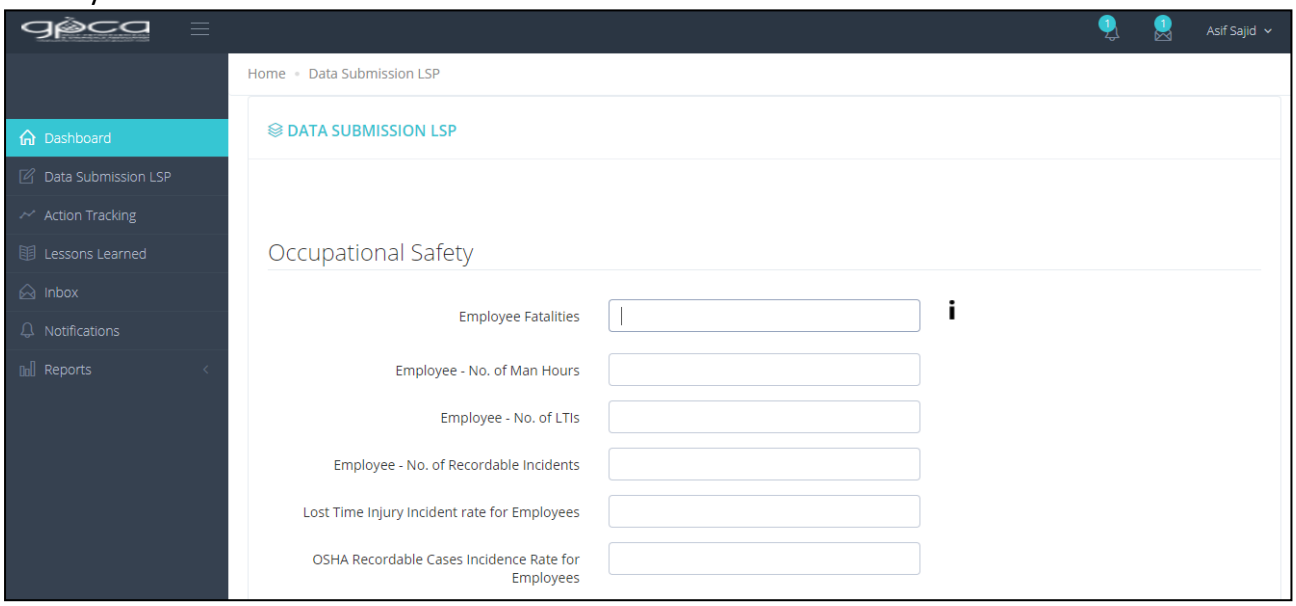
The website's main page provides functionality to members companies for logging in.
The "Forgot password" hyperlink redirects users to "Forgot password" page.
The "Register" hyperlink opens a pop-up window where members can register.

Data Submission:

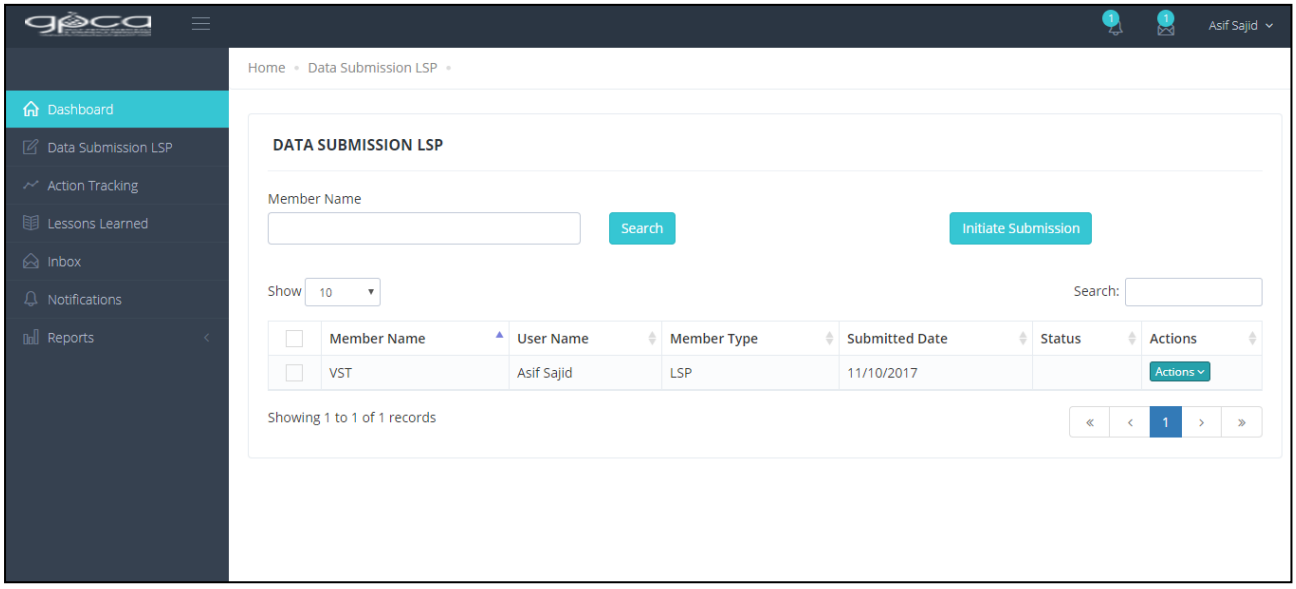
Clicking on the "Data submission" bar would take you to the following screen.



Once you've completed the page and pressed "Initiate submission", the below screen will appear. If you click on any textbox, the letter "i" – for "information" – will appear on the side. Hover your mouse over it to access the information.



You then need to fill in all fields and submit the data. After submitting the data, the below screen will appear.



Once you submit your data, you will receive a confirmation email like the below.

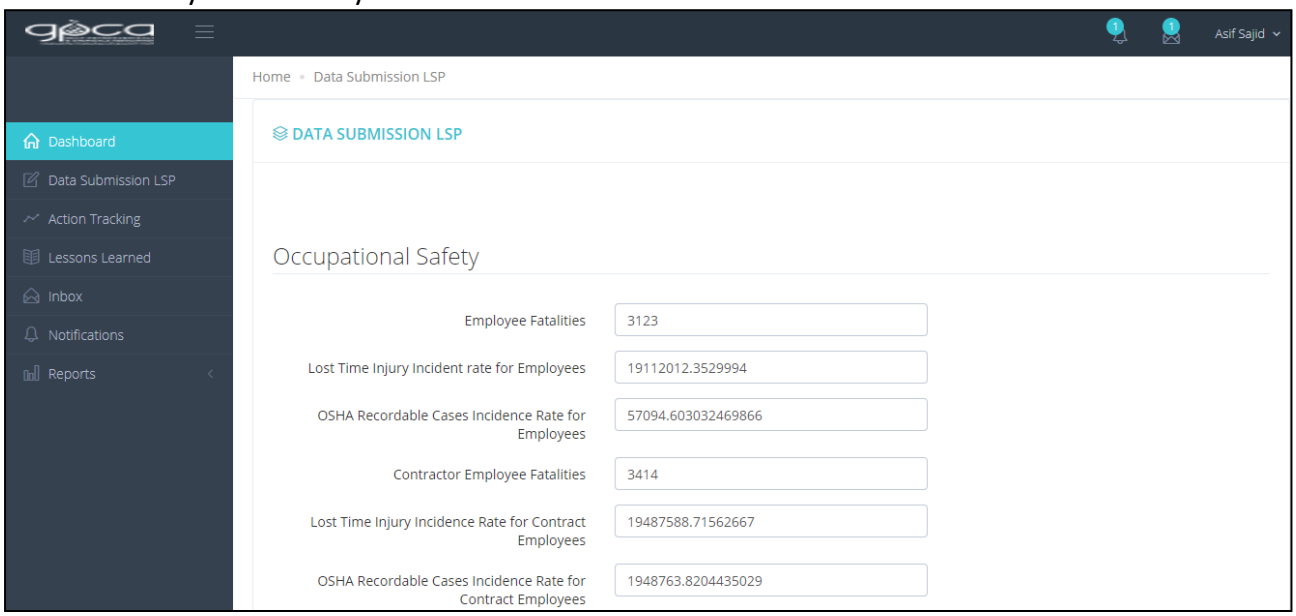
Dear Asif Sajid,

Thanks you for submitting the Performance Metrics Data for the performance year 2016. A separate action item shall be generated in case there is any query or conflict in the submitted data.

In case you want to modify any submitted data set, Please feel free to call us at +97144510666 Ext. 112 or send us email at rc@gpca.org.ae in case of any issues/queries.

Yours Sincerely,
GPCA RC Platform Messaging Service.

If you press on “Edit” under the action dropdown menu, you will be taken to the following screen where you can edit your details.



3. Terminology

Annual

The period of one Gregorian calendar year starting from Jan 1 (00:00 Hrs.) and ending on Dec 31 (23:59 Hrs.)

Available to the public

Information that can be found with little or no interaction with the company (e.g. through a website)

Boundaries of reporting

All metrics are to be reported for operations related to the chemical and petrochemicals business of the member companies in the GCC region. Business operations could include import, marketing, distribution, manufacturing and R&D.

Contractor employees

A person employed by a contractor or contractor's sub-contractor(s) that is directly involved in execution of prescribed work under a contract with the reporting company.
Examples of work that is likely to fall under the contractor definition include (but are not limited to) maintenance, construction, security, engineering consulting, janitorial, food service, information management, and training.

CO_2 equivalents

Quantity of Green House Gas (GHG) emissions converted to equivalent quantity of carbon dioxide (CO_2) based on the gases Global Warming Potential (GWP) compared to carbon dioxide. Global warming potential for the GHG have been set by the UN IPCC.

Employees

Personnel that are on the company's payroll or personnel supplied through manpower supply contracts working under the direct supervision of company employees.

Electrical consumption

Kwh (units consumed from electricity meter)

Fatal cases

Fatal cases are those work related injuries that result in death of one or more employees or contractors irrespective of time between injury and death. Only qualified physicians are authorized to certify death.

Feedstock electricity

Electricity used directly in a chemistry process, i.e., electrolysis.

Green House Gases (GHG)

Carbon dioxide, methane, nitrous oxides, HFC, PFC, and SF6

Incidents involving authorities

All incidents that require involvement of authorities (EPA, industrial zones, emergency services, police, etc.) during transit and loading/unloading.

Kilometers driven loaded

Total distance covered in kilometers with cargo

Kilometers driven unloaded

Total distance covered in kilometers without cargo

Lost Time Injury Frequency Rate (LTIFR)

Work related injury(s) or fatality (s) resulting in one or more days away from work. It includes Lost Work Case (LWC) and fatal cases.

$$\frac{\text{Annual number of Lost Time Work Cases (including fatal cases) x 200,000 employee hours}}{\text{Annual number of employee hours worked}}$$

Loss of product

Number of incidents involving loss of product during transit, storage and loading/unloading operations

LSP

Logistic Service Providers

Metric ton

1,000 kilograms

Non-feedstock electricity

The preponderance of electricity, purchased plus self-generated, used in the business of chemistry, including electricity used to power machinery.

Process safety incident

See Process Safety Incident at page 14

Production

Production should be counted for that portion of a corporation or company that is used to determine GPCA membership. Production includes intra-company transfers of products but excludes wastes, and recycled materials.

Reportable SOx and NOx emissions

GPCA member companies will report annual emissions inventory for criteria pollutants, NOx and SOx, for those company sources within facilities that would otherwise be required to prepare and submit annual emissions inventory as per their respective permitting/regulatory requirements.

Recordable incidents

It includes all work related fatalities, illnesses and injuries which result in a loss of consciousness, days away from work, restricted work or transfer to another job, medical treatment beyond first aid within the company and diagnosed by a physician.

Total recordable incident rate (employee and contractor)

The number of OSHA recordable incidents for each 100 full-time employees per year, based on 2,000 hours worked per person (employee or contractor) per year.

$$\frac{\text{Annual \# of Recordable Incidents x 200,000 employee/contractors hours}}{\text{Annual number of employee/contractors hours worked}}$$

Tons of cargo moved

Metric tons of cargo handled per year

Water consumption

The total amount of water pumped, piped, or otherwise brought on site for use in manufacturing and related activities and not returned to the water source from which it was withdrawn. It does not include storm water (i.e., rainwater or snowmelt). Water consumption is generally tracked in three categories: groundwater, surface water, and purchased potable water. **See appendix B**.

4. Performance metric definitions and reporting guidelines

Occupational safety

There are six metrics in this section, three each for employees and contract employees (also refered to as contractors). The reporting requirements and calculation methods remain the same, therefore, this section shall discuss three performance metrics only; however, members will report six metrics – three each for both categories.

In order to be consistent with ICCA guidelines, the titles of the metrics shall be as follows:

	Current GPCA metric name		
A	**Occupational safety**		
1	Employee fatalities	Employees	Fatal cases
2	Lost time injury rate for employees		Lost time injury frequency rate
3	OSHA recordable cases incident rate for employees		Total recordable incident rate
4	Contract employee fatalities	Contactors	Fatal cases
5	Lost time injury rate for contract employees		Lost time injury frequency rate
6	OSHA recordable cases incident rate for contract employees		Total recordable incident rate

Fatal cases

Death, regardless of the time between injury or exposure and death or length of the illness, caused by a work-related event or exposure.

Units:

- Number of fatal cases for employees
- Number of fatal cases for Contractors

Member reporting instructions

Each GPCA member company must provide complete information for the entire company for both employee and contractors.

Lost time injury frequency rates

Defined as the number of lost time injuries for each 100 full-time employees per year, based on 2,000 hours worked per employee per year

The calculation is as follows:

$$\frac{\text{Annual \# of lost time work cases x 200,000 employee hours}}{\text{Annual number of employee hours worked}}$$

Units:

- Lost time injury frequency rate for employees
- Lost time injury frequency rate for contractors

Total recordable incident rate

Defined as the number of recordable incidents for each 100 full-time employees per year based on 200,000 hours worked per year.

The calculation is as follows:

$$\frac{\text{Annual \# of recordable incidents x 200,000 employee hours}}{\text{Annual number of employee hours worked}}$$

Units:

- Total recordable incident rate for employees
- Total recordable incident rate for contractors

Member reporting instructions

All criteria for classifying injuries, illnesses and fatalities should be consistent with those prescribed by the United States' OSHA. Additional information regarding occupational injury and illness recordkeeping can be accessed at www.osha.gov. Each GPCA member company must provide complete information for the entire company for both employee and contractor data.

For contractor data the reporting definitions for injuries, illnesses, fatalities, and number of hours worked are the same as the OSHA definitions used for employee reporting except that "contractor" should be substituted with "employee" as necessary.

Companies must develop their own systems for collecting contractor occupational injury illness information. This can be accomplished in at least two ways: 1) Solicit data directly from contractors; or 2) Estimate the data via best available information. Direct collection of data from contractors will provide the most accurate information. Many companies have begun to require in their contract or purchase order agreements that contractors provide information on injuries and illnesses that occur during performance of the work and contractor man hours worked can be obtained in the same way. Even where there is not an existing reporting obligation established through the procurement agreements most contractors will voluntarily provide this information when asked. GPCA requires a single report consolidating the experience of all contractors used by your company not a contractor-by-contractor report.

Notes:

A. Member companies shall provide the number of incidents (lost time and recordable) along with man-hours worked for the year for employees and contractors. The system has the capability to calculate the required rates automatically.

B. Member companies reporting these rates per million man-hours worked can continue to do so for their ***other*** reporting purposes, however, GPCA shall continue to determine the rates on 200,000 man-hours basis.

Process safety

This section requires member companies to report the following three performance metrics

- Process Safety Incidents (PSI)
- Process Safety Total Incident Rate (PSTIR)
- Process Safety Incident Severity Rate (PSISR)

A detailed explanation on identification, severity allocation and reporting guidelines can be found in Appendix A (ICCA Globally Harmonized Process Safety Metric)

Process safety incidents

A process safety incident has occurred when:

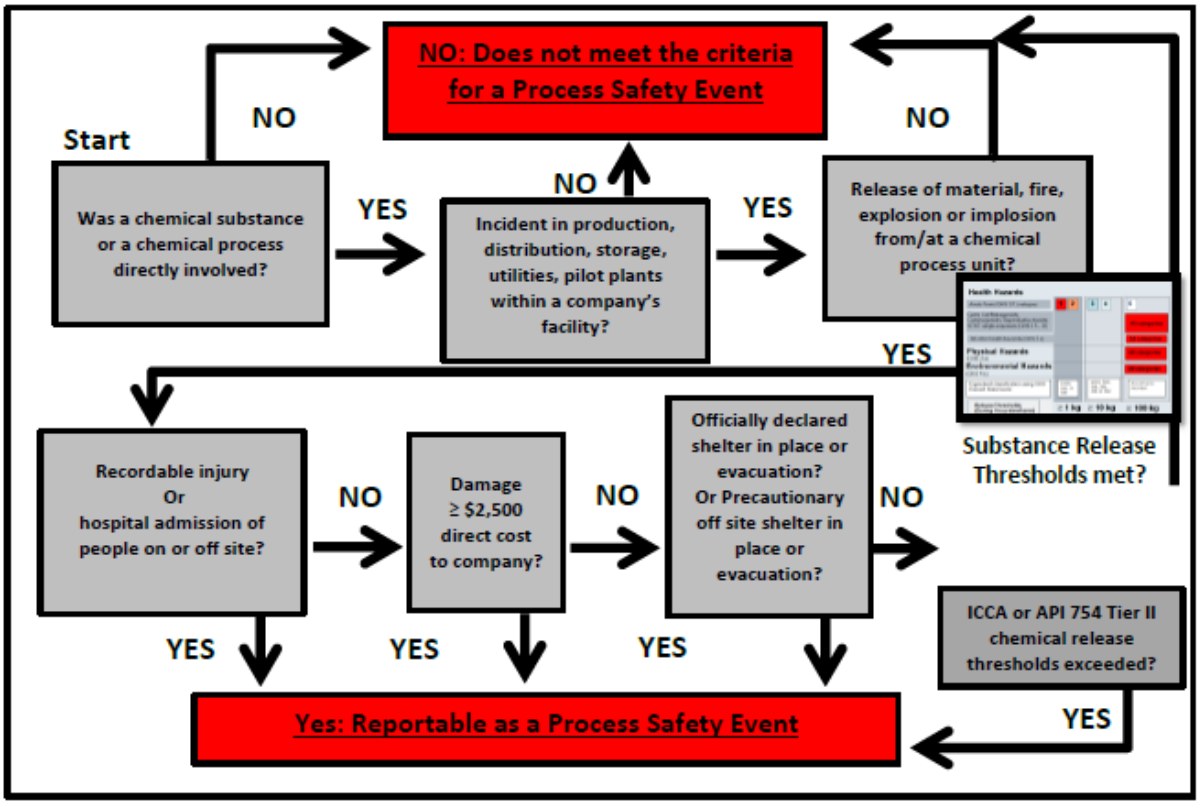
A. Chemical substance or chemical process is directly involved; **AND**
B. The incident occurred in production, distribution, storage, utility, pilot plant within the site boundaries of company's facility; **AND**
C. There was a release of material or energy (e.g. fire, explosion, implosion) from a process unit; **AND**
D. 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 cost**
   - Fire, explosion or clean-up necessary to avoid/remediate environmental damage resulting in a direct cost equal to or greater than USD 2,500; **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**
   - A precautionary off site shelter in place or evacuation; **OR**
4. **Threshold Release**
   - The material released meets one of the GHS thresholds in Table 1. (measured in amount released during one hour)

Unit:

- Process Safety Incident Count (PSIC) or number of process safety incidents

Overview of ICCA Process Safety Event Criteria as a Flow Chart



Process Safety Total Incident Rate (PSTIR)

The cumulative (annual) count of PSI normalized by man-hours, per the formula described in section 4.0 of attachment A

Unit

- Process Safety Total Incident Rate (PSTIR)

The process safety total incident rate can be determined using the following formula;

Process Safety Total Incident Rate (PSTIR): $\frac{\text{Total event incidents x 200,000}}{\text{Total worker hours}}$

Process Safety Incident Severity Rate (PSISR)

The cumulative (annual) severity-weighted rate of Process Safety Incidents (PSI) per the formula described in section 4.0 of attachment A

Unit

- Process Safety Total Incident Rate (PSTIR)

The process safety total incident rate can be determined using the following formula:

Process Safety Incident Severity Rate (PSISR): $\frac{\text{Total event incidents x 200,000}}{\text{Total worker hours}}$

Member reporting instructions

The GPCA has adopted the ICCA Globally Harmonized Process Safety Metric guidelines for the purpose of process safety reporting. The relevant definitions of a PSI, guidelines for classification and severity levels are given in their document, attached as appendix A.

Each GPCA member company must provide complete information for the entire company.

Notes:

A. Member companies shall provide process safety incidents segregated by severity (Tier 1 and lower Tiers). This reporting is optional for performance year 2016 and 2017; however, it is mandatory for 2018 onwards.

B. Until 2018 all member companies shall provide total process safety incidents and if possible segregated data based on tier/severity level of incident.

C. Member companies shall provide the number of incidents along with man-hours worked for the year for employees and contractors. The system has the capability to calculate the required rates automatically.

D. Member companies reporting these rates per million man-hours worked can continue to do so for their ***other*** reporting purposes; however, GPCA shall continue to determine the rates on 200,000 man-hours basis.

Emissions / Discharges to environment

Definitions:

- **Hazardous waste**

  Waste that because of its toxic, infectious, radioactive or flammable properties poses an actual or potential hazard to the health of humans, other living organisms, or the environment. Amounts are to be reported according to national definitions.

  If available, or UN definitions available at http://unstats.un.org or EPA.

- **Non-hazardous waste**

  Waste not classified as hazardous. Non-hazardous waste is generally defined by the national laws and regulations. In the event that no national standards exist, the United Nations definitions can be used.

Disposal includes:

a) Deposit into or onto land (e.g. landfill, etc.)

b) Land treatment (e.g. biodegradation of liquid or sludgy discards in soils, etc.)

c) Deep injection (e.g. injection of pump able discards into wells, salt domes or naturally occurring repositories, etc.)

d) Surface impoundment (e.g. placement of liquid or sludgy discards into pits, ponds or lagoons, etc.)

e) Specially engineered landfill (e.g. placement into lined discrete cells, which are capped and isolated from one another and the environment, etc.)

f) Release into a water body except seas/oceans

g) Release into seas/oceans including sea-bed insertion

h) Biological treatment not specified elsewhere which results in final compounds or mixtures which are discarded by means of any of the operations listed above

i) Physio-chemical treatment which results in final compounds or mixtures which are discarded by means of any of the operations listed above (e.g. evaporation, drying, calcinations, etc.)

j) Incineration on land

k) Incineration at sea

l) Permanent storage (e.g. emplacement of containers in a mine, etc.)

m) Blending or mixing prior to submission to any of the operations above

n) Storage pending any of the operations numbered (excluding temporary storage, pending collection, on the site where it is produced)

There is no distinction between onsite and offsite disposal. In the case that significant amounts of soil, for example, is sent for remediation during a one-time event, this should be noted separately.

Units:

- Hazardous waste for disposal in metric tons per year
- Non-hazardous waste for disposal in metric tons per year

Reporting requirements

Quantity of hazardous and non-hazardous waste generated from manufacturing operations and disposed, whether offsite or onsite during the reporting year, in metric tons.

Exclusions include

- Waste water
- Municipal /sanitary waste from office buildings and eating facilities

Water discharges - Quantity and chemical oxygen demand:

Definitions:

- **Waste water discharges**

  Annual quantity of waste water discharged to the environment directly or through a third party water treatment facility. Treated waste water used for irrigation, is not considered discharge to the environment.

- **Chemical oxygen demand (COD)**

  The amount of oxygen required for the chemical oxidation of compounds in water, as determined using a strong oxidant (most standard methods use dichromate).

Units:

- Waste water discharged to the aquatic environment m^3 /year
- Chemical oxygen demand metric tons /year

Reporting requirements

- Companies need to report the annual quantity of waste water discharged to the environment directly or through a third party water treatment facility and the amount of COD in the discharged waste water.
- For sites that have their wastewater treated at a shared third party facility before discharge to the environment, and cannot obtain individual data. The efficiency factor of the wastewater

treatment unit should be assumed and taken into consideration when calculating COD of the discharged waste water.

- Treated waste water used for irrigation is not considered discharge to the environment.
- Companies which are not discharging any waste water directly or indirectly (through third party facilities) to the environment should report this number as "zero".
- Member companies are advised to report water discharges in cubic meter (m^3) and avoid converting the numbers to millions as the system has the capability to do so.

Sulphur oxides (SOx) and nitrogen oxides (NOx):

Definitions:

- **Reportable SOx and NOx emissions**

  GPCA member companies will report annual emissions inventory for criteria pollutants, NOx and SOx, for those company sources within facilities that are required to prepare and submit annual emissions inventory as per their respective permitting / regulatory requirements. Although countries reporting requirements for SOx and NOx emission vary in terms of scope, GPCA's reporting defers to the countries reporting requirement.

Units:

- Metric tons of SOx per year
- Metric tons of NOx per year

Member reporting instructions

- Total SOx and NOx air emissions in metric tons per year shall be reported.

Total Green House Gas (GHG) emissions and GHG intensity

Definitions:

- ### Green House Gases (GHG)

  Carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), hydro fluoro carbons (HFC), per fluoro carbons (PFC), and sulfur hexa fluoride (SF_6)

- ### CO_2 equivalent

  The GHG converted to equivalent metric tons of CO_2 based on their global warming potential using factors established by the IPCC.

- ### Production

  Production should be counted for that portion of a corporation or company that is used to determine GPCA membership. Production includes intra-company transfers of products but excludes wastes and recycled materials.

- ### IPCC

  The United Nations, Inter Government Panel on Climate Control.

  See appendix C for emission factors and appendix D for worksheets. Also the general instruction and FAQs section is available at the home page.

Units:

- Metric tons of carbon dioxide (CO_2) equivalents emitted
- Metric tons of carbon dioxide (CO_2) equivalent emissions per metric ton of production.

Member reporting instructions

The GPCA energy efficiency and greenhouse gas emissions work sheet will be used for generation of this metric. Member companies will report:

- Total GHG emissions in equivalent metric tons CO_2.
- Total GHG emissions in equivalent metric tons per metric ton of production.

D. Resource utilization

Process water consumption

Definitions:

- The total amount of water pumped, piped, or otherwise brought on site for use in manufacturing activities and not returned to the water source from which it was withdrawn. It does not include storm water (i.e., rainwater or snowmelt water).
- Consumption will be tracked in three categories: groundwater, surface water, and purchased potable or desalinated water.
- See appendix B for the water flow chart illustrating what is reported under this metric as well as FAQs for this metric.

Units:

- Millions of cubic meter consumed in the manufacturing process

Member reporting instructions

Each company will report net water consumed in manufacturing process in millions cubic meters.

Energy efficiency:

Definitions:

- **MMBTUs consumed**

  Total energy, in Million British Thermal Units (MMBTUs), consumed at GPCA member company facilities. This includes purchased non feedstock power and energy from combustion of waste or by product streams. Energy recovered from the process is not considered as consumed energy.

- **Production**

  Production should be counted for that portion of a corporation or company that is used to determine GPCA membership. Production includes intra-company transfers of products but excludes wastes, and recycled materials.

- **Tons of Fuel Oil Equivalent (TOE)**

  Tons of oil equivalent defined as 41.868 GJ (Giga Joules or 109 Joules)

Units:

- Expressed as TOE consumed per metric ton of production

Member reporting instructions

The GPCA energy efficiency and greenhouse gas emissions work sheet will be used for data collection and calculation for this metric. Member companies will report energy consumption in Tons of Fuel oil Equivalent (TOE) per metric ton production.

E. Product distribution

Distribution incidents

Definitions:

Any incidents during the transport of chemicals resulting in:

A. Death or injury

- Incident resulting in death or injury that requires intensive medical treatment, or
- Requires a stay in hospital of at least one day, or
- Results in the inability to work for at least three consecutive days.
- Irrespective of whether or not the chemical product contributed to the death and/or injury

B. Spill or release of product

- More than 50 kilogram or liter of dangerous goods (classification according to the UN recommendations for the transport of dangerous goods), or
- More than 1000 kilogram or liter of non-dangerous goods
- Material damage or environmental damage

C. Property damage

- Damage exceeding USD 50,000, to the property of any party (including environmental cleanup), resulting from the transport incident, irrespective of whether or not the chemical product contributed to the damage.

D. Involvement of authorities

- Direct involvement of the authorities or emergency services in the transport incident, or
- The evacuation of persons or closure of public traffic routes for three hours or more caused by the transport incident

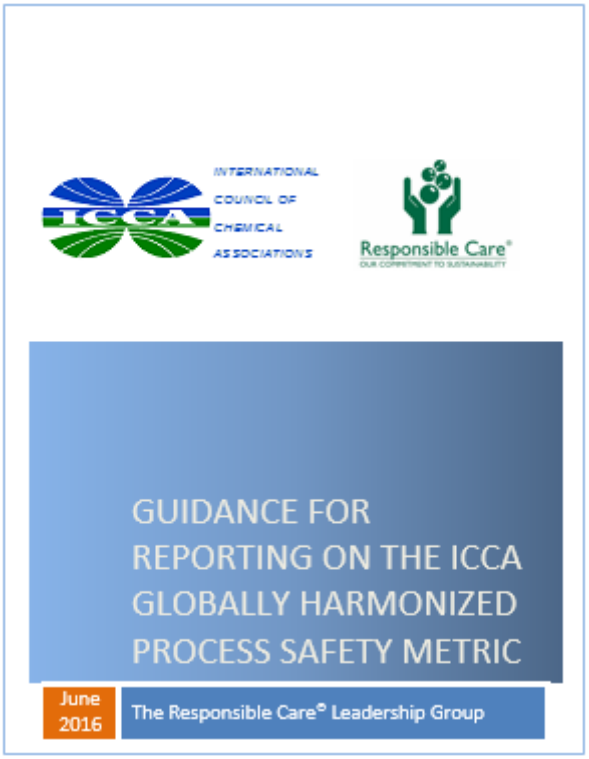
Units:

- Number of distribution incidents meeting the definition given below.

Member reporting instructions

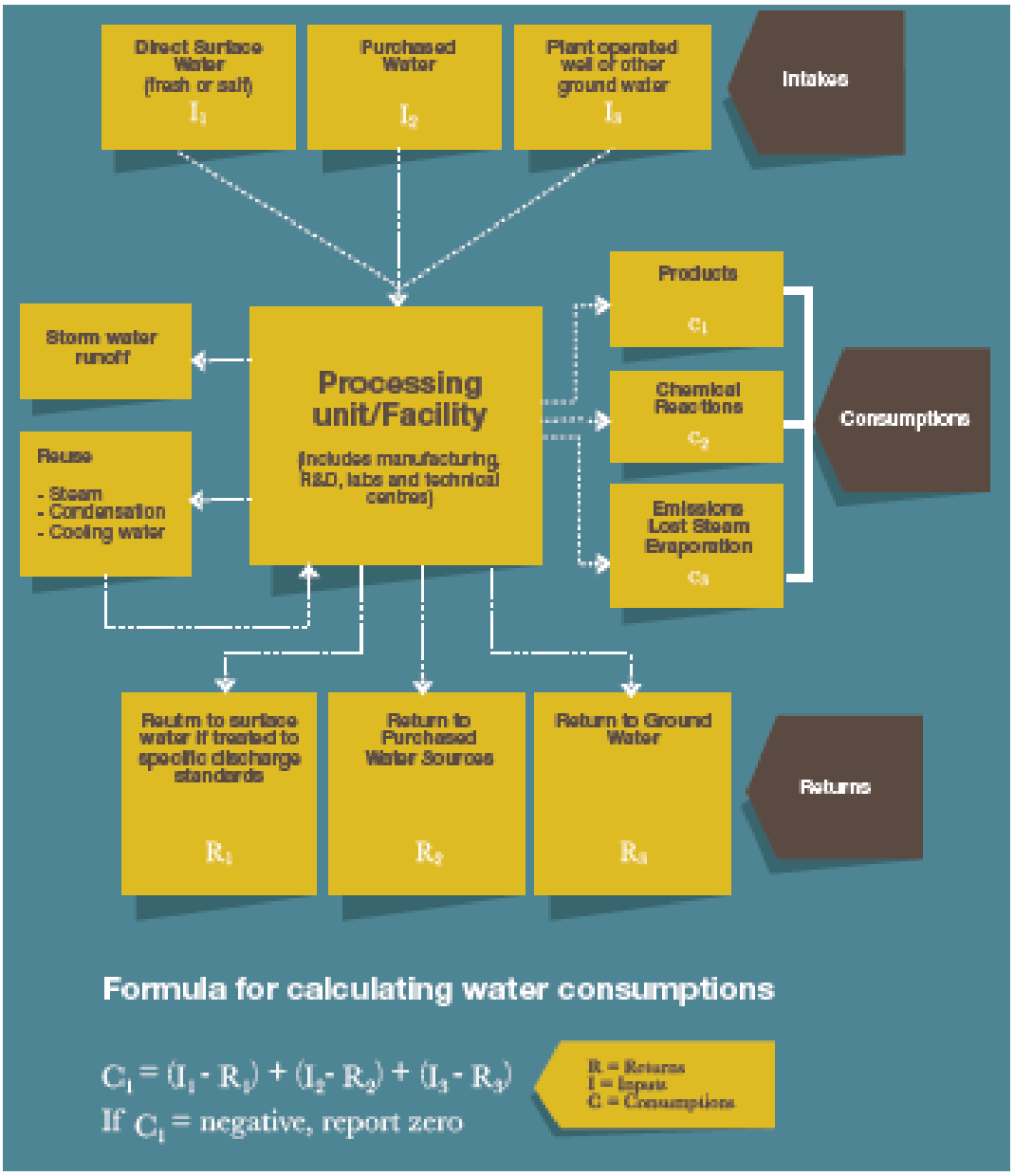
- Incidents are attributable to the GPCA member if the member is the distributor or the carrier.
- Members need to report annual number of incidents broken down by each means of transportation, i.e., rail, pipeline, road, or sea.

Appendix A – ICCA Globally Harmonized Process Safety Metric Reporting Guidelines



ICCA Process Safety Guidance.pdf

Appendix B – Process water consumption



Appendix C - ALTERNATIVE ESTIMATED CO_2 EMISSION FACTORS

FUEL TYPE	CO_2 EMISSION FACTOR LB/MMBTU
Acetylene	158
Alcohol	190
Coal Tar Oil	260
Coke Oven Gas	102
Methanol	142
Municipal Solid Waste (MSW)	206
Phenol Residue	162
Propane	140
Refuse Derived Fuel (RDF)	231
Toluene	179
Wood	200

SELECTED BTU CONTENT

FUEL	BTU/UNIT
Coal Tar Oil	145,000 /gal
Coke Oven Tar	34.68 MM / Metric Ton
Phenol Residue	160,000 /

Appendix D - Green House Gas emission other than CO_2 produced from combustion of fuels

Material emitted	IPCC conversion factor, ton CO2/ton of gas
Process CO2	1
Methane	25
Nitrous oxides	298
HFC	
HFC-23	14,800
HFC-32	675
HFC-125	3,500
HFC-134a	1,480
HFC-143a	4,470
HFC-152a	124
HFC-227ea	3,220
HFC-236fa	9,810
HFC-4310mee	1,640
Other HFCs (3)	-
PCFS	
Perfluoromethane (CF4)	7,390
Perfluoroethane (C2F6)	12,200
C4F10	8,860
C6F14	9,300
Sulfur Hexafluoride (SF6)	22,800