PSM Glossary of Definitions and Abbreviations

EGPC-PSM-GL-011

PSM Guidelines

The Egyptian Process Safety Management Steering Committee (PSMSC Egypt)
PSM TECHNICAL SUBCOMMITTEE (PSMTC)

Acknowledgements

This publication has been produced as a result of the comprehensive efforts carried out by the PSM Technical subcommittee on behalf of the Egypt PSM steering committee, formed per the Memorandum of Understanding signed between the Ministry of Petroleum and Mineral Resources and Methanex Egypt in February 2020 overseeing the design and implementation of a detailed PSM program to promote and enhance PSM culture for MOP and its affiliated companies following industry best practice, international codes and standards. The Egyptian Process Safety Management Steering Committee is formed of representatives from MOP, EGPC, ECHEM, EGAS, Ganope and Methanex Egypt.

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During developments and prior approval, all PSM technical subcommittee documents are subjected to a thorough technical peer-review process. The PSM technical subcommittee gratefully appreciates the thoughtful comments and suggestions of the peer reviewers. Their contributions enhanced the accuracy and clarity of the documents.

The PSM technical sub-committee acknowledges the following reviewers from major Process Safety consultants as well as major operators & EPC who provided valuable comments during the technical peer reviews that resulted in an outstanding product structure and quality:

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DOCUMENT NO	TITLE	ISSUE DATE
EGPC-PSM-GL-011	PSM Glossary of Definition and Abbreviations	28-10-2021

Approval

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1. Definitions

Term	Definition
ALARP Demonstration	The procedure by which an ALARP case is confirmed through an appropriate Cost / Benefit Analysis.
As Low As Reasonably Practicable	Means to reduce a risk to a level which is as low as reasonably practicable and involves balancing reduction in risk against the time, trouble, difficulty and cost of achieving it. This level represents the point, objectively assessed, at which the time, trouble, difficulty and cost of further reduction measures becomes unreasonably disproportionate to the additional risk reduction obtained To demonstrate achieving ALARP concept, organization may be required to perform full quantification of risk through Quantitative Risk assessment (QRA) in addition to cost benefit analysis (CBA).
Asset Integrity	The ability of an Asset to perform its required function, effectively and efficiently in order to achieve business objectives, safeguarding people, environment, asset and Company reputation.
Barriers	Barriers are the tangible Plant, Process, People risk reduction measures that are intended to prevent the incident occurring and/or control its impact or frequency and/or mitigate its effect on people, the environment, or our business.
Brownfield Site	An operated site that has live hydrocarbon process and utility facilities, or commissioned operating plant or plants, systems, equipment and facilities where operations activities may be conducted. A brownfield site is normally an operation controlled site.
Cause (of a Risk Event)	Uncertainties (in conditions, circumstances, choices, practices or activities) that could lead to a Risk Event occurring. Cause(s) are the source of a risk and could be internal or external to Oil and Gas Holding Companies and its Subsidiaries and Affiliates.
Company	Refers to any operating company, subsidiary, affiliated, Joint Venture companies that are belonging to an ENTITY.
Consequence (of a Risk Event)	- Possible effects arising were a Risk Event to occur. - Adverse effects or harm, which causes the quality of human health or the environment to be impaired. Basically, it is the loss that can be inflicted if any hazardous event occurs. - Outcome of an event affecting objectives. **Notes:** - *An event can lead to a range of consequences.* - *A consequence can be certain or uncertain and can have positive or negative effects on objectives.* - *Consequences can be expressed qualitatively or quantitatively.* - *Initial consequences can escalate through knock-on effects.*
Controls, safeguards, and barriers	These terms are often used interchangeably to describe the layers of protection in-place or proposed that either prevent an undesirable event prior to its occurrence, or mitigate the consequences of such an event.

Cost Benefit Analysis	An analysis which evaluates the expected costs of a risk reduction measure versus the benefits obtained to reduce risk associated with its implementation.
Decision analysis	The process of evaluating decision options and deciding what reasonable options to implement to further reduce or mitigate risk.
Design intent	Definition of how the plant is expected to operate in the absence of deviations.
Deviations	Departures from the design intention are discovered by systematically applying the guide words to process parameters (flow, pressure, etc.) resulting in a list for the team to review (no flow, high pressure, etc.) for each process section.
Emergency Control Centre (ECC)	An area where designated personnel co-ordinate information, develop strategies for addressing the media and government agencies, handle logistical support for the response team, and perform management functions. A centralised support facility allows emergency managers and staff to contend with incident issues more effectively.
Emerging Risk	Risk which has been identified during the operation phase which require further risk assessment.
Endorsement	The process to obtain formal support for existing risk management measures, resources required and any additional actions to continue operations.
Entity	Refers to the Egyptian General Petroleum Corporation (EGPC) and Oil and Gas Holding Companies, including the Egyptian Natural Gas Holding Company (EGAS), the Egyptian Petrochemical Holding Company (ECHEM) and the South Valley Petroleum Holding Company (GANOPE).
Event	Occurrence or change of a particular set of circumstances. **Notes:** - *An event can be one or more occurrences, and can have several causes.* - *An event can consist of something not happening.* - *An event can sometimes be referred to as an "incident" or "accident".* - *An event without consequences can also be referred to as a "near miss", "incident", "near hit" or "close call".*
Expected value	The weighted average outcome using the probabilities as weights. For decisions involving uncertainty, the concept of expected value provides a way of selecting the best course of action and of forecasting portfolio level performance. **Notes:** *Do not confuse 'expected value' with 'most likely.' If, for example, an event has a 90% chance of yielding $10 but a 10% chance of yielding zero, then the expected value is $9 although in an individual case this outcome is impossible and the most likely outcome is $10.*
Facility	Onshore establishment or offshore installation and connected pipelines. Means the whole area under the control of the same person where specified hazardous substances are present in 1 or more places. Two or more areas under the control of the same person and separated only by a road, railway, inland waterway, pipeline, or other structure are treated as 1 whole area for the purposes of this definition.

Facility boundary	A single Facility is the Facility under the control of a single person (e.g. Site Manager, Plant Manager) who takes responsibility for the Facility
Failure	The outcome when expressly defined goals are not fully met (cf. Success). In a project, it is critical to set unambiguous success and failure criteria.
Failure of a control	This means if the control: - is a positive action or event: the non-occurrence or the defective occurrence of that action or event - consists of a limitation on an operational activity, process or procedure: the breach of that limitation.
Frequency	The number of times an event is estimated to occur over a specified period of time.
Globally Harmonized System	The Globally Harmonized System of Classification and Labelling of Chemicals, published by the United Nations.
Greenfield Site	A site that is physically separate from an operation site and has not been subject to hydrocarbon operations; typically, a construction site.
Grouping	The process of collecting together a number of risks that have similar causes, consequences and risk management measures.
Guidewords	Simple words that are used to qualify or quantify the design intention and to guide and stimulate the brainstorming process for identifying process hazards
Hazard	A circumstance, condition or practice that has the potential to cause harm to people, the environment, reputation, assets or business impact. Including ill health and injury, damage to property, products or the environment; production losses or increased liabilities.
Hazard and Operability Review	Systematic qualitative technique to identify and evaluate process hazards and potential operating problems, using a series of guidewords to examine deviations from normal process conditions.
Holistic	Consciously including all relevant disciplines and influences, which might affect the operations or project.
Identify	The phase of the projects risk management process in which the risk events relevant to the project are identified and articulated as comprehensively as possible.
Impact	Estimate of the Consequences were a Risk Event to occur.
Impaired safety critical element (SCE)	An SCE that does not fully meet, or may not fully meet, one or more of its Performance Standard criteria. Impairment include: - *SCE overdue maintenance, inspection & testing;* - *Failed SCE (not meeting the performance criteria);* - *Degraded SCE (partial failure to meet its functionality);* - *Unavailable SCE.*
Implied cost to avert a fatality	Defined by the net cost of the risk reducing measures divided by the statistical number of potential fatalities averted by the measures. It provides a useful indication of the effectiveness of the safety.
Incident	An undesirable event or chain of events which cause, or could have caused injury, illness and/or damage (loss) to the environment, assets or third parties.

Incident Commander	The person in charge of managing an emergency for the facility and has overall responsibility for all functions performed by facility personnel during an emergency
Independent Protection Layer	Device, system, or action that can prevent a postulated accident sequence from proceeding to a defined, undesirable endpoint. An IPL is (1) independent of the event that initiated the accident sequence and (2) independent of any other IPLs. IPLs are normally identified during the layer of protection analyses.
Individual Risk	Combined fatal risks to a named individual. IR takes into account factors such as: **Total Risk:** The sum of risk contributions from all hazards to which the individual is exposed. **Occupancy:** The proportion of time a workgroup individual is exposed to workplace hazards.
Inherent risk	Risk in the absence of any prevention or mitigation controls.
Inherently Safer Design	Any approach, process and following action applicable at all levels of design and operation from conceptual design to plant operations having the specific attention to the elimination or significantly reduction of hazards rather than the control of hazards assessed.
Initiate	The phase of the project's risk management process in which the scope, objectives and context for the risk management process are defined.
Integrity	It is a term applied to disciplines or functions associated to a process, system or asset that conveys all the activities, studies or actions aimed to ensure the achieving its appropriate and intended requirements under stated operating conditions starting from design and during all life cycle.
Isolated Quantity	A quantity of a hazardous substance where its location at the facility is such that it cannot on its own initiate a major incident elsewhere at the facility.
Layers of Protection Analysis	Semi quantitative method for the assessment of adequacy of protection layers used to determine the performance requirements for Safety Instrumented System (SIS).
Likelihood	Estimate of the Probability or Frequency of a Risk Event occurring.
Local Community	This is defined as: a) meaning, at a minimum, all persons within a 1 km radius of any point on the perimeter of a MHF, and b) including all persons in an area which might be affected by a major incident occurring at a MHF. The words 'at a minimum' mean the 1 km radius does not mark the extent of the definition. Paragraph (b) may extend the scope of the definition well beyond 1 km in some circumstances.

Location Specific Individual Risk	It is a measure of geographical spread of risk. LSIR is defined as the frequency per year at which an individual, who stays unprotected for 24 hours per day and 365 days per year at a specific location, is expected to sustain fatal harm due to exposure to hazards induced by industrial activity. This refers to a hypothetical individual who is always present at a particular location. This is useful for showing the spatial distribution of risk.
Loss of Primary Containment	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) irrespective of whether the material is released into the environment, or into secondary containment, or into other primary containment not intended to contain the material released under normal operating condition. For drilling operations, any unplanned or uncontrolled release to the surface (seabed or ground level) are included.
Manageability	An expression of the ability to mitigate a threat or leverage an opportunity, demonstrated by creating response plans that are expected to be effective. It is also the degree of control that Oil and Gas Holding Companies and its subsidiaries and affiliates can exert in the circumstances surrounding an event.
Major Accident Hazard	A hazard with the potential that if realized, it would lead to major impact to employees' safety, environment, and the business. MAH *event could result in:* - *Multiple fatalities or severe injuries; or* - *Extensive damage to structure, installation or plant; or* - *Large-scale impact on the environment (e.g. persistent and severe environmental damage that can lead to loss of commercial or recreational use, loss of natural resources over a wide area or severe environmental damage that will require extensive measures to restore beneficial uses of the environment)."* Major accident Hazard could be substances, activities, operations or conditions.
Major Accident Hazard Pipeline	A 'major accident hazard pipeline' is one which conveys a dangerous fluid which has the potential to cause a major accident
Major Hazard Facility	Any process plant, storage Facility, terminal, pipeline, offshore installation, drilling rig or any other Facility handling or storing dangerous materials that has Major Accident Potential at any time in the course of routine and/or non-routine operations.
Monetized	A risk is said to be 'monetized' if the impact is expressed in financial terms, usually dollars. In cases where financial measures are not practical, oil volumes (e.g. in exploration) or other appropriate quantitative units may be used.

Monte Carlo simulation	A statistical analysis process that takes a random sample from each of the input probability distributions and combines the sampled values according to the equations in a model to produce an overall probability distribution for the output.
Net Assessment	The assessment of the potential Impacts and associated Likelihoods of a Risk Event reflecting representative assumptions, including the effectiveness of existing Risk Management Measures.
Notification	The process to inform individuals in defined roles in the company of a risk.
Occupational Safety	Under HSE Department, it covers the management of personal safety of people engaged in work or employment, however well- developed management system also addresses process safety issues. The goal of occupational safety includes to foster a safe and healthy work environment.
Occupied Building Risk Assessment	It measures the risk to people in occupied buildings in a process plant and identifies any improvements that are required to ensure that they are adequately safeguarded.
Operator	Means the person who: a) manages or controls a Facility or a proposed Facility; and b) has the power to direct that the whole Facility be shut down. In relation to pipeline, the person who is to have or (once fluid is conveyed) has control over the conveyance of fluid in the pipeline.
Opportunity	A risk that, should it occur, would have a positive impact.
Parameters	Conditions are used to define a process, including flow, pressure, temperature, and level.
Performance Standard	A specification, quantitative or qualitative, of the design characteristics and operational performance required for the Safety Critical Systems (and their contributory safety critical elements) to be used as a basis for design and management of the hazard. It shall, where possible, be expressed in terms of functionality, availability, reliability, survivability and dependency. *"A qualitative or quantitative statement of the required performance of a safety critical element (SCE) that contains the information necessary to validate its effectiveness during design, construction, testing, commissioning, operation and decommissioning".* As per " Energy Institiute, 2020. *Guidelines for management of safety critical Elements (SCEs)"*
Potential Loss of Life	Defined as the sum of overall accident scenarios of the consequences (in terms of fatalities) of accident multiplied by the frequency of occurrence of these accidents over specified period. PLL is expressed as number of fatalities per year or number of fatalities for a specified period such as project lifetime.

Primary Containment	It is the first level of containment of a fluid, such as a pipe, tank, vessel, truck, rail car, or other equipment designed to keep a material within it, typically for purposes of storage, separation, processing or transfer of gases or liquids. **Note:** - *Primary containment for a specified material may comprise a vessel or pipe that is inside another vessel that is also designed as primary containment for a different material; for example, a heating tube is primary containment for fuel gas or fuel oil, even though the tubes may be inside a firebox which is in turn within an oil-water separator.*
Proactive risk response	An action or set of actions to reduce the probability or impact of a threat (or delay its occurrence), or increase the probability or impact of an opportunity (or bring forward its occurrence). Proactive risk responses, if approved, are carried out in advance of the occurrence of the risk.
Probabilistic	A modelling approach in which inputs are recognized to have uncertainty, and consequently model outputs also have uncertainty ranges.
Probability	The likelihood or Chance that a particular risk event will occur. **Notes:** - *The mathematical definition of probability is "a real number in the scale 0 to 1 attached to a random event."* - *Probability may be expressed as a deterministic value (i.e. single value) or as a range/distribution of values incorporating uncertainty.* - *Probability can be related to a long-run relative frequency of occurrence or to a degree of belief that an event will occur. For a high degree of belief, the probability is near one (1).* - *Degrees of belief about probability can be chosen as classes or ranks like "rare / unlikely / moderate / likely / almost certain" or "incredible / improbable / remote / occasional / probable / frequent."*
Probability distribution	A mathematical relationship between possible values of a variable and their associated probabilities. Typically, probability distributions are displayed as frequency or cumulative frequency plots.
Probability Impact Grid	A diagram depicting the importance of a risk and which plots probability on the x-axis and impact on the y-axis.
Process Safety	Generally refers to unintentional releases that can have a serious effect to the personnel, plant and environment.
Process Safety Event	It is a Loss of Primary Containment (LOPC) from a process that meets the Tier (1) or Tier (2) definitions in API/ANSI RP 754. A PSE is a Key Performance Indicator (KPI) and is recordable. For recording a PSE: - Drilling facilities are part of a process when operations are 'in-hole'. - Land or marine vessels (trucks and ships) are part of a process when physically connected to a production facility.

Process Safety Near Miss	It is any significant release of a hazardous substance that does not meet the threshold for a "Process Safety Incident" lagging metric, or a challenge to a PSM system, where challenges to a PSM system can be divided into the following categories: - Pressure Relief Device (PRD) challenge, - Safety Instrumented System (SIS) challenge, or - Process deviation or excursion.
Promise	A guaranteed outcome that has not yet occurred.
Qualitative Risk Assessment	An approximate assessment of risk using knowledge, judgement and analogue information, but without quantitative analysis. Qualitative techniques include the definition of risk, the recording of risk details and relationships, and the categorization and prioritization of risks relative to each other.
Quantitative Risk Assessment	It is a formal and systematic approach of combining actual or estimated numerical values of inputs with an assumed or known relationship between values, using arithmetic or statistical techniques, to determine a range of likely outcomes, or to understand how variance in one or more inputs is likely to affect the outcome. In QRA statistical values are derived for potential loss of life and damage to resources and environment. **Note:** - *These values must never be interpreted as unavoidable and acceptable losses. It must always be recognized that the calculated fatality (or loss) figures are based on experience, statistical failure and incident rates representing an average historical quality of management. Incident investigations usually show that these 'historical' incidents were, with the benefit of hindsight, quite preventable.* - *QRA is a tool which helps to translate this hindsight into foresight (planning) in order to assist management in deciding the best approach and show ways and means (e.g. improved engineering, procedures, supervision, etc.) to prevent the potential incidents from happening. QRA is not to be used to justify or encourage risk taking.*
Reactive risk response	An action or set of actions to be taken after a risk event has occurred (as defined by the trigger condition) in order to reduce or address the effect of the threat, or maximize the effect of the opportunity. The cost of reactive risk responses is met from contingency (Unallocated provision). More usually applied to threats, and detailed within a contingency plan.
Recommendations	Suggestions for design changes, procedural changes, or areas for further study (e.g., adding a redundant pressure alarm or reversing the sequence of two operating steps).
Relative Risk	The comparative risk of a system or activity to other systems or activities respectively. Taking into consideration the available control measures in each case.

Residual Risk	A loose term that means the rating of the risk after the risk treatment have been executed. **Notes:** - *Residual risk can contain unidentified risk.* - *Residual risk can also be known as "retained risk".*
Respond	The phase of the risk management process in which responses are planned and implemented.
Risk	Potential for an undesired impact to: - People, the environment or reputation, assets or business arising from own operations and activities (whether due to an internal or external Cause); or - Workforce, reputation, assets or business from exposure to external events. **Notes:** - *An effect is a deviation from the expected — positive and/or negative. Risks with a positive impact are called opportunities while those with a negative impact are called threats.* - *Objectives can have different aspects (such as financial, health and safety, and environmental goals) and can apply at different levels (such as strategic, organization-wide, project, product and process).* - *Risk is often characterized by reference to potential events and consequences, or a combination of these. Either or both of these parameters may be represented by a probability distribution where the true value is uncertain.* - *Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated probability of occurrence).*
Risk Acceptance	The documented process by which management demonstrates that the risks inherent are acceptable from a business perspective on the understanding that response plans are completed.
Risk Acceptance Criteria	The criteria, which define those risks, its significance is evaluated, and require specific acceptance by management. These criteria are developed in the initiate stage and are usually defined using a matrix of probability versus impact. This matrix is termed the Probability Impact Grid. **Notes:** - *Risk criteria are based on organizational objectives, and external and internal context.* - *Risk criteria can be derived from standards, laws, policies and other requirements*
Risk Analysis	Assessment and synthesis of the risks affecting an operations or a project to gain an understanding of their individual and combined impact on the objectives. This forms the basis for prioritizing risk responses. **Notes:** - *Risk analysis provides the basis for risk evaluation and decisions about risk treatment.* - *Risk analysis includes risk estimation.*
Risk Appetite	The amount of risk an entity is willing to accept in pursuit of value.

Risk Assessment	The process of identifying and evaluating the risks associated with operations or a project. Risk assessment should be semi-quantitative or quantitative, and should be conducted using accepted professional methods and criteria.
Risk Classification	Category or type of Risk Event. This is assigned with reference to the risk types (e.g. Strategic and Commercial, Safety and Operational and Compliance and Control).
Risk Determination	The process of combining the results of consequence and probability analysis into a single descriptor of risk (that is, risk ranking on the Risk Matrix).
Risk Evaluation	Process of comparing the results of risk analysis with risk criteria to determine whether the risk and/or its magnitude is acceptable or tolerable. **Note:** - *Risk evaluation assists in the decision about risk treatment.*
Risk Event	An event: - Within Oil and Gas Holding Companies' operations or activities (whether due to an internal or external Cause) with the potential for an undesired impact to people, the environment, or reputation, assets or business; or - External to operations or activities with the potential to expose Oil and Gas Holding Companies to an undesired impact on its workforce, reputation, assets or business.
Risk Identification	Process of finding, recognizing and describing risks. **Notes:** - *Risk identification involves the identification of risk sources, events, their causes and their potential consequences.* - *Risk identification can involve historical data, theoretical analysis, informed and expert opinions, and stakeholder's needs.*
Risk Management	The overall process whereby risk is identified, described, understood and responses to the risks are formulated, justified, planned, initiated, progressed, monitored, reviewed, adjusted and closed.
Risk Management Framework	Set of components that provide the foundations and organizational arrangements for designing, implementing, monitoring, reviewing and continually improving risk management throughout the organization. **Notes:** - *The foundations include the policy, objectives, mandate and commitment to manage risk* - *The organizational arrangements include plans, relationships, accountabilities, resources, processes and activities.* - *The risk management framework is embedded within the organization's overall strategic and operational policies and practices.*
Risk Management Maturity	A measure of the extent to which an organization formally applies effective and efficient risk management to support decision-making and increase business value.

Risk Management Measure	A measure or activity intended to reduce the Likelihood (i.e. control or prevention barrier) or Impact (i.e. contingency or mitigation barrier) of a Risk Event or a check that the controls and/or contingencies are working as intended. These comprise: - Existing risk management measures already in place; and - Additional actions intended to improve management of the risk.
Risk Management Plan	A document defining how risk management is to be implemented to manage a risk, which could include a description, classification and assessment of the risk and summary of the existing risk management measures and additional actions. **Notes:** - *Management components typically include procedures, practices, assignment of responsibilities, sequence and timing of activities.* - *The risk management plan can be applied to a particular product, process and project, and part or whole of the organization.*
Risk Management Policy	Statement of the overall intentions and direction of an organization related to risk management.
Risk Management Process	Systematic application of management policies, procedures and practices to the activities of communicating, consulting, establishing the context, and identifying, analysing, evaluating, treating, monitoring and reviewing risk.
Risk Accountable	The individual accountable for maintaining appropriate focus on a risk and its management and for appropriate consultation with subject matter experts, including Legal.
Risk Rating	A measure of risk importance, usually using a combination of probability and impact. May be expressed semi-quantitatively or quantitatively.
Risk Reduction	Actions taken to lessen the probability, negative consequences, or both associated with a particular risk. A semi quantitative analysis includes aspects of both qualitative and quantitative analyses.
Risk Register	A repository for recording risks and risk management information (it could be a software or spreadsheet or database) containing all the risks identified for an organization, along with a description of each risk and a documentation of information relevant to the ownership, assessment and response of each risk. It give an accurate figure about the status of recommended actions that shall be taken to eliminate / minimize each risk.
Risk Response	Action taken to reduce the probability of a threat arising or to reduce its impact if it were to arise. For an opportunity, the response aims to increase the probability of it arising and to increase its beneficial impact. Proactive risk responses (mitigations) are funded from within the budget, while reactive responses (interventions) are funded from contingency.
Risk Status	At any point in the life of a risk, it is either 'active', 'dormant', 'accepted' or 'closed'.

Risk Treatment	Process to modify risk. **Note:** Risk treatment can involve: - *Avoiding the risk by deciding not to start or continue with the activity that gives rise to the risk;* - *Taking or increasing risk in order to pursue an opportunity;* - *Removing the risk source;* - *Changing the probability;* - *Changing the consequences;* - *Sharing the risk with another party or parties (including contracts and risk financing); and* - *Retaining the risk by informed decision.*
Risk-weighted	The result of impacting one or more outcomes from an uncertainty assessment with risk(s). Risks might take the form of specific losses (i.e., costs), the impact of failure (failure to achieve a goal), or other representations. It is typically expressed in a risk-weighted value such as a Net Risk-Weighted value, an Economic-Risk-Weighted-Resource value, (or various other risk-weighted parameters), and/or by impacting the probability intercept of a cumulative-frequency curve on a cumulative frequency plot.
Safeguards	Engineered systems or administrative controls designed to prevent the cause, protect against the deviation progressing to a loss event or mitigate the immediate loss event consequences (e.g., process alarms, shutdowns, automatic isolation)
Safety Critical Element (SCE)	Means such parts of an installation and such of its plant (including computer programs), or any part thereof: - *the failure of which could cause or contribute substantially to; or* - *a purpose of which is to prevent, or limit the effect of, a major accident.*
Secondary Containment	An impermeable physical barrier specifically designed to prevent release of materials into the environment that have already breached primary containment (i.e., an LOPC). 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.
Societal Risk	Societal risk is defined as the frequency per time period, usually per year, that N or more fatalities can occur as a result of industrial activities. When presented graphically, the plot is usually known as "F-N curve".
Stakeholder	An individual or organization that has an effect on, or could be affected by, the outcome of the organization.
Structure	Means anything that is constructed, whether fixed, moveable, temporary, or permanent; including: - buildings, masts, towers, frameworks, pipelines, quarries, bridges, and underground works (including shafts or tunnels) - any component of a structure - part of a structure.

Study nodes	Sections of equipment with definite boundaries (e.g., a line between two vessels) within which process parameters are investigated for deviations. The locations on P&IDs at which the process parameters are investigated for deviations.
Success	The outcome where expressly defined organization goals are fully met. **Note:** - *It is important that success criteria are clearly defined.*
Target resolution date	The date at which the active risk responses should be completed or at least showing favourable results.
Threat	A risk that, should it occur, would have a negative impact.
TIER	One of the four levels of the Process Safety KPIs, which is in turn based on the API/ANSI RP 754.
TIER 1	Is a PSE / LOPC with the greatest consequence as defined by ANSI/API RP 745. A Tier (1) PSE is 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 one or more of the Tier (1) consequences. **Notes:** - *Some non-toxic and non-flammable materials (e.g., steam, hot water, or compressed air) have no threshold quantities and are only included in this definition because of their potential to result in one of the other consequences.* - *PRD, SIS, or manually initiated emergency de-pressure discharge is a LOPC due to the unplanned nature of the release. The determination of Tier (1) PSE is based upon the criteria described in the Annex A.* - *An internal fire or explosion that causes a LOPC from a process triggers an evaluation of the Tier (1) consequences.*
TIER 2	Is a PSE / LOPC with lesser consequence. A Tier (2) PSE is 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 one or more of the Tier (2) consequences, and is not reported as a Tier (1) PSE. **Notes:** - *Some non-toxic and non-flammable materials (e.g., steam, hot water, or compressed air) have no threshold quantities and are only included in this definition because of their potential to result in one of the other consequences.* - *A PRD, SIS, or manually initiated emergency de-pressure discharge is a LOPC due to the unplanned nature of the release. The determination of Tier (2) PSE is based upon consequences and threshold quantities described in ANSI/API RP 754 - Table.* - *Fire or explosion that causes a LOPC from a process triggers as in Tier (2) consequences.*

TIER 3	Typically represents challenges that progressed along the path to harm but is stopped short of a Tier (1) or Tier (2) PSE consequence. Indicators at this level provide an additional opportunity to identify and correct weaknesses within the barrier system. They are too facility specific for benchmarking or developing industry applicable criteria and are intended for internal company use and can be used for local (facility) public reporting. The most common examples of Tier (3) metrics are safe operating limit (SOL) excursions, primary containment inspection outside acceptable limits, demands on safety systems, and other LOPCs (less than that defined as Tier (1) or Tier (2)).
TIER 4	These metrics represent the most leading process safety performance indicators (process safety metrics). These indicators provide an opportunity for a company to identify and correct weaknesses within the barrier system. Tier (4) indicators can dramatically enhance the process safety culture and the process safety performance of a COMPANY. Indicators at this level provide an opportunity to identify and correct isolated system weaknesses. They are indicative of process safety system weaknesses that may contribute to future Tier (1) or Tier (2) PSEs. In that sense, they may identify opportunities for both learning and systems improvement. As well as they are too facility-specific for benchmarking or developing industry applicable criteria. They are intended for internal company use and for local reporting.
Tolerable Risk	Risk which is accepted under definition of a tolerable threshold, based on the current state of international and company standards.
Trigger condition	A definition of the circumstances in which a risk is deemed to have occurred, or upon which a reactive response will be initiated.
Uncertainty	A representation of the possible range of values associated with either (1) a future outcome or (2) the lack of knowledge of an existing state. Uncertainty can be expressed as a deterministic quantitative value (i.e. a single number), a qualitative value (high, low, medium, etc.), or as a probability distribution (i.e. a range of quantitative values and the likelihood that any value in the range will occur).
Uncertainty Assessment	The process of combining uncertainties, as with a Monte Carlo Simulation, to generate output parameters expressed as probability distributions. No involvement of risk is implied. Example: Multiplying ranges of possible lengths, and widths to arrive at a range of resulting possible areas.
Unoccupied remote facility	A facility that is operated, maintained, or serviced by employees who visit the facility only periodically to check its operation and to perform necessary operating or maintenance tasks. No employees are permanently stationed at the facility.
Worker	A person who carries out work in any capacity for an operator. It covers almost all working relationships, including employees, contractors, sub-contractors, and volunteer workers.
Workplace	A place where work is carried out for an operator, including any place where a worker goes, or is likely to be, while at work.

Worst Credible Assessment	The assessment of the most severe and plausible potential impacts of a Risk Event reflecting assumptions that include the failure of existing Risk Management Measures.

2. Abbreviations

Term	Description
AIChE	American Institute of Chemical Engineers
AIMS	Asset Integrity Management System
ALARP	As low as reasonably practicable
API	American Petroleum Institute
BAT	Best Available technology
BFD	Block Flow Diagram
BOD	Basis of Design
CBA	Cost Benefit Analysis
CCPS	Centre for Chemical Process Safety
CEO	Chief Executive Officer
CFD	Computation Fluid Dynamics
CFR	Code of Federal Regulations
CMMS	Computerized Maintenance Management System
CONOPS	Concurrent Operations
CRA	Concept Risk Analysis
CRO	Certified Risk Officer
DCS	Distributive Control System
DHM	Design Hazard Management
ECC	Emergency Control Centre
EERA	Escape Evacuation and Rescue Assessment
ERP	Emergency Response Planning
ESD	Emergency Shutdown
ESSA	Emergency Systems Survivability Analysis
ETA	Event Tree Analysis
F&G	Fire and Gas
FEED	Front End Engineering Design
FERA	Fire and Explosion Risk Assessment
FMEA	Failure Mode and Effect Analysis
FMECA	Failure Mode, Effects & Criticality Analysis
FSS	Facility Siting Study
FTA	Fault Tree Analysis
GHS	Globally Harmonized System
H_2S	Hydrogen Sulphide
HAC	Hazardous Area Classification
HACCP	Hazard Analysis and Critical Control Point
HAZID	Hazards Identification
HAZOP	Hazards and Operability
HIRA	Hazard Identification & Risk Analysis
HITRA	Hazard Identification and Task Risk Assessment
HP	High pressure
HSE	Health, Safety, and Environment
IC	Incident Commander
ICAF	Implied Cost to Avert a Fatality

IEC	International Electro-technical Commission
IPL	Independent Protection Layer
IR	Individual Risk
IRPA	Individual Risk Per Annum
ISD	Inherently Safer Design
ISO	International Organization for Standardization
JSA	Job Safety Analysis
KPI	Key Performance Indicator
LOPA	Layers of Protection Analysis
LOPC	Loss of Primary Containment
LP	Low Pressure
LSD	Local Shutdown
LSIR	Location Specific Individual Risk
LUP	Land Use Planning
MA	Major Accident
MAE	Major Accident Event
MAH	Major accident Hazard
MAR	Major Accident Risk
MEL	Master Equipment List
MOC	Management of Change
MHF	Major Hazard Facility
OBRA	Occupied Building Risk Assessment
P&ID	Piping and Instrument Diagram
PFD	Process Flow Diagram
PHA	Process Hazard Analysis
PLL	Potential Loss of Life
PMT	Project Management Team
PS	Performance Standard
PSD	Process Shutdown
PSE	Process Safety Event
PSSR	Pre-Startup Safety Review
PSV	Pressure safety valve
QA/QC	Quality Assurance / Quality Control
QRA	Quantitative Risk Assessment
RAGAGEP	Recognized and Generally Accepted Good Engineering Practice
RBDM	Risk Based Decision Making
RBI	Risk-Based Inspection
RRAP	Risk Register and Action Plan
RRF	Risk Reduction Factor
SAR	Search and Rescue
SCE	Safety Critical Element/Equipment
SFAIRP	So Far As Is Reasonably Practicable
SIFs	Safety Instrumented Function
SIL	Safety Integrity Level
SIMOPS	Simultaneous Operations
SIS	Safety Instrumented System

SME	Subject Matter Expert
SWIFT	Structured What If Technique
TOR	Terms of Reference