

## **Short summary of Risk Based Process Safety**

### ***Foundational Block: Commit to Process Safety***

Element 1 - Process Safety Culture: A positive environment where employees at all levels are committed to process safety. This starts at the highest levels of the organization and is shared by all. Process safety leaders nurture this process.

Element 2 - Compliance with Standards: Applicable regulations, standards, codes, and other requirements issued by national, state/provincial, and local governments, consensus standards organizations, and the corporation. Interpretation and implementation of these requirements. Includes development activities for corporate, consensus, and governmental standards.

Element 3 - Process Safety Competency: Skills and resources that the company needs to have in the right places to manage its process hazards. Verification that the company collectively has these skills and resources. Application of this information in succession planning and management of organizational change.

Element 4 - Workforce Involvement: Broad involvement of operating and maintenance personnel in process safety activities, to make sure that lessons learned by the people closest to the process are considered and addressed.

Element 5 - Stakeholder Outreach: Activities with the community to help outside responders and the public to understand the plant's hazards and potential emergency scenarios and how to address these scenarios.

### ***Foundational Block: Understand Hazards and Risk***

Element 6 - Process Knowledge Management: The assembly and management of all information needed to perform process safety activities. Verification of the accuracy of this information. Confirmation that this information is correct and up-to-date. This information must be readily available to those who need it to safely perform their jobs.

Element 7 - Hazard Identification and Risk Analysis: Identification of Process Safety hazards and their potential consequences. Definition of the risk posed by these hazard scenarios. Recommendations to reduce or eliminate hazards, reduce potential consequences, reduce frequency of occurrence. Analysis may be qualitative or quantitative depending on the level of risk.

### ***Foundational Block: Manage Risk***

Element 8 - Operating Procedures: Written instructions for a manufacturing operation that describes how the operation is to be carried out safely, explaining the consequences of deviation from procedures, describing key safeguards, and addressing special situations and emergencies.

Element 9 - Safe Work Practices: Procedures to safely maintain and repair equipment such as permits-to-work, line breaking, and hot work permits.

Element 10 - Asset Integrity and Reliability: Activities to ensure that important equipment remains suitable for its intended purpose throughout its service. Includes proper selection of materials of construction; inspection, testing, and preventative maintenance; and design for maintainability

Element 11 - Contractor Management: Practices to ensure that contract workers can perform their jobs safely, and that contracted services do not add to or increase facility operational risks

Element 12 - Training and Performance Assurance: Practical instruction in job and task requirements and methods for operation and maintenance workers, supervisors, engineers, leaders, and process safety professionals. Verification that the trained skills are being practiced proficiently.

Element 13 - Management of Change: Process of reviewing and authorizing proposed changes to facility design, operations, organization, or activities prior to implementing them, and that the process safety information is updated accordingly.

Element 14 - Operational Readiness: Evaluation of the process before start-up or restart to ensure the process can be safely started. Applies to restart of facilities after being shut down or idled as well as after process changes and maintenance. Also applies to start-up of new facilities.

Element 15 - Conduct of Operations: Means by which management and operational tasks required for process safety are carried out in a deliberate, faithful, and structured manner. Managers ensure workers carry out the required tasks and prevent deviations from expected performance.

Element 16 - Emergency Management: Plans for possible emergencies that define actions in an emergency, resources to execute those actions, practice drills, continuous improvement, training or informing employees, contractors, neighbors, and local authorities, and communications with stakeholders in the event an incident does occur.

***Foundational Block: Learn from Experience***

Element 17 - Incident Investigation: Process of reporting, tracking, and investigating incidents and near-misses to identify root causes, taking corrective actions, evaluating incident trends, and communicating lessons learned.

Element 18 - Measurement and Metrics: Leading and lagging indicators of process safety performance, including incident and near-miss rates as well as metrics that show how well key process safety elements are being performed. This information is used to drive improvement in Process Safety.

Element 19 - Auditing: Periodic critical review of process safety management system performance by auditors not assigned to the site to identify gaps in performance and identify improvement opportunities, and track closure of these gaps to completion.

Element 20 - Management Review and Continuous Improvement: The practice of managers at all levels of setting process safety expectations and goals with their staff and reviewing performance and progress towards those goals. May take place in a staff or “leadership team” meeting or one-on-one. May be facilitated by process safety lead but is owned by the line manager.