



# EPROM

Engineering for Petroleum & Process Industries

**Engineering Safer Operations,  
Sustaining Reliable Assets.**

— *From Hazard to Harmony* —

**Company Profile**

ABOUT EPROM

# Why Process Safety Management Matters

Independent engineering and consulting firm specialising in Process Safety Management (PSM) and Asset Integrity Management (AIM) for the oil & gas, petrochemical and energy industries.

<p><b>70%+</b></p> <p>of major incidents are linked to weak Process Safety culture  <i>Source: CCPS / OSHA</i></p>	<p><b>\$1B+</b></p> <p>per major process safety event in oil &amp; gas  <i>Source: Marsh – 100 Largest Losses</i></p>	<p><b>5x</b></p> <p>ROI from mature PSM programs vs. reactive operations  <i>Source: API / CCPS</i></p>
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## Why PSM Matters

<p><b>Protect People &amp; Environment</b></p> <p>Prevent catastrophic incidents that endanger people, communities, and the environment.</p>	<p><b>Safeguard Assets</b></p> <p>Avoid multi-million-dollar losses from unplanned shutdowns, fires, and explosions.</p>
<p><b>Social License to Operate</b></p> <p>Strengthen license to operate with regulators, investors, and the communities you serve.</p>	<p><b>Operational Excellence</b></p> <p>Drive reliability, efficiency, and sustainable performance across every facility.</p>

## PROCESS SAFETY MANAGEMENT

# The 20 Elements of CCPS Risk-Based Process Safety

EPROM helps clients implement, mature and audit each of the 20 RBPS elements across the four foundational pillars: Commit to Process Safety, Understand Hazards & Risk, Manage Risk, and Learn from Experience.

<p><b>1. Process Safety Culture</b></p> <p>Leadership commitment, policies and behaviours that make safety the way we operate.</p>	<p><b>2. Compliance with Standards</b></p> <p>Identifying and adhering to applicable codes, standards and regulatory requirements.</p>
<p><b>3. Process Safety Competency</b></p> <p>Building and sustaining the right knowledge, skills and succession across the workforce.</p>	<p><b>4. Workforce Involvement</b></p> <p>Engaging operators and technicians in PSM decisions, hazard reviews and improvements.</p>
<p><b>5. Stakeholder Outreach</b></p> <p>Transparent dialogue with regulators, communities and partners on process safety performance.</p>	<p><b>6. Process Knowledge Management</b></p> <p>Capturing, controlling and retaining PFDs, P&amp;IDs, MSDS, chemicals data and design basis.</p>
<p><b>7. Hazard Identification &amp; Risk Analysis</b></p> <p>HAZID, HAZOP, LOPA, QRA, FERA, Bowtie and Safety Case to identify and manage MAHs.</p>	<p><b>8. Operating Procedures</b></p> <p>Structured SOPs (startup, shutdown, normal, ESD, temporary) for every unit and utility.</p>
<p><b>9. Safe Work Practices</b></p> <p>PTW, isolations, confined space, working at height, SIMOPS, MOPO and related controls.</p>	<p><b>10. Asset Integrity &amp; Reliability</b></p> <p>AIM framework, RBI, RCM, inspection, QA/QC, corrosion, rotating, electrical &amp; instrumentation.</p>
<p><b>11. Contractor Management</b></p> <p>Selecting, orienting and overseeing contractors to meet PSM expectations on site.</p>	<p><b>12. Training &amp; Performance Assurance</b></p> <p>Training matrices, task analysis and verification that personnel can perform safely.</p>

<p><b>13. Management of Change</b></p> <p>Controlled review and approval of technical, organizational and procedural changes.</p>	<p><b>14. Operational Readiness (PSSR)</b></p> <p>Pre-Startup Safety Reviews to confirm facilities are safe to commission and operate.</p>
<p><b>15. Conduct of Operations</b></p> <p>Shift handover, labeling, communication, housekeeping and disciplined field execution.</p>	<p><b>16. Emergency Management</b></p> <p>ERP, accident scenarios, mock drills and tabletop exercises for credible MAH events.</p>
<p><b>17. Incident Investigation</b></p> <p>Root cause analysis of incidents and near-misses to prevent recurrence.</p>	<p><b>18. Measurement &amp; Metrics</b></p> <p>Leading and lagging KPIs to monitor PSM health and drive accountability.</p>
<p><b>19. Auditing</b></p> <p>Independent verification that PSM elements are designed and functioning as intended.</p>	<p><b>20. Management Review &amp; Continuous Improvement</b></p> <p>Periodic leadership review closing the loop on performance, learning and improvement.</p>

## EPROM APPROACH

# Our 5-Phase Implementation Roadmap

A structured journey from diagnosis to sustained excellence — taking your facility from **hazard** to **harmony**.

**01****Phase 1 — Diagnose**

Gap Analysis & Physical Barrier Screening — diagnose where you stand.

**02****Phase 2 — Design**

Design and document the PSM management system, element by element.

**03****Phase 3 — Studies**

PHA, HAZOP, LOPA, SIL, QRA and other risk & integrity studies.

**04****Phase 4 — Deploy**

Deploy procedures, tools, training and audits in the field.

**05****Phase 5 — Sustain**

KPIs, continuous improvement and assurance to keep the system alive.

PHASE 1

# Diagnose — Gap Analysis & Barrier Screening

Independent benchmarking of current Process Safety & Asset Integrity practices against CCPS RBPS, API, ASME and ISO standards. Systematic screening of safety-critical equipment and barriers against major accident hazards.

## Methodology

<p><b>Document Review</b></p> <p>Comprehensive review of existing procedures, policies, inspection records, and compliance documentation.</p>	<p><b>Employee Interviews</b></p> <p>Structured interviews with operators, engineers, and management to identify knowledge gaps and process insights.</p>
<p><b>Site Visits &amp; Field Observations</b></p> <p>On-site walkthroughs and field inspections to assess physical conditions and operational practices.</p>	<p><b>Barrier Health Verification</b></p> <p>SCE identification &amp; register, bow-tie &amp; LOPA alignment, performance verification of every layer of protection.</p>

## Deliverables

- Gap Analysis Report with maturity scoring per PSM element
- Physical Barrier Assessment Report
- Compliance Assessment against CCPS RBPS, API, ASME, ISO
- Prioritized Improvement Roadmap
- Executive Dashboard via **Risk Lens** — EPROM's secure analytics platform

## PHASE 2

# Design — System & Procedure Development

Designing and documenting the full PSM & AIM management system, element by element. Procedures, registers and workflows tailored to your facility, codes and corporate standards.

## System Documents

- Code updates philosophy & reliability framework
- Maintenance strategy & regulatory integrity requirements procedure
- Asset register development & preservation procedures
- Reporting & tracking system for findings, repairs and actions
- SCE register at Tag level

## Inspection Deliverables

- Radiography, Ultrasonic, MPI & DPI inspection procedures
- Pressure vessels, columns, piping, tanks, fired heaters, boilers, flares
- PSV testing procedure & tracking system
- Heat exchangers / air coolers inspection procedure
- Inspection deferral & lifting equipment procedures
- Written scheme of examination per equipment tag
- Advanced NDE procedure & selection criteria
- Structural Integrity Management & Risk Assessment procedures
- Dead Leg, Mixing & Injection Points, Soil-to-Air management

## RCM, RBI & QA/QC

- Criticality Analysis Procedure
- Fitness for Service procedure
- Decommissioning & recommissioning procedure
- Fabrication control strategy & welding management
- Material receiving & handling procedure

PHASE 3

# Technical Studies — PHA, RBI & RCM

Hazard identification, risk assessment, and integrity studies that quantify risk and define the engineering basis for safety and reliability.

## Process Hazard Studies

<p><b>HAZID — Hazard Identification</b></p> <p>Early-phase systematic identification of internal and external hazards across the facility lifecycle. Multi-discipline workshop, guideword brainstorming, real-time scoring.</p>	<p><b>HAZOP — Hazard &amp; Operability</b></p> <p>Structured P&amp;ID-based deviation analysis using guidewords (No, More, Less, Reverse...) to expose process hazards and operability issues; aligned with IEC 61882.</p>
<p><b>LOPA — Layer of Protection Analysis</b></p> <p>Semi-quantitative evaluation of independent protection layers to determine required SIL for safety-instrumented functions.</p>	<p><b>Bowtie &amp; Safety Case</b></p> <p>Visual barrier-based representation of MAHs — threats, top events, consequences, preventive and mitigative barriers, escalation factors.</p>

## Risk-Based Inspection (RBI)

Quantitative risk-ranking of fixed equipment and piping circuits to focus inspection effort where it reduces the most risk — fully aligned with API 580 / 581.

- Corrosion Circuit Marked-Up PFDs & P&IDs
- Corrosion Study Sheets & Circuit Tables
- Damage Mechanism review (API 571)
- Dead Legs, Injection & Mixing Points, Soil-to-Air interfaces
- Equipment & Piping Risk Ranking and Risk Distribution
- Inspection Plans, Tasks, Intervals & PRV Pop Test scheduling
- Integrity Operating Windows (IOW)

## Reliability-Centered Maintenance (RCM)

- Layer One RCM Study Report & Layer Two Criticality Analysis
- Failure Modes & Effects Analysis (FMECA)
- Equipment Criticality & Spare Parts Criticality
- Maintenance Optimization & Predictive Maintenance strategies

■ Reliability Improvement plans

PHASE 4

# Deploy — Roll-Out, Training & Audit

Translating developed PSM & AIM systems into day-to-day operations through structured implementation plans, change leadership, training and on-site coaching.

<p><b>System Roll-Out &amp; Field Deployment</b></p> <p>Implementation strategy, phased roll-out, procedures and workflow deployment, change management, on-site mentoring of operations &amp; maintenance teams, KPI dashboards.</p>	<p><b>Competency Development Program</b></p> <p>Training Needs Analysis &amp; competency matrix; PSM 20-element deep-dives; HAZOP / LOPA / Bow-Tie facilitator training; RBI, RCM &amp; IOW practitioner courses; train-the-trainer certification.</p>
<p><b>Independent Audit &amp; Verification</b></p> <p>PSM compliance audit against CCPS RBPS; Asset Integrity &amp; inspection program audit; Barrier &amp; SCE performance verification; audit findings register with corrective actions.</p>	<p><b>Continuous Improvement</b></p> <p>Management review &amp; continuous improvement plan; sustained risk reduction; capable &amp; empowered workforce; measurable performance KPIs; regulatory compliance.</p>

PHASE 5

# Sustain — KPIs & Outcomes

Closing the loop with measurable outcomes, executive reporting and continuous improvement so that performance is sustained year on year.

<p><b>Sustained Risk Reduction</b></p> <p>Demonstrable reduction of process-safety risk across the facility lifecycle.</p>	<p><b>Capable &amp; Empowered Workforce</b></p> <p>People with the competency, tools and authority to operate safely and reliably.</p>
<p><b>Measurable Performance KPIs</b></p> <p>Leading and lagging indicators that drive accountability and improvement.</p>	<p><b>Regulatory &amp; Standards Compliance</b></p> <p>Verified alignment with CCPS RBPS, API, ASME, ISO and national regulations.</p>
<p><b>Independent Assurance</b></p> <p>Third-party verification giving leadership and stakeholders confidence in performance.</p>	<p><b>Real-Time Visibility</b></p> <p>Risk Lens dashboards providing real-time visibility into integrity status and metrics.</p>

## COMPLIANCE

# Standards & Codes We Apply

Every EPROM deliverable is anchored in the leading international standards for process safety, asset integrity and pipeline management.

## Pipeline Integrity Management

- ASME B31.8S — Managing System Integrity for Gas Pipelines
- API 1160 — Hazardous Liquid Pipelines Integrity
- API 1173 — Pipeline Safety Management Systems
- 49 CFR 192 / 195 — Pipeline Integrity Management Regulations
- NACE SP0502 / SP0206 / SP0204 — ECDA, ICDA, SCCDA

## Asset Integrity & Risk-Based Inspection

- CCPS — Risk-Based Process Safety Framework
- ISO 55000 — Asset Management Systems
- API RP 580 / 581 — Risk-Based Inspection
- API RP 584 — Integrity Operating Windows
- API RP 571 — Damage Mechanisms Affecting Fixed Equipment
- API 579-1 / ASME FFS-1 — Fitness for Service
- API 754 — Process Safety Performance Indicators

## Inspection Codes

- API 510 — Pressure Vessel Inspection Code
- API 570 — Piping Inspection Code
- API 653 — Tank Inspection, Repair, Alteration and Reconstruction
- API 576 — Inspection of Pressure Relieving Devices
- API 577 — Welding Inspection and Metallurgy
- API 578 — Material Verification Program for Alloy Piping
- ASME Section VIII — Pressure Vessels

## Corrosion, Cathodic Protection & Barriers

- NACE SP0169 — External Corrosion Control of Underground Piping
- NACE MR0175 / ISO 15156 — Materials for H<sub>2</sub>S Containing Environments
- API 1163 — In-Line Inspection of Pipelines
- API RP 583 — Corrosion Under Insulation and Fireproofing
- IOGP Report 544 — Standardization of Barrier Definitions
- IEC 61511 — Functional Safety for Safety Instrumented Systems
- IEC 61508 — Functional Safety of E/E/PE Systems

## GET IN TOUCH

# Let's Engineer Safer Operations Together

Whether you are starting your PSM journey or maturing an existing AIM program, EPROM brings the people, methodology and tools to deliver lasting results.

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<b>Tagline</b>	<i>Engineering Safer Operations, Sustaining Reliable Assets — From Hazard to Harmony.</i>

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