Risk Based Process Safety
Making a Step Change Improvement in Operational Excellence

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Introduction

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• ERM Partner – Sustainability Information Solutions
• Focused on project and program delivery of EHS software solutions to help facilitate and automate EHS processes
• SAP, Enablon, IHS, Intelex – however, we are software agnostic
• 22 years of experience in EH&S projects
Admission

I am not a Chemical Engineer
ERM in Brief

ERM

- 4,500 global resources, 160 offices in 40 Countries
- Focused on Chemicals, Oil & Gas, Manufacturing, Mining & Metals, High Tech, and Pharma

EHS Services

- Site assessments to remediation – “cradle to grave” EHS expertise
- Sustainable safety practice
- Process safety and risk expertise
- Post Merger Integration
- Organizational change management
- Information Solutions - 100% focused on enabling EHS processes with software and technology
- Information Solutions - 250+ EMIS Deployments
Process Safety

• What is Process Safety
What is Process Safety…

Process Safety….

the protection of people and property from EPISODIC and CATASTROPHIC incidents that may result from UNPLANNED or UNEXPECTED DEVIATIONS or process conditions.

Safety Leadership challenges in industry

Process Safety performance is a continuing source of risk to business, and an increasing focus of business leadership.

- Incident rates are flat-lining in many organizations
- Serious Process Safety events, fatalities and injuries persist.

Companies are spending as much as 15 to 20% of OpEx / CapEx on safety process and programs.¹

As little as 5% of this effort is impacting behaviours on the front-line and therefore safety performance.

¹ For example, safety training, hazard analysis, Management of Change, capture and dissemination of data, accident investigation. Data comes from ERM engagements with senior leaders in major corporations in the extractive industries.
Increasing Performance Expectations

Process Safety performance expectations are rising on the back of:

- Declining tolerance of risk generally.
- Eliminating Process Safety events are critical to business performance and continuity planning
- 24-7 media, dramatic story lines
- Tightening regulation and more stringent enforcement by regulators

Improvement in performance must keep pace with rising expectations.

Costs of failures continue to escalate.
The Challenges

• Landscape and daily challenges
• Real world drivers
• EHS Performance Dimensions
Day to Day Challenges

Corporate Leaders have no transparency into daily operations – they are accountable and need transparency which they do not have.

Site Management

Site-level Management & Leadership are drowning in data and have bad tools – they are frustrated.

Individual employees are not engaged in Safety programs – both Corporate and Management want to invest to improve individual effectiveness.

Corporate

Individual
Influencing Factors

Alignment with Corporate and EHS IT Strategies

Redundancy: multiple IT systems across the business performing the same function

In-house developed solution costly, approaching their end of life cycle and with functionality gaps

Difficulty with accurate reporting and timely intelligence for decision making

Need for mobility, particularly for production facilities
Influencing Factors

Deficiencies in processes resulting in high compliance and process safety risk
- Poor process definition and inaccuracy of safety information
- Increasing complexity in product regulation management including REACH, RoHS, WEEE
- Increasing enforcement actions (civil and criminal)
- Operational Compliance - at site level e.g. legal requirements register: obligations in permits and permitting management

Lack of harmonization / standardization of processes

Manual processes
- Increased and duplication of effort with data accuracy and completeness challenges
- Poor integration with ERP systems (material master, HR etc.)
EHS Performance Over Time

- Lack of alignment prevents and limits performance
- Costs are persistent and/or increasing costs
- Lack of transparency into overall risk profile
EHS Performance Over Time

- Engineering Controls
- Hardware
- Safety emphasis & EHS Compliance
- Software

- Integrated EHS MS
- Reporting
- Assurance
- Competence
- Risk Management

- Behaviour
- Visible leadership/personal accountability
- Shared purpose & belief
- Aligned performance commitment
- EHS delivers business value

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Risk Based Process Safety Program

• What is Risk Based Process Safety
Risk Based Process Safety (RBPS) Principles

Based on graphic from Center for Chemical Process Safety (CCPS), “Guidelines for Risk Based Process Safety, 2013"
RBPS Comparison with Other Similar Systems

- Risk Based Process Safety
- CCPS Model
- ISO 14001
- RCMS
- Responsible Care Management System
- SEMS
- PSM
- SEVESO
RBPS Health Check

• Where are you now?
• Where do you want to go?
• So I do I get there?
Understanding Where You Are Now

- How well are your organization’s RBPS processes performing and being maintained at the element level?
- How well are you managing and learning from risks and hazards?
- Are your company’s processes consistent across all assets & locations?
- Are you fully leveraging solution capabilities?
- Is your infrastructure (people, process and technology) supporting EHS needs and aspirations – both currently and in the future?
RBPS Elements Illustrative System Mapping

**Commit to process safety**
- Compliance with Standards
- Process Safety Competency
- Workforce Involvement
- Stakeholder Outreach

**Understand hazards**
- Process Knowledge Management
- Hazard Identification and Risk Analysis

**Contractor Management**
- Document Management
- Risk Assessment
- Work Permit Management
- Enterprise Asset Mgmt.
- Human Resource Management
- Management of Change
- Incident Management
- EHS & Audit Management
- Product Safety & Compliance

**Manage risk**
- Operating Procedures
- Safe Work Practices
- Asset Integrity and Reliability
- Contractor Management
- Training and Performance Assurance
- Management of Change
- Operational Readiness
- Conduct of Operations
- Emergency Management

**Learn from experience**
- Incident Investigation
- Measurement and Metrics
- Auditing
- Management Review and Continuous Improvement
- Implementation and the Future

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The value of system integration for RBPS

Process Safety
Event Occurs

Locations
Where did it occur?

Materials
What materials were involved?

What potential risks surfaced from an event?
What are risks from all sources revealing about overall risk profile?

Risk Management

Human Resources
Who was involved?

Who will investigate?
Who are the action and task owners?

Workflow / Action Management

Management of Change

Workflow / Action Management

Human Resources

Who was involved?

Who will investigate?
Who are the action and task owners?

Management of Change

Costs / Finance
What are all the costs of an event?

Reporting & Analytics
Trending and reporting of leading and lagging indicators

Assets & Maintenance
What assets were involved?

Workflows / Action Management

What assets were involved?

Maint. workflow Notifications

Document Management
Common document storage across landscape

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Process / System Integration & Interface Areas

Risk Based Process Safety Program

Assets & Maintenance
Workflow / Action Management
Human Resources
EHS Management
Costs / Finance
Locations
Materials
Regulatory Content Management
Reporting & Analytics
ERM Combined Differentiation

ERM EHS Services

- Sustainable safety practice
- Process safety and risk expertise
- Organizational change management
- Helping our clients move to the next level in operational risk management performance
- Post Merger Integration

ERM Information Solutions

- 100% Focused on Enabling Process with Technology
- Accelerators and Tools for process analysis and deployments
- 250+ EMIS solution deployments
- Market & software evaluation

The global knowledgebase of ERM’s 5000+ EHS domain experts

Industry focused market leading integrated EHS solutions including SAP, Enablon and Intelex, etc

Best practices for EHS solution deployments.

Accelerators and Tools for process analysis and technology enablement
ERMs Operational Excellence Journey

Assess
- Strategic Vision
- Business Needs
- EHS Infrastructure
- EHS Solutions

Diagnose
- Gap Assessment
- Business Case
- Governance
- Management of Change process

Roadmap & Prioritization
Revise or upgrade
- Existing processes and solutions
- New processes and solution(s)
- Continue As-Is

Execution & Deployment(s)
- Implement and execute plans
- Control and monitor
- Repeat – cycle of continuous improvement

ERM Health Check(s)

Level 1 – a one day assessment

Level 2 – a 2-3 week deeper dive assessment

Customized Strategic Assessments & Deployments
Questions
ERM Clients

People

Plant

Process

Total

Anglo American

Rio Tinto

Schneider Electric

ConocoPhillips

Jabil Circuit

Samsung

Chevron

Valero

PG&E

ArcelorMittal

S-Oil

Goldcorp

Trafigura

Dow Corning

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