Effectively Manage PSM Training using Process Safety Enterprise®

An ioMosaic White Paper

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Overview

Process Safety Enterprise® (PSE), a cloud-based platform, helps manage PSM Training, ensuring compliance with OSHA's PSM standard. This white paper details the key features of PSE, including:

- Document Control System: Easily stores and retrieves documents
- Intelligent Form Builder: Creates customizable forms
- Action Tracking System: Manages all tasks related to PSM training
- Reporting and Dashboard/KPI: Provides real-time insights into activities
- PSM Training Workflow: Guides users through determining and assigning the required initial and refresher training, tracking training to completion, and meeting all OSHA PSM requirements.
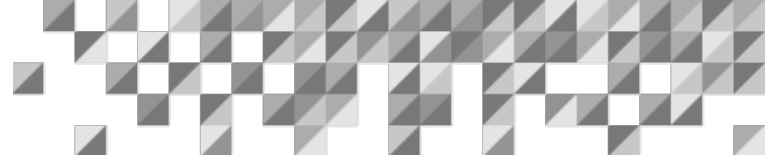
A case study highlights how PSE and an effective training program could have helped to prevent this disaster by managing and executing required PSM training.

Introduction

PSM training is crucial for effectively implementing the Occupational Health and Safety Administration (OSHA) Process Safety Management (PSM) 29 CFR 1910.119 standard. The standard requires Training in many places for PSM awareness, emergency action plan awareness, operators, maintenance, welders, risk assessment leaders, auditors, employees who assist with safe evacuations, and emergency responders if the site allows this function.

Businesses often encounter challenges overseeing PSM training, as employees must be trained differently, depending on their job duties and other functions. Training must also be completed when employee job duties change within the covered process. Overlooking the required training or implementing an ineffective training program risks the safety of employees, plant assets, the community, and the environment.

An effective PSM training program should include identifying the required awareness training for all employees and specific Training for job duties that impact the covered processes. A policy or procedure should state the required passing grade for training tests and hands-on demonstrations. It should also state if a failed test can be retaken and, if so, whether it can be retaken immediately or if the trainee must wait a certain amount of time. A method for asking each trainee if the training frequency is appropriate should also be established.
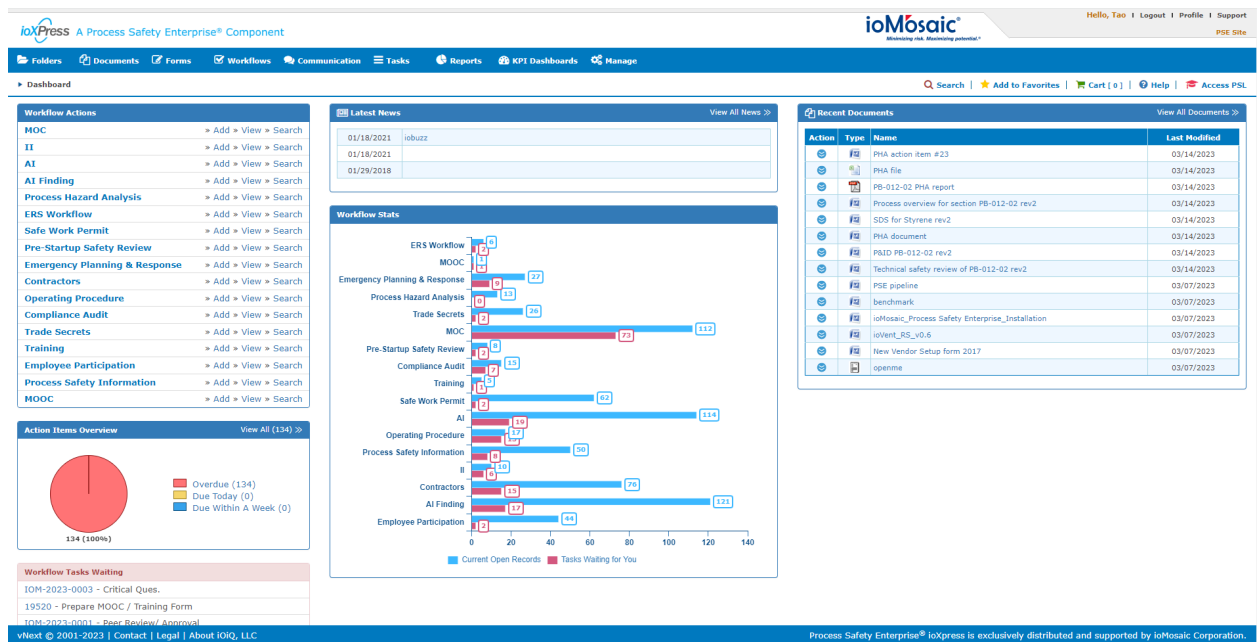
Training should be tracked for all employees with the training topic, date completed, employee name, and the method for determining understanding. A document management system is needed to create and store the procedures, training materials, tests, and hands-on evaluations.

Effective training systems help companies plan, execute, and store required PSM training. This workflow can help companies comply with the PSM requirements of the 29 CFR 1910.119 standard.

We recommend a PSM Essentials eLearning course like the one offered by Process Safety Learning® (PSL) to help you better understand the PSM standard's requirements.

For businesses serious about implementing a comprehensive PSM compliance system, ioMosaic offers the Process Safety Enterprise® (PSE) (Figure 1). PSE is a cloud-based platform enabling easy ongoing management of process safety data, helping businesses achieve compliance, manage risk, and remain competitive. Unlike any other system available in the market today, PSE is a centralized web-based application that integrates all PSM elements and workflows, making it THE ultimate solution for managing PSM training effectively. This white paper delves into the key features of PSM training and how it benefits companies seeking to improve and elevate their training systems to manage the identified PSM hazards.
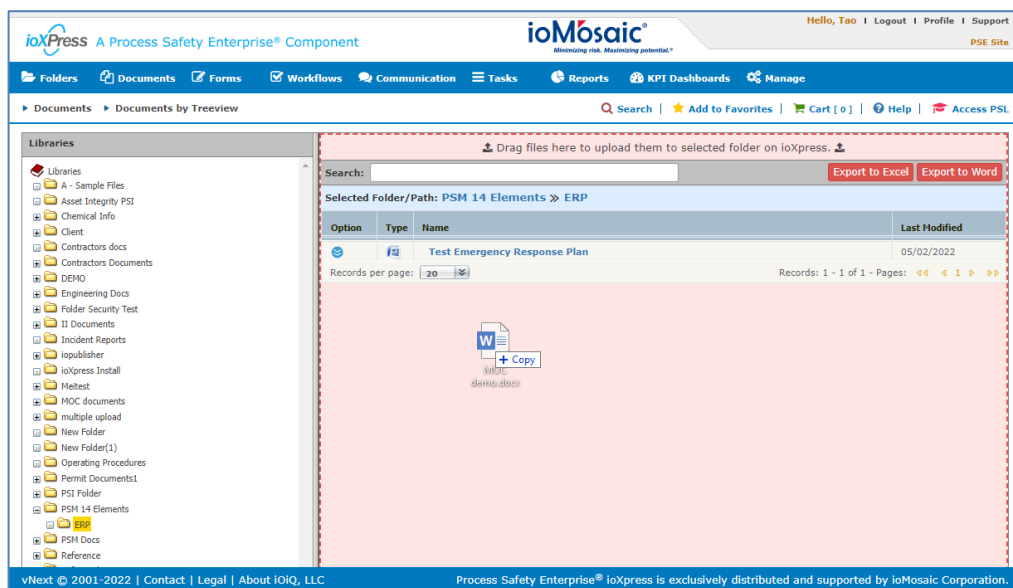
Figure 1. Process Safety Enterprise® (PSE)

Source: ioMosaic Corporation – PSE

Document Control System

The document control system of PSE's platform is a key component for facilitating easy access to all critical process safety data. It allows users to easily access and add documents using a simple drag-and-drop (Figure 2) feature. This action quickly organizes documents into folders for easy retrieval. Its advanced search function indexes all documents with full text, allowing users to find necessary information quickly. An embedded document viewer feature not only enhances accessibility but also bolsters security measures. By granting users view-only permissions, they can view documents as images, preventing unauthorized downloads and eliminating the need to log into their computers for access. This document control component is an effective tool for managing various types of data, including but not limited to training procedures, materials, and tests, Process Safety Information (PSI), records, pictures, videos, animation, and reports. This component further ensures that all stakeholders have easy access to vital information related to PSM training stored in a centralized location.

Figure 2. Drag and drop feature to add document(s)

Source: ioMosaic Corporation – PSE

Intelligent Form Builder

PSE also includes an intelligent form builder for efficient data capture and linking to documents in a central digital library. This dynamic form builder enables users to create a practical, customizable training process.

The ability to customize forms for unique training requirements ensures that all necessary data is captured accurately and consistently. Moreover, this feature allows for easy export of data to an Excel format, making data analysis and sharing even more seamless. Implementing a customizable form builder like the one in PSE streamlines training by capturing data accurately and efficiently.

Figure 3 shows an example of a training form.

Figure 3. Example of Training Completeness From

Source: ioMosaic Corporation – PSE

PSM Training Workflow

PSE is the only process safety platform integrating all of OSHA's Process Safety Management (PSM) elements using visual workflows. This single enterprise platform includes workflows for PSM's 14 elements, action tracking modules, and document control. The Training workflow

allows you to manage the training requirements of all site employees. Contractor training is managed within the contractor workflow.

The PSE Training workflow establishes steps for assigning the required initial and refresher training and tracking training to completion. The PSE workflow links to the [Process Safety Learning](#)® (PSL) platform to assign and administer all training, determine if the trainees believe the training frequency is appropriate, discuss missed test answers or hands-on demonstration steps, and ensure understanding. Failed tests can be readministered as allowed by the site procedures.

The final step of the PSE workflow then checks that all documentation is in place and that any comments on the appropriateness of refresher training frequency have been addressed before the workflow can be closed.

Figure 4 illustrates the PSM Training workflow steps. Completed steps are in blue, Inactive steps in light gray, Not applicable steps in dark gray, and Ready steps are in green. The workflow can only be closed once all required steps are completed.

The PSE Training workflow ensures that required training on hazardous activities is identified and executed per the OSHA standards and guidelines.

Figure 4: Example of Training Workflow

Source: ioMosaic Corporation – PSE

Action Tracking System

PSE features a comprehensive action item management system (Figure 5). It tracks all tasks related to each process safety management workflow, such as Training. This feature ensures that all action items are managed within the platform, reducing or eliminating the risk of overlooked or forgotten tasks. An additional feature, the 'Automatic Reminders,' enforces all tasks to be completed on time.
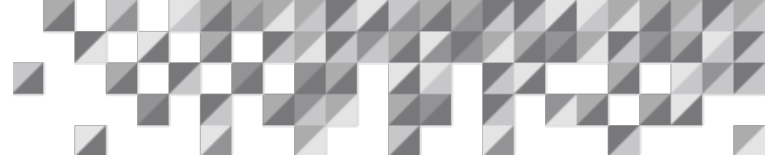
Figure 5. Training Action Item

Source: ioMosaic Corporation – PSE

Reporting and Dashboard/KPI

An effective dashboard (Figure 6) is an invaluable 'must-have' asset for any data-driven enterprise looking to increase performance and productivity. Well-designed dashboards featuring various widgets such as bar charts, pie charts, line charts, and tables provide a comprehensive overview of the PSM program from a single source. These dashboards allow business owners to make quick, informed decisions at a glance based on real-time data.

Moreover, the reporting and dashboard capabilities provide real-time visibility into training activities, allowing organizations to identify trends and areas of concern quickly. This capability enables timely corrective action, reducing the risk of incidents and non-compliance. PSE's robust reporting and dashboard/KPIs are essential tools for optimizing Training and mitigating potential risks.
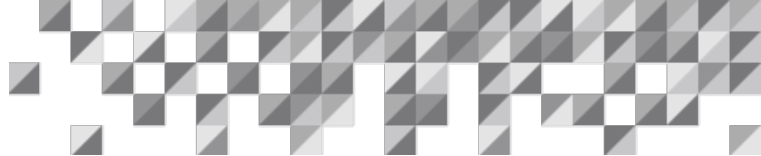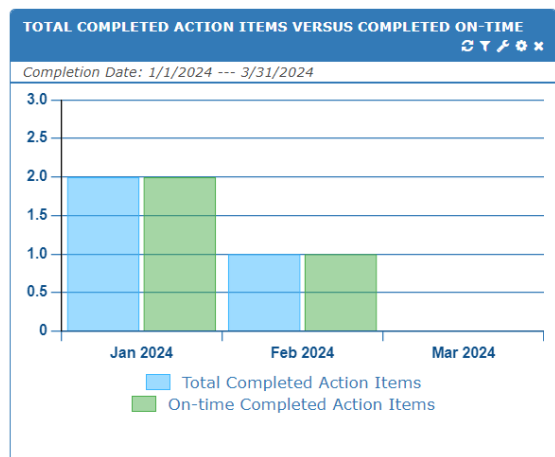
Figure 6. Dashboard/KPI
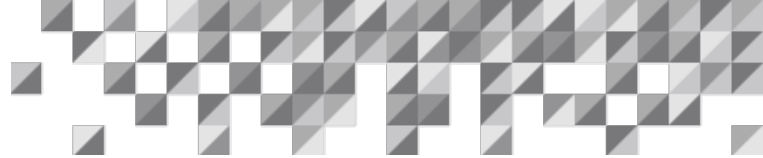

Source: ioMosaic Corporation – PSE

Case Study – The Consequences of Ineffective Training

The Challenge

The US Chemical Safety and Hazard Investigation Board (CSB) investigated a fatal release that occurred on July 27, 2021, at the LyondellBasell La Porte Complex in La Porte, Texas. Three contract workers employed by Turn2 Specialty Companies (Turn2 were working to remove an actuator from a plug valve in the site's acetic acid unit. The workers inadvertently removed pressure-retaining components of the valve while attempting to remove the actuator, and the pressure ejected the plug from the valve body.

According to the CSB report, approximately 164,000 pounds of an acetic acid and methyl iodide mixture erupted from the open equipment, and all three contract workers were sprayed. Two of the workers were fatally injured by chemical burns and toxic inhalation injuries from exposure to the mixture. Additionally, the third Turn2 worker and a LyondellBasell responder were seriously injured. LyondellBasell transported 29 other personnel to medical facilities for further evaluation and treatment. LyondellBasell's property damage resulting from the incident, including loss of use, was estimated to be $40 million.

The CSB found that LyondellBasell did not provide the work crew with a procedure detailing how to remove the actuator from the plug valve. In addition, neither LyondellBasell nor Turn2 trained the work crew on the steps necessary to remove the actuator. Finally, LyondellBasell did not adequately assess the potential risk of exposing the contract crew to hazardous chemicals during the actuator removal despite historical incidents in the industry in which workers had inadvertently

removed pressure-retaining components from plug valves installed in pressurized service. For the detailed CSB report, please view this [link](#).

LyondellBasell could have potentially prevented this disaster if they had adequately assessed the hazards of this job based on prior industry incidents and then trained their employees and contractors on the specific procedural steps required to avoid those hazards while removing the actuator from the plug valve.

An effective PSM training program should have been in place based on the known hazards of the process and related industry incidents to avoid this disaster. However, an existing program solely relying on individuals to execute the training requirements and maintain the documentation can be prone to human error. Creating a documented program that relies on an electronic platform for establishing training requirements, creating or sourcing appropriate training materials, conducting the training, and ensuring a thorough understanding of the content can improve process safety oversight and employee and contractor safety. An electronic program can also reduce the risk of worker fatalities and injuries using appropriate Training.

Our Approach

Process Safety Enterprise® Training Workflow is a cloud-based platform that provides a centralized database accessible and visible to all employees and contains a step-by-step guided workflow. This workflow could have avoided the LyondellBasell incident when coupled with the other workflows, such as the PSL eLearning platform, Incident Investigation workflow for investigating related industry accidents, and the Process Hazard Analysis (PHA) workflow for identifying and managing process hazards. Additionally, PSE can integrate multiple sites and various data into one uniform system (which would have further minimized the incident) by:

- Developing a unique ID system to differentiate facilities and areas
- Setting up sign-on access for users at all facility sites
- Identifying and developing consistent data definitions and Key Performance Indicators (KPIs)
- Standardizing search queries to ensure data quality
- Devising site-specific and corporate reporting capabilities

Customizable workflows are available within PSE and can assist with creating unique PSM training processes.

PSE's built-in features, such as the automatic assignment of approvals, action item tracking, document linking, and email notifications, all contribute to ensuring the documentation and execution of PSM Training is properly captured, accessible, and visible to employees.

The Benefits

For companies serious about their process safety compliance and the PSM Training process, PSE is a user-friendly platform with workflows for document control that is scalable and affordable.

The Training workflow ensures that all required PSM training is identified for each individual and conducted on time. Missed questions are verified to be reviewed and understood, and training frequency is established with employee feedback.

Finally, the PSE workflows have KPIs that track open and completed workflows. The KPIs are graphed with interactive data, allowing you to drill down to the specific data. Reports can also be generated to view the upcoming training due dates to ensure on-time training completion.
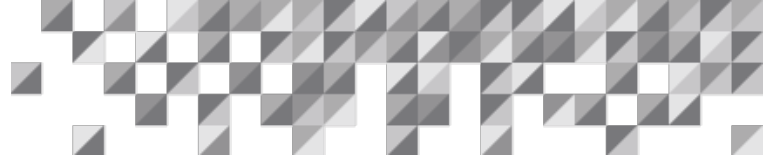
Conclusion

Managing PSM training effectively and consistently can be challenging; fortunately, Process Safety Enterprise® (PSE) provides an integrated solution that makes the process more efficient and effective. With its dynamic form builder, action tracking feature, and integrated workflows to standardize the process, companies reduce the risk of incidents and non-compliance.

PSE offers additional benefits, including enhanced collaboration, improved data management, and increased compliance with process safety regulations. With the reporting and dashboard capabilities, organizations can easily identify trends and potential areas of concern, gaining real-time visibility into all process safety-related activities. The automatic notification system sends reminders and alerts, ensuring items are addressed timely.

PSE's customizable Training workflow module includes steps to assign, track, document, and verify effective Training. This process ensures that all necessary information is captured in one centrally located platform.

PSE is the only product of its kind in the market today that provides an all-inclusive process safety compliance platform that makes compliance easy.

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Useful Links

PSE link to software demo requests

PSE link to PSE overview

PSM Essentials Training link

Process Safety Learning link

CSB report link

Additional PSE White Papers:

PSM Compliance Made Easy with Process Safety Enterprise®

Effectively Manage Mechanical Integrity with PSE

Effectively Manage Processes Chemicals Equipment and Personnel with PSE

Process Safety Enterprise® Asset Integrity Management Service (AIMS) and KPI Dashboard