

# **Effectively Manage Incident Investigations using Process Safety Enterprise<sup>®</sup>**

An ioMosaic White Paper

**Date:** July 1, 2024



## Overview

Process Safety Enterprise® (PSE), a cloud-based platform, helps manage PSM Incident Investigation, 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 managing incidents
- Reporting and Dashboard/KPI: Provides real-time insights into activities
- PSM Incident Investigation Workflow: Guides users through documenting an incident investigation, such as the time, date, location, and incident details. Incident classification for Tier 1, 2, 3, and near-miss incidents per API 754 can also be documented.

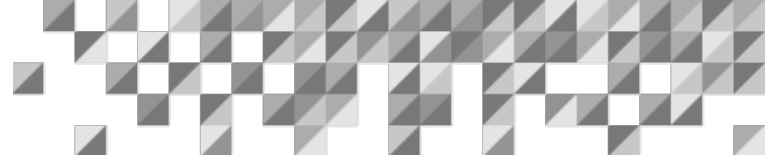
A case study highlights the consequences of inadequate incident management. It emphasizes how a process to ensure incident investigations could have helped to prevent this disaster.

## Introduction

Incident investigation is crucial to OSHA's PSM 29 CFR 1910.119 standard. It ensures that accidents and near misses are promptly investigated, root causes are identified and addressed, and a report is written to document and communicate the findings.

Businesses often encounter challenges overseeing these activities since the incident must be recorded, a team must be formed, data must be captured, root causes must be identified before recommendations can be made and pursued, and impacted personnel must be informed. Overlooking any of these activities can result in root causes that are not adequately addressed, which can lead to future incidents. These incidents can jeopardize the safety of employees, plant assets, the community, and the environment. Production could also be interrupted if an accident occurs.

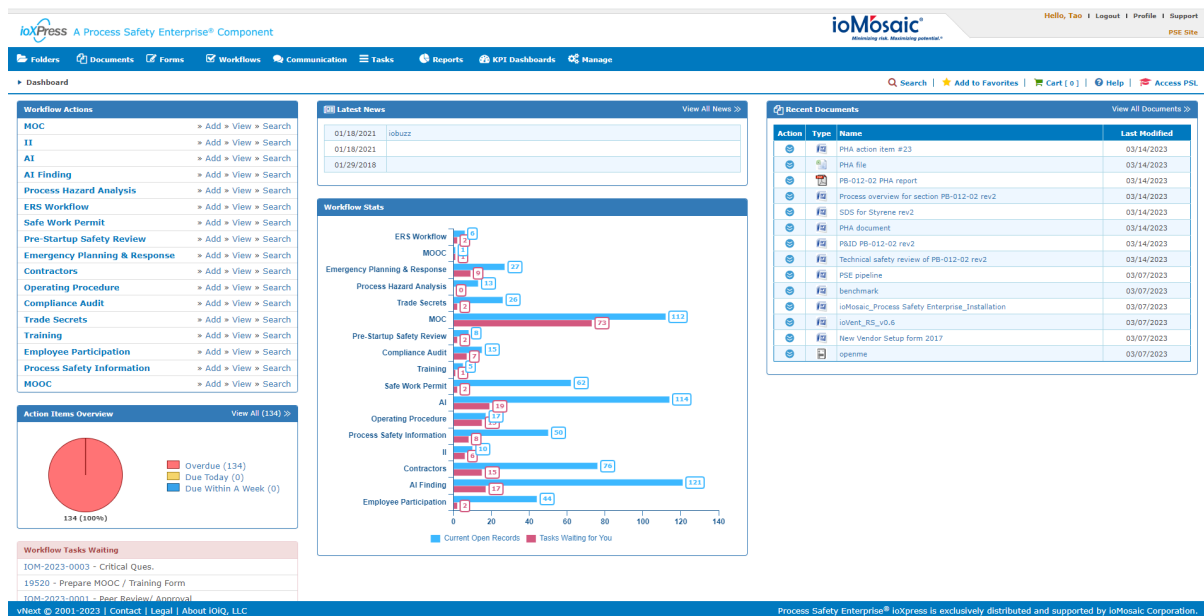
An effective incident investigation process should include each of the activities above and track them to completion. Training should also be tracked for team leaders facilitating the root cause analysis process. Effective incident investigation systems help companies investigate, understand, and document incidents to prevent future occurrences. This workflow can help companies comply with the PSM requirements of the 29 CFR 1910.119 standard.



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 incident investigation effectively. This white paper delves into the key features of incident investigation and how it benefits companies seeking to improve and elevate their investigative systems to manage accidents and near misses and prevent future events.

To help you better understand the requirements of the PSM standard, we recommend a [PSM Essentials eLearning course like the one offered by Process Safety Learning®](#).

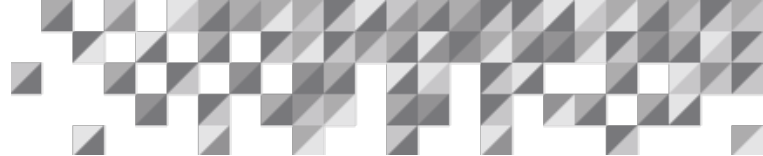
Figure 1. Process Safety Enterprise® (PSE)



Source: ioMosaic Corporation – PSE

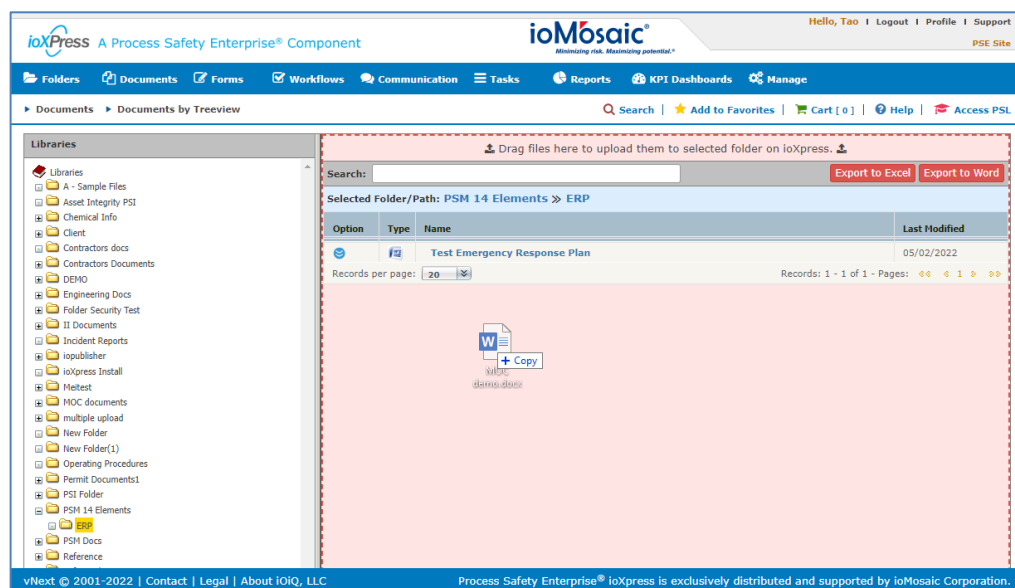
## Document Control System

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 incident investigation data, records, pictures, videos, animation, and reports. This component further ensures that all stakeholders have easy access to vital information related to incident investigations 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 incident investigation process.

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

Figure 3 shows an example of an Incident Investigation workflow form for initiating the incident investigation.

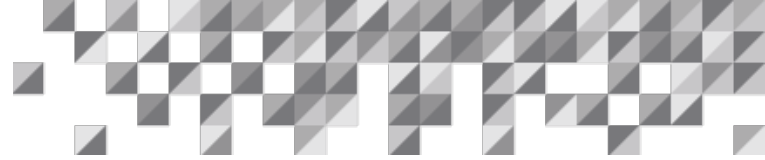
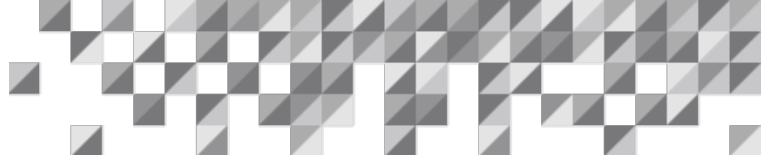


Figure 3. Example of an Initiation Form within the Incident Investigation Workflow

You are working on Incident Investigation form of workflow II # 20592 - t

Incident Notification	Data History	Workflow Note												
<p><b>*Incident Number *</b> 20592 *Unique Identifier</p>														
<p><b>*Incident Title *</b> t</p>														
<p><b>*Incident Date *</b> 1/17/2024</p>														
<p><b>*Incident Time *</b> 11:13 AM</p>														
<p><b>*Affected Process *</b> Other Tank Farms</p>														
<p><b>*Area where incident occurred *</b> Refinery Shipping</p>														
<p><b>*Specific location or equipment *</b> t</p>														
<p><b>*Plant conditions at the time of the incident *</b></p> <table border="0"> <tr> <td><input type="checkbox"/> Daylight</td> <td><input type="checkbox"/> Icy</td> </tr> <tr> <td><input checked="" type="checkbox"/> Dusk/Dawn</td> <td><input type="checkbox"/> Cold</td> </tr> <tr> <td><input type="checkbox"/> Night</td> <td><input type="checkbox"/> Hot</td> </tr> <tr> <td><input type="checkbox"/> Clear</td> <td><input type="checkbox"/> Temperate</td> </tr> <tr> <td><input type="checkbox"/> Rain</td> <td><input type="checkbox"/> Foggy</td> </tr> <tr> <td><input type="checkbox"/> Sleet</td> <td></td> </tr> </table>			<input type="checkbox"/> Daylight	<input type="checkbox"/> Icy	<input checked="" type="checkbox"/> Dusk/Dawn	<input type="checkbox"/> Cold	<input type="checkbox"/> Night	<input type="checkbox"/> Hot	<input type="checkbox"/> Clear	<input type="checkbox"/> Temperate	<input type="checkbox"/> Rain	<input type="checkbox"/> Foggy	<input type="checkbox"/> Sleet	
<input type="checkbox"/> Daylight	<input type="checkbox"/> Icy													
<input checked="" type="checkbox"/> Dusk/Dawn	<input type="checkbox"/> Cold													
<input type="checkbox"/> Night	<input type="checkbox"/> Hot													
<input type="checkbox"/> Clear	<input type="checkbox"/> Temperate													
<input type="checkbox"/> Rain	<input type="checkbox"/> Foggy													
<input type="checkbox"/> Sleet														
Incident Description														
<p><b>*Incident Description *</b></p>														
<p><b>*Immediate actions taken *</b></p>														
<p><b>*Material involved in the incident: *</b> 0</p>														
<p><b>Internal witnesses</b> [User Icon] [Clock Icon] [Plus Icon]</p>														
<p><b>Contractor witnesses</b> Text Input</p>														
<p><b>*Incident Classifier *</b> [User Icon] Tao Yao [Close Icon]</p>														
<p><b>*Is this a Near Miss? *</b> <input type="radio"/> Yes <input checked="" type="radio"/> No</p>														

Source: ioMosaic Corporation – PSE



## PSM Incident Investigation Workflow

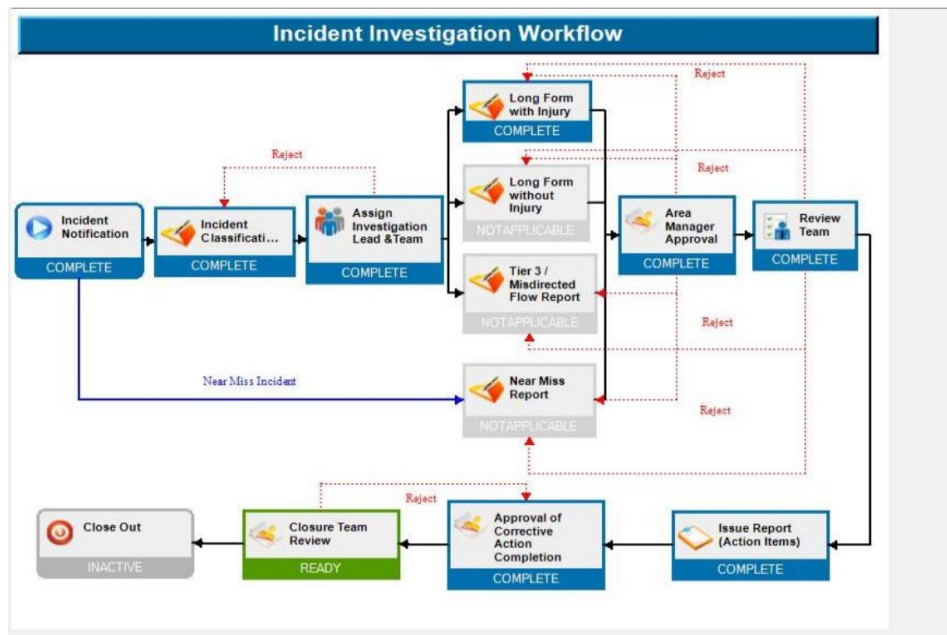
PSE is the only process safety platform integrating all of OSHA's Process Safety Management (PSM) elements using visual workflows in a single enterprise system. This workflow includes PSM's 14 elements, action tracking modules, and document control. The PSE workflow allows you to create and manage incident investigations and document the evidence, related activities, approvals, root causes, and reports.

The Incident Investigation workflow establishes steps for capturing the initial incident information, classifying the incident, creating a team, determining the root causes, approving the results, implementing the corrective actions, and documenting the report. It can be customized to meet the specific needs of any company.

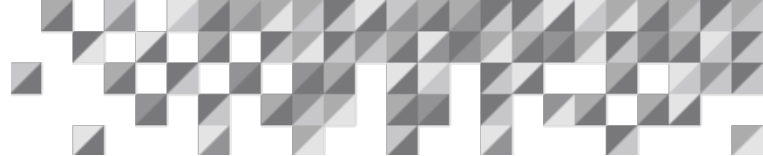
Figure 4 illustrates the Incident Investigation workflow steps, with blue Complete, gray Not applicable, and green Ready steps. The workflow can only be closed once all required steps are completed.

This PSE workflow is crucial for creating and managing incident investigations and identifying and addressing root causes to prevent future reoccurrences.

Figure 4: Example of Incident Investigation Workflow



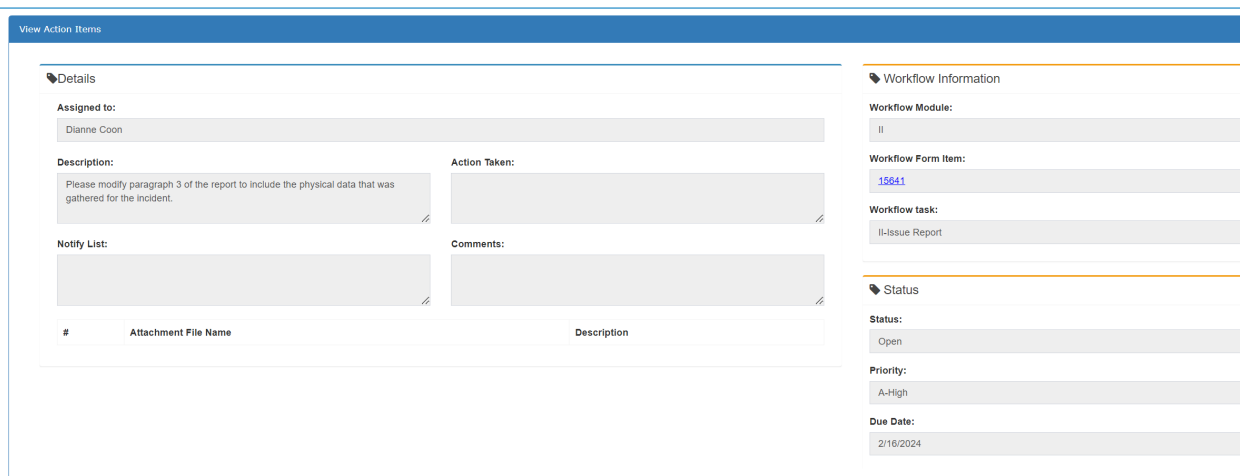
Source: ioMosaic Corporation – PSE



## 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 incident investigation. 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. Incident Investigation Review Action Item



The screenshot displays a web interface titled "View Action Items". It is divided into several sections:

- Details:**
  - Assigned to:** Dianne Coon
  - Description:** Please modify paragraph 3 of the report to include the physical data that was gathered for the incident.
  - Action Taken:** (Empty text area)
  - Notify List:** (Empty table with columns #, Attachment File Name, and Description)
  - Comments:** (Empty text area)
- Workflow Information:**
  - Workflow Module:** II
  - Workflow Form Item:** 15641
  - Workflow task:** II-Issue Report
- Status:**
  - Status:** Open
  - Priority:** A-High
  - Due Date:** 2/16/2024

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 incident investigation 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 incident investigations and preventing future incidents.

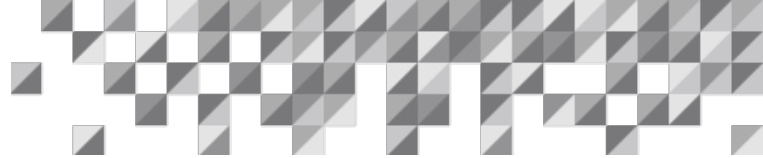
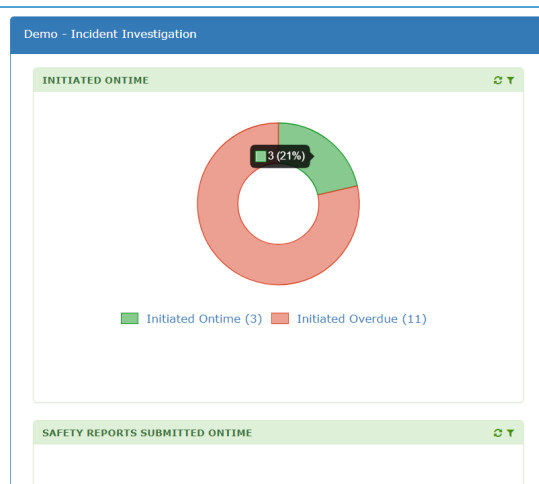


Figure 6. Dashboard/KPI



Source: ioMosaic Corporation – PSE

## Case Study – The Consequences of Not Identifying and Managing Process Hazards

### The Challenge

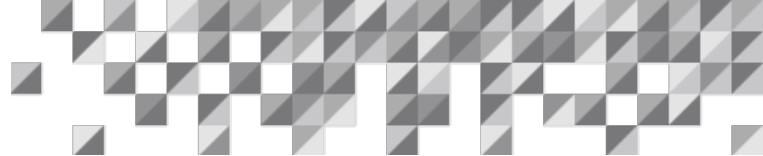
The US Chemical Safety and Hazard Investigation Board (USB) investigated an explosion that occurred at the Airgas manufacturing facility in Cantonment, Florida, in February 2016. The investigation found that the likely cause of the explosion was a pump that overheated the nitrous oxide during the initial offloading from a truck trailer. The CSB also found three of the six previous nitrous oxide industry incidents were due to a pump overheating the material.

The CSB concluded that reactive materials such as nitrous oxide should be included in the PSM standard to ensure that the hazards of the process are understood and managed. The final CSB report can be found at this [link](#).

PSM requires that previous incidents that could impact the process be included in PHAs and that any lessons learned from incident investigations be shared with impacted employees.

Airgas could have potentially prevented this disaster if they had adopted a PSM program to identify, understand, and manage the hazards of nitrous oxide, even though OSHA did not require them to do so. Reviewing prior industry incident investigations would have identified the pump heat as a potential hazard that could have been managed. All companies can benefit from reviewing relevant incident investigations and determining if the root causes apply to their current processes.





An electronic platform for managing the requirements of PSM, such as incident investigations and PHAs that should review related industry incidents, can assist companies with identifying, understanding, and managing related process hazards to prevent or mitigate catastrophic accidents such as this.

## Our Approach

Process Safety Enterprise® Incident Investigation 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 Incident Investigation workflow could have avoided the Airgas incident when coupled with 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

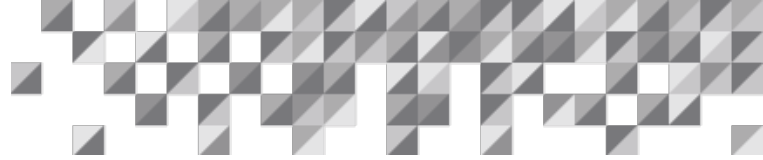
Customizable workflows are available within PSE and can assist with creating unique PSM incident investigation processes.

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 Incident Investigation are properly captured, accessible, and visible to employees.

## The Benefits

For companies serious about process safety compliance and the PSM Incident Investigation process, PSE is a user-friendly platform with scalable and affordable workflows for document control. The Incident Investigation workflow streamlines initiating, creating, classifying, approving, investigating, and documenting incident investigations.

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 history of incident investigations within a given timeframe.



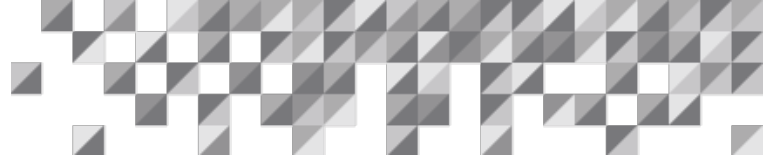
## Conclusion

Managing incident investigations 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 workflow to standardize the process, companies reduce the risk of future 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 to stakeholders, ensuring items are addressed in a timely manner.

PSE's customizable Incident Investigation workflow module provides an efficient process while capturing all necessary information 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.



## Authors

1. Jian Lan: [lan.j.nh@iomosaic.com](mailto:lan.j.nh@iomosaic.com)
2. Dianne Coon: [coon.d.nh@iomosaic.com](mailto:coon.d.nh@iomosaic.com)

## Useful Links

PSE [link](#) to software demo requests

PSE [link](#) to PSE overview

PSM Essentials Training [link](#)

CSB report download [link](#) for facility explosion

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](#)