

2025 GLOBAL CONFERENCE ON PROCESS SAFETY & BIG DATA



EPSC



Leveraging
Digitalization
and Artificial
Intelligence
to Enhance
Process Safety.

NOVEMBER 11 – 12, 2025

Leonardo Royal Hotel Frankfurt | Frankfurt am Main, Germany

SUBMIT YOUR ABSTRACT(S) BY July 9, 2025

You are invited to attend the **2025 Global Conference on Process Safety and Big Data**, taking place on **November 11-12** at Leonardo Royal Hotel Frankfurt in **Frankfurt am Main, Germany**. We encourage all professionals from industry, academia, and research institutions to submit their abstract(s) on the advancement of process safety and digitalization, for oral or poster presentations.

SESSION TOPICS INCLUDE:

- Practical digitalization and AI use cases in Process Safety
- Advanced analytics and AI-driven safety systems; AI-supported safe plant operation
- Asset integrity predictive analytics and machine learning (ML)
- Dynamic risk modeling and visualization
- Human and AI interaction and digital trust
- Validation of data-driven and AI-based safety results
- Digitalization for frontline error reduction
- Technologies to reduce human exposure



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2025 Global Conference on Process Safety and Big Data

CALL FOR ABSTRACTS

Practical digitalization and AI use cases in Process Safety

Digitalization and AI are transforming process safety by changing the way industries approach risk management and boost operational efficiency. By utilizing advanced data analytics, machine learning, and real-time monitoring, organizations can identify potential hazards, evaluate operational risks, optimize maintenance schedules, and enhance incident response times. This session welcomes presentations that showcase practical applications of digitalization and AI, such as HAZOP, MOC, LOPA, QRA, incident data assessment, and automated language translation. Presenters are encouraged to share insights gained from both successful and unsuccessful implementations.

Advanced analytics and AI-driven safety systems; AI-supported safe plant operation

Advanced analytics and AI-driven safety systems leverage AI algorithms to analyze historical incident data, monitor real-time operational variables, identify patterns, and recommend preventive measures or corrective actions. For instance, monitoring and assessing the plant's operational data to identify early signs of potentially hazardous operating conditions, allowing for adjustments in the plant controls to steer performance back within the desired operational parameters. This session invites presentations that showcase applications of these advanced safety systems in use cases such as enhanced plant control, early warnings for adverse scenarios, barrier health management, verification and validation of critical procedures, and management of overrides.

Asset integrity predictive analytics and machine learning

Asset integrity predictive analytics, when paired with machine learning (ML), is essential for improving process safety and risk management in industrial operations. By examining historical data alongside real-time sensor inputs, these advanced technologies can pinpoint potential failures and anomalies before they develop into significant incidents. They can drive maintenance requirements and streamline inspection schedules. This session welcomes presentations that showcase the integration of predictive analytics and machine learning to enhance process safety outcomes and optimize risk management strategies.

Dynamic risk modeling and visualization

Dynamic risk modeling is a cutting-edge approach that continuously evaluates and updates risk profiles in real-time, adapting to evolving process conditions and new information. In contrast to traditional static models that depend on fixed assumptions and historical data, dynamic risk modeling utilizes real-time data inputs, simulations, and predictive analytics to deliver a more precise and responsive understanding of potential risks. This session invites presentations that showcase the applications of dynamic risk modeling to improve the visualization of safety-critical barriers, enhance the recognition of changes, and provide early warnings for adverse scenarios, elevated risk, abnormal situations, or potential personnel exposure.

Human-AI interaction and digital trust

Establishing trust in human-AI interactions is essential for the effective adoption of AI in process safety and risk management. Building confidence in AI-generated outcomes requires tackling the challenges of the "black box" nature of AI and ensuring transparency, while also taking into account ethical considerations, reliability, integrity, and security. This session encourages presenters to share their hands-on experiences in evaluating or fostering digital trust in human-AI interactions for applications such as hazard identification, field and operational risk assessments, change recognition, plant safety systems controls, process safety information verification and validation, or other pertinent examples.

Validation of data-driven and AI-based results

Evaluating data-driven and AI-based results is crucial for ensuring their accuracy and reliability in process safety decisions and actions. This assessment entails a systematic review of the methodologies employed to produce these results, verification of the quality of the underlying data, and confirmation that the AI models are operating as intended. Presenters are invited to share their expertise in validating these results for applications such as hazard identification, field and operational risk assessments, plant safety system controls, assets inspection, or other relevant examples.

Digitalization for frontline error reduction

Digitalization plays a crucial role in minimizing errors at the frontline through operation and maintenance lifecycle. Emerging technologies like augmented reality (AR), virtual reality (VR), guided remote work instructions, real-time task monitoring, and wearable devices significantly enhance training and operational processes. They offer real-time, interactive guidance and simulations that enable workers to better visualize complex tasks and procedures. This session welcomes presentations on successful implementations of these frontline technologies, including applications such as conducting maintenance with greater accuracy, performing remote inspections, simulating hazardous scenarios for risk-free training, and other pertinent process safety applications.

Technologies to reduce human exposure

Drones and robotics are prime examples of technologies being increasingly utilized to minimize human exposure to hazardous environments, significantly enhancing safety across multiple industries. This session invites presentations on the practical implementation of this type of technologies to mitigate the risk of human exposure in applications such as asset inspections and maintenance in hard-to-reach locations, emergency response initiatives, and the integration of these technologies with big data analytics and AI for the detection, reporting, and resolution of anomalies.