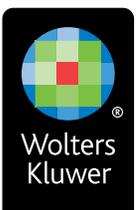




Case Study

How PHE Subholding Upstream Strengthens Operational Risk Management with BowTieXP Enterprise



Enablon Bowtie Suite

Summary

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The need:

Pertamina Hulu Energi needed a single solution to consolidate major accident hazard scenarios and clearly visualize hazards and barrier status for both operations and management.



The solution:

Pertamina Hulu Energi implemented BowTieXP Enterprise to consolidate major accident hazard scenarios into clear bowtie visualizations and provide visibility into hazard registers and barrier status across operations.



The results:

With BowTieXP Enterprise, Pertamina Hulu Energi gained visibility into thousands of major accident hazard scenarios and can now track barrier status, escalate priority risks, and take corrective action more proactively.

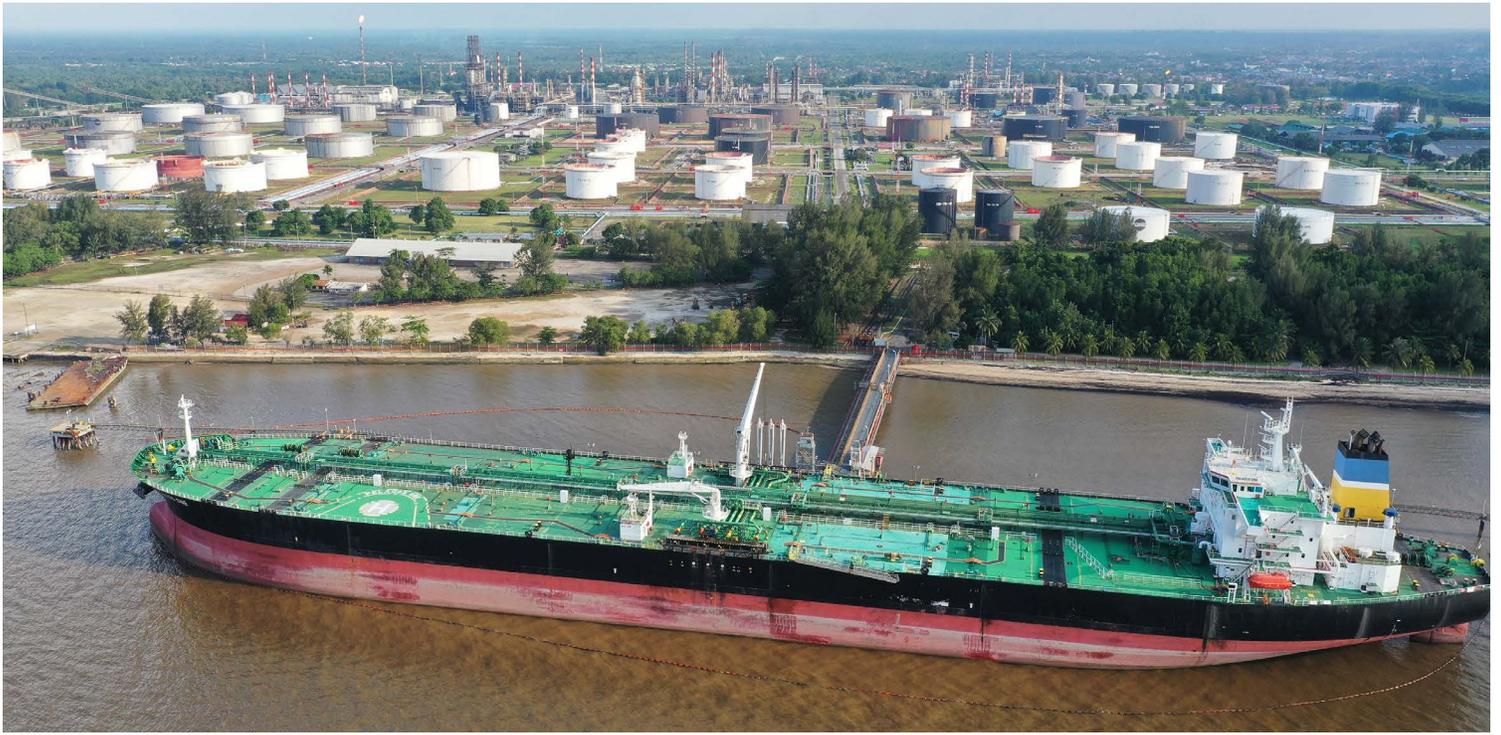
About Wolters Kluwer Enablon

Enablon, a Wolters Kluwer business, is the world's leading provider of integrated risk management, operational risk management, EHS and sustainability software solutions. Bowtie Suite is the leading provider in barrier-based risk management solutions. It's an off-the-shelf, intuitive, process safety software solution that supports your organization during every step of your safety journey to enable safe and efficient operations.

About the client

PT Pertamina Hulu Energi (PHE) is a subsidiary of PT Pertamina (Persero), Indonesia's state-owned oil and gas company. Headquartered in Jakarta, PHE manages upstream oil and gas activities across Indonesia and offshore locations. Its mission is to drive efficient, innovative, and sustainable upstream operations that support national energy security while delivering value to society.

In late 2024, Pertamina took a major step forward by implementing BowTieXP Enterprise as part of its process safety management transformation. This case study highlights why Pertamina selected the BowTieXP Enterprise solution, the significant benefits already achieved, and the promising future they envision as the rollout continues.



Pertamina's challenges and reasons for adopting BowTieXP Enterprise

Like many oil and gas operators, Pertamina contends with high-risk scenarios such as loss of primary containment, fires, and other major accident hazards inherent in daily operations. The challenge lies in gathering each risk scenario and combining these scenario risk assessments into one complete solution that is easy to understand both for frontline teams and management.

“Risk assessments and HAZOP reports can be very complex. When they are shared on their own, operators and management do not always fully understand the situation.”

Traditional risk assessments and HAZOP reports, while thorough, were often complex for operators and decision-makers to interpret. Pertamina sought a solution that could turn thousands of data points from operations across Indonesia into structured insights that drive action. Bowtie diagrams offered a clearer, more accessible way to communicate major accident hazards.

“BowTieXP Enterprise emerged as the most effective tool for consolidating and visualizing all major accident scenarios. It enables consistent evaluation of barrier status, hazard registers, and recommendations, ensuring that actions can be prioritized and executed efficiently. The goal was to bring all risk scenarios and their corresponding assessments together in a single, user-friendly platform that is easy for both frontline teams and management to understand.”

David Karunia Mulyono,
Senior Analyst Process Safety Assurance
at PT Pertamina Hulu Energi



Implementation and training in BowTieXP Enterprise

Pertamina has now been using BowTieXP Enterprise for about a year, including the development of a customized dashboard and extensive user training. The implementation was strongly supported by Enablon BowTieXP Suite and SynergenOG, an official BowTieXP Suite partner in Indonesia.

Many team members transitioned smoothly thanks to prior experience creating bowties manually. For users unfamiliar with

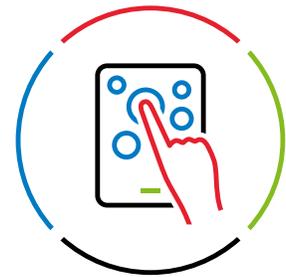
bowties, it took some time to understand the software logic. However, regular Q&A sessions and responsive technical support further contributed to a confident, well-equipped user base.

With swift installation, effective training, and ongoing support, Pertamina successfully embedded BowTieXP Enterprise into its operations and laid the foundation for long-term process safety enhancements.





Benefits and potential of BowTieXP Enterprise at Pertamina



One of the most valued advantages of BowTieXP Enterprise is its ability to tailor visualizations to different audiences. Frontline operators can view detailed information such as specific tech numbers of a pressure safety valve while management receives a high-level view focused on key decisions and actions. This clarity makes it easier for every stakeholder to understand hazards and take the right action to mitigate and ensure barriers are functioning as intended.

Crucially, BowTieXP Enterprise has helped Pertamina uncover and prioritize thousands of major accident hazard scenarios that previously required follow-up or escalation. With the new system, the organization now has:

- A clear view of which scenarios require management attention.
- Monthly updates for scenarios pending mitigation.
- Proactive insight into barrier health, enabling faster and more proactive corrective actions before a barrier fails.

This visibility represents a major leap forward in operational risk control and preventive safety.

Pertamina also sees potential in integrating AI to further enhance bowtie visualizations, particularly for predicting scenarios and identifying necessary barriers based on similar cases. While they believe human expertise, intervention and oversight remains essential, they view AI as a future enhancer of process safety decision-making.

Additionally, they envision connecting BowTieXP Enterprise with Enterprise Resource Planning (ERP) tools to automate barrier status updates directly from maintenance activities. For instance, if a maintenance team conducts maintenance in the field, they can update the status in the ERP tool, and the status of the barrier will be automatically updated in BowTieXP Enterprise. Such integration could significantly accelerate decision-making and strengthen real-time safety management.

“Before using BowTieXP Enterprise, we identified thousands of major accident hazard scenarios in our operations that had not yet been mitigated and required management attention. After implementing BowTieXP Enterprise, we can clearly see which scenarios need to be escalated from operations to higher levels of the organization, as well as track corrective actions and understand the effectiveness and status of our barriers.”

David Karunia Mulyono,
Senior Analyst Process Safety Assurance
at PT Pertamina Hulu Energi



The future with BowTieXP Enterprise at Pertamina

Pertamina Hulu Energi has recommended BowTieXP Enterprise to other Pertamina subsidiaries, including Pertamina Hulu Rokan and Pertamina Hulu Indonesia.

While the software itself is powerful, Pertamina emphasizes the importance of strong collaboration with the Enablon and SynergenOG teams, especially as they continue to build bowties for thousands of major accident scenarios.

“Developing bowties for thousands of major accident scenarios is complex, so the work is ongoing and requires continued collaboration with Enablon, SOG, and Pertamina.”

Looking ahead, Pertamina aims to develop a robust roadmap to ensure every major accident hazard is systematically addressed and mitigated. BowTieXP Enterprise is now a central pillar in this vision, supporting safer, more resilient, and more informed operations across the company.

“Last year, we conducted a formal process safety and asset integrity forum led by Pertamina Hulu Energi and invited other subsidiaries, including Pertamina Hulu Rokan, Pertamina Hulu Indonesia, and other Pertamina entities. We also collaborated with Enablon.”

David Karunia Mulyono,
Senior Analyst Process Safety Assurance
at PT Pertamina Hulu Energi

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