



A Smarter Path to Safety: How Artificial Intelligence Can Prevent the Next Workplace Tragedy

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The Occurrence of Multiple Occupational Safety Failures

Preventable industrial accidents, such as the Tabas coal mine collapse, the Damghan mine accident, and more recently, the major explosion at Shahid Rajaei Port in Bandar Abbas, demonstrate that when hazards are not anticipated or mitigation strategies are lacking, the results are often catastrophic and irreversible. The cause of the recent accident was initially attributed to failure to follow standard protocols for storing hazardous materials and inadequate segregation. (1) All these incidents are preventable and underscore the critical importance of hazard identification, comprehensive risk assessment, prevention, and the implementation of robust control measures in the workplace.

The International Labor Organization's 2025 theme: Accepting the importance of digitalization in health and safety

The theme chosen by the ILO for the World Day for Safety and Health at Work in 2025 is "Revolutionizing health and safety: the role of Artificial Intelligence and digitalization at work." (2) This powerful message calls for a fundamental change in occupational safety practices, namely, shifting from defensive and reactive protocols to agility in identifying and responding to threats or changes in real-time. This is a fundamental organizational imperative. Artificial intelligence and data-driven digital technologies enable better decision-making and predictions by employing intelligent prevention strategies, which help identify emerging risks, analyze patterns, and issue timely warnings. (3) Intelligent systems in industries, when equipped with sensors and monitoring tools, can identify unsafe conditions through data and simulation, assess potential hazards, and prevent accidents before they happen.

Conclusion and Summary

Digitalization in occupational safety is expanding rapidly in Iran, but it still faces challenges. It is necessary to accelerate the adoption of predictive technologies, big data analytics, innovative safety platforms, and the integration of AI-based systems. Due to its strong scientific base and growing technology ecosystem, Iran can lead regional efforts in smart workplace safety, provided that institutional will and strategic investment are aligned.

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