CHAPTER 5
EUROPEAN EXPERIENCE OF UKRAINE OCCUPATIONAL SAFETY MONITORING

Pochapska Iryna, Candidate of Technical Science, Associate professor, Associate professor of the Department of Occupational and Life Safety, Lviv Polytechnic National University, Lviv

Article 43 of the Constitution of Ukraine guarantees every individual the right to proper, safe, and healthy working conditions. Ensuring this right requires systematic monitoring of occupational safety at enterprises. The entities, authorities, and forms of control and supervision in the field of occupational health and safety (OHS) are comprehensively defined in the Law of Ukraine «On Occupational Safety» [1].

Occupational safety monitoring in Ukraine represents an integrated system that combines mechanisms of state supervision – implemented by competent regulatory bodies, in particular the State Service of Ukraine on Labour (commonly known as Derzhpratsi) – with internal organizational control at the enterprise level. This system operates through scheduled and unscheduled inspections, workplace certification based on working conditions, continuous staff training in OHS, as well as the identification and assessment of occupational risks. The primary objective of monitoring is the prevention of occupational injuries and the ensuring of compliance with current legislation, which is achieved through the activities of specialized OHS units within enterprises.

Following the signing of the Association Agreement between Ukraine and the European Union in 2014, Ukraine has undertaken significant efforts to harmonize its national legislation with international and European standards in occupational safety and health.

Table 1

Comparative Analysis of Occupational Safety Monitoring in the EU and Ukraine by Sector

Sector	European Experience / Regulatory Framework	Ukraine
Energy and electrical work	Use of remote monitoring sensors at substations, allowing personnel to avoid entering high-risk zones unnecessarily (Directive 2013/35/EU)	Transition from paper-based work permits to digital authorization systems and online monitoring of insulation and grounding conditions
Chemical industry and hazardous substances	Continuous monitoring of airborne substance concentrations using automated systems integrated into enterprise networks (REACH Regulation; Directive 98/24/EC)	Introduction of EU-standard safety data sheets and replacement of outdated laboratory methods with portable gas analyzers with data transmission functions
Digital sector and remote work (IT, offices)	Monitoring of mental health and ergonomics; implementation of the "Right to Disconnect" as part of psychosocial risk management (Directive 90/270/EEC)	Adoption of European workplace standards and employee mental health insurance as part of well-being monitoring
Transport and logistics	Strict monitoring through digital tachographs with automatic data transmission to supervisory authorities (Directive 2002/15/EC)	Full harmonization with EU rules on drivers' working and rest time; monitoring has become fully digital

By Resolution of the Cabinet of Ministers of Ukraine dated December 12, 2018 (No. 989-r), the Concept for Reforming the Occupational Safety Manage-

ment System in Ukraine was approved. Its primary objective is the establishment of a national system for the prevention of occupational risks, ensuring the effective realization of employees' rights to safe and healthy working conditions, and the gradual implementation of the provisions of Council Directive 89/391/EEC of June 12, 1989, on the introduction of measures to encourage improvements in the safety and health of workers at work.

Ukraine is gradually adopting an approach similar to the practices of the European Agency for Safety and Health at Work (EU-OSHA), whereby labour inspections are based on the risk level of enterprises and utilize data on occupational accidents for planning inspection activities.

Key areas aligned with the general principles defined in Directive 89/391/EEC [2] include strengthening employer responsibility; encouraging voluntary OHS audits; introducing economic incentives for employers and employees to promote safe and healthy working conditions; enhancing employee training; fostering a culture of occupational safety and health; improving OHS legislation by eliminating duplicative, outdated, and contradictory provisions; and integrating international standards into national legislation. [3]

European approaches – particularly through sector-specific directives – are being adapted across various sectors of the Ukrainian economy. A comparative sectoral analysis is presented in Table 1. In the European Union, occupational safety monitoring is largely based on and focused around specific Directives. [4]

Potential risks across selected sectors in Ukraine are presented in Table 2. The proposed safety improvement measures are based on key indicators used for occupational safety monitoring in accordance with EU Directives.

European integration involves not only changes in regulatory frameworks but also technological modernization. Occupational safety monitoring is becoming increasingly «smart», incorporating innovations such as sensors embedded in construction helmets, driver fatigue monitoring systems, and advanced fire safety con-

trol systems. This transformation integrates Ukrainian science and technology into the global safety ecosystem.

Table 2

Comparative Analysis of Sectoral Risks Based on EU Standards in Ukraine

Sector	Key Monitoring Instrument in the EU	Impact on Technologies in Ukraine
Agriculture	Monitoring of vibration and noise (Directive 2002/44/EC)	Modernization of machinery fleets and installation of high-protection cabins
Healthcare	Protection against biological agents (Directive 2000/54/EC)	Implementation of electronic systems for tracking infectious risks and personal protective equipment (PPE)
Mining	Monitoring of mine atmosphere composition (Directive 92/104/EEC)	Automated personnel positioning and emergency communication systems underground

Risk analysis methods in Ukraine are currently undergoing a significant transformation – from outdated Soviet-era approaches to modern international standards, particularly those based on ISO frameworks.

Historically, Ukraine inherited a system of occupational safety control from the Soviet period that differs fundamentally from contemporary European models. The primary focus was placed on technical reliability and strict compliance with state standards, rather than on probabilistic risk assessment.

One of the central methods used was the compliance audit, which involved comparing the actual condition of a facility with prescribed standards. This approach emphasized formal compliance with regulatory norms without assessing the real probability or severity of risks under specific conditions. For example, if a

standard required a protective barrier height of 1.1 meters, a height of 1.0 meters would be considered a violation regardless of the actual level of risk.

Statistical analysis was also employed, based on indicators such as injury frequency rates and severity coefficients. However, monitoring was typically reactive, beginning only after an accident had occurred. In the absence of reported injuries during a given period, it was assumed that «no risks were present».

The administrative and public three-tier control system (within the Occupational Safety Management System) was operationally effective; however, its hierarchical structure often suffered from excessive formalism, including superficial reporting practices.

Workplace Certification (attestation of workplaces) remains partially in use in Ukraine and involves the measurement of physical factors such as noise, dust, vibration, and lighting conditions.

Nevertheless, the primary objective of Workplace Certification has traditionally been not the elimination of hazards but rather the confirmation of employees' entitlement to «benefits and compensations» (e.g., provision of milk, additional leave, or early retirement). In contrast, the European approach prioritizes the elimination of harmful factors, rather than compensatory measures.

Following the signing of the Association Agreement between Ukraine and the European Union, the very essence of occupational safety monitoring has undergone significant transformation (see Table 3). Reactive approaches have largely been replaced by proactive strategies, fundamentally reshaping the concept of safety. The modern approach is aligned with contemporary requirements and is no longer limited to large industrial enterprises but increasingly extends to small and medium-sized businesses.

Directive 89/391/EEC (Article 6) [2] obliges employers to maintain documented risk assessments. In Ukraine, this requirement is becoming mandatory through updated audit procedures.

Table 3

Comparison of Approaches to Occupational Safety Monitoring

Comparison Parameter	Traditional Approach (Ukraine before reform)	European Approach (Directive 89/391/EEC)	Current Status in Ukraine
Philosophy of control	Reactive: response to accidents or violations	Proactive: prevention through hazard identification	Transitional stage; implementation of risk management systems
Object of monitoring	Compliance with strict standards (DSTU, DSN, DBN) and documentation	Risks: assessment of probability and severity at each workplace	Gradual replacement of outdated regulations with new frameworks
Role of employee	Passive executor of instructions; subject of supervision	Active participant reporting hazards (“right to know”)	Introduction of safety representatives
Main document	Standard OHS instructions (template-based)	Risk Assessment: dynamic, context-specific document	Implementation of ISO 45001 and internal audits
Purpose of monitoring	Avoidance of penalties during inspections	Continuous improvement (Vision Zero concept)	Focus on reducing injury rates as key performance indicators (KPIs)

For example, in excavation works (which are critical for engineering infrastructure), the European approach requires continuous monitoring of soil conditions and groundwater levels on a shift-by-shift basis, rather than only prior to the commencement of the project.

European practices also involve the use of digital checklists in mobile applications, enabling real-time monitoring instead of retrospective recording in paper-based logs.

In essence, the harmonization of Ukrainian legislation with European directives – particularly Directive 89/391/EEC – constitutes an integral component of EU social policy. At the same time, modern occupational safety monitoring is increasingly dependent on digital solutions and specialized software, including IoT sensors in construction, automated risk control systems, and Big Data analytics. This transformation contributes to the development of the «Smart Safety» paradigm in Ukraine.

At present, Ukrainian enterprises implement occupational safety monitoring (albeit not always comprehensively) using the following methods:

– Checklist Analysis

This method involves compiling a list of questions based on regulatory requirements (NPAPO and DSTU standards). An inspector or OHS engineer evaluates the workplace by marking «yes/no» responses (e.g., «Is grounding provided?» «Are moving parts properly guarded?»). While simple and practical, this method primarily identifies visible violations and does not account for hidden or latent risks.

– Matrix Method (based on DSTU ISO 31010:2022)

Actively implemented within the framework of European integration, this method evaluates each hazardous event according to its probability of occurrence (from «rare» to «frequent») and severity of consequences (from «minor injury» to «fatality»). The product of these parameters determines the risk level (low, medium, high, critical).

– What-If Analysis

Typically applied during the design or modernization of production lines and engineering systems. Expert teams pose hypothetical scenarios such as: «What if

this valve fails?» or «What if there is a power outage?» This method enables the identification of non-standard and complex accident scenarios.

– Preliminary Hazard Analysis (PHA)

Used in the early stages of projects, this method involves identifying all potential sources of hazards (electrical, pressure-related, chemical, mechanical) and defining preventive safety measures for each.

– Fine–Kinney Method

Widely used in large Ukrainian enterprises, particularly those with foreign investment, due to its quantitative precision.

Risk (R) is calculated as: $R=S\times E\times P$

where:

S (Severity) – consequence severity;

E (Exposure) – frequency of exposure to the hazard;

P (Probability) – likelihood of occurrence.

– Fault Tree Analysis (FTA)

Applied to high-risk facilities (e.g., nuclear power plants, chemical plants). This method involves constructing a graphical model in which the top event represents a major accident, while underlying branches illustrate combinations of equipment failures and human errors leading to that event.

The Matrix Method, ISO 45001 [5], and DSTU EN ISO 12100:2016 [6] are increasingly replacing traditional inspection approaches based solely on checklists in Ukraine.

Thus, monitoring under EU Directives represents a proactive process – focused on identifying risks before accidents occur – whereas Ukraine historically relied on a reactive model, responding only after incidents had taken place. European integration is fundamentally aimed at facilitating the transition toward a proactive, risk-oriented monitoring system [7, 8].

A significant conceptual shift is also observed: from a system focused solely on compliance with standards to one centered on the protection of human life and

health, as well as the risks associated with human activity. The emphasis on punitive measures is being replaced by the elimination of root causes of hazards. The economic dimension is also evolving – from compensating for damages to investing in preventive measures.

Occupational safety documentation at enterprises is undergoing transformation as well: electronic document management systems are being introduced, risk assessments are becoming standard practice, and digital checklists are replacing extensive paper logs and multiple approval signatures.

The previous safety monitoring system was effective for large industrial enterprises operating under strict discipline; however, it lacks the flexibility required for modern technologies and dynamic work environments. European integration requires Ukraine to move away from «paper-based safety» toward real risk assessment, to transition from a punitive model (based on fines) to a preventive model (based on risk management), to design safe workplaces in accordance with European standards, and to implement transparent reporting practices aligned with EU methodologies.

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