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Technical Faculty "Mihajlo Pupin"
Zrenjanin, Republic of Serbia



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University of Novi Sad
Technical Faculty "Mihajlo Pupin"
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INTRODUCTION

Department of Mechanical Engineering and Department of Environmental Protection of Technical Faculty "Mihajlo Pupin" Zrenjanin have organized the XIII International Conference Industrial Engineering and Environmental Protection – IIZS 2023. The first international conference IIZS was organized in October 2011, and since October 2017, two departments have jointly participated in organizing this event. The topics of the scientific conference cover the fields of Industrial engineering and Environmental protection: Mechanical engineering, Energetics and Process Technique, Design and Maintenance, Oil and Gas Engineering, Health and Environmental Protection, Environmental Management, Occupational Safety, and Engineering management.

This year, IIZS was organized in a hybrid manner. Received and accepted papers were presented orally on the premises of the Technical faculty "Mihajlo Pupin" Zrenjanin and online using the Zoom platform. A specific number of papers was presented through posters. The Proceedings of IIZS 2023 contains 69 papers from 198 participants, among whom 49 are foreign authors. Besides Serbia, the authors come from 12 countries: Croatia, Bosnia and Herzegovina, Romania, India, Iran, Turkey, Bulgaria, Denmark, China, Montenegro, Slovenia, Austria, and Slovakia.

The main objectives of the IIZS 2023 conference are to innovate and expand engineering knowledge from industry and environmental protection, provide support to researchers in presenting their research results, establish new contacts with leading national and international institutions and universities, popularize the faculty and its leading role in our society and its immediate environment, draw the attention of diligent young researchers to study at our faculty, cooperate with other organizations, public companies, and industry, initiate collection of new ideas in solving specific practical problems, introduce professional and business organizations to results of scientific and technical research, present scientific knowledge and exchange experiences regarding the topics of the conference program.

We wish to express our gratitude to our long-term partners of the conference – „Aurel Vlaicu” the University of Arad, Faculty of Engineering, Arad, Romania, University “St. Kliment Ohridski,” Technical faculty, Bitola, Macedonia, University Politehnica Timisoara, Faculty of engineering, Hunedoara, Romania, University of East Sarajevo, Faculty of mechanical engineering East Sarajevo, B&H, Republic of Srpska, and University of Giresun, Faculty of Engineering, Giresun, Turkey for supporting the organization of IIZS 2023. We are also grateful to all the authors who have contributed with their papers to organizing the scientific meeting IIZS 2023.

We want to extend our special thanks to the Technical faculty “Mihajlo Pupin” Zrenjanin and Dean Prof. Ph.D. Milan Nikolic for their active support concerning the organization of IIZS 2023. Also, our gratitude goes to the Ministry of Education, Science and Technological Development, Republic of Serbia, for providing financial support to organize this event.

The IIZS Conference became a traditional meeting of researchers from all over the world every year. We are open to and thankful for all valuable suggestions that could contribute to the next International Conference on Industrial Engineering and Environmental Protection organizationally and technically.

Chairman of the Organizing Committee
Assist. Prof. Mića Đurđev, PhD

Zrenjanin, October 5-6, 2023.

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CROSS-SECTION OF LAW ON ENVIRONMENTAL PROTECTION LEGAL REQUIREMENTS AND ISO 14001 REQUIREMENTS

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Abstract: The legal framework that governs human actions that may have a negative effect on the environment and natural resources is indicated by the Law on Environmental Protection. The requirements outlined in Environmental protection laws are mandatory and obligatory for individuals, businesses, and organizations operating within the jurisdiction covered by this legal act and derived by-laws. Compliance with these laws is legally required, and failure to comply can result in penalties, fines, legal actions, or other sanctions, depending on the severity of the violation and the specific regulations in place. ISO 14001 -Environmental management systems, is a voluntary international standard developed by the International Organization for Standardization (ISO) to provide a framework for organizations to establish and operate an Environmental Management System (EMS). Although ISO 14001 is voluntary, organizations that choose to adopt it need to adhere to the requirements outlined in the standard to achieve and maintain certification. Compliance with ISO 14001 involves implementing and documenting an EMS based on the standard guidelines and principles. Within this research the cross-section of environmental legal requirements and ISO 14001 standard requirements is conducted. The study's objective is to show which requirements of the standard have already been met by conforming to the stipulations of the law.

Key words: ISO 14001, Law on Environmental Protection

INTRODUCTION

Environmental responsibility entails conscientiously considering and minimizing the ecological impact of actions, fostering a harmonious relationship between human activities and the natural world, and ensuring a sustainable legacy for future generations. Adopting ISO 14001 shows a proactive approach to managing environmental impacts and continuously improving environmental performance, at the same time enhancing the organization's market competitiveness [1]. While ISO 14001 certification is not a legal requirement, it can help organizations ensure compliance with applicable environmental laws and regulations by providing a structured approach to environmental management. Improved efficiency and cost savings through enhanced resource efficiency, waste reduction, energy efficiency, and optimized processes, lead to financial benefits for organization. Certification can enhance an organization's reputation, demonstrating to stakeholders, including customers, employees, and investors, that the organization is committed to environmental protection. Within the ISO 14001 the general requirements for establishing an EMS, including aspects like environmental policy, planning, implementation, and operation, monitoring and measurement, and continual improvement, are outlined [2]. ISO 14001 places a strong emphasis on improving environmental performance, setting objectives and targets related to significant environmental aspects, and striving for continual improvement in an organization's environmental impact[3].

The Law on Environmental Protection ("Official Gazette of the RS", no. 135/2004, 36/2009, 36/2009 - other laws, 72/2009 - other laws, 43/2011 - US decision, 14/2016, 76/2018, 95 /2018 - other law and 95/2018 - other law) regulates the integral system of environmental protection, which ensures the realization of the human right to life and development in a healthy environment and a balanced relationship between economic development and the environment in the Republic of Serbia [4]. Within the Article 2 it is stated that the environmental protection system foreseen measures, conditions, and instruments for:

- sustainable management, preservation of natural balance, integrity, diversity and quality of natural values and conditions for the survival of all living beings.
- prevention, control, reduction, and remediation of all forms of environmental pollution.

The eleven principles of environmental protection are listed within Article 9 of the Law on Environmental Protection. It encompasses the principles of integrity, prevention and precaution, preservation of natural values, sustainable development, responsibility of the polluter and his legal successor, the "polluter pays" principle, the "user pays" principle, the principle of subsidiary responsibility, principle of implementation of incentive measures, the principle of public information and participation, the principle of protection of the right to a healthy environment and access to justice.

The law mandates a thorough assessment of potential environmental impacts for certain projects and activities. An Environmental Impact Assessment (EIA) helps identify, predict, and mitigate adverse effects on the environment. Waste management (including collection, treatment, disposal, and recycling) and pollution control (limiting pollution from various sources) are also regulated by Law. The determined standards and requirements for maintaining the quality of water bodies and air are set with the aim of protecting public health and the environment. Legal provisions cover the sustainable use and conservation of natural resources, including water resources, forests, biodiversity, and minerals, to ensure their long-term availability and protection. Biodiversity conservation, establishing protected areas, protecting endangered species, and preserving natural habitats are also very important issues covered by law. Organizations and authorities are required to monitor and report on environmental parameters and compliance with environmental standards, providing transparency and accountability. The law includes provisions for enforcement, compliance monitoring, penalties for non-compliance, and legal actions against violators. Public participation and access to information present an important part of the law emphasizing the importance of public involvement in environmental decision-making processes and grant access to environmental information, fostering transparency and citizen engagement. For cross-border cooperation and international agreements the provisions outline cooperation with neighboring countries and adherence to international agreements related to environmental protection.

MATERIAL AND METHODS

The cross-section analysis of the requirements of Law on Environmental Protection[4] and ISO 14001 requirements[3] was conducted. The results of comparison present a useful tool which allows the easier integration of ISO 14001 standard in business operations, while the law's obligations must be followed.

Aligning ISO 14001 requirements with environmental law requirements is crucial for organizations seeking to achieve effective environmental management and compliance. This alignment ensures that an organization's environmental management system (EMS) not only meets international standards but also complies with the specific legal obligations and regulatory framework of the country. The advantages highlighting the importance of this alignment are presented in Fig. 1.

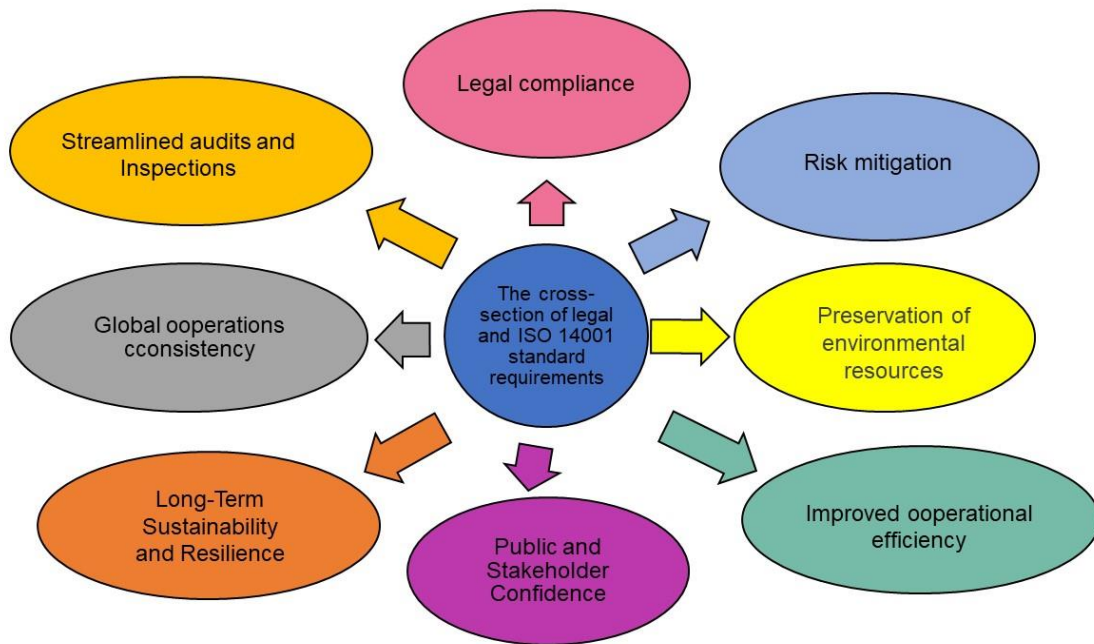


Fig. 1. The overlap of the requirements of the Law on Environmental Protection with the requirements of the ISO 14001 standard

Aligning ISO14001 with environmental laws helps ensure that the organization's environmental practices and procedures are in full compliance with the legal requirements of the jurisdiction. This reduces the risk of legal issues, fines, sanctions, or operational disruptions due to non-compliance.

Understanding and integrating legal requirements into the EMS allows organizations to identify potential legal risks and liabilities associated with their operations. By addressing these risks within the EMS, organizations can proactively mitigate legal exposure and associated financial and reputational risks.

Compliance with environmental laws demonstrates a commitment to the preservation of environmental resources. Aligning ISO 14001 with these laws enhances an organization's ability to meet its environmental responsibilities, reduce its environmental impact, and contribute positively to the surrounding community and ecosystem.

Aligning with legal requirements often involves understanding the optimal use of resources, waste reduction, energy efficiency, and sustainable practices. By integrating these practices into the EMS, organizations can improve operational efficiency, reduce costs, and enhance resource management.

Demonstrating compliance with both ISO 14001 and environmental laws increases public confidence and trust. Stakeholders, including customers, investors, regulators, and communities, often expect organizations to uphold legal and international standards, and alignment helps meet those expectations.

By incorporating legal requirements into the EMS, organizations can better position themselves for long-term sustainability and resilience in a rapidly changing regulatory landscape. Adapting to legal changes promptly and effectively is crucial for the organization's ongoing success and competitiveness.

For organizations operating across multiple jurisdictions, aligning with both ISO 14001 and relevant environmental laws provides a consistent approach to environmental management. This consistency ensures that environmental objectives and practices are harmonized across various locations, aiding in a cohesive and standardized approach.

Aligning ISO 14001 with legal requirements facilitates smoother audits and inspections. When an organization's EMS aligns with the applicable legal framework, audits become more efficient, saving time and resources for both the organization and the auditing bodies.

RESULTS AND DISCUSSION

Within Article 39 of the Law on Environmental Protection, the requirements in respect of environmental quality are stipulated. Limit values of the levels of pollutants, noise, radiation and energy and limit values of the emissions in the air, water, and soil, including the emission from mobile sources of pollution, shall be determined by the Government in compliance with special regulations. Within Clause 6 of ISO 14001, the Environmental aspects shall be determined. Environmental aspects are defined as an element of an organization's activities, products or services that may impact, or do impact, the environment. An environmental impact is a result of an environmental aspect. Organizations are required to determine the environmental aspects of their activities, products, or services that can interact with the environment. This would involve identifying how the organization's operations affect the environment and aligning these aspects with local environmental priorities and concerns. The list of recognized environmental aspects along with their evaluation will give confidence that the company, by meeting the requirements of ISO 14001 - Clause 6, meets the requirements of the Law.

Within Article 72 of the Law on Environmental Protection it is, among other, stated that an operator of the installation, i.e., of the establishment that is a source of emissions and environmental pollution shall be obliged to perform monitoring, in compliance with the law, through the competent authority, authorized organization or independently, providing that it complies with the legally prescribed conditions. This requirement coincides with the Environmental goals (Clause 6.2) and Environmental Policy (Clause 5.2), whose aim is providing the decrease of the negative impact and the indicators which will prove the decrease (Key performance indicator – Clause 9.1).

Article 102 states the ways that legal and natural people are obliged to provide the protection of the environment in conducting their activities. It emphasizes the need for: application and implementation of the regulations on environmental protection; sustainable use of natural resources, goods and energy; introduction of energy more efficient technologies and through the use of renewable natural resources; the use of products, processes, technologies and practice that jeopardize the environment less; taking preventive measures or removal of consequences of jeopardizing of and damage to the environment; maintenance of records in the prescribed manner and delivery thereof to the competent authorities; control of activities and operation of the installations that may present a risk or cause danger to the environment and human health; The requirements of this Article coincides with the Context of the organization (Clause 4) and Environmental policy (Clause 5.2) which proves the company's commitment to environmentally responsible business operations. The maintaining of the mentioned records corresponds to Clause 9.1 (Monitoring, Measurement, Analysis and Evaluation) and Clause 7.5. (Documented Information) of ISO 14001. Environmental Objectives and Planning to Achieve Them (ISO 14001 Clause 6.2) - ISO 14001, requires organizations to set environmental objectives and targets considering their significant environmental aspects and legal requirements. Organizations would align these objectives with the environmental goals outlined in national and regional environmental plans and policies.

Legal Compliance (Clause 6.1.4) of ISO 14001 requires organizations to establish and maintain procedures to identify and have access to legal and other requirements related to environmental aspects. In Serbia, this would involve aligning with the relevant national and regional environmental laws, regulations, and permits applicable to the organization's operations.

Resources, Roles, Responsibility, and Authority (Clause 7.1) of ISO 14001 states that an organization needs to define roles, responsibilities, and authorities for individuals involved in the EMS. This aligns with responsibilities outlined in environmental legislation.

CONCLUSION

The Law on Environmental Protection in Serbia is mandatory and enforceable, applicable to all organizations operating in Serbia, regardless of their nature or size. ISO 14001 is a voluntary international standard that organizations can choose to adopt. While it's not a legal requirement, many organizations adopt it to improve their environmental performance, enhance their reputation, and potentially meet customer and stakeholder expectations. The Law on Environmental Protection provides specific legal requirements and regulations that organizations in Serbia must adhere to, whereas ISO 14001 offers a structured approach to environmental management based on a set of internationally recognized standards and guidelines. To ensure compliance with both the Law on Environmental Protection in Serbia and ISO 14001, organizations operating in Serbia may need to integrate the specific legal requirements into their EMS based on ISO 14001. This integration ensures alignment with both legal obligations and international best practices in environmental management. Aligning ISO 14001 requirements with environmental law requirements is a strategic approach that fosters legal compliance, operational efficiency, stakeholder trust, and long-term sustainability. It's an integral part of responsible and effective environmental management in today's business environment.

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