A summary of the article "Normative-regulatory compliance in industrial safety law: comparative analysis and practical recommendations", R. Sultanov, etal is presented below. The summary incorporates greater detail on the theoretical framework, provides more in-depth examples from international practice, offers a more nuanced analysis of Russian legislation, and includes a dedicated discussion section to explore the implications of the findings.

Normative-Regulatory Compliance in Industrial Safety Law: A Comparative Analysis and Strategic Recommendations for the Russian Federation

Abstract

This article is devoted to a critical analysis of the Theory of Regulatory Compliance (TRC) within the context of Russian industrial safety legislation. A comparative analysis of the key principles of TRC and the regulatory acts in force in Russia, Germany, Canada, and Sweden has been conducted. The analysis identifies the main issues within the Russian regulatory system, including excessive detail, a prevailing formal approach over substantive safety, and significant inconsistency in legal requirements. The article discusses established international methods, such as risk-based regulation, flexibility in regulatory requirements, and the development of robust self-regulation mechanisms. Based on this analysis, the authors propose concrete measures to improve Russia's legislative framework. These include eliminating the duplication of norms, introducing predictive risk assessment methods using modern data analytics, expanding the powers and responsibilities of self-regulated organizations (SROs), and increasing the transparency of legal procedures. The effective implementation of these changes is projected to improve the efficacy of state control, reduce administrative burdens on businesses, and align the Russian industrial safety system with leading international standards.

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1. Introduction

In the modern industrial landscape, rapid technological and economic development necessitates a parallel evolution in industrial safety standards. Effective safety protocols are essential for minimizing negative consequences such as industrial accidents, workplace injuries, and equipment degradation, which lead to significant economic losses and human suffering[1-8]. The goal is to create universal, simplified norms that expedite decision-making and enhance production efficiency[9]. Industrial safety is, therefore, a critical component of sustainable development and the protection of public interest[10].

Internationally, considerable attention is paid to the Theory of Regulatory Compliance (TRC), which advocates for a balance between strict adherence to legal norms and the practical

effectiveness of their application[11]. This theory posits that both under-regulation and over-regulation can have detrimental effects, and that an optimal "golden mean" of regulatory intervention exists to achieve the most effective outcomes[12]. This study is particularly relevant due to the urgent need to improve the system of state regulation and control in the Russian Federation[13]. As Russia's economy continues to develop, it is crucial to find a balance between effective regulation and the freedom of entrepreneurial activity[14].

The purpose of this work is to review the main provisions of TRC, compare them with current Russian regulations in industrial safety, and formulate concrete recommendations for their improvement based on successful international experience[15].

Research Objectives:

1. To study and analyze the foundational principles of TRC and their application in international practice[16].
2. To assess the compliance of current Russian legislation with the core requirements of TRC[17].
3. To conduct a comparative analysis of regulatory approaches in Russia, Germany, Canada, and Sweden[18].
4. To formulate actionable recommendations to optimize the Russian regulatory system in industrial safety[19].

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2. Research Methods

The research methodology for this paper is multifaceted, incorporating several analytical techniques to provide a comprehensive assessment.

- **Regulatory Benchmarking**: The study involved a comparative analysis of key Russian legislation, including Federal Law No. 116-FZ ("On Industrial Safety of Hazardous Production Facilities"), Federal Law No. 248-FZ ("On State Control"), and Federal Law No. 294-FZ ("On the Protection of the Rights of Legal Entities"), with foreign regulatory frameworks such as Germany's Ordinance on Industrial Safety (BetrSichV) and Canada's Occupational Health and Safety Act (OHSA)[20]. The comparison emphasizes the application of risk-based approaches and self-regulation mechanisms[21].
- **Qualitative Analysis**: The core principles of TRC—such as the risk-based approach, regulatory flexibility, proportionality, and self-regulation—were studied in detail[22]. The alignment of Russian regulations with these principles was then systematically assessed[23].

- **Risk Assessment Analysis**: Qualitative and quantitative risk assessment methods were used to evaluate the effectiveness of Russian legislation[24]. Specifically, the implementation of risk-based approaches in FZ No. 248-FZ and FZ No. 294-FZ was analyzed[25].
- **International Learning**: The study examined the best practices for industrial safety regulation in Germany, Canada, and Sweden[26]. This included a review of how these countries have implemented predictive risk assessment methods and developed the role of self-regulatory organizations (SROs)[27].
- **Modeling and Forecasting**: The potential consequences of introducing TRC principles into the Russian regulatory system were projected using modeling methods[28]. This involved an analysis of possible legislative changes and their likely impact on the effectiveness of state control and industrial safety outcomes[29].

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3. Results

3.1 Core Principles of the Theory of Regulatory Compliance (TRC)

TRC provides a framework for designing smarter, more efficient, and effective regulatory systems. Instead of focusing merely on punishment for non-compliance, it seeks to understand and influence the behavior of regulated entities. Its main principles include:

- **Risk-Oriented Approach**: This principle dictates that regulatory attention and resources should be concentrated on the most significant risks[30]. This allows for the optimization of inspection and enforcement costs, moving away from a one-size-fits-all model[31]. Instead of uniform scrutiny, TRC advocates for developing key risk indicators and employing differentiated monitoring to focus on the most critical factors[32323232].
- **Flexibility of Regulation**: The ability to adapt safety norms to the specific context of an enterprise or industry is crucial for effectiveness[33]. A rigid, command-and-control approach can be inefficient and may not address the unique safety challenges of different operations[34].
- **Proportionality of Requirements**: Regulation should impose a reasonable burden on businesses, avoiding excessive and purely formal requirements that do not materially contribute to safety[35]. Over-regulation can overload both regulatory authorities and businesses, reducing the overall effectiveness of control[36].
- **Self-Regulation and Business Involvement**: TRC encourages creating conditions where enterprises take primary responsibility for ensuring compliance[3737]. This involves

empowering self-regulatory organizations (SROs) and promoting a culture of voluntary compliance[38383838].

- **Transparency and Accountability**: Regulatory processes must be open and clear, fostering trust from both society and the business community[39]. This includes ensuring that companies have timely access to up-to-date information about applicable requirements[40].

3.2 Russian Industrial Safety Legislation: Problems and Challenges

The primary law governing industrial safety in Russia is Federal Law No. 116-FZ. However, the regulatory system it anchors is characterized by several systemic problems that hinder its effectiveness[41].

- **Excessive Detail and Formalism**: The system is marked by an abundance of detailed norms, which complicates enforcement and compliance[42]. There is a strong emphasis on formal adherence to prescribed criteria rather than on the substantive management of actual risks[43]. This can lead to a "tick-box" compliance culture where real safety is secondary to paperwork.
- **Fragmented and Inconsistent Requirements**: Regulatory requirements are scattered across multiple laws, primarily FZ No. 116-FZ, FZ No. 248-FZ (governing state control), and the now largely superseded FZ No. 294-FZ, as well as numerous subordinate by-laws[44]. This creates a complex and often contradictory legal landscape[45]. For example, the risk-based approach is defined and applied differently in FZ No. 248-FZ (for planning external state inspections) and FZ No. 294-FZ (for an organization's internal control), leading to duplication and inconsistencies[46464646].

The key distinction between Law No. 248-FZ and Law No. 294-FZ lies in their focus. FZ No. 248-FZ uses a risk-based approach primarily as a tool for state authorities to prioritize external inspections, focusing resources on areas with a higher likelihood of violations[47]. In contrast, FZ No. 294-FZ intended for the risk approach to be integrated into an enterprise's internal management system to proactively identify and prevent risks[48]. This dual-track system creates confusion and administrative redundancy.

3.3 International Experience: A Comparative Overview

An examination of regulatory systems in other industrialized nations reveals a strong trend toward TRC principles, offering valuable models for Russia.

Criterion	Russia	Germany	Canada	Sweden
Regulatory Approach	Prescriptive, with an emphasis on formal compliance.	Performance-based and risk-oriented, with detailed hazard assessments.	Combination of prescriptive rules and performance-based Process Safety Management (PSM).	Highly performance-based, guided by the precautionary principle.
Risk Assessment	Categorical risk assessment used by the state to plan inspections (FZ No. 248)[49].	Mandatory, detailed hazard assessments (Gefährdungsbeurteilung) for all work processes and equipment.	Advanced quantitative and qualitative risk analysis (e.g., HAZOP) under PSM systems[50].	Predictive risk assessment methods integrated with environmental impact studies[51].
Flexibility of Norms	Largely universal requirements with limited adaptation[52].	High adaptability to industry specifics; goals are set, but methods are flexible[53].	Flexible, as PSM is adapted to the specifics of each hazardous facility.	Very flexible, focuses on achieving safety and environmental outcomes.
Role of Self-Regulation	Limited and secondary role for SROs[54].	Strong involvement of independent certification bodies (e.g., TÜV) and industry associations[55].	Active business and SRO involvement in developing standards and best practices[56].	Strong emphasis on corporate responsibility and voluntary agreements, with SROs playing a key role[57].

- **Germany**: Germany's system is based on a risk-oriented approach institutionalized in laws like the Federal Security Facilities Control Act[58]. The system mandates regular, detailed risk assessments at production facilities and involves independent, accredited organizations like TÜV for audits and certification, ensuring a high level of technical expertise and objectivity[59].

- **Canada**: In Canada, industrial safety is regulated through frameworks like the Occupational Safety Act and the Process Safety Management (PSM) system[60]. PSM is a comprehensive management program that focuses on the proactive identification, evaluation, and control of hazards associated with chemical processes. It emphasizes detailed risk analysis and incident prevention rather than merely reacting to accidents[61].
- **Sweden and Finland**: Sweden regulates industrial safety under its comprehensive Environmental Protection Act, which is built on precautionary principles and predictive risk assessment methods[62]. Neighboring Finland provides another strong example, adhering to a voluntary compliance model under its Occupational Safety and Health Act. This model actively aims to develop the capacity of SROs and reduce the direct administrative burden on businesses[63].

These international examples demonstrate the clear advantages of flexible, adaptive, and risk-focused regulation[64].

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4. Discussion

The analysis reveals a significant gap between Russia's current industrial safety regime and international best practices aligned with the Theory of Regulatory Compliance. The Russian system, with its focus on rigid compliance with a vast number of detailed and often conflicting norms, appears to be caught in a state of over-regulation that paradoxically leads to lower real-world safety effectiveness[65]. The emphasis remains on formal procedure rather than on substantive risk management, creating a significant administrative burden without a proportional increase in safety[66].

The "regulatory guillotine" initiative in Russia is a positive step, aiming to revise and unify legal acts to align with federal requirements[67]. The goal is to eliminate duplicate provisions and clarify departmental regulations[68]. This reform aligns perfectly with the recommendations derived from TRC. Transitioning to updated, consolidated regulations can simplify compliance, reduce the interpretive load on enterprises, and increase legal transparency[69].

However, the implementation of these changes faces challenges. A transition to a risk-based model requires not only legislative amendments but also a cultural shift within both regulatory bodies and enterprises. It necessitates investment in training, data analytics capabilities, and the development of competent SROs. There may be resistance from those accustomed to the certainty of a prescriptive system, and there is a risk of delays in publishing updated regulations due to complex inter-departmental reconciliations[70].

Despite these challenges, the potential benefits are substantial. A system based on TRC principles promises greater efficiency, a reduced administrative load, and, most importantly, more effective safety outcomes by focusing resources where they are most needed[71717171].

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5. Conclusion and Recommendations

The Russian industrial safety system is at a critical juncture. While possessing a strong legal foundation, its effectiveness is hampered by formalism, fragmentation, and an excessive regulatory burden. The introduction of principles from the Theory of Regulatory Compliance is essential for modernizing the system and bringing it in line with international standards[72].

To achieve this, the following strategic recommendations are proposed:

1. **Regulatory Optimization and Consolidation**:
    - Systematically eliminate the duplication and contradictions between FZ No. 248 and FZ No. 294, creating a single, coherent framework for risk-based control[73].
    - Move towards consolidated versions of laws (known as "codification"), following the German example. This involves publishing single, consistently updated legal texts rather than a base law with numerous separate amendments[74].
    - Simplify the language of regulations to make them more accessible and understandable for business operators[75].
2. **Implementation of Advanced Risk-Based Methods**:
    - Transition from purely categorical risk assessment to more dynamic, predictive models. This should involve using big data and analytics to forecast potential safety incidents[76].
    - Implement quantitative risk metrics, similar to those used in Canada's PSM, to allow for a more precise measurement and management of risks[77].
3. **Development of Self-Regulation**:
    - Significantly expand the powers and responsibilities of SROs, particularly in conducting audits, developing industry-specific standards, and certifying compliance[78].
    - Introduce economic incentives, such as tax benefits or reduced insurance premiums, for enterprises that demonstrate robust voluntary compliance and superior safety performance[79].

4. **Increased Transparency and Accessibility**:
    - Create a single, official online portal that provides the public with up-to-date, consolidated versions of all relevant laws and regulations, eliminating legal uncertainty[80].

The introduction of these TRC-aligned practices requires systemic change but promises to significantly enhance the efficiency of state control without increasing the administrative burden[81]. By embracing a more flexible, risk-focused, and collaborative approach, Russia can achieve a higher standard of industrial safety, increase legal certainty for businesses, and better align its regulatory framework with global best practices[82].

Please go to the following for all the footnotes: Sultanov, R., Mufazalov, A., Karataeva, A., & Manevich, D. (2025). Normative-regulatory compliance in industrial safety law: Comparative analysis and practical recommendations. In *E3S Web of Conferences* (Vol. 627, p. 05009). EDP Sciences.