# Normative-regulatory compliance in industrial safety law: comparative analysis and practical recommendations

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**Abstract.** The article is devoted to the analysis of the Theory of Regulatory Compliance in the context of Russian industrial safety legislation. A comparative analysis of the key principles of this theory and the regulatory acts in force in Russia, Germany, Canada, and Sweden has been conducted. The main issues of the Russian regulatory system have been identified, including excessive detail, a formal approach, and inconsistency in requirements. International methods, such as risk-based regulation, flexibility in regulatory requirements, and the development of self-regulation mechanisms, are discussed. The authors propose measures to improve the legislative framework, including eliminating the duplication of norms, introducing predictive risk assessment methods, expanding the powers of self-regulated organizations, and increasing the transparency of legal procedures. The implementation of these changes will improve the effectiveness of state control, reduce administrative burdens, and bring the Russian industrial safety system closer to international standards.

## 1 Introduction

In the modern world, where production processes are developing so rapidly, workers are directly and often faced with changes in various characteristics at the enterprise. This leads to the need to develop industrial safety standards that can correct and direct production processes to a given point of economic development with a minimum number of negative consequences that occur, such as industrial accidents caused by the human factor, injury to workers and wear and tear of equipment that affect the occurrence of subsequent hazards, risks and economic losses at production facilities. Creating universal norms, simplifying their use for developers of the legislative framework will speed up decision-making and improve production efficiency. Industrial safety is a critical component of sustainable development and public interest protection. In international practice, considerable attention is paid to the Theory of Regulatory Compliance (TRC), which focuses on the balance between strict compliance with norms and the practical effectiveness of their application [1]. The relevance of the study is due to the need to improve the system of state regulation and control in the Russian Federation. In the context of dynamic economic and technological development, it

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is important to ensure a balance between the effectiveness of regulation and freedom of entrepreneurial activity. Regulatory compliance theory offers an approach to find the optimal level of regulatory requirements to achieve the best results. The effectiveness of regulation is largely determined by its adaptability to changing conditions and ability to minimize negative externalities.

The purpose of the work is to review in detail the main provisions of the TRC, compare them with modern Russian regulations in the field of industrial safety and offer recommendations for their improvement based on international experience.

Research objectives:

1. Study and analysis of basic TRC principles and their application in international practice.
2. Assessment of compliance of Russian legislation with TRC requirements.
3. Comparative analysis of approaches to regulation in Russia, Germany, Canada and other countries.
4. Formulation of recommendations to optimize the regulatory system.

## 2 Methods

### 2.1 Regulatory benchmarking

Russian legislation (Federal Law No. 116-FZ, Federal Law No. 248-FZ, Federal Law No. 294-FZ) and foreign regulations (BetrSichV in Germany, OHSA in Canada) were analyzed. Comparison of approaches to regulating industrial safety in Russia and abroad with an emphasis on a risk-based approach and self-regulation.

### 2.2 Qualitative analysis of regulatory requirements

Key TRC principles such as risk-based approach, flexibility of regulation, proportionality of requirements and self-regulation have been studied [1, 2]. Compliance of Russian regulations with these principles was assessed.

### 2.3 Risk assessment

Qualitative and quantitative risk assessment methods were used to analyze the effectiveness of Russian legislation. Risk-based approach was analyzed in FZ No. 248-FZ and FZ No. 294-FZ.

### 2.4 International learning

The best practices of industrial safety regulation in Germany, Canada and Sweden were analyzed. Mechanisms of introduction of predictive methods of risk assessment and development of self-regulatory organizations (SRO) in foreign countries are considered.

### 2.5 Modeling and forecasting

Modeling methods were used to predict the consequences of introducing TRC principles into the Russian regulatory system. An analysis of possible changes in legislation and their impact on the effectiveness of control was carried out.

# 3 Results

The main principles of TRC include:

- Risk-oriented approach - assessment and management of the most significant risks, which allows optimizing costs and resources [1].
- Flexibility of regulation - the ability to adapt norms to the specifics of a specific object or industry to increase their efficiency [2].
- Proportionality of requirements - establishing a reasonable level of normative load, excluding excessive and formal requirements that do not affect safety.
- Self-regulation and business involvement - creating conditions for the responsibility of enterprises for compliance with standards, the development of self-regulatory organizations (SROs).
- Transparency and accountability - openness of regulatory processes, which contributes to trust on the part of society and business.

The TRC Regulatory Compliance Theory states that over-regulation, as well as under-regulation, can negatively affect the final results. Studies show that there is a "golden mean" of regulatory compliance, in which positive outcomes are achieved most effectively consider regulation as a complex system, in which it is important to take into account not only the degree of control, but also the economic validity of the requirements, which directly correlates with the TRC concept [1]. Instead, the concept proposes an emphasis on the development of key risk indicators and the use of differentiated monitoring, which allows the reallocation of resources to control the most critical factors.

The practical task of analyzing the relationships between various regulatory documents is particularly complex. In addition to the vast number of possible combinations, the question of which documents are complementary or conflicting, and for what reasons, is highly intricate and ambiguous. A comprehensive study of all possible document combinations is not only hardly feasible in practice but is also unlikely to be of great interest to readers [3].

Organizations may employ various frameworks and mechanisms to manage compliance risks. A key aspect of compliance management is the monitoring of regulatory changes, enabling the company to receive up-to-date information in a timely manner, comprehend the applicable requirements, and assess its level of compliance. Compliance management is closely interconnected with business continuity assurance [4].

Regulation is a crucial strategy for ensuring safety, but relying solely on one approach, such as command and control regulation, can be limiting due to its inflexibility and inefficiency. A more effective strategy involves using a combination of regulatory instruments tailored to specific safety goals, where different approaches complement each other and address the limitations of individual methods [5].

## 3.1 Russian legislation: problems and challenges

The main document - Federal Law No. 116-FZ - establishes requirements for licensing, examinations and supervision of hazardous facilities. However, the system is characterized by:

- Over-detail - a host of norms complicate enforcement.
- Formalism - emphasis on meeting criteria rather than managing risks.
- Scattered - requirements are distributed in laws No. 248-FZ, No. 294-FZ and by-laws.

For example, the risk-based approach in FZ No. 248-FZ is used for planning inspections, and in FZ No. 294-FZ - for internal control of enterprises. This creates duplication and inconsistencies.

A comparison of Federal Laws No. 248 "On State Control (Supervision) and Municipal Control in the Russian Federation" dated 31.07.2020 and No. 294 "On the Protection of the Rights of Legal Entities in the Exercise of State Control" dated 26.12.2008 is presented in Table 1:

**Table 1.** Comparison of Federal Laws No. 248 dated of 31.07.2020 and No. 294 dated of 26.12.2008.

| Differences | Federal Law No. 248 of 31.07.2020 | Federal Law No. 294 of 26.12.2008 |
|---|---|---|
| Application goals and objectives | The main focus is on external control - it is with its help that the priority of control measures is formed and the resources of the supervisory authorities are distributed. The risk-based approach here is used to identify areas of increased likelihood of violations, which allows you to purposefully plan inspections. | The approach is integrated into the internal management system of the organization. Its goal is to build an internal control system that not only identifies, but also prevents potential risk situations, contributing to a prompt response and minimizing negative consequences. |
| Risk assessment methodology | It is assumed mainly a qualitative risk assessment based on the analysis of threats and vulnerabilities in the activities of the subjects of control. This approach helps to quickly identify areas for inspection. | The emphasis is on comprehensive assessment, where both qualitative and quantitative methods are combined. This allows you to more accurately measure the level of risk and form reasonable priorities for developing measures to reduce it. |
| Scope | The risk-based approach is used for planning and conducting external inspections by state control bodies. It serves as a tool for selecting objects and areas of supervision. | The approach is intended for implementation within the organization itself, where it is required to create a risk management system adapted to the specifics of the enterprise, which contributes to the constant monitoring and adjustment of security measures. |
| Documentation and reporting | Risk assessment results are documented in the form of reports that are used for strategic planning of inspections and allocation of control resources. | More detailed documentation is provided - organizations are required to regularly update risk assessments and record measures to reduce them, which makes it possible to track the dynamics and effectiveness of the measures taken. |
| Responsibilities | The responsibility for applying a risk-based approach lies with the state control authorities, which implies a centralized nature of planning and conducting inspections. | Responsibility is distributed within the organization: senior management and specialized units are obliged to organize internal control and respond in a timely manner to identified risks. |

Thus, the key difference is that Law No. 248 is focused on external supervision and control in order to optimize scheduled inspections, and Law No. 294 is focused on creating and maintaining an effective system of internal risk management in organizations.

Comparison with international experience is presented in Table 2:

**Table 2.** Comparison of regulatory approach between Russia and other countries.

| Criterion | Russia | Germany, Canada, Sweden |
|---|---|---|
| Risk-based approach | Categorical risk assessment (Federal Law No. 248) | Predictive analytics and quantitative methods |

| Flexibility of norms | Universal requirements | Adaptation to industry specifics |
|---|---|---|
| Self-regulation | Limited role of SROs | Active business and SRO involvement |

One of the key ideas of TRC is that excessive regulatory requirements can lead to their formal implementation, reducing real security. Instead, the concept proposes an emphasis on the development of key risk indicators and the use of differentiated monitoring, which allows the reallocation of resources to control the most critical factors.

In foreign practice, TRC principles are widely applied in the legislation of various countries. For example, Germany has a Federal Security Facilities Control Act , which is based on a risk-based approach and prescribes regular risk assessment at production facilities. The German safety management system also includes mandatory audits and the participation of independent certification organizations (TÜV).

In Canada, industrial safety is regulated under the Occupational Safety Act and the Process Safety Management (PSM) system, which focuses on risk analysis and incident prevention.

In Sweden, industrial safety is regulated by the Environmental Protection Act, which includes precautionary principles and predictive risk assessment methods.

Finland adheres to a voluntary compliance model: the Occupational Safety and Health Act aims to develop self-regulatory organizations (SROs) and reduce the administrative burden on businesses.

These examples demonstrate the advantages of flexible and adaptive regulation, which can be useful for improving the Russian industrial safety system.

Excessive regulation can overload regulatory authorities and regulatory entities, which in turn reduces the effectiveness of control and increases the likelihood of non-compliance with critical standards. Therefore, it is necessary to focus on the development of key risk indicators and differentiated monitoring, allowing you to direct resources to the most vulnerable areas.

The development of self-regulatory organizations and voluntary compliance contributes to improving the quality of regulation and reducing the burden on state control bodies.

## 4 Conclusion

Recommendations:

1. Regulatory optimization:
   - Eliminate duplication in FZ No. 248 and No. 294.
   - Go to consolidated versions of laws (following the example of Germany).
2. Implementation of risk-based methods:
   - Use big data for predictive risk assessment.
   - Implement quantitative metrics (similar to Canadian PSM ).
3. Development of self-regulation:
   - Expand the powers of SROs in conducting audits.
   - Encourage voluntary compliance through tax incentives.
4. Increased transparency:
   - Create a single portal with up-to-date versions of laws.
   - Simplify the language of regulations for business.

As part of the implementation of the "regulatory guillotine" mechanism in Russia, regulatory legal acts and documents are being revised in order to unify them and bring them into line with federal requirements. In particular, it is proposed to clarify the wording of departmental regulatory documents, eliminate duplicate provisions and bring them in line

with federal standards. It is recommended to leave only those requirements in departmental regulations that are not taken into account in federal regulations, provided that they do not contradict federal regulations [6].

The transition to updated departmental regulations and the revision of corporate standards of enterprises will optimize the number of regulatory provisions, while maintaining the required level of requirements. This will ensure consistency with federal regulations, eliminate possible discrepancies in the wording and increase the convenience of their use in oil refineries, contributing to improving the efficiency of the regulatory system [6].

The pros and cons of the transition to updated regulations are presented in Table 3.

**Table 3.** Advantages and disadvantages of implementing TRC principles in the legislation of the Russian Federation.

| Advantages | Disadvantages |
|---|---|
| Simplification of work with regulations, elimination of the need to find amendments and changes. | Need for more frequent editorial updates and additional resources to maintain them. |
| Increasing transparency of legislation, reducing legal uncertainty. | Possible delays in publishing updated versions due to complex reconciliations. |
| Reducing the load on enterprises and regulatory authorities when interpreting norms. | |

The introduction of TRC principles into Russian practice requires systemic changes: reducing excessive requirements, integrating risk-oriented methods and developing self-regulation. This will bring domestic standards closer to international ones and increase the efficiency of control without increasing the administrative burden.

The introduction of this practice into Russian industrial safety legislation could significantly facilitate the work of regulatory authorities and businesses, increase legal certainty and reduce the likelihood of errors in compliance with the norms. The analysis shows that the Russian industrial safety system is focused on strict compliance with numerous standards, which can lead to a formal approach and a decrease in the real effectiveness of control. The introduction of TRC principles requires systemic changes: reducing excessive requirements, integrating risk-oriented methods and developing self-regulation. The application of these principles and the continuation of reforms in this area will achieve a balanced approach to regulation and increase its effectiveness in monitoring Russian industrial safety regulation without increasing the administrative burden and bring it closer to international standards.

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