

**Appendix 1**  
**of MATRIZ Regulations for Multi-Level Certification**  
**of TRIZ Users and Specialists**

Approved for use by MATRIZ Presidium  
on July 27, 2016

*In effect with additions as of March 1, 2017  
according to the European calendar.*

**TRIZ knowledge base requirements**  
**for applicants seeking Level 1–3**  
**TRIZ User certification**

**Level 1**

**Required knowledge, abilities and skills:**

- Methods for activating creative thinking and generating ideas.
- History of the creation and evolution of TRIZ.
- TRIZ objects and basic definitions (the engineering system, product, tool, super-system, subsystem, function, ideality, ideal final result, competing and alternative systems, system operator, inventive situation, inventive problem, etc.).
- Function analysis (FA) for products.
- Trimming for products.
- Basics of cause-effect analysis.
- Resources and resource analysis.
- Engineering contradiction (EC) and EC resolution principles.
- Altshuller's matrix for the elimination of engineering contradictions.
- The formulation and elimination physical contradictions(PC).

**Required level of competence:**

- 1.1. Facility with TRIZ and FA objects and area/frames of application.
- 1.2. An understanding of the essence and fundamental notions of TRIZ and FA.
- 1.3. The ability to find subsystems and super-systems of specified objects.
- 1.4. The ability to formulate the main function of specified products.
- 1.5. The ability to build function models for products.
- 1.6. The ability to formulate trimming conditions for a product's components.
- 1.7. The ability to build a cause-effect chain of disadvantages.
- 1.8. The ability to formulate engineering contradictions.
- 1.9. The ability to work with Altshuller's matrix for the elimination of engineering contradictions.
- 1.10. The ability to formulate and resolve physical contradictions.

**Certification testing format:**

One written test.

**Duration of recommended training:** not less than 24 class hours in addition to independent studies.

## Level 2

### **Required knowledge, abilities and skills:**

- Analysis of Cause-effect chains and the ability to discern root/ key disadvantages.
- Formulation of key problems/issues.
- Feature transfer (combining alternative systems).
- Function analysis for processes.
- Functionality Vs. Problem (Cost) diagram (Diagnostic analysis).
- Su-Field analysis. Standards for inventive problem solving.
- Basics of the Algorithm of Inventive Problems Solving (ARIZ-85C).
- Developmental stages of technical systems. The uneven development of technical systems and their parts.
- Indicators and recommendations for every development stage of technical systems.

### **Required level of competence:**

- 2.1. Successful passage of Level 1 requirements.
- 2.2. An understanding of the essence of cause-effect analysis and identify root / key disadvantages.
- 2.3. The ability to formulate key problems.
- 2.4. The ability to find competitive and alternative systems.
- 2.5. The ability to identify pairs of opposite features for alternative systems.
- 2.6. The ability to build function models for processes.
- 2.7. The ability to formulate the trimming conditions for process components.
- 2.8. Complete knowledge of the principles of construction and transformation of Su-Field models.
- 2.9. Complete knowledge of the structure of ARIZ-85C.
- 2.10. 0. Complete knowledge of the indicators and characteristics of the development stages of technical systems.

### **Certification testing format:**

Successful defense of a term paper or completion of a written test.

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**Duration of recommended training:** not less than 40 class hours in addition to independent study.

## **Level 3**

### **Required knowledge, abilities and skills:**

- Flow analysis.
- Application of analogue problems
- Super-effects analysis.
- Trends in the evolution of engineering systems.
- TRIZ-based forecasting.
- The Algorithm of Inventive Problem Solving (ARIZ-85C).
- Subversion analysis for failure determination and prevention.

### **Required level of competence:**

- 3.1. Successful passage of Level 2 requirements
- 3.2. The ability to build and analyze models of flows of substance, energy, and information.
- 3.3. Complete understanding of various applications of database effects.
- 3.4. Complete understanding of various applications of database analogue problems.
- 3.5. The ability to apply super-effects analysis.
- 3.6. Knowledge of trends in the evolution of engineering systems.
- 3.7. The ability to create a developmental forecast for a technical system.
- 3.8. The ability to work with ARIZ-85C.
- 3.9. Knowledge of the basics of subversion analysis.

### **Certification testing format:**

Successful defense of a thesis with mandatory analysis of a problem by ARIZ-85C plus, prior to issuing a certificate, a 15-20 minutes long interview with an interviewer appointed by MATRIZ CEM. This interview may take place in person or via Skype or some other communication software.

**Duration of recommended training:** not less than 80 class hours in addition to independent studies.