**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, as of August 15, 2016
per 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 creating 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 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 VEA.
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.
**Required study hours**: not less than 24 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. 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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**Required study hours**: not less than 40 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.

**Required study hours**: not less than 80 hours in addition to independent studies.