

A New Theory of Systems Reliability

**Alexandru STAMATIU, Eugen BADEA, Bogdan IVAN,
George PĂLTINEANU**

Universitatea Tehnică de Construcții București

Abstract

The paper presents the theoretical bases of the new theory of evolution of systems from nature, called in 2004 The entropic theory of systems (ETS), based on new mathematical formalism and concepts developed in the last 11 years: the entropy S form $= - \ln p$, which led to the maximum entropy determined for the end of the evolution of a process, time step, quantum time, sustainability, life remaining, canonical entropic graph, entropic risk and global availability. It is shown that the mathematical model called the canonical form of entropic graph or canonical entropic graph (CEG) is in interconnection with the most important fundamental principles or laws of nature known, of which, the principle of minimum action, the action by contiguity principle (step by step), the principles of thermodynamics, the principles of special and general relativity theory, the fundamental principles of quantum physics, plus quantum time, etc. The new theory of reliability systems presented in the paper, accompanied by the principles, laws, theorems and applications, thus appears as an application of the more general theory of evolution systems from nature. Consequences and conclusions presented in the last chapter, of which the implications and possible applications in quantum theories of electromagnetism and gravity, with great power forecasting of the new theory spares us the other explanations we need.

References:

- [1] Stamatiu, Al. – Asupra necesitatii redefinirii cuantei de timp, The 11th International Conference on Quality and Dependability, Proceedings CCF-2008, Sinaia, 24th – 26th september.
- [2] Stamatiu, Al. – Fiabilitatea instalatiilor, MATRIX ROM, Bucuresti, 1998, 295 p.
- [3] Stamatiu, Al. – Entropie si fiabilitate, Conferinta Facultatii de Instalatii, Universitatea Tehnica de Constructii, Bucuresti, 1999.
- [4] Stamatiu, Al. – Schimbare si entropie, Conferinta Nationala de Instalatii, Sinaia, 2000.
- [5] Stamatiu, Al. – Implicatii ale legii entropiei in analiza fiabilitatii sistemelor, The 7th International Conference on Quality, Reliability, Maintainability – CCF 2000, Proceedings of CCF 2000 (I), Sinaia, 27th – 29th september.
- [6] Stamatiu, Al., Ivan, N., Badea E. – Modelarea entropica a unor Lanturi Markov finite, a VIII-a Conferinta a Facultatii de Instalatii, Bucuresti, 2001.
- [7] Stamatiu, Al., Ivan, N., Badea E. – Contributii la evaluarea MTTF prin modelul degradarii entropice, a VIII-a Conferinta a Facultatii de Instalatii, Bucuresti, 2001.
- [8] Stamatiu, Al. – O problema de matematica foarte veche cu implicatii multiple in unele chestiuni fundamentale actuale, Conferinta Nationala de Instalatii, 2001.
- [9] Stamatiu, Al. – Entropia maxima – solutii pentru evaluarea schimbarii entropice, a VIII-a Conferinta a Facultatii de Instalatii, Bucuresti, 2001.
- [10] Stamatiu, Al. – Considerations on Maximum Entropy, World Energy Council, Regional Energy Forum, Neptun-Olimp, Romania, 2002.

- [11] Stamatiu, Al., Badea, E. – Aplicatii ale modelarii entropice in fiabilitatea instalatiilor energetice, a XXXVII-a Conferinta de Instalatii Electrice si Automatizari, Sinaia, 2002.
- [12] Stamatiu, Al., Ivan, N. – Un nou model entropic pentru analiza sistemelor redondante, a XXXVII-a Conferinta de Instalatii Electrice si Automatizari, Sinaia, 2002.
- [13] Ivan, N. – Consideratii asupra aplicarii modelarii entropice pentru determinarea duratei de functionare pana la defectare a sistemelor de tip “a din n”, rev. Asigurarea Calitatii, nr 35, 2003.
- [14] Stamatiu, Al. – Modele entropice pentru evaluarea fiabilitatii sistemelor, The 8th International Conference on Quality, Reliability, Maintainability, Proceedings CCF 2002, Sinaia, 18th – 20th september.
- [15] Stamatiu, Al. – Consideratii asupra posibilitatii modelarii entropice a unor fenomene naturale, Simpozionul National de Electrotehnica Teoretica–SNET 2003, Universitatea Politehnica Bucuresti, iunie 2003.
- [16] Stamatiu, Al. – Noi confirmari si consecinte ale modelarii entropice a fenomenelor naturale, Conferinta Facultatii de Instalatii, Bucuresti, noiembrie, 2003.
- [17] Stamatiu, Al. – Bazele unei teorii entropice a sistemelor. Aplicatii in fiabilitate, The 9th International Conference on Quality and Dependability – Proceedings CCF 2004, Sinaia, 29th sept.– 1th oct.
- [18] Ivan, N. – Un model simplu pentru evaluarea fiabilitatii sistemelor complexe, rev. Asigurarea Calitatii, nr 36, 2004.
- [19] Ivan, N. – Contributii la evaluarea duratei de functionare neintrerupta a unor scheme de alimentare cu energie electrica, SIEAR, 2004.
- [20] Badea, E. – Contributii la optimizarea proiectarii instalatiilor electrice si de automatizare, Teza de doctorat, Catedra de Electrotehnica, Universitatea Tehnica de Constructii Bucuresti, 2010.