MODELS OF DECISION-MAKING SUPPORT ON THE BASIS OF RISKS-SITUATIONS

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Introduction of concepts "risk-situation"and "risk-event" is proved. These concepts allow to consider complex character and necessary parametres of risks. Management process by risks-situations in organizational-technical systems is described. Set of fuzzy models for decision-making support on the basis of risks-situations is offered: model of risks-situations; estimation model of risks-situations; choice model of ranged groups of actions. The generalised algorithm of interaction of these models is described.

Keywords: risk-situation, decision-making support, fuzzy models.

References

[1] ISO 14121: 2007. Safety of machinery. Principles assessment. Part 1: Principles.

[2] ISO 31000:2009. Risk management. Principles and guidelines.

[3] Kalkis V., Kristines I., Roy J. Labour safety − the basic directions of an estimation of risks of a working environment. Riga: SIA «Jelgavas tipogrāfija», 2006. (in Russian)

[4] Korolev V.Yu., Benning V.E., Sorgen S.Ya. Mathematical bases of the risk theory, Moscow, Fizmatlit, 2011. (in Russian)

[5] Reliability of technical systems and technogenic risk. *The electronic manual*, http://www.obzh.ru/nad. (in Russian)

[6] RD 03–418–01. Methodical instructions on carrying out of the analysis of risk of dangerous industrial objects. *Confirmed by the Decision of Gosgortekhnadzor of Russia*, no. 30, 10.07.2001. (in Russian)

[7] Dirk Proske. Catalogue of risks − Natural, Technical, Social and Health Risks. Springer, 2007.

[8] Yazenin A.V. Possibilistic–probabilistic models and methods of portfolio optimization. *Studies in Computation Intelligence*, 2007, vol. 36, pp. 241–259.

[9] OHSAS 18001: 2007. Occupational health and safety management systems – Requirements.

[10] OHSAS 18002:2008. Occupational health and safety management systems. Guidelines for the implementation of OHSAS 18001:2007.

[11] GOST R 51897–2002. Risk management. Terms and definitions.

[12] Borisov V.V., Senkov A.V. Intelligent management of risk in complex technical-organizational systems. *Informacionnye tehnologii* [Information technology], 2011, no. 10, pp. 47-51. (in Russian)

[13] Senkov A.V. Borisov V.V., Bobryakov A.V., Gavrilov A.I. Approach to risk management in complex organizational-technical systems. *Vestnik Moskovskogo energeticheskogo instituta* [Bulletin of the Moscow Power Engineering Institute], 2013, no. 6, pp. 156-161. (in Russian)

[14] Senkov A.V. the Method of the analysis of risks at hazardous production objects based on a fuzzy tree of failures. *Neyrokomputery: razrabotka, primenenie* [Neurocomputers: Design, Application], 2009, no. 8, pp. 31-37. (in Russian)

[15] Borisov V.V., Belozerskiy A.Yu. Risk analysis on the basis of fuzzy Bayesian networks. *Neyrokomputery: razrabotka, primenenie* [Neurocomputers: Design, Application], 2009, no. 8, pp. 23-30. (in Russian)

[16] Ren J., Wang J., Jenkinson I., Xu D.L., Yang J.B. An offshore risk analysis method based on fuzzy Bayesian networks// EPSRC report, 2005.

[17] Shafer G. A Mathematical Theory of Evidence. Princeton University Press. 1976.

Bibliographic citation

Borisov V.V., Senkov A.V. Models of decision-making support on the basis of risks-situations. *Nechetkie sistemy i myagkie vychisleniya* [Fuzzy Systems and Soft Computing], 2014, vol. 9, no. 1, pp. 19–38. (in Russian)