

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Evaluation of the satellite power system survivability with the selfish algorithm. SVETLANA V. POROSEVA, JACOB LOWE, BRYAN E. KAISER, University of New Mexico — Engineering networks (electric power, gas, water, transportation systems, etc.) are traditionally designed for normal operating conditions. Reliability analysis provides tools for describing the network's performance under such conditions. In the modern society, the likelihood of adverse conditions has dramatically increased along with the scale and cost of the network's failure. For some networks such as, for example, those in spacecrafts or in military applications, adverse conditions are normal. Due to differences in the mathematical formulation, reliability analysis is not applicable to networks under adverse conditions. Instead, survivability analysis should be applied. Survivability analysis due to the network's topology is the emerging discipline. In Poroseva et al, IEEE ESTS, 2005, a network survivability analysis based on a probabilistic approach was proposed for networks with heterogeneous nodes. Later, the selfish algorithm was developed to evaluate the topological survivability of networks. The approach is applicable to networks with multiple sources and sinks. The application of this algorithm to a satellite electric power subsystem will be demonstrated at the conference.

Svetlana V. Poroseva
University of New Mexico

Date submitted: 15 Nov 2013

Electronic form version 1.4