

Article Abstract

Title:	Application of ant colony optimization for reconfiguration of shipboard power system
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Journal:	<i>International Journal of Engineering, Science and Technology</i> , Vol. 2, No. 3, 2010, pp. 119-131.
Abstract:	The shipboard power system (SPS) supplies energy to sophisticated systems of weapons, navigation, services and communication. Due to battle damage or faults, electric energy delivery may be interrupted to critical loads. Reconfiguration of electrical network in the SPS is necessary, to either restore the service to all the possible loads or to meet some of the operational requirements of the naval ship. In this research work, ant colony optimization (ACO) has been utilized to reconfigure given SPS network, satisfying the operational requirements, priorities of the loads and considering islanding operation and distributed generation. Graph theory has been applied to represent SPS electrical network to simplify the mathematical formulation to be used by ACO. Developed technique has been applied to an eight bus and thirteen bus representative shipboard power system model to reconfigure, while maximizing the load magnitude, or load priority, or load magnitude with priority. Satisfactory results have been obtained for both the test cases.
Keywords:	Shipboard power systems, islanding, reconfiguration, graph theory, ant colony algorithm