MASTER OF SCIENCE
IN
SPACE SYSTEMS OPERATIONS

CONCEPT OF OPERATIONS FOR A SELF-ORGANIZING THEATER BALLISTIC MISSILE DEFENSE NETWORK

Daniel D. Sunvold-Lieutenant, United States Navy
B.S., United States Naval Academy, 1992
Master of Science in Space Systems Operations-March 1999
Advisors: Craig W. Baldwin, Naval Space Systems Academic Chair
Carl R. Jones, Information Systems Academic Group

Theater Ballistic Missile Defense (TBMD) is a leading area of concern for military commanders as well as national policy makers. The increased threat is evident from the number of test launches by developing countries. As the United States Department of Defense conducts research and development of new TBMD systems, the importance of a sound Battle Management, Command, Control, Communications, Computers, and Intelligence (BMC4I) network for the dissemination of launch and targeting information needs to be stressed. The focus of this research is to explore the concept of a self-organizing TBMD sensor network – a network that will adapt to dynamic situations and reconfigure itself, both physically and logically, to efficiently and accurately pass information from sensor-to-shooter. It will also be able to optimize area coverage with available assets. The self-organizing network concept will display many characteristics of a Complex Adaptive System (CAS).

DoD KEY TECHNOLOGY AREAS: Battlespace Environments, Command, Control, and Communications, Computing and Software, Modeling and Simulation

KEYWORDS: Theater Ballistic Missile Defense, TBMD, Theater Missile Defense, TMD, Complexity Theory, Complex Adaptive Systems, Self-Organizing Systems, Modeling and Simulation