12th ICCRTS
Adapting C2 to the 21st Century

Title of Paper:
The Environment in Network Centric Operations: Terrain Reasoning for Command and Control

Topics:
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- o C2 Technologies and Systems
- o C2 Concepts, Theory, and Policy
- o Modeling and Simulation

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Abstract

As Command and Control practices are transformed by Network Centric Operations, the effect of the environment needs to be considered. The constraints of terrain and weather are two key limitations that apply to all operations. Thus the technologies developed by the commercial world to deal with these constraints, such as Geospatial Information Systems (GISs), have direct relevance to coalition forces. Conversely, advanced environmental reasoning services developed for coalition forces can also, in selective areas such as mobility analysis, have applicability to civil, humanitarian operations. Thus, technologies developed in these selective areas have the ability to leverage commercial technologies while transforming C2 processes.

In this paper we both present a conceptual framework for how environmental effects relate to Network Centric Command and Control, and investigate the utility of this framework through an advanced technology program. Battlefield Management Language (BML) is being developed as a common representation of military mission suitable for automated processing. BML is used to relate terrain features to operations resulting in a methodology (geoBML) that identifies the key environmental aspects needed for specific missions. geoBML enhances a Command and Control process, be it military or civilian, by making terrain information explicit and computational.

Suggested Topics

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Outline

- o Introduction
    - o Effects of the Environment in Network Centric Operations
    - o Need for a Framework relating the Environment and C2
    - o Ability of Environmental Reasoning to transform the C2 Process
- o An Integrating Framework
    - o Ubiquitous Use of GISs
    - o C2 services on the basis of Geospatial Information
    - o Dealing with Different Data Representations and Formats
    - o Network Considerations in Information Flow
    - o Description of the Framework
- o Investigating the Framework – How is C2 Affected?
    - o Battlefield Terrain Reasoning and Awareness – Battle Command Program
    - o A Geospatial BML
    - o Preliminary Work
        - ▪ Precomputation of Effects
        - ▪ Generating Actionable Information
- o Quantifying the Effects
    - o Applicability to Civil Operations
    - o Defining Future Research with the Framework
- o Conclusion