ABSTRACT

TITLE: THE USE OF AHP IN DEFENSE PLANNING AND PRIORITIZATION

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Europe may find itself in the next decade or so having to defend against cruise missiles (CM) and tactical ballistic missiles (TBM) whether as part of a full scale war, or an isolated accidental launch or terrorist or blackmail operation. An even more likely instance could involve member nations of NATO either collectively or individually providing forces and materiel for an Out-Of-Area scenario which would require defense of NATO personnel and assets against the possibility of combined attacks. Today, Europe has no NATO-wide systems in place to defend against long range tactical ballistic missiles. Some systems are in development in some of the nations with the intent of providing defense against one or more, but not all, of the potential threats.

The problem of Extended Air Defense (Extended Air Defense is defined as the classical defense against air-breathing threats plus defense against tactical ballistic missiles) becomes more complex with the dimensions and time scales involved. The distances involved across one or more national boundaries and the flight times of typical ballistic missiles are measured in seconds or at most, a small number of minutes. NIAG SG-37 recognized early in their work that no single system could with any foreseeable technology provide adequate defense against all threats. Furthermore, the wide range of possible scenarios, together with the differing requirements for each scenario, suggests the use of resource allocation techniques to investigate optimal mixes of various system architectures.

In this investigation, a matrix of six system architectural options was examined in four scenarios and sub-scenarios. The common thread among all scenarios was the functional requirements imposed on all defensive systems: The requirement to (1) Shoot (2) Survive (3) Sustain (4) Move and (5) Communicate. Additionally, the architectures were evaluated in terms of risk, and schedule and a cost-benefit ratio calculated for each. Sensitivities to each of the common requirements was examined, along with that of the decision maker's risk tolerance. It is conclusively shown that each segment of the architecture performs best under at least one scenario and time slice. A cost-estimation technique based on AHP is suggested for future work (expected to be pursued during 1996).

The presentation will be UNCLASSIFIED.