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The Center for Education and Research in Information Assurance and Security

Using Red & Blue Team Exercises to Highlight Challenges, Gaps and Deficiencies in Defense Systems Capabilities Against Emerging Air Threats

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Overview

There are different challenges that Counter Unmanned Aerial Systems (C-UASs) face related to detection, monitoring, and mitigation stages. Moreover, these challenges are rapidly increasing with the sophistication of warfare technologies. Therefore, in this project, we assess gaps and deficiencies of multiple operated deployed systems to propose an integrated defense system, which communicates information and retaliates using the appropriate available assets using a layered approach.

Goals

The project had the following main goals:

1) Highlight technical gaps current deficiencies, and limitations for defense systems capabilities against emerging air threats including unmanned aerial vehicles (UAVs) and missile attacks;
2) model & simulate current defense systems to test their capabilities and limitations; and
3) propose recommendations for near and long terms future modifications and enhancements.

Scope & Methodology

There was a need to modify the Integrated Air Missile Defense (IAMD) system with enhancements and improvements that are based on the current limitations and examined deficiencies of the current defensive missile system against UAVs attacks.

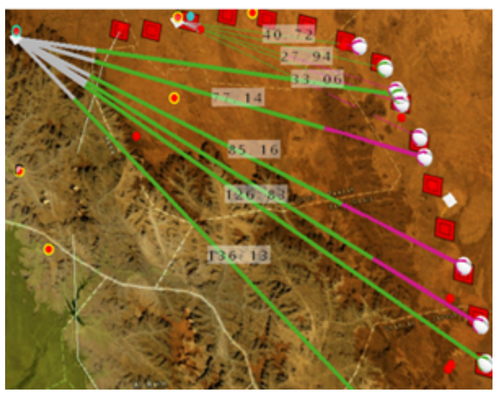
- We acquired information from Lockheed Martin, along with the use of open-source data for data to describe the threats, assets, systems, current capabilities and proposes an enhancement to the current AMD and integrates them into the IAMD to meet the set objectives.
- We analyzed, and evaluated the emerging air threats in the region, such as UAVs and cruise missiles and their capabilities.
- We created simulated attack scenarios to test, analyze, and evaluate the gaps, challenges and hypothesized deficiencies.

Analysis of the Proposed System

The proposed layered IAMD architecture incorporates an Air-to-Air interception layer that helps defend incoming attacks

Types of Analysis

Viewshed



Line of Sight

Summary of Advantages

Increase radar coverage for incoming attacks by modifying the layout

Increase the ability to handle a large group of incoming attacks

Future Advancements

The operations of the proposed deployed systems needs to include planning, coordination, management, and transportation of assets, which will aid in performing the desired tasks (i.e., detection, monitoring, and mitigation).

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