



42nd Annual Gun & Missiles Symposium & Exhibition

Raytheon

## Phalanx CIWS For Defense Against Rockets, Artillery, and Mortars



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## The Current Tactical Situation...

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### Requires The Capability To Defeat ...

- Cruise Missiles
- Various Military Aircraft
- UAVs
- Slow Civilian Aircraft
- Helicopters
- Lightly Armored Vehicles
- Small Boats With Weapons



**AND Rockets, Artillery, and Mortars!!**

**Expanding The Role Of A High Value Site Defense System Can Signal A Revolution In War-fighting By Defeating Enemy Rockets, Artillery And Mortars BEFORE They Impact The Ground**



# Characteristics of a High Value Site Defense System

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- **Positive Command & Control**
- **Positive Target Identification**
- **Quick Response**
- **Capability Against a Large Target Set**
  - **Both Air and Surface Threats**
- **Programmable & Dynamic No-Engage Sectors**
- **Limit Collateral Damage**



**Demands a System Which Can Neutralize Multiple Threats & Types In a Single Engagement**



# Phalanx Block 1B Overview

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## Primary Mission:

**Terminal Defense Against ASCM threat and High Speed Aircraft Penetrating Other Fleet Defensive Envelopes**

## Added Missions:

- **Surface Mode**
  - **Counter Small, Fast Surface Craft and Slow Flying Helicopters and Aircraft**
- **Sensor Support For Close-in Missile Engagements**
- **High Value Site Defense**

## Benefits:

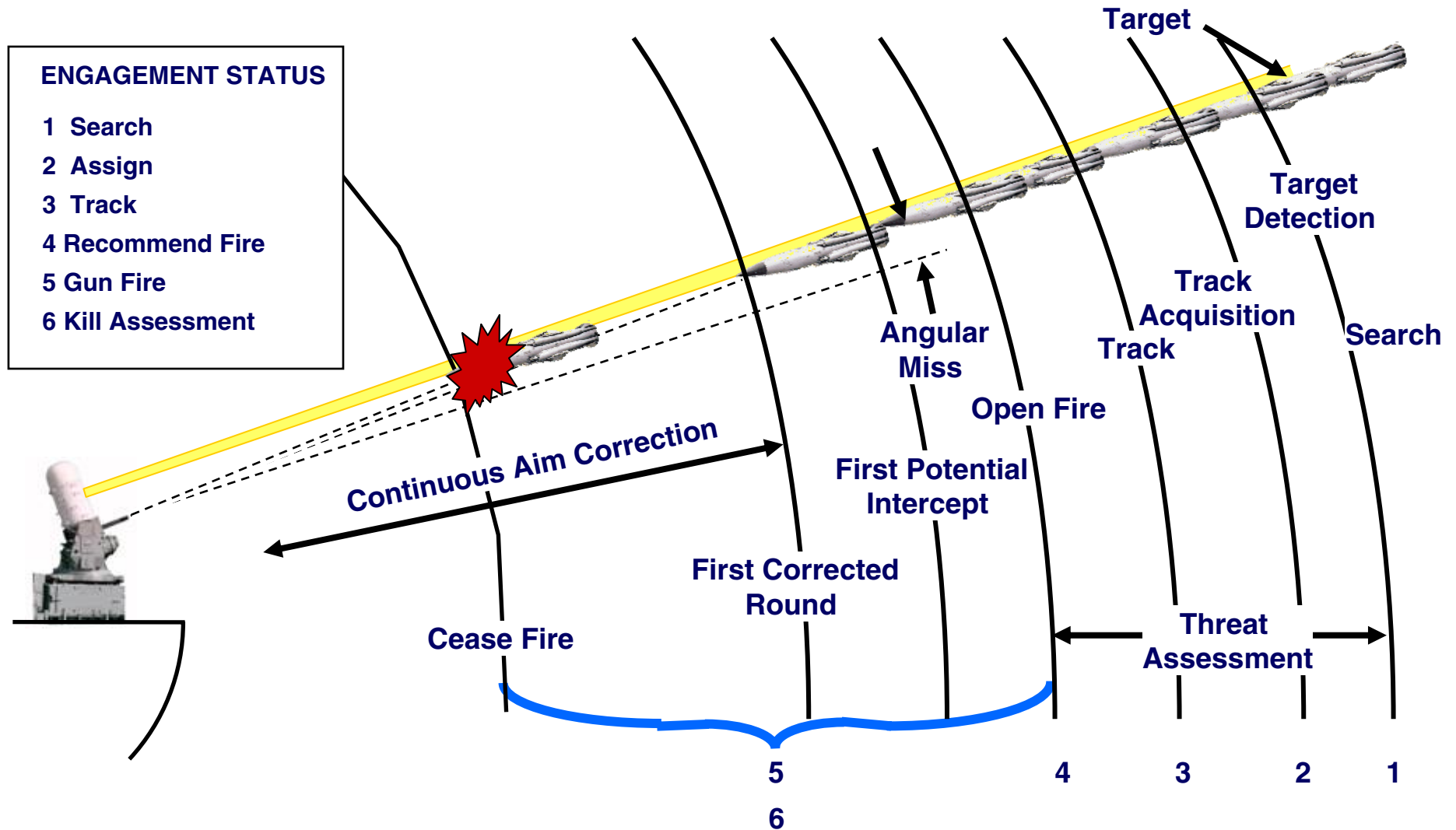
- **Supports Multiple Roles In Ships Self Defense**
- **Man-in-the-Loop, Autonomous or Integrated Operation**
- **Fast Reaction**





# Phalanx CIWS AAW Operational Sequence

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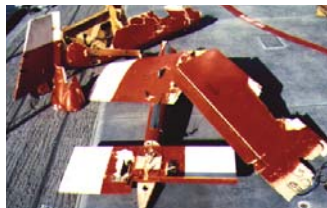




# Proven Against Threats in Both Anti-Air and Surface Mode

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## SeaSkimming ASM



UAV



155mm

Subsonic Tactical ASCM  
Mach 2+ ASCM Test Targets  
High G Maneuvering ASCM  
High Diving ASCM  
155 mm Shells  
Mortars/Rockets  
Mine Simulators  
Jetski  
18 & 35 ft Boats  
C12 & S3 Jet Aircraft  
Mirage, F-18 & A4 Jet Aircraft  
SH-60, HH-1N, Cobra Helos  
Man-in-Water (Swimmer)  
50 & 80 knot Boats



Cobra Helo w/Flares



A4 Jet Aircraft



Small Boat Engagement



Rigid Inflatable Boat



Boghammar

Track Only Op



# Today's HVSD Solution: Land-Based Phalanx Weapon System (LPWS)

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## LPWS Mission

**Terminal Defense Against Mortars and Rockets**

**Sensor Support For Close-in Engagements**

**Search Radar Provides Low False Alarm Rate Target Detect**

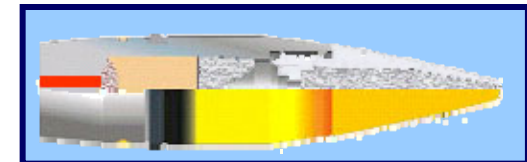
**Track Radar Provides Accurate Target Track Information**

**Accurate Point of Impact Prediction**

**Man-in-the-loop, Autonomous Or Integrated Operation**

**Improved Gun Mounting Optimized Gun Barrels (OGB)**

**M-940 High Explosive Incendiary Traced Self-Destruct (HEIT-SD) Ammunition**



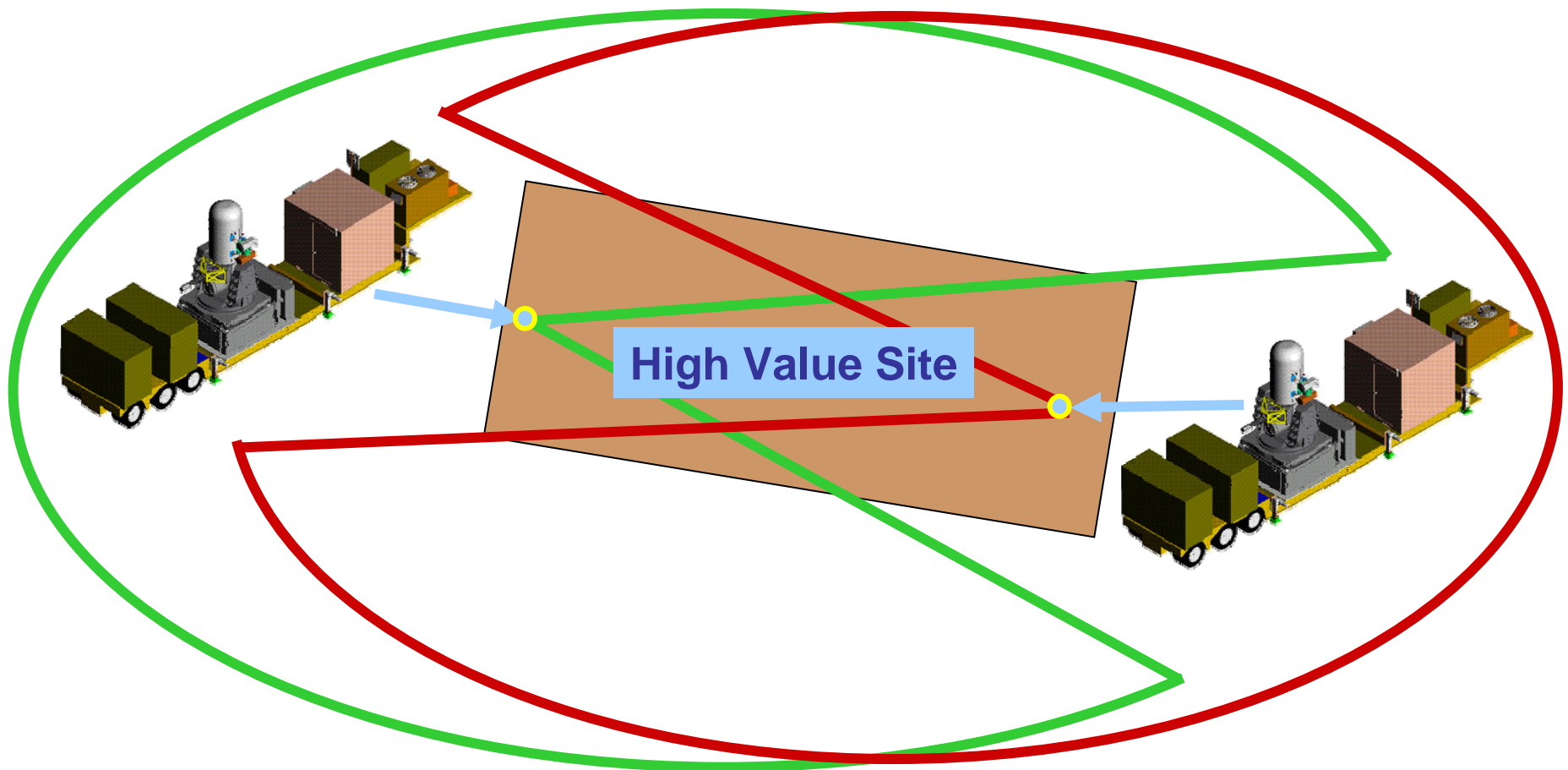
**Standard Mk-149 (Penetrator) Ammunition Could Be Lethal**  
**M-940 Ammunition Eliminates Collateral Damage**



# Strategic Placement Provides for Overlapping Protection

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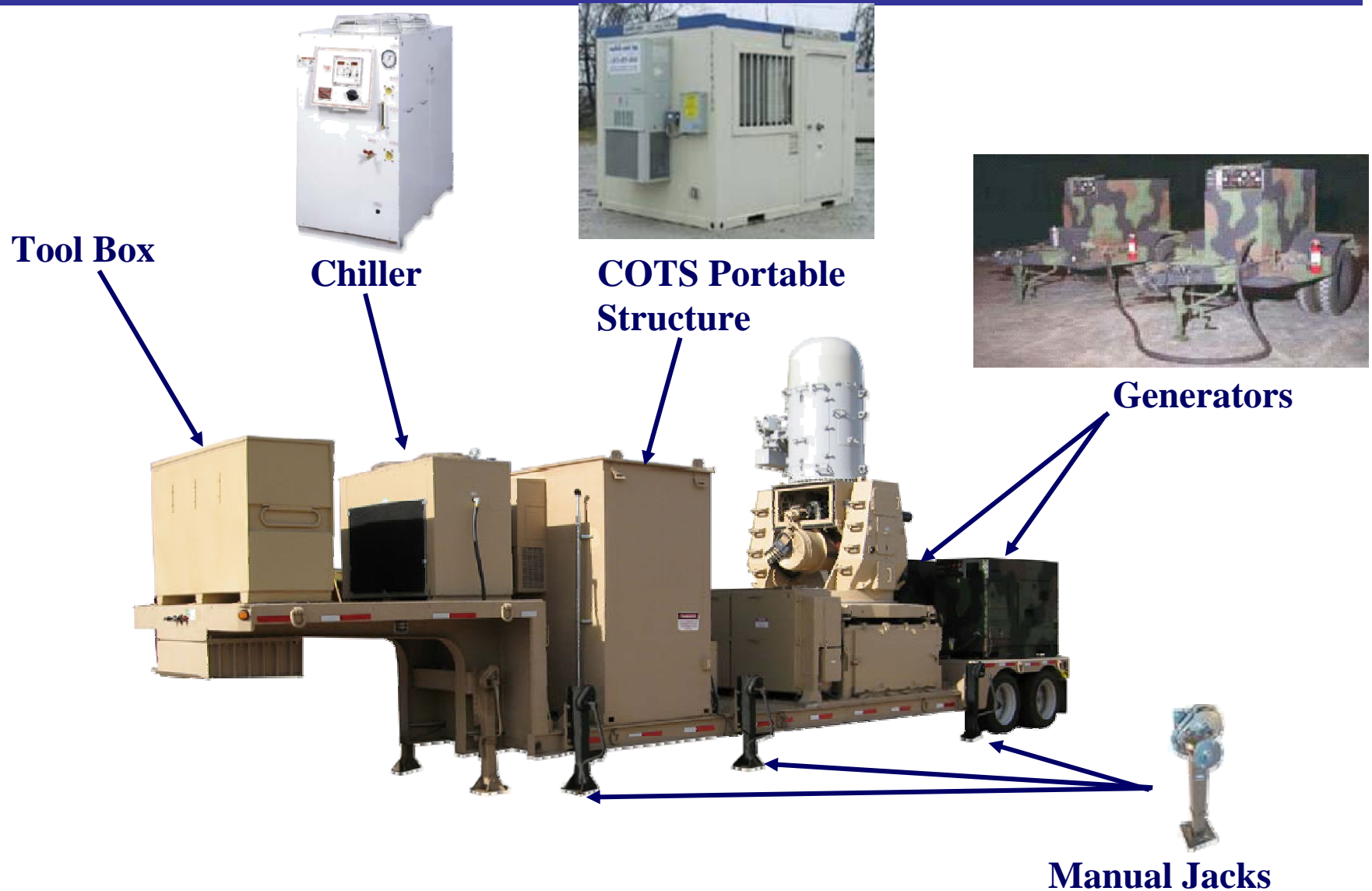
- 2 Weapon Systems (Minimum) Per Site Provides 360 Degree Coverage
- Proper placement would Allow Both Systems to Engage
- Provides Surveillance/Control for Road/Water Route Access Routes







# Self-Contained Lowboy Trailer Design **Raytheon**



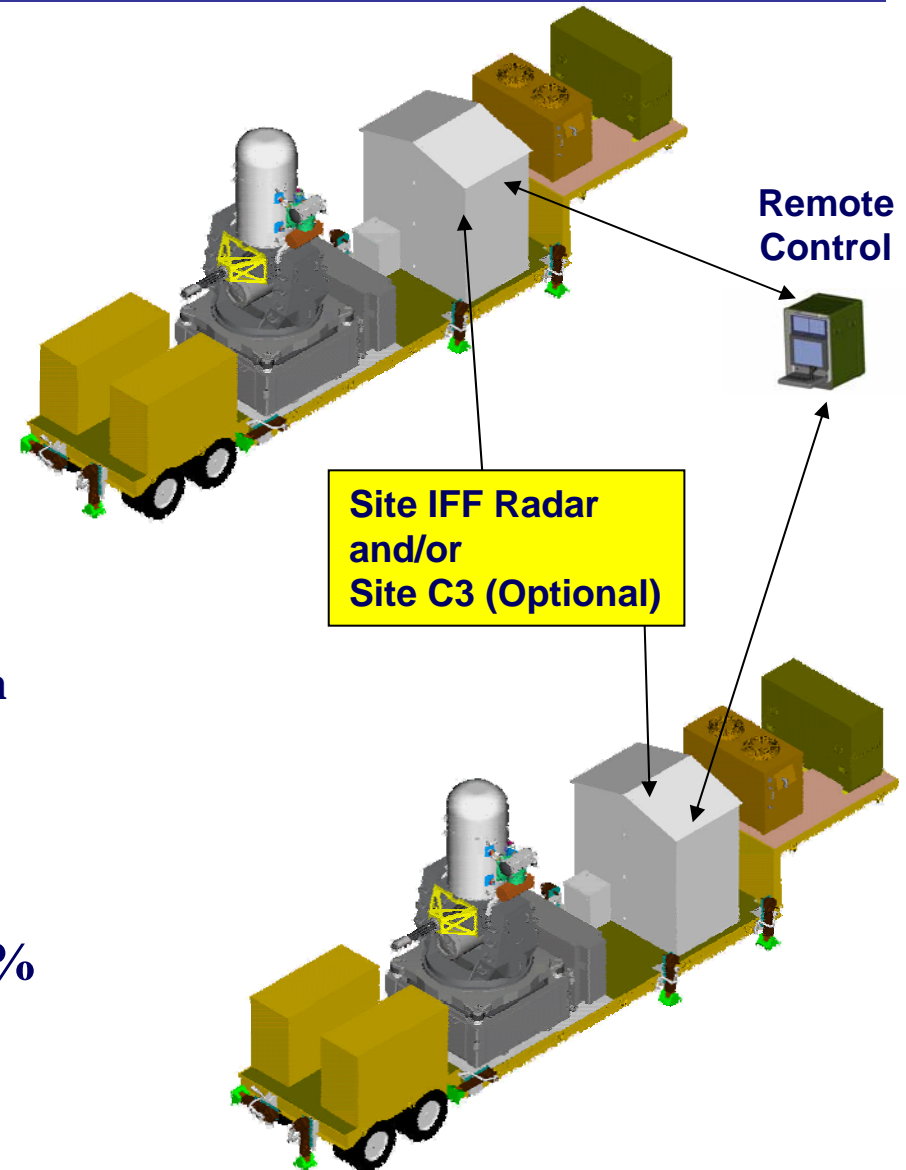


# LPWS

## Site Hardware Arrangement

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- **“Movable” Installation**
  - Self Contained
    - Power
    - Cooling
    - Operator Station
  - Trailer Mounted
    - Commercial Chiller
    - Jacks Provide Stability
- **Ethernet Fiber-optic Based Interfaces**
  - Allow Several Km Distances Between Protected Areas And Site Control
  - Portable Remote Control Unit Can Be Placed At Centralized Control Location
- **Remote Equipment Monitoring Facilitated By “On-trailer” Automatic Maintenance & Operational Data Collection**
- **Phalanx Gun Mount Hardware Is 99.9% Common With Existing USN Block 1B Systems**

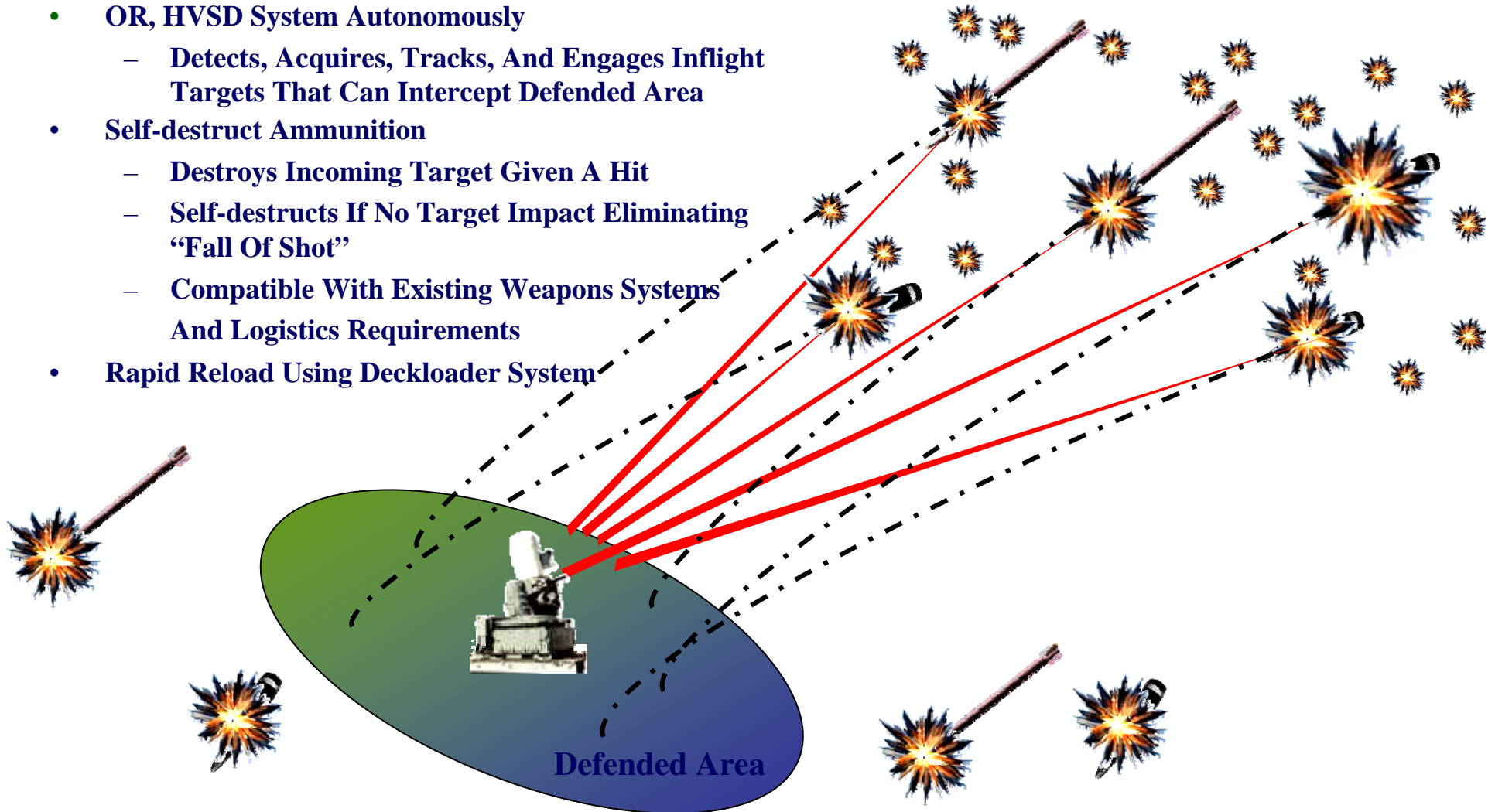




# Concept of Operation

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- **HVSD System Receives External Target Cue**
  - Air Or Surface Search Radars
- **OR, HVSD System Autonomously**
  - Detects, Acquires, Tracks, And Engages Inflight Targets That Can Intercept Defended Area
- **Self-destruct Ammunition**
  - Destroys Incoming Target Given A Hit
  - Self-destructs If No Target Impact Eliminating “Fall Of Shot”
  - Compatible With Existing Weapons Systems And Logistics Requirements
- **Rapid Reload Using Deckloader System**





# Conclusions

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- **Phalanx Block 1B Has Demonstrated Capability to Defeat a Wide Range of Air and Surface Threats to High Value Sites**
  - **Positive Threat Identification**
    - Radar to Detect Incoming Targets
    - FLIR For Visual Target ID
  - **Defense Against Air Threats**
    - Rockets, Artillery, Mortars
    - Cruise Missiles
    - Low Slow Aircraft
  - **Defense Against Surface Threats**
  - **Lowboy Trailer Configuration Provides Ability to Move System to High Threat Area**
  - **Self-Destruct Ammunition Reduces Collateral Damage From Fall of Shot**



**Phalanx Can Play a Significant Role  
in High Value Site Defense**



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# The Land-based Phalanx Weapon System

Proven In Testing...

Currently Deployed...

Proven In Battle...

Saving Lives Today!