

IV.MS.2005.01

Infantry Warrior Simulation (IWARS)

This is a joint program between the Natick Soldier Center, the Army Materiel Systems Analysis Activity (AMSAA) and the Human Research & Engineering Directorate (HRED), ARL, to build upon the collective work successes completed under the prior STO, i.e., the Integrated Unit Simulation System (IUSS), and the AMSAA Infantry MOUT Simulation (AIMS) by combining them to form the Army's Infantry Warrior Simulation (IWARS). AMSAA will use mission resources to support simulation development, provide standard physical algorithms, produce certified data, and perform Verification & Validation (V&V) for IWARS models. HRED will continue to team with Natick and AMSAA in the generation of close combat data. The new simulation will provide high resolution, small unit information transfer representations as well as the Dismounted Infantry/Warrior Systems thread for the RDECOM Modeling Architecture for Technology, Research and Experimentation MATREX STO. IWARS will not only support the S&T community, but also will provide a certified simulation and data for use in AMSAA technical trade analyses, TRADOC's Soldier Battle Lab concept exploration analyses, TRADOC Analysis Center's (TRAC's) Analysis of Alternatives (AoA's) (e.g., Land Warrior small arms analyses, etc.) and the Army Test & Evaluation Command's (ATEC's) assessment of Land Warrior.

FY05-FY07 NSC will: In FY05, explore alternative representations of intra-small unit information transfer, identify and develop optimal software approaches for integrating AMSAA's target detection, target engagement, and weapons effects algorithms into the Microsoft.net format for inclusion in IWARS. Explore IWARS potential use for TRAC's Land Warrior Block II Milestone C decisions. Release IWARS version 1.0. (SRL 3) In FY06, complete information centric capability for intra-platoon operations. Release IWARS version 2.0. (SRL 4) In FY07, provide initial small unit battle command module to support small unit information transfer impacts. Release IWARS version 3.0. (SRL 5). IWARS will be High Level Architecture (HLA) compliant.

Supports: Future Force Warrior ATD, PEO Soldier, TRADOC Analysis Center, AMSAA, Soldier Battle Lab, Army Test and Evaluation Command, and the Army Transformation Concept Development and Experimentation Campaign Plan.

STO Manager

AMSRD-NSC-SS-MA
Natick Soldier Center, RDECOM
508-233-4256
DSN (256)

Technology Staff Officer

HQDA, SAAL-TT
703-601-1558
DSN (329)

TRADOC FOC Lead

S&T Division Chief, UAMBL
(502) 624-4336
DSN (464)

TRADOC POC

Act'g Director, USAIC-DCD
706-545-1515
DSN (835)

Infantry Warrior Simulation

Status: Proposed New FY05

1. What is the problem?

Lack of an operationally diverse Infantry model, to include databases, to support technology selection, engineering design, concept development, experimentation and AoAs

2. What are the barriers to solving this problem?

- Incomplete understanding and lack of physical and behavioral small unit functionalities within an integrated warrior focused simulation, e.g. situational understanding, search and target acquisition, netted fires, networking the warrior, etc.
- Lack of small unit close combat data

3. How will you overcome those barriers?

- Partnering with AMSAA, the Soldier Battlrelab, the medical (physiological) and behavioral communities, and others; develop first order behavioral and small unit functionalities
- Leverage and influence LW limited user tests and experiments
- Mine or develop data through limited experiments at US, e.g. McKenna MOUT, and international sites, e.g. UK Copehill Downs

4. What is the capability you are developing and where is it described?

A Soldier M&S capability to support the acquisition process as well as for use in concept development and experimentation. FOCs 05-01, 05-03, 12-02, 13-01.

5. What is the product of this STO? (Include M&S)

An HLA compliant, Infantry model with annual version releases, as well as algorithms, methodologies and data for distribution to Army, USMC, DoD PM's, TTCP Nations and NL.

6. Quantitative Metrics: (Including Affordability)

Current	Program Objective	Army Objective
<ul style="list-style-type: none"> • IUSS architecture that supports basic urban operations. (SRL 3) 	<ul style="list-style-type: none"> • Model that provides a core set of small unit warrior functionalities, including information impacts (SRL 5) 	<ul style="list-style-type: none"> • Army Infantry Model with full spectrum functionality and all associated behaviors.

7. What is the Warfighter Payoff?:

- Assist evaluation of materiel solutions & improved integration
- Improved warfighter survivability and combat effectiveness across the spectrum of infantry operations
- Cost avoidance through virtual prototype testing
- Reduction of Soldier experimentation support and facility use through the application of simulations
- Get better equipment/systems into the hands of soldiers faster

8. Transition Milestones:

- IWARS Configuration Control Board (CCB) will provide annual releases & support to include user feedback to PM-SDR, FFW ATD, TRAC, Soldier Battle Lab, MATREX STO, PM OneSAF and AMSAA.

9. Endorsements:

- DUSA-OR, 5/04; Dir. AMSO, 5/04; PM-OneSAF, 5/04; Deputy Director, UAMBL, FOC Lead Mounted/Dismounted Maneuver, 4/04; Acting Director, USAIC – DCD, 5/04; FFW TPM, 5/04, PEO Soldier, 6/04

10. Other STO Attributes:

Modeling and Simulation

Product is a simulation to be used in all acquisition phases. Multiple agencies have expressed a need to obtain IWARS releases; TRAC, FFW, PEO Soldier. The model can support selected high fidelity soldier representations in the OneSAF Objective System and Combat XXI and will support the MATREX STO Dismounted Infantry / Warrior Systems thread.

Technology Protection Plan

- *Is it required?* Yes, Pending

International Program:

Project Agreement with the Netherlands; Chair, TTCP 5 Joint Systems & Analysis, Dismounted Combatant Operations

Affordability Metrics

DAMO-SB / Natick have been directed to investigate a long range plan to fund non-6.2 work under Army Enterprise Simulations (6.6). No associated product cost to customers.



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Schedule & Cost

MILESTONES	FY05	FY06	FY07
<ul style="list-style-type: none"> Explore alternative representations of information transfer within small unit. Develop approaches to integrate algorithms for engagement and weapons effects into IWARS 			
	Release IWARS 1.0		
<ul style="list-style-type: none"> Implement algorithms to model platoon level Netted Fires. 			
		Release IWARS 2.0	
<ul style="list-style-type: none"> Validate selected algorithms with close contact data. Deliver module to assess impact of information transfer on small unit capability. 			
			Release IWARS 3.0

Purpose:

Provide a capability to assess the combat worth of Network Centric Warfare technologies on Warrior Systems concepts for individuals and small units

Product:

- A small unit force-on-force model with battle command capabilities*
- Algorithms & methodologies to assess impact of information on small unit operations*
- Small Unit Close Contact Data*

Payoff:

- Reduced time and cost for research, development and acquisition of warrior battlefield systems*
- Transition annual model releases to PEO-SDR, FFW ATD, TRAC, Soldier Battle Lab, MATREX STO, PM OneSAF and AMSAA*

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FY05	FY06	FY07
<p>Small Unit Information & Movement</p>	<p>Multiple Asset Battle Damage Assessment</p>	<p>Small Unit Information Transfer Impacts</p>
<p>SRL 3 Explicit representation of intra-small unit information transfer</p> <p>METRICS: Demo combat worth of network centric small unit comms</p>	<p>SRL 4 Information-centric capability for intra-platoon operations to support Netted Fires</p> <p>METRICS: Demo multiple asset Battle Damage Assessment</p>	<p>SRL 5 Initial representation of linkage between Warrior Systems and planned small unit level SoS NCW assets</p> <p>METRICS: Demo impact of information transfer between small unit level NCW sensors & robotics</p>
<p>SRL 4 Complete AMSAA Infantry MOUT Simulation & IUSS algorithm& data integration into IWARS</p> <p>METRICS: Validate initial core module architecture</p>	<p>SRL 4 Initial Dynamic Target Engagement data & algorithms</p> <p>METRICS: Demo impact of representing static and dynamic targets with time-varying exposure levels</p>	<p>SRL 5 Representation of information effects on small unit level UDOP</p> <p>METRICS: Initial IWARS data & algorithms</p>
<p>SRL 3 Small Unit (SU) Intelligent Movement</p> <p>METRICS: Demo small unit intelligent movement through obstacles in Urban Canyon</p>	<p>SRL 4 Incorporate Intelligent Agent decision making capabilities in MOUT building interiors</p> <p>METRICS: Demo initial capability</p>	<p>SRL 5 Initial Small Unit Battle Command representation</p> <p>METRICS: Demo SU Comm flow to/from command hierarchy & capability to coordinate with external resources</p>
<p>Release IWARS Version 1.0 SRL 3</p>	<p>Release IWARS Version 2.0 SRL 4</p>	<p>Release IWARS Version 3.0 SRL 5</p>

Pacing Technologies

•Warrior System & Small Unit NCW Representations

•Hi-Resolution Small Unit Close Combat Data & Algorithms

•Intelligent Agent Human Behavior Representation

•Release Version of Verified and Validated IWARS