



# ROLE OF MODELING AND SIMULATION IN REDUCING RISK IN TEST & EVALUATION

## CLOSE COMBAT TACTICAL TRAINER (CCTT) SUPPORT TO THE U.S. ARMY'S SMART INITIATIVES

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*Presented By:*

***Jude Tomasello***

***US Army - Program Executive Officer Simulation, Training, & Instrumentation (PEO STRI)***

***Office of the Project Manager for Combined Arms Tactical Trainers (PM CATT)***

***(407) 384-3829***

***jude.tomasello@peostri.army.mil***

# Briefing Outline

**Way Ahead for Weapons Systems T&E Risk Reduction Using M&S**

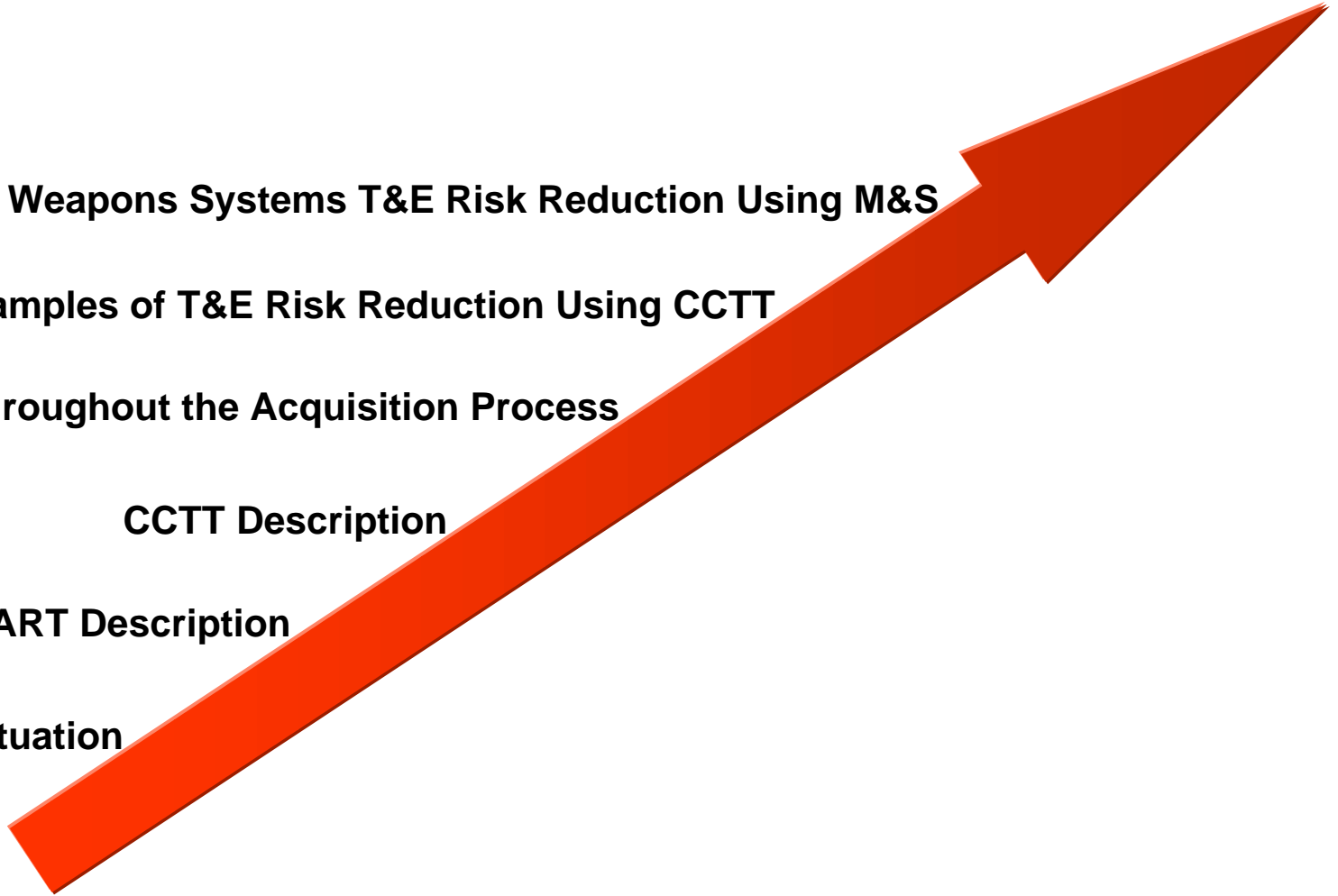
**Examples of T&E Risk Reduction Using CCTT**

**Risk Reduction Throughout the Acquisition Process**

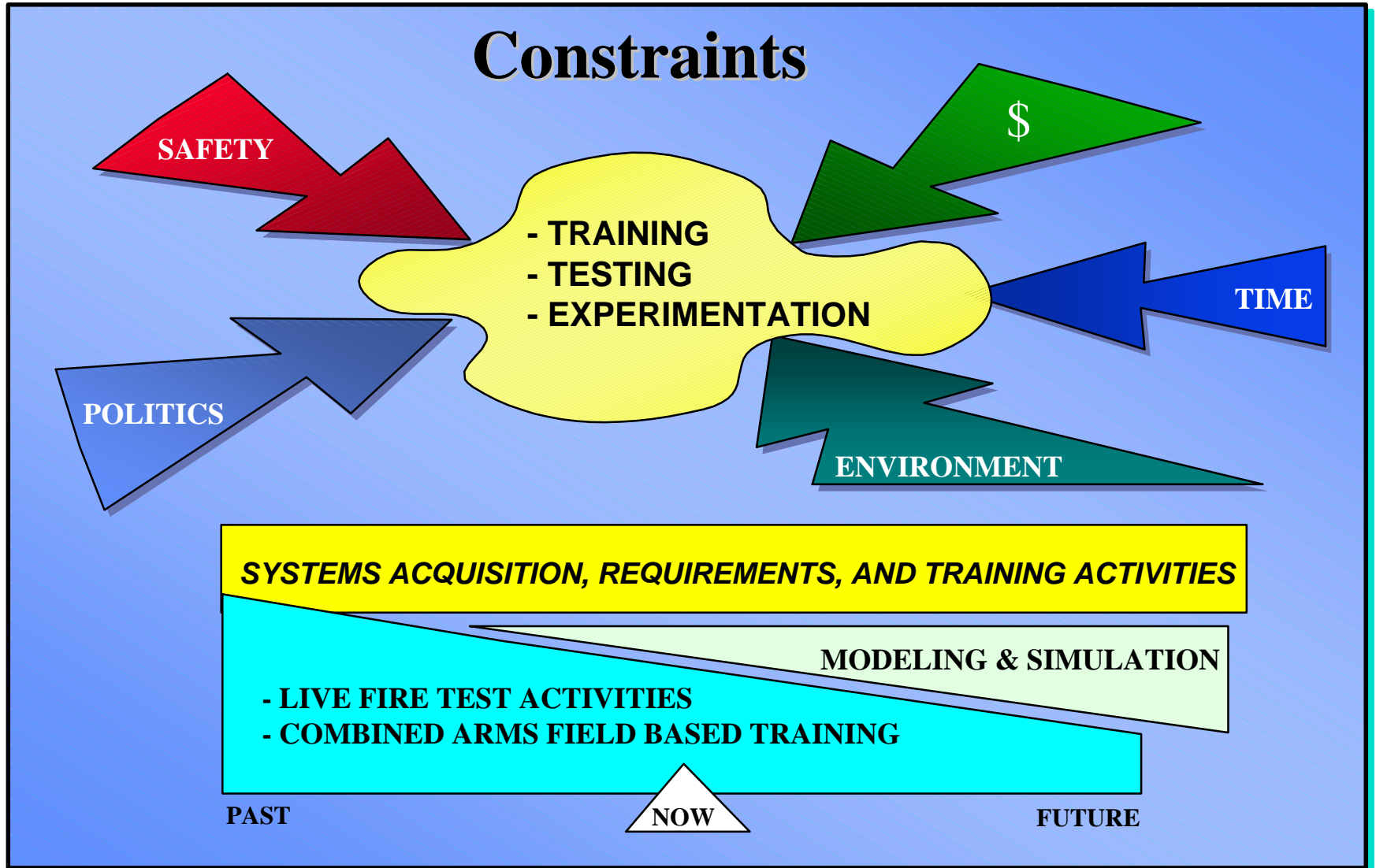
**CCTT Description**

**SMART Description**

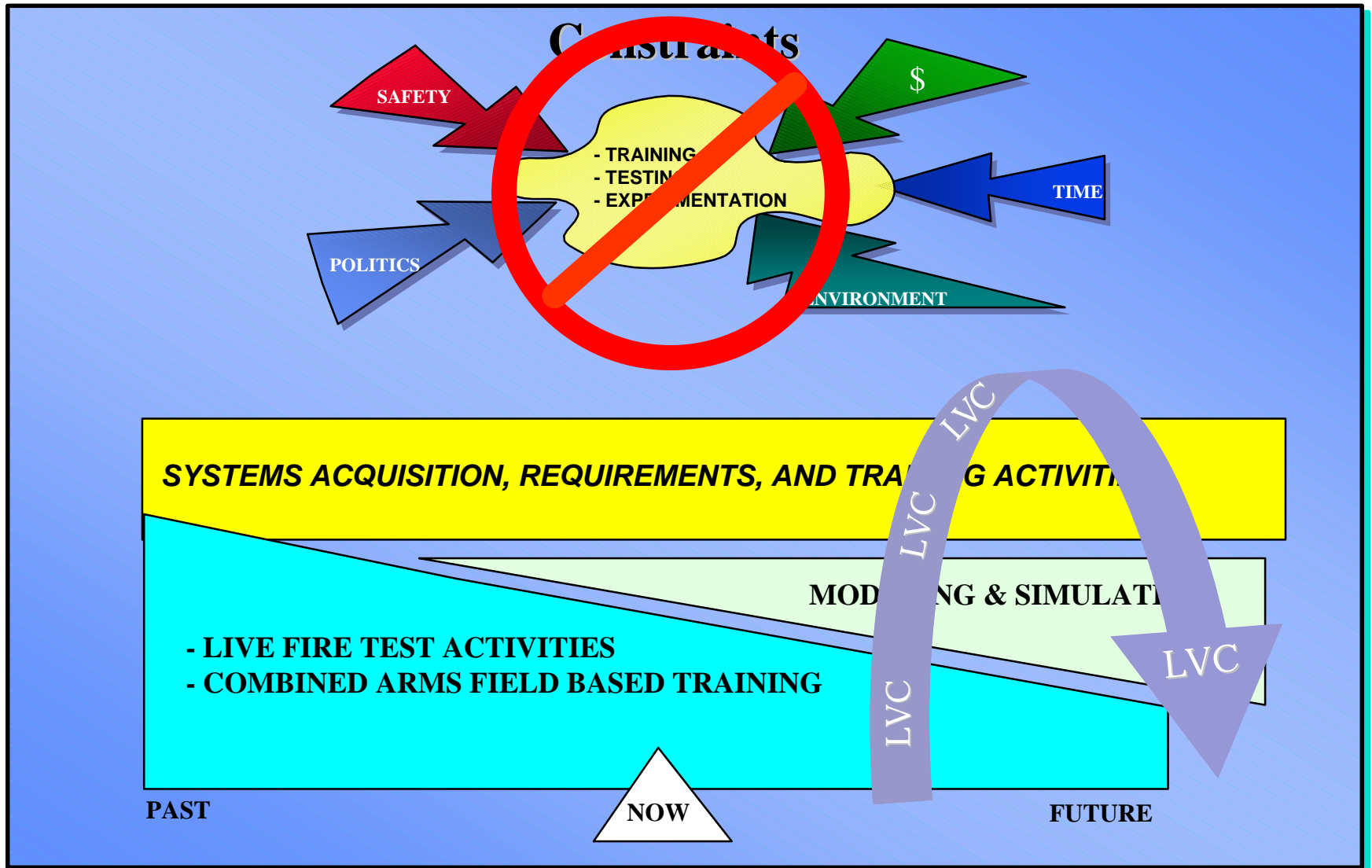
**Current Situation**



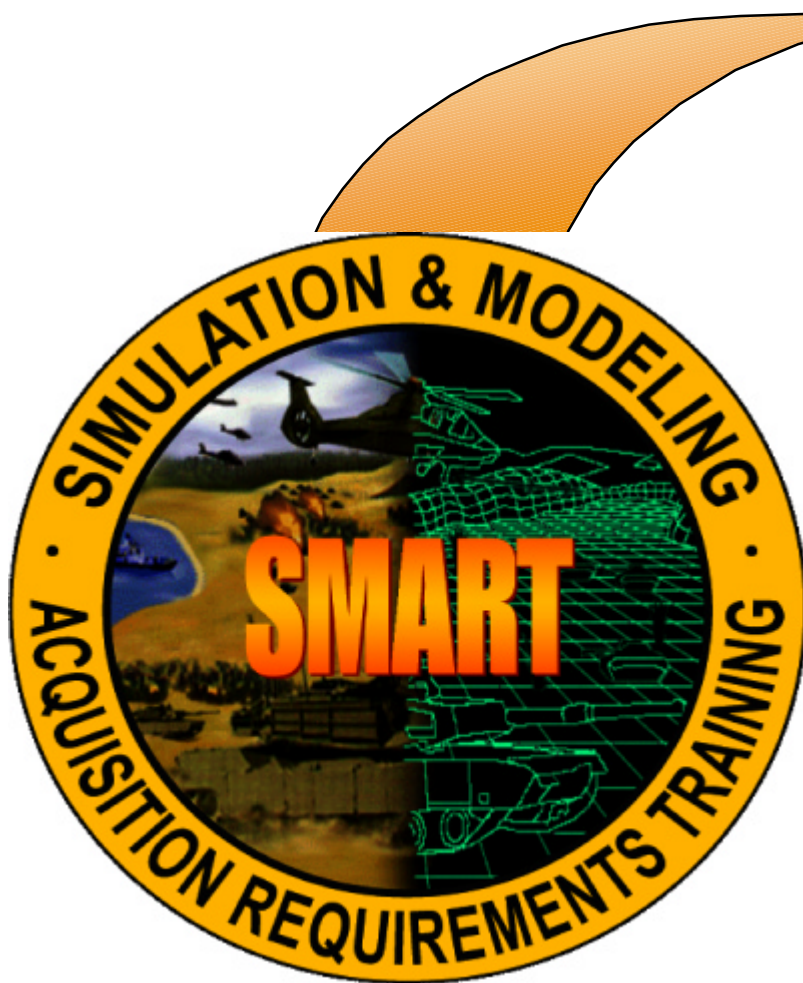
# Today's Situation



# Live/Virtual/Constructive Enabler



# Simulation and Modeling for Acquisition, Requirements and Training (SMART) Defined

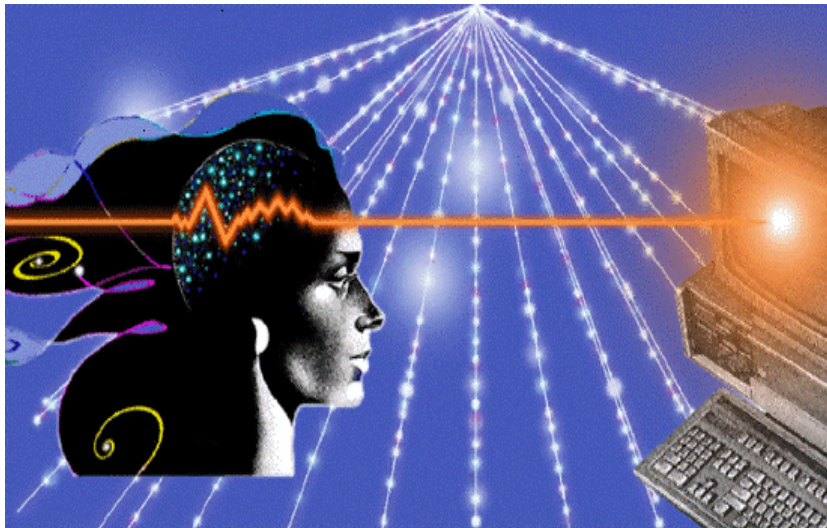


SMART is a process in which we capitalize on Modeling and Simulation (M&S) technology to address the issue of system development and life-cycle costs through the combined efforts of the requirements, training and acquisition communities.

# **“SMART” IS ABOUT COLLABORATION**

**Collaborative Engineering Environments...**

**Collaboration across Functional Areas...**



**Collaboration with  
Contractors...**

**Collaboration with the  
Entertainment Industry...**

**Collaboration with  
Academia...**

**Collaboration with Other  
Government Organizations...**

# SMART USES SIMULATION TO SUPPORT:



- ⇒ **Combat Development**
  - ⇒ **Engineering/Design/Manufacturing**
  - ⇒ **Test & Evaluation**
  - ⇒ **Logistic Support**
  - ⇒ **Training**
- 
- **Up Front and Continuous**
  - **Optimize Across All Attributes Vice Against One Another**

# US ARMY SMART PILOT PROGRAMS



- **Apache** poised to re-assess basic load, capitalize on product improvements to re-engineer logistic support

- **Future Combat System** ideally poised to benefit from M&S and Systems Engineering



- **CCTT** can be employed to explore Doctrine and TTP for Future Systems to influence design and support Weapons Systems Operational Test activities



# Close Combat Tactical Trainer

CCTT IS A NETWORKED SYSTEM OF HIGH FIDELITY MANNED SIMULATORS, SUPPORTED BY EMULATORS AND SEMI-AUTOMATED FORCES THAT PROVIDE COMBAT SUPPORT, COMBAT SERVICE SUPPORT, AND BOTH FRIENDLY AND OPPOSING FORCES. CCTT SUPPORTS ACTIVE AND RESERVE COMPONENT COLLECTIVE TASK TRAINING ON A SYNTHETIC COMBINED ARMS BATTLEFIELD.

## CCTT SYSTEM CONFIGURATION

### MANNED SIMULATORS

M1  
(Variant)



M1A2  
SEP



M113



BFIST



HMMWV



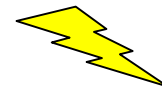
M2  
(Variant)



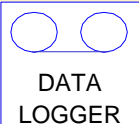
DSM'T INF



Interoperable  
Simulations



### AFTER ACTION REVIEW



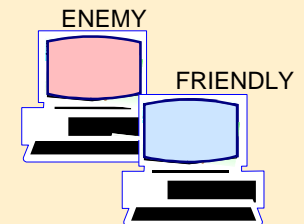
### INITIALIZATION & MAINTENANCE

- MAINTENANCE CONSOLE (MC)
- MASTER CONTROL CONSOLE (MCC)

### TACTICAL WORKSTATIONS

- MOTAR FIRE DIRECTION CENTER
- UNIT MAINTENANCE COMMAND POST
- COMBAT TRAIN (LOG) COMMAND POST
- TACTICAL AIR COMMAND POST
- FIELD ARTILLERY BN TOC
- COMBAT ENGINEER SUPPORT
- BRIGADE HQ
- BATTALION TF TOC

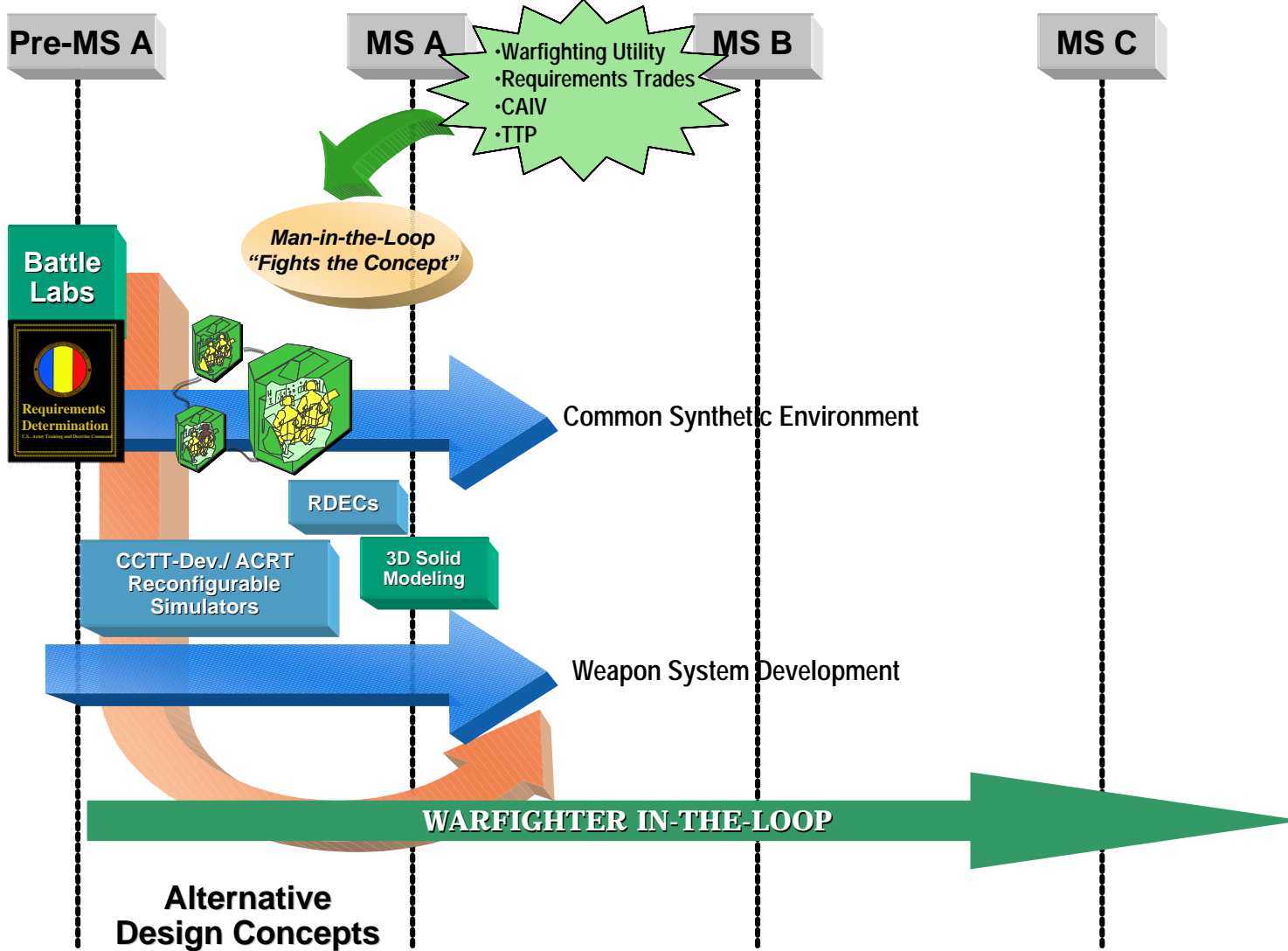
### SEMI-AUTOMATED FORCES (SAF) WORKSTATIONS



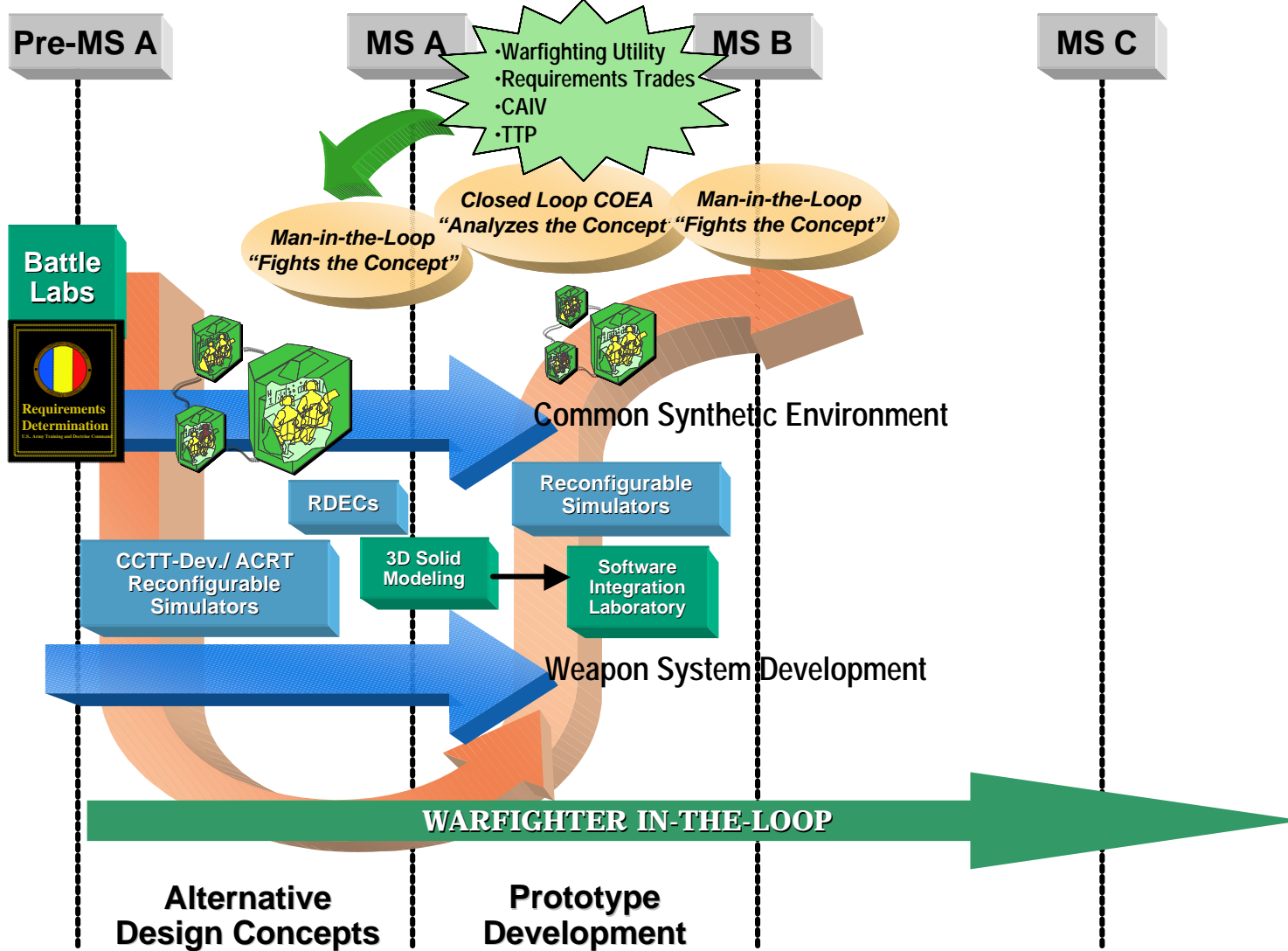
### TERRAIN DATABASES

- |                       |          |              |
|-----------------------|----------|--------------|
| - Desert (NTC)        | - Kosovo | - Ft Riley   |
| - Temperate (Germany) | - Korea  | - Ft Carson  |
| - Ft Hood, TX         | - Graf   | - Ft Stewart |

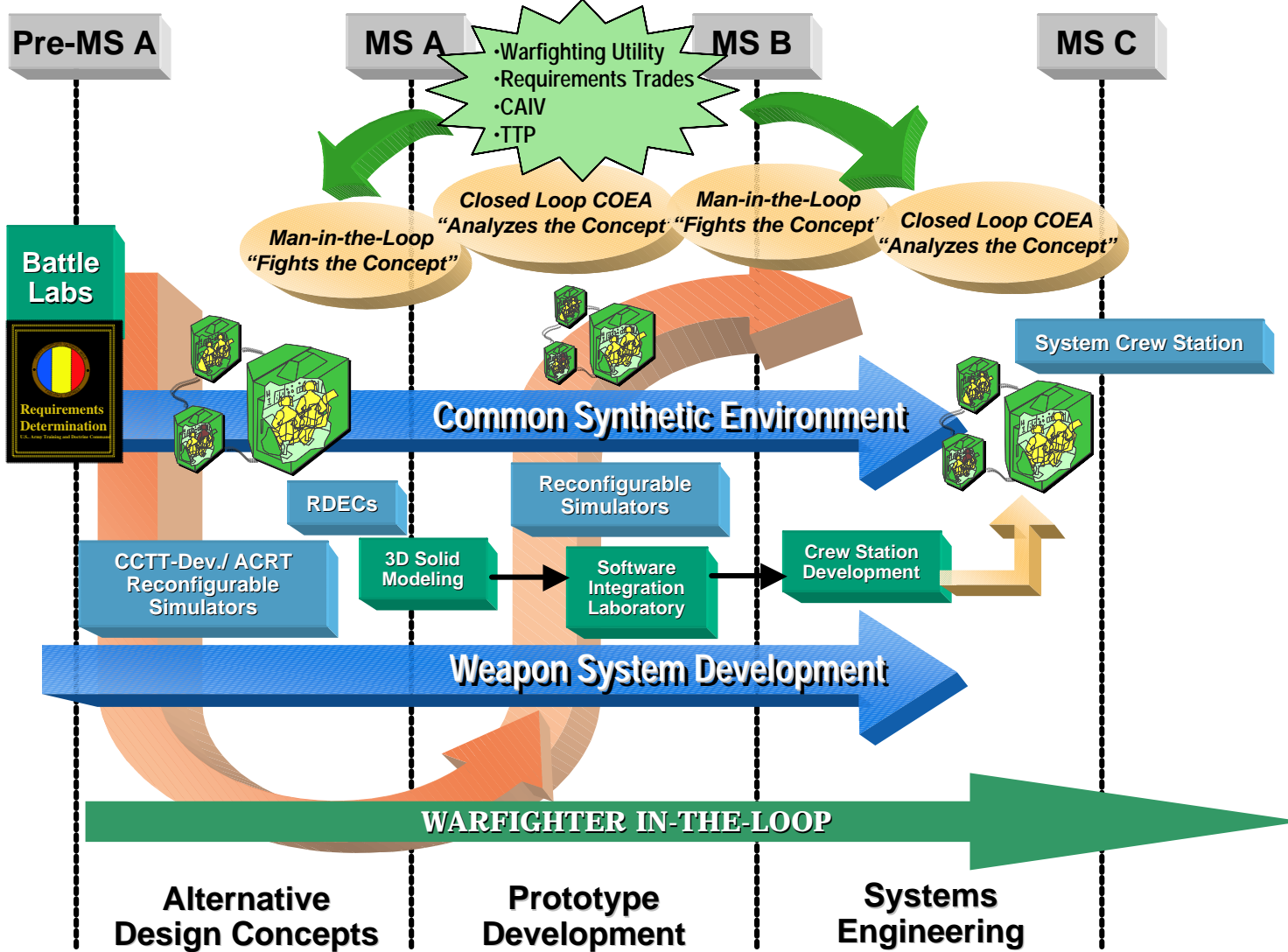
# SMART Risk Reduction Throughout the Acquisition Process



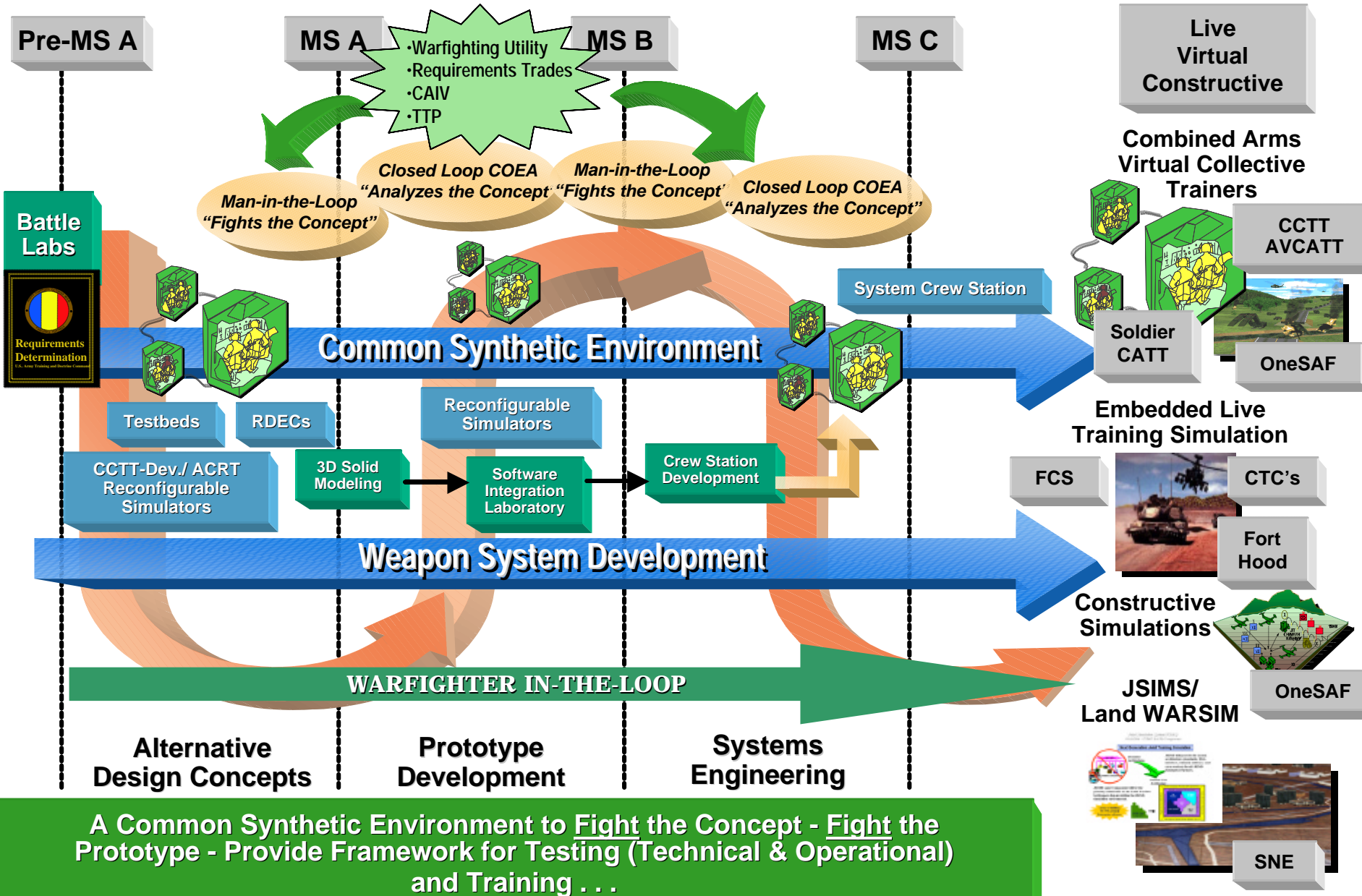
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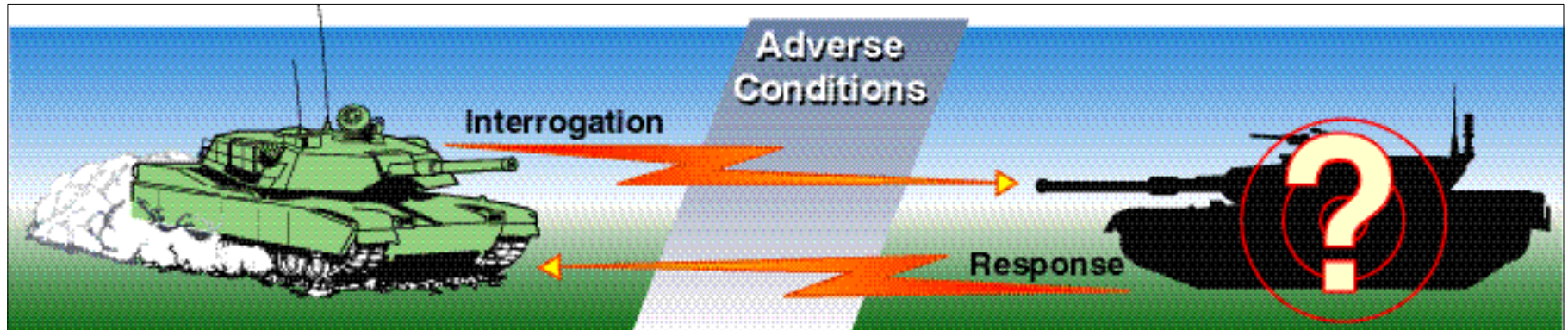


# Risk Reduction Using CCTT in the T&E Process



- **Force XXI Battle Command Brigade and Below (FBCB2)**
- CCTT equipped with FBCB2 hardware and software prior to Operational Test
- Allowed simulators to be used to train role players and test staff prior to Operational Test event
- More effective and efficient test personnel = Reduced Risk

# Risk Reduction Using CCTT in the T&E Process

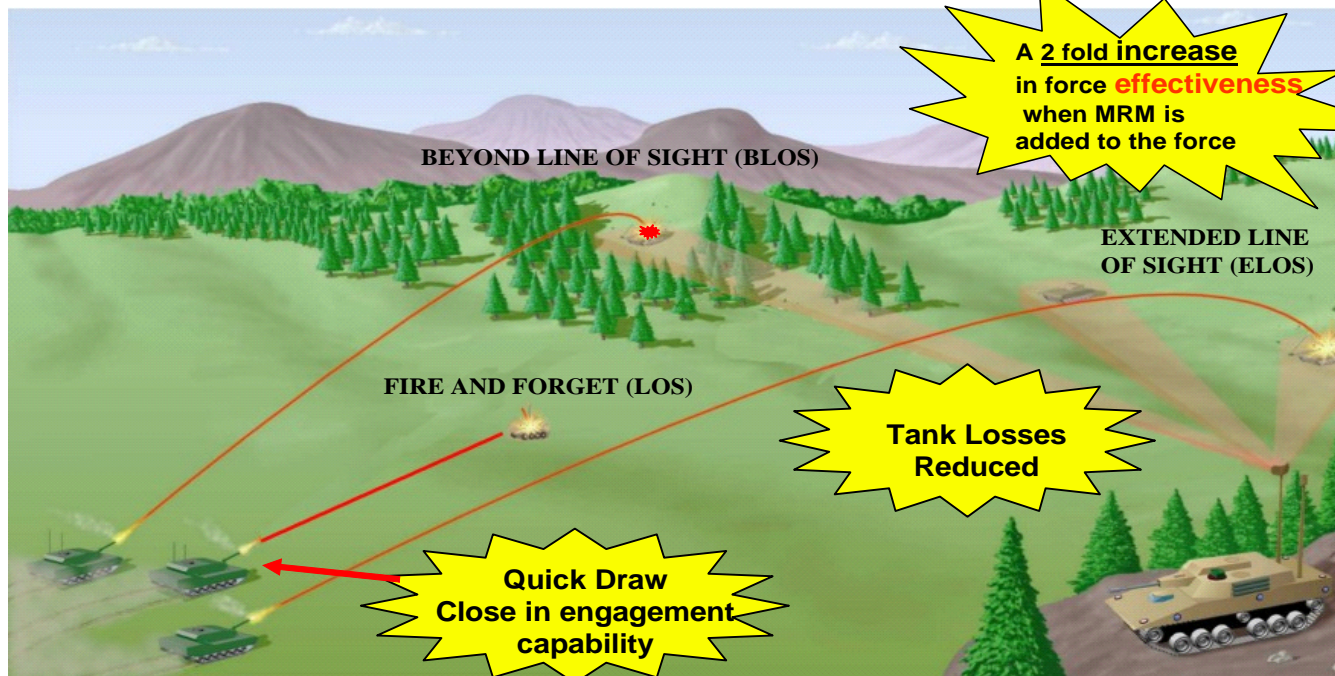


- **Battlefield Combat Identification System (BCIS)**
- CCTT used as the host to demonstrate the Operational Effectiveness of BCIS in Combined Arms scenarios under day/night and adverse weather conditions

# Risk Reduction Using CCTT in the T&E Process

- **Medium Range Munition (MRM)**
- FY03 - FY06 plan to support Concept Experimentation, Doctrine Development, Operational Test, and Training for Combined Arms Man-in-the-Loop Operations

MRM OPERATIONAL CONCEPT



MRM enables the Mech TF to dominate and expand battle space



# Reducing Risk in Weapons Systems T&E

## ~ Way Ahead for M&S ~

- **Further increase realism of simulation for representative systems**
  - **Some changes made, more to follow**
  - **Collaboration with Institute of Creative Technologies**
  - **Analyze validated source data - revise as necessary**
  - **Enable systems to operate in Classified mode**
- **Concurrency: Continuous functionality growth as Weapons Systems and Simulation Technologies advance**
- **Interoperability:**
  - **Live/Virtual/Constructive**
  - **Multi Service & Multi National simulation exercises**

***Train & Test as you fight !***



IS SIMULATION

AMERICA

*Facing the  
Future...  
...Together*