

Squad Overmatch Study Outbrief



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Strategic
Requirements
Integrator

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Outbrief Agenda



- Introductions
- Study Overview
- Preliminary Observations

- Study Environment & Demonstrations
 - ✓ Games (10 Min)
 - ✓ Virtual (15 Min)
 - ✓ Live (at CACTF)

- Summary (at Clarke Simulation Center)
- Squad Feedback & Open Discussion
- Preliminary Recommendations / Quick Wins

**Clarke Simulation
Center
ELITE Classroom
50 Minutes**

**SimCenter &
Selby CACTF
90 Minutes**

**Elite Classroom
40 Minutes**





The Squad Overmatch Study Team



Program Executive Office
for Simulation, Training
and Instrumentation



Army
Research
Laboratory



Army
Research
Institute



3rd ID, 3rd BCT



USMC
PM
TRASYS





Core Team



PEO STRI / STTC

- Rob Wolf (PEO STRI Project Director)
- SGM Alan Higgs (PEO STRI)
- Brian Kemper PM TRADE Chief Engineer
- Rob Parrish PM CATT Chief Engineer
- Dr. Joan Johnston (ARL/STTC) Senior Research Psychologist
- Pat Garrity (ARL/STTC) Chief Engineer
- Sam Napier (ARL/STTC) Engineering Psychologist

MITRE

- Paul Butler (Lead Systems Engineer)
- Rick Osborne (Simulation Engineer)
- Pat Ogden (SGM Ret.)
- Ryan Sivek (Simulation Engineer)

Cognitive Performance Group

- Bill Ross (Behavioral Scientist – Scenario Development)
- Brandon Woodhouse (Sr. Military Analyst – Scenario Development)





Technology Providers



Products Supplemented Program of Record Systems

- **Live**

- ✓ Cubic - Interactive Target
- ✓ Laser Shot – Interactive Target
- ✓ MIL-SIM-FX – IED, Extreme Trauma
- ✓ Organic Motion – Avatar Target
- ✓ Scent Air - Scents
- ✓ Stress Vest - MILES Haptic cues

- **Virtual**

- ✓ Intelligent Decisions – DSTS Unreal

- **Games**

- ✓ Real Time Immersive

- **Foundation Training & Games**

- ✓ Perceptronic Solutions - SRTS
- ✓ USC-ICT - STRIVE





Study Origin



- 2011 AUSA Conference, MCoE Commander LTG Brown presented the concept that The Squad is the Foundation of the Decisive Force.
- Presentation seeded concept for Squad Overmatch Study submission in 2012 to the Army Study Program Management Office.
- The Army Study Program Management Office (Army Chief of Staff G-8) awarded the Squad Overmatch Study as its top priority program to PEO STRI.





Study Focus Areas



- Optimize squad performance and discourage PTS (Formally PTSD) and suicide.
 - Integrate training for advanced situational awareness and stress management (physiological, cognitive) into warrior skills training
 - Replicate realistic stressors in existing gaming, virtual, live, training environments
 - Provide future integrated training methodology recommendations

Avoid being a casualty – Physically and Mentally





The Study Methodology



- Use case-based experiential learning and guided practice to assess how advanced situational awareness skills combined with stress management techniques facilitate recognition, perception, and adaptation to combat stressors by simulating their effects under realistic combat conditions.
- The Stress Exposure Training (SET) framework incorporated situational awareness and stress management with:
 - ✓ Existing and new programs of instruction (Foundation skills)
 - ✓ Existing and new TADSS and technologies (Enhanced realism)
- The study methodology implemented accelerated two day study sessions that simulate key learning opportunities that would normally be presented to Soldiers across their entire warrior skill training continuum (2 years), from basic through advanced training, unit training, and while deployed.





The Study Methodology continued



- Stress based scenarios with common story line threads in Foundation Education, Gaming, Virtual, and Live environments incorporates repetitive exposure to learning key skills.

- **Situational Awareness**

- Group behavior
- Body language
- Deception & risk cues

- **Stress Management**

- Positive thought
- Breathing
- Auditory & verbal cues to refocus

- **Stress Exposure**

- Operational emotional stressors
- In-stride planning
- Multi tasking
- Trauma
- Information overload

Study Scenarios Incorporated 9 of the top Walter Reed Army Institute of Research (WRAIR) Operational and Emotional Stressors

WRAIR provided 98 PTS contributing stressors

Scenario Goals:

- ✓ *Improve Squad's ability to process information but not be paralyzed by event*
- ✓ *Create a suspension of disbelief (it seems real)*
- ✓ *Change not what they do, but how they think*





Demonstration Agenda - Each Squad



Day 1

0900-0930 Squad Overmatch Study Program Introduction

0930-1405 Foundation SET Education – Cloud / Mobile Platform Based Scenarios

- Comprehensive Soldier and Family Fitness (CSF2) – *positive thinking*
- Advanced Situational Awareness (ASA) deception, atmospherics..
- Stress Resilience in Virtual Environments (STRIVE) *introspective*
- Stress Resilience Training System (SRTS) *biofeedback*

**Education /
Drills**

1420-1750 SET Based Gaming Scenarios

- Virtual Battlespace 3 (VBS3)
- Technology enhancements for SA and resilience

Core Skills

Day 2

0900-1230 SET Based Virtual Scenarios

- Dismounted Soldier Training System (DSTS)
- Technology enhancements for SA and resilience

Immersive

1400-1730 SET Based Live Scenarios

- CACTF Selby Phase II *Pop-ups, avatars, and realistic effects*

Live

Hotwash – Conducted after each Scenario with Warrior Skills, SA, CSF2 focus

Integrated AAR – Data Collection and experiential learning discussion after hotwash

AAR





BLUF - Not a Single Solution



Graduated SET methodology is an integrated balance of four key experiential learning tenets:

- 1) **Continuum**: When We Train (*Basic to Advanced – graduated training*)
- 2) **Scenarios**: What We Train (*Mental models designed for producing desired behaviors and skills*)
- 3) **Technology / Cognitive Realism**: How We Train (*Believable Presentation*)
- 4) **Integrated AAR**: How We Learn (*Holistic AAR incorporating guided team self correction environment of reinforcement & discussion*)

Optimized Human Performance





Train As You Fight?





Squad Integrated Training Approach



Resilience and Mental Skills Training¹

Warrior Skills Training²

Situational Awareness Skills Training³

**SET Based Exercises in
Gaming, Virtual, and Live Environments
with AGFT, DSTS, CACTF**

Integrated AAR

U.S. Army Objective is

Squad Overmatch



- 1) CSF2 Mental Resilience Skills
- 2) Warrior Skills from Battle Drills
- 3) ASA Skills





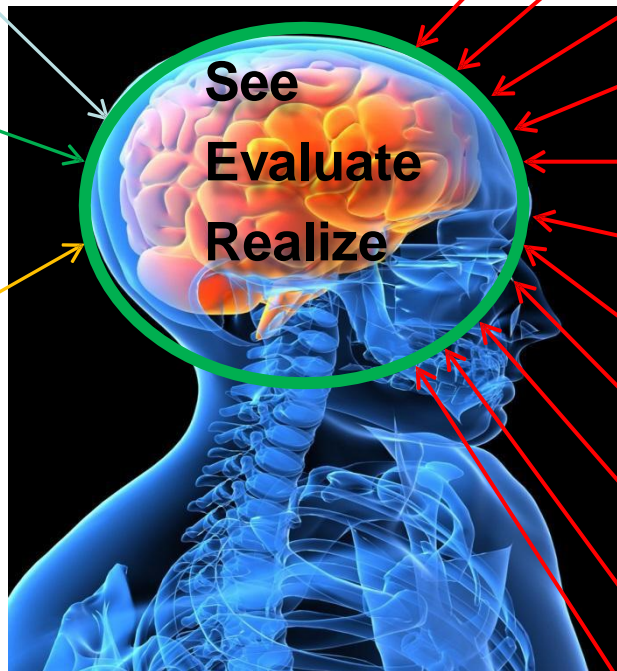
Objective Training Model



Warrior Skills

Resilience Skills

Situational Awareness Skills



Post Event Mental State

Accept

Reject

Adapt

Had a close call, was shot or hit, but protective gear saved you

Being responsible for the death of an enemy combatant

Exposure to Dead bodies or human remains

Member of Patrol/Unit Killed in Action

Engaging enemy with direct fire or returning fire

Being responsible for the death of a noncombatant

Attack by enemy on Forward Operating base or patrol base Perimeter

Clearing or searching homes or buildings

Seeing ill or injured women or children whom you were unable to help

Indirect fire attack from Incoming artillery, rocket, or mortar fire

Wounded in action or have a team member wounded in action

Stressors defined by Walter Reed Army Institute of Research





Continuum



Graduated SET methodology is an integrated balance of four key experiential learning tenets:

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Optimized Human Performance





Squad Training Continuum (1)



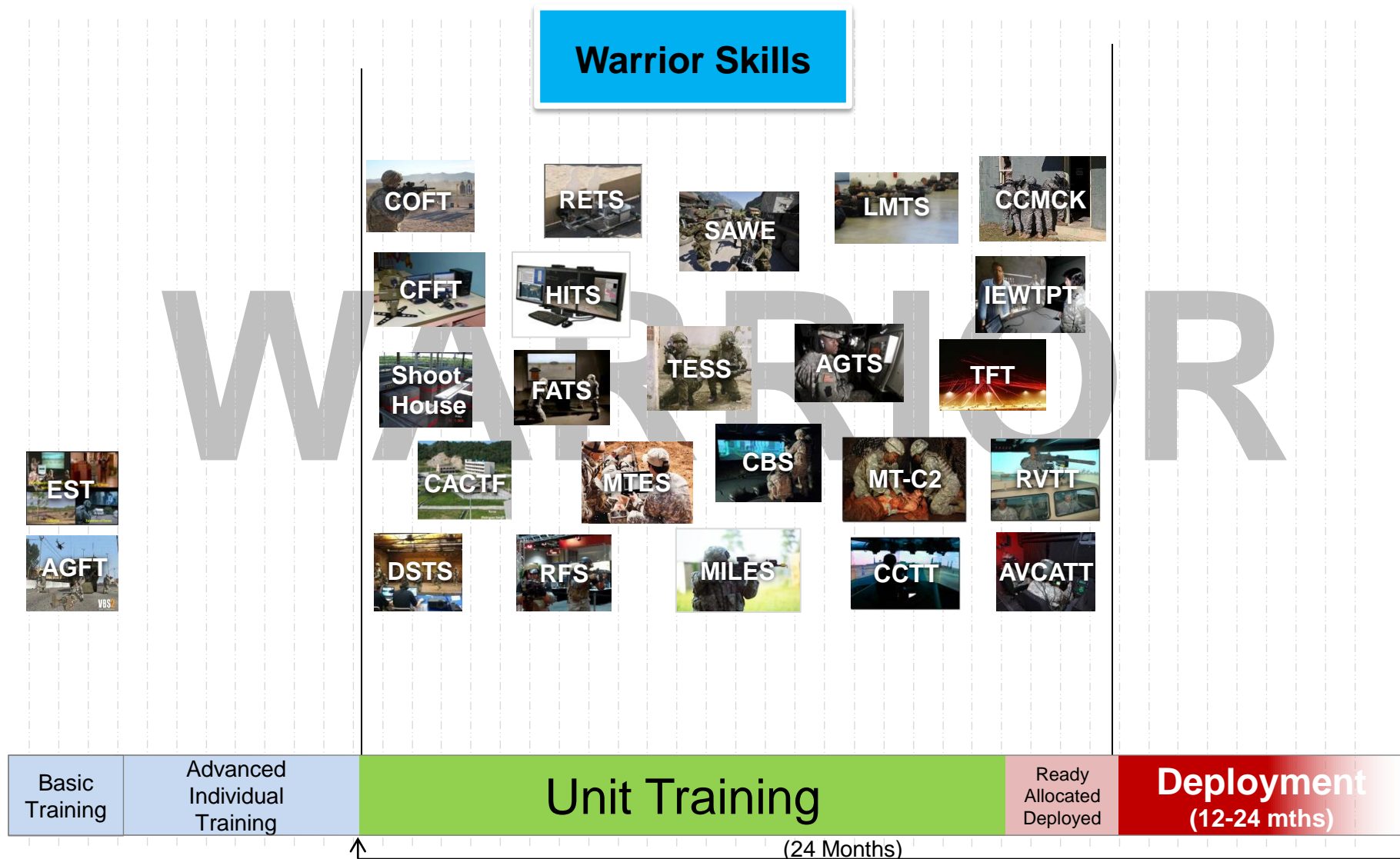
Typical Squad Training Cycle (diagram not to scale)

Training Cycle





Squad Training Continuum (2)





Squad Training Continuum (3)



Limited Resilience / Situational Awareness Training (Current)

COGNITIVE



Basic
Training

Advanced
Individual
Training

Unit Training

Ready
Allocated
Deployed

Deployment
(12-24 mths)



(24 Months)

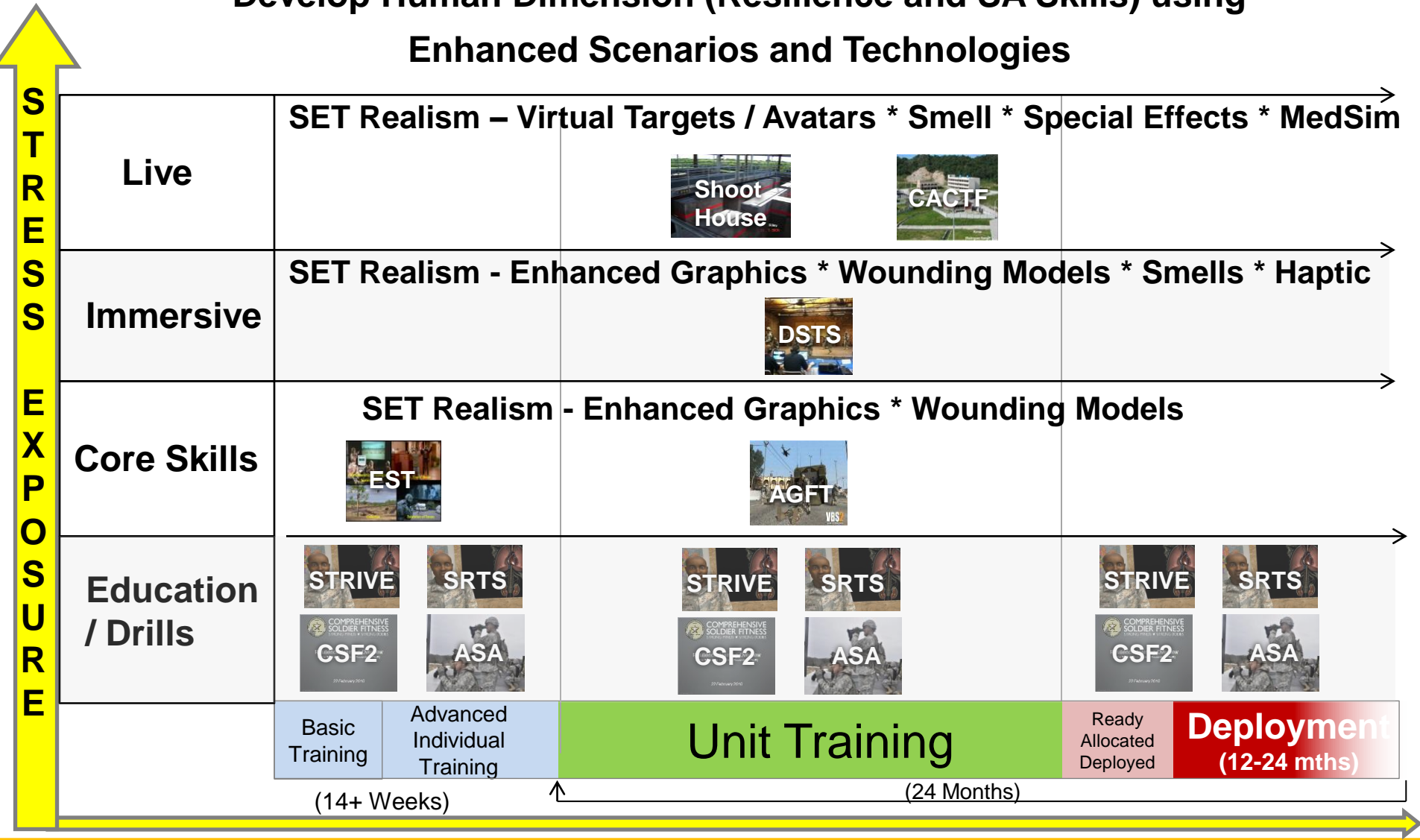




Squad Training Continuum (SET Strategy)



Develop Human Dimension (Resilience and SA Skills) using
Enhanced Scenarios and Technologies





Scenarios



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Optimized Human Performance





Scenarios



- Graduated levels of SET (resilience and SA) skills across the training continuum incorporating CSF2 and ASA principles
- Immersive and experiential learning addressing specific points in individual and squad development (e.g., coping with an innocent civilian dying)
- Provide for tactical cues and other factors that are present in the operational environment (atmospherics, body language, deception, interrogation)
- Provide for decision points that present learning opportunities
- Include tasks and events that have corresponding observable, measurable performance conditions
- Structured to develop human dimension competencies
- Provide for reusability and variability, to include varying levels of stress
- Leverage across multiple training aids (e.g., AGFT, DSTS, and CACTF)
- Cognitively authentic – provides cues and factors to help Squads make decisions and solve problems





Technology / Cognitive Realism



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Foundation Education

Blending existing and new programs of instruction



Foundation resilience and stress management training



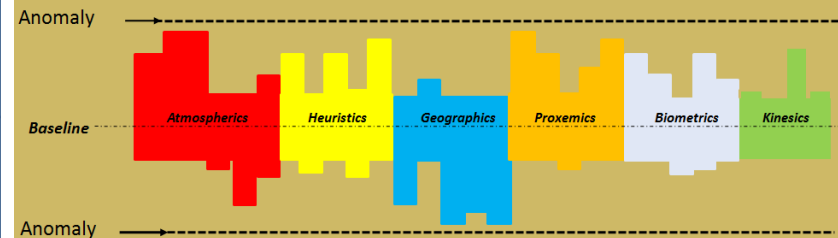
CSF2 – building resilience



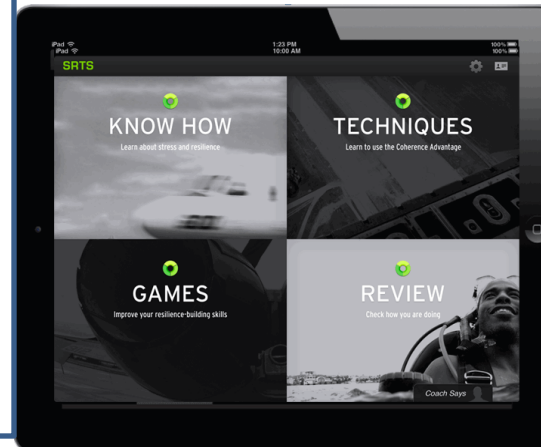
Stress Resilience in Virtual Environments (STRIVE) - introspective

Baseline + Anomaly = Decision

- Baseline Cues (anomalies) come in Clusters. The combat rule of 3's dictates that anytime 3 or more anomalies are observed an action must be taken!



Advanced Situational Awareness (ASA) - deception, atmospherics



Stress Resilience Training System (SRTS)
biofeedback, self-regulation





Gaming Technologies

TADSS: Army Games for Training (AGFT)



Existing VBS3

Developed and Integrated
8 WRAIR Stressors



- ✓ Squad member KIA
- ✓ Death of enemy combatant
- ✓ Death of innocent civilian
- ✓ Direct fire engagement with enemy
- ✓ Clearing & searching homes
- ✓ Seeing injured women you couldn't help
- ✓ Squad member wounded in action

Realism Enhancement Enables
Cognitive and Situational
Awareness Training



Technology Enhancement Demonstration:

Increased realism, higher fidelity facial expressions, body language, and wounding models enabling resilience and SA skills development.





Virtual Technologies

TADSS: Dismounted Soldier Training System (DSTS)



Immersing the Soldier in the Game

Existing DSTS with VBS2 Developed and Integrated 8 WRAIR Stressors



- ✓ Squad member KIA
- ✓ Death of enemy combatant
- ✓ Death of innocent civilian
- ✓ Direct fire engagement with enemy
- ✓ Clearing & searching homes
- ✓ Seeing injured women you couldn't help
- ✓ Squad member wounded in action

Realism Enhancement Enables Cognitive and Situational Awareness Training



Technology Enhancement Demonstration:
Immersive lifelike resolution provides cognitive realism. Enables reading body language, facial expressions, atmospherics, realistic wounding models, building resilience and SA skills.





Live Technologies

TADSS: Combined Arms Collective Training Facility (CACTF)



Existing TADSS Limited Training



Technology:
Pop-up Targets

Realism Enhancements Enable Warrior, Resilience and SET Training

Dynamic Human Interaction with Targets



Virtual Targets & Interactive Avatars

*Integrated
SET
Scenarios
with various
technologies*

Scenario / Environment Realism



IED / Indirect Fire



Wounding / Trauma



Improved
Scenario
Smells

Haptic



Additional
MILES
hit/kill
feedback
(vibration)





Enhanced AAR



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Integrated AAR



- Current AARs focus on Warrior Skills
- Integrated AAR incorporates resilience and SA discussion (CSF2 and ASA) reinforces experiential and shared learning
- Focus On Reflection
 - What happened
 - Why it happened
 - Goal: Squad operates as a system

Emphasis on not changing what we do..., but how we think!





Typical Squad AAR Comments



Participants responses to the technology were consistently positive across squads that participated in the two day Squad Overmatch sessions.

AAR Question: Was your experience real enough to feel the stress and build resilience?

"I was freaked out. That avatar on the wall was having a conversation with me. This was a very real experience to me. I couldn't believe it was a game." SL/TL

AAR Question: Would this type of experience prepare your squad for deployment?

"The scenarios seemed real to me. I went cold when I experienced the IED attack and during the meeting with that old woman. It was real to me." SL

"When you kill someone, you hear the thud and see the spray." TL

AAR Question: Should this type of experience be part of your squad's preparations for deployment?

"I experienced a mass casualty event just like this, but we had no training to prepare us. This is great!" PltSgt

"When I saw her run out of the room, I just knew she had been wounded. I had to help her right away." TL

"Hey dude, I am Catholic. This is what a church smells like." SL

AAR Question: How satisfied was your squad with this experience?

"I know this was just a demonstration, but this was more than check the box training for my squad." SL





CSF2, ASA, and Squad Comments



CSF2 AAR guided discussion facilitators

- Mr. Shawn Saylor

ASA AAR guided discussion facilitators

- SSG Jacobs

1st Demo Squad Comments

- 1LT Moschgat, HHC/2-69 AR Mortar Platoon Leader

Medical Training NCO, DCS-Surgeon

- SFC David Lowe, 18D, U.S. ARMY Special Operation Command

Individual Squad Comment (at CACTF and Summary)





Study Environment Tour



The SET framework incorporated situational awareness and stress management with:

- ✓ Existing and new programs of instruction (Foundation skills)
- ✓ Existing and new TADSS and technologies (Enhanced realism)

- 1) VBS3 Gaming Environment and Squad Exercise Video Clips**
- 2) DSTS Virtual Environment and Squad Exercise Video Clips**
- 3) CACTF Live Environment Demonstration (bus transportation provided to CACTF)**
- 4) Return to Simulation Center ~ 1530**





Study Environment Tour





Leveraged Opportunities



The SET framework incorporated situational awareness and stress management with:

- ✓ Existing and new programs of instruction (Foundation skills)
- ✓ Existing and new TADSS and technologies (Enhanced realism)

- ✓ **VBS3 Gaming Environment**
- ✓ **DSTS Virtual Environment**
- ✓ **CACTF Live Environment**

--- 1st Squad Closing Comments ---





Methodology Take Away



- 1) **Continuum**: When We Train (*Basic to Advanced – Continuous*)
 - ✓ Focus on skill development and adult learning strategies
 - ✓ Align instructional tools with learning requirements
- 2) **Scenarios**: What We Train (*Mental Models / Behavior*)
 - ✓ Sequence SET skills training based on stage of learning
 - ✓ Construct scenarios to practice decision making & problem solving
- 3) **Technology / Cognitive Realism**: How We Train (*Believable Presentation*)
 - ✓ Implement technologies that support experiential learning
- 4) **AAR**: How We Learn (*Discussing and Accepting Experiential Learning*)
 - ✓ Reflect on experiences to change individual mental models
 - ✓ Reinforce learning with coaching and feedback with guided team self correction

Optimized Human Performance





Implementation Take Away



Implementing Human Dimension Training across multiple mission training areas will require a paradigm shift in Army training methodology.

1) Single Requirements Integration Manager – The Big Picture

- ✓ Multiple organizations have independent but overlapping missions
- ✓ Fragmented Lines of Responsibility = Fragmented Implementation

2) Implementation Strategy Plan of Action: What's Next

- ✓ Mature the Continuum, Scenarios, Technology, and Integrated AAR
- ✓ Need to develop skills task list (What to Train) and related desired behavior development scenario (How we train)
- ✓ Scenario behavior and skills development strategy – No simple feat, requires dedicated cross-functional team

3) Early Implementation and Validation – Maturing the Vision

- ✓ Establish a CoE for Overmatch Training: development, integration, testing, and implementation strategy

Optimized Human Performance





Initiating Quick Wins



- Quick Wins to complement Warrior Skills Training:
 - **Implement ASA and CSF2 scenarios in VBS3 (games and virtual)**
 - Define and develop SET scenarios
 - Realism: Body language fidelity, voice inflection, accents, atmospherics
 - Push scenarios to sites and train the trainer
 - **Implement realism in CACTF to support ASA and CSF2 skills development**
 - Realism: Avatars, Wounding Effects, Environmental Effects (atmospherics: Scents, Sounds, Sights, Touch)
 - Define and develop SET scenarios
 - Train the trainer curriculum
 - **Design and implement team self-correction AAR strategy incorporating CSF2 and ASA resilience and SA skills**
 - CSF2 / ASA Partnering – Mission Consolidation





Final Squad Overmatch Study Report



Final study report and related recommendations will be submitted to the Army Study Program Management Office by 30 September 2014

- **RECOMMENDATION TOPICS FOR FUTURE REQUIREMENTS:** (partial list)
 - Identify single lead for implementing the human dimension vision
 - Cohesive training integration strategy
 - Architecture implications (common engine across the domains)
 - Training strategies and methodologies (mental models)
 - Training continuum
 - Immersive instructional strategies
 - Graduated stress exposure training
 - AAR methodology to improve resilience and ASA
 - Enhanced technologies
 - Identify immediate opportunities based on existing capability documents
 - Provide recommended future requirement objectives
 - Other areas as identified





Feedback/Open Discussion

