

# Adaptive Training Systems



Image courtesy of JFK SWCS

## The Approach

- Sandia expertise in designing and deploying culturally relevant multiplayer problem solving training simulations & games
- Immersive multiplayer environment leverages commercial game engines, and high fidelity human and physical simulation
- Novel in-game, real-time assessment capability for observer controllers and After Action Review of individual or team performance
- Instructors and students build their own scenarios or modify in real-time
- Students hone the ability to anticipate the ramifications of different courses of action to problems that may not have a “right” answer

## Applications

- Mission rehearsal
- Future Combat Systems
- CONOPS development
- Embedded training
- Strategy in communication
- Cultural awareness training
- Homeland security
- Intelligence
- Decision-making in stressed environments
- Hypothesis testing
- Observer Controller training and Instructor training
- Technology insertion
- Visualization

## The Problem

Complex problem solving approaches and novel strategies employed at the squad, team, and commander level are often best learned experientially. Although live action exercises can be costly, advances in simulation training technology offer exciting alternatives. Since 2003 Sandia National Labs has led teams in the design, development, and deployment of multiplayer game-based training systems that foster cultural awareness, adaptive thinking, non-kinetic engagement skills, and leadership development.

Sandia’s objective is to share lessons learned via experiential training environments that hone participants’ critical thinking, mental agility, interpersonal adaptability, cultural acumen, and observational skills. We create interactive environments that unleash participants’ abilities, compel them to make crucial decisions, and sharpen their focus. We carefully consider the efficacy of technology-enhanced training in the context of existing training programs and focus on training personnel to think on their feet while confidently and consistently making good decisions—especially when faced with novel situations and ambiguous phenomena.

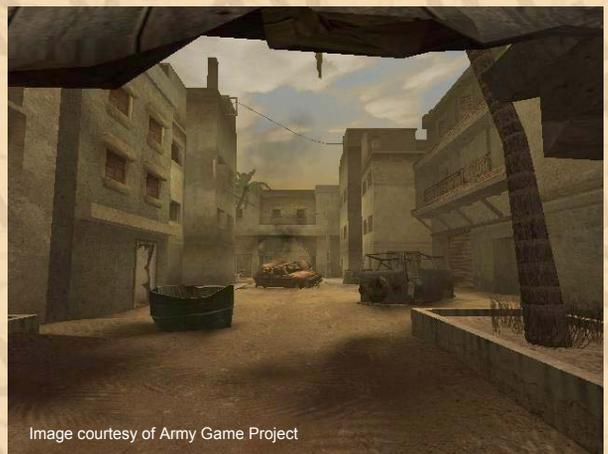


Image courtesy of Army Game Project



## Project Process Description

During the first phase of project work, Sandia conducts an in-depth study of the organization's training program in order to best reinforce existing efforts with the innovative approaches designed by Sandia. The second phase consists of collaborating with game companies, government and industry and leading the team to design & develop an adaptive training system and innovative AAR process. The third and fourth phases involve deployment and evaluation of the multiplayer, experiential game-based training system. Sandia has led development on 2 government game titles (America's Army ATL, and DARWARS NK!), with one training system in use for 3 years at Ft. Bragg.

Immersive, single-player and multiplayer scenarios provide opportunities to develop adaptability along the following dimensions:

- Critical thinking, metacognition
- Problem solving
- Increased situational awareness
- Mental model development to understand novel situations & strategies
- Interpersonal adaptability
- Cross-cultural sense-making
- Application of cultural knowledge
- Communication competence
  - Collaborative (identify common goals)
  - Competitive (persuasion)
  - Effective written communication and situation analysis
- After Action Review (AAR) dynamically allows for real-time assessment & feedback review, analysis, and discussion using time-stamped, synchronized sound and video sequences.



## Benefits

Sandia's innovative design method benefits the participant by its focus on problem-solving in open-ended, culturally relevant environments in which participants build awareness of the problem domain, internalize strategic thinking and hypothesis building, develop cultural recognition skills, and hone the perceptual sensitivity to confidently navigate complex phenomena. The uniqueness and benefit of Sandia's approach lies in the design of unobtrusive reasoning principles that guide participants to have "aha" experiences in context.

## Contact

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## Sponsors

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For more information on use and deployment of the DARWARS NK! Training system contact Dr. Ralph Chatham, Training superiority, DARPA DSO, (703) 696-7501, [rchatham@darpa.mil](mailto:rchatham@darpa.mil).

