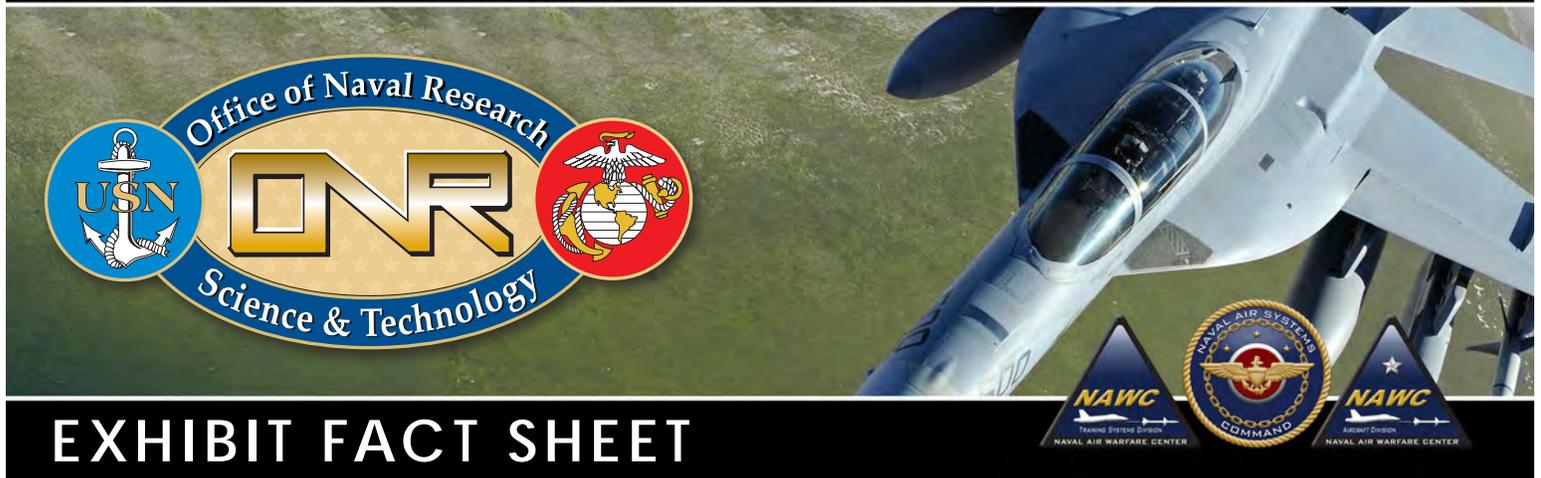


# Tactical Semi-Autonomous Forces for LVC



## EXHIBIT FACT SHEET

### What it is:

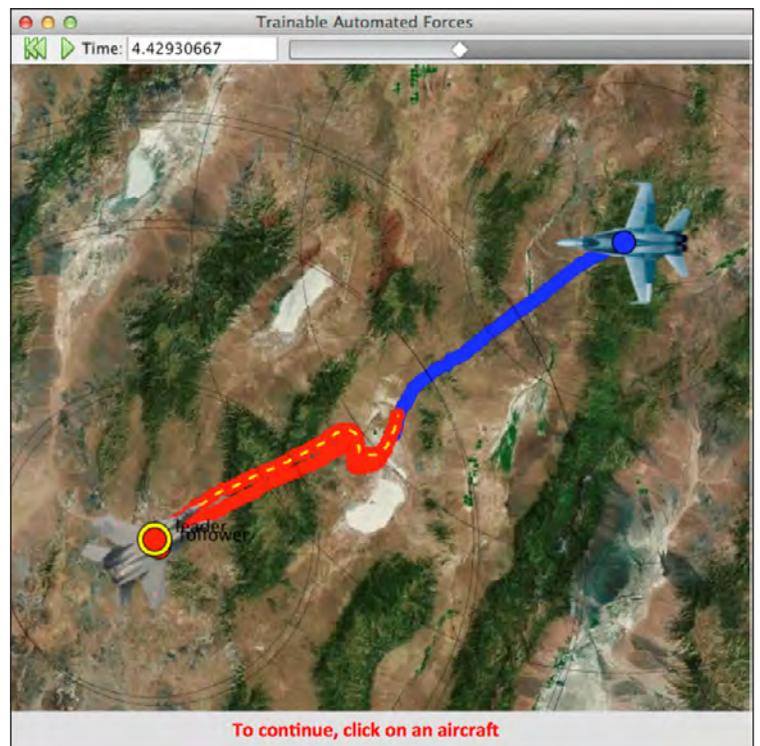
- Navy pilot training requires realistic, simulated friendly and enemy forces.
- Today's semi-automated force (SAF) tools enable one instructor to role-play multiple entities, but SAF applications are labor intensive to operate, and expensive to develop and maintain.
- This effort is developing tools enabling end-users to rapidly author and modify SAF behaviors and to reduce operator workload by automatically adapting SAF behaviors to an individual student's training needs.

### How it works:

- Using Trainable Automated Forces (TAF), end users create new SAF tactics by selecting recorded examples of the tactic from an archive of recorded exercises.
- New tactics are automatically integrated within behavior models that are aware and responsive to the tactical and pedagogical situation.
- A Training Executive Agent (TXA) monitors student performance and modulates SAF enemy and friendly behavior to present appropriate levels of challenge.

### What it will achieve:

- Cost savings in all phases of SAF construction, operation, and maintenance
- Increased realism for simulated friendly and enemy forces



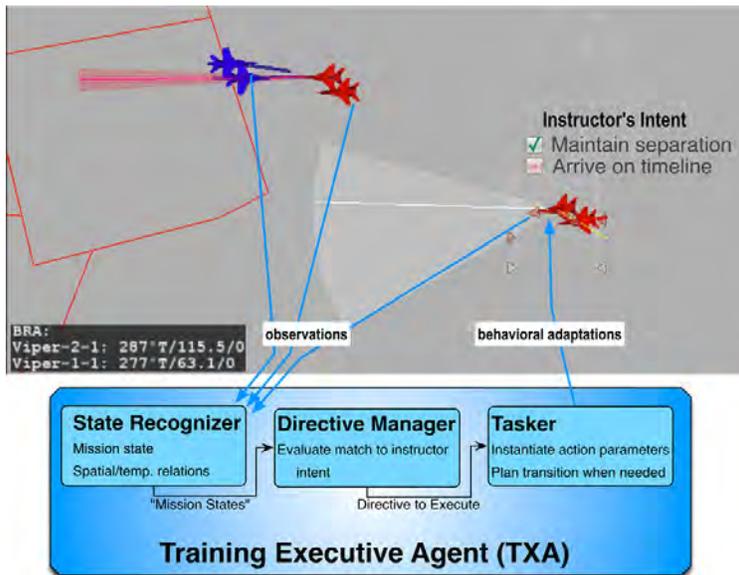
### Trainable Automated Forces (TAF)

- Tailored experience for students of various skill levels and in support of varied pedagogical objectives

### Overview

Many approaches to SAFs employ behavior models that require specialized personnel in one or more development phases:

- Behavior Engineering and Scenario Scripting
- Training Operations, Maintenance, and Upgrades



This process is costly, and does not efficiently adapt over time to the needs of end-users, new platforms, or changes in tactics, techniques, and procedures (TTPs). Specialized personnel requirements result in high support costs over the life-cycle of the product.

*Trainable Automated Forces (TAF)* supports Live/Virtual/Constructive training by generating a Constructive entity to stand in for a human role player in response to constraints on manpower or aircraft readiness. TAF works by recognizing the tactics used by a pilot in a previously-recorded Live or Virtual exercise, and generating a Constructive entity that simulates the pilot's tactics. The TAF Constructive

entity is *not* just a replay of recorded trajectory; instead, TAF configures a generalized behavior model from NGTS (the Next Generation Threat System) so it will respond in a similar manner to the human pilot when it encounters similar situations, but will respond differently if the training mission unfolds along a different path.

Costs can also be reduced by increasing instructional effectiveness of SAFs. The *Training Executive Agent (TXA)* is a software agent that acts as a virtual operator facilitator. It reasons and acts in accordance with the instructor-define training scenario context. The TXA monitors the dynamic scenario and maps its progression to instructor intent. When appropriate, the TXA will recommend and/or enact a change to an individual TACSAF entity's behavior in order to better match instructor intent. The TXA is founded on dynamic tailoring and supervisory control technologies.

These new technologies will be integrated into the Next Generation Threat System (NGTS).

## Research Challenges and Opportunities:

- Automated adaptation of real-world tactics to constructive agents that continuously adjust to changing situations
- Supporting the human instructor's training goals by adapting agent behavior to influence the course of the training scenario