

TACSIM

AI-Enabled Wargaming for Multi-Domain Operations Readiness

Constructive tactical wargaming and simulation platform

OUTLINE

constructive wargaming

product capability

current AI-enabled CGF

MDO orientation

AAR

interoperability

VV&A

conclusion

TACSIM — SCENARIO EXECUTION



TACSIM — TACTICAL SIMULATION ROOM



Training without operational risk



Repeatable scenario-based exercises



A pathway to a NATO simulation ecosystem

CA2X2 = Computer Assisted Analysis, Exercise and Experimentation • CGF = Computer-Generated Forces • • MDO = Multi-Domain Operations • AAR = After-Action Review • VV&A = Verification, Validation and Accreditation

What TACSIM is



Constructive computer-assisted wargaming platform



Human-in-the-loop scenario control and adjudication



AI-supported simulated-force CGF behaviour



Current AI-supported CGF



“TACSIM contributes to selected MDO readiness functions through repeatable, instrumented and bounded constructive wargaming.”



Not an autonomous operational decision system



Not a full all-domain operational-level simulation

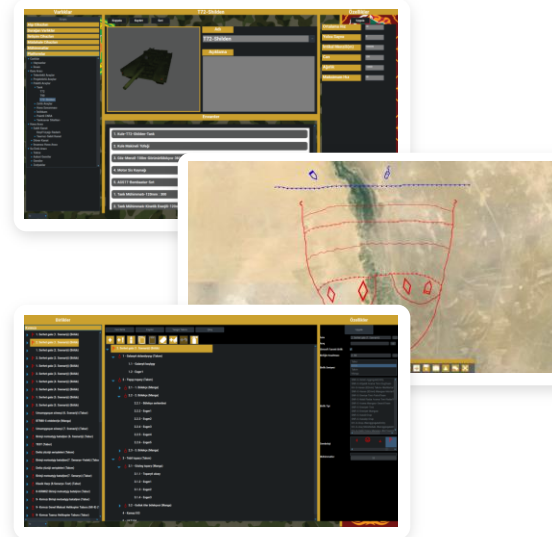


Not a predictive estimate outside a declared VV&A boundary

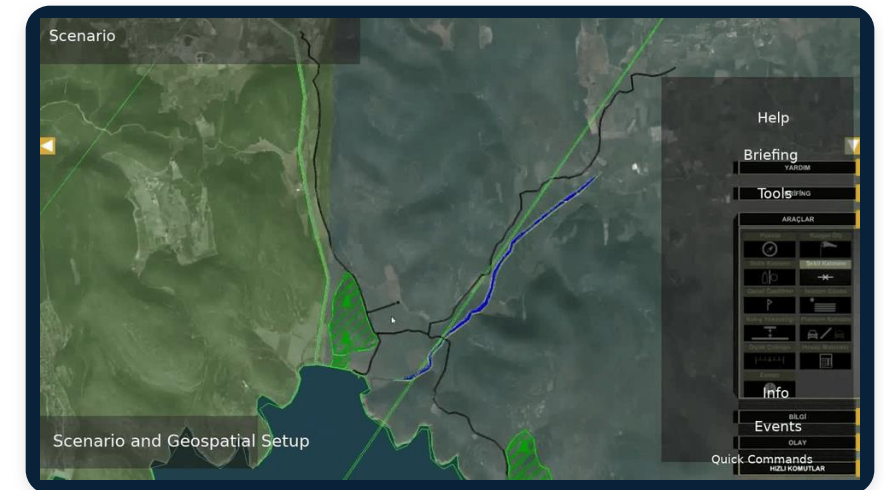
AI = Artificial Intelligence • CGF = Computer-Generated Forces • VV&A = Verification, Validation and Accreditation

TACSIM capability architecture

From scenario design to assessment in a closed learning loop



SCENARIO & GEOSPATIAL SETUP



ROE = Rules of Engagement • AAR = After-Action Review

CAPABILITIES

TACSIM product capability and model coverage

Operational scale, training environment and interacting model families

Operational capacity

Up to **100**
users

100+
platforms

Unlimited
scenarios

Training environment



2D map-based command view and 3D simulation view



Touch-enabled tactical control, including large tactical-table configurations



Expandable architecture with adjustable model fidelity

CONSTRUCTIVE SIMULATION RUNTIME



Model & training coverage

Vehicles

sensors

weapons

communications

human / neutral entities

Risk-free rehearsal

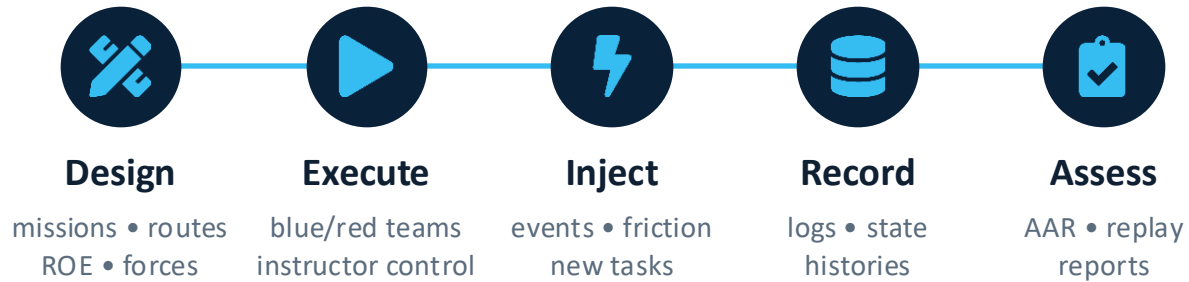
tactical-plan testing

repeatable scenario experience

2D = two-dimensional • 3D = three-dimensional

Scenario lifecycle and mission scope

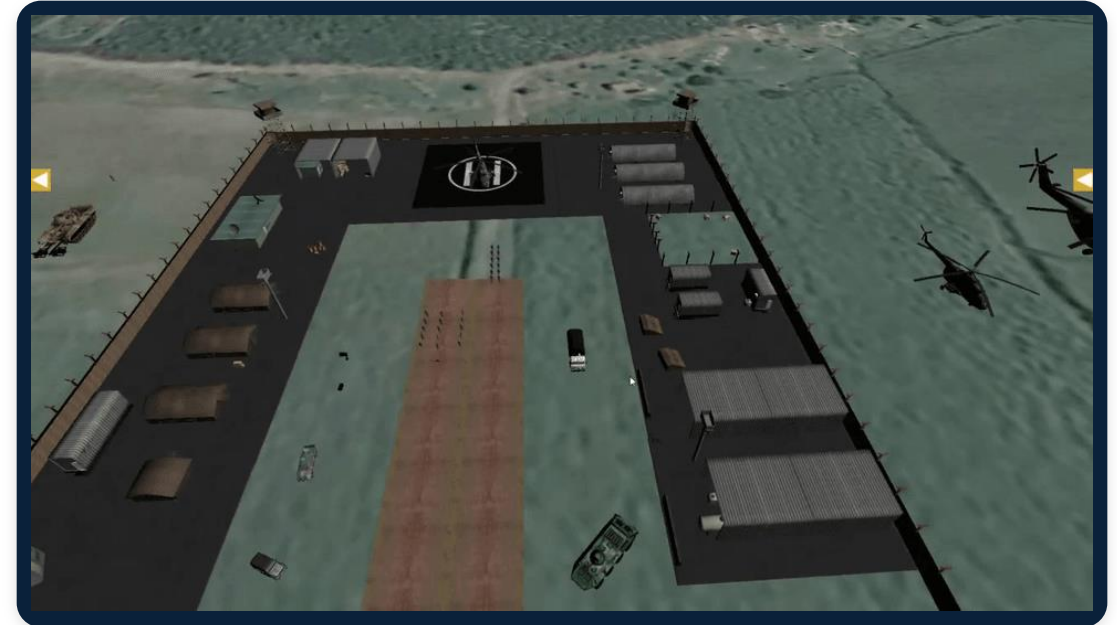
From scenario design to after-action review across reusable tactical missions



Instructor as white cell

The instructor can shape the exercise during runtime, introduce uncertainty, modify plans and follow all feedback through the instructor console.

TACSIM SCENARIO LIFECYCLE



Representative missions

border security

river / sea border

combined arms

fire support

air defence

engineering / mines

Current AI-supported capabilities in TACSIM



Current AI-supported entity control

- behaviour functions and command capabilities
- intelligent path-finding and script-based control
- instructor-governed scenario behaviour



Controller workload reduction

- reduces controller workload while preserving white-cell control
- supports larger blue/red/neutral force scenarios



current AI supports simulated-force control; doctrine-informed and explainable AI are planned roadmap items.

CGF RUNTIME ENVIRONMENT



Behaviour functions



Command capabilities



Intelligent path-finding



Script-based control

SME = Subject Matter Expert

Illustrative MDO vignette

A bounded tactical vignette mapped to measurable MDO readiness dimensions

TACSIM RIVER-CROSSING SCENARIO



Readiness dimensions

cognitive

procedural

effects

interoperability

data

assessment



ISR delayed

Delayed observation / uncertainty



Comms degraded

Reduced C2 tempo / alternate reporting



Air-defence threat

Constrained aviation and ISR windows



Engineer bottleneck

Crossing timing and exposure



Branch decision

Activate sequel before tempo is lost



Assessment questions

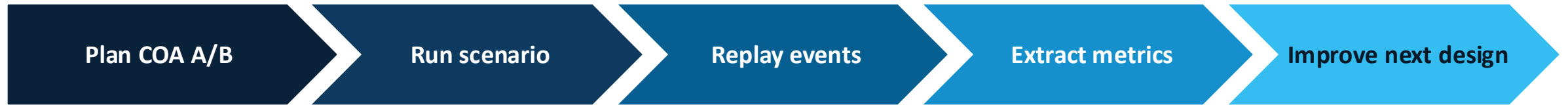
- Did the staff identify dependencies?
- Were fires, movement and airspace synchronized?
- Were branches activated before tempo was lost?

The scenario can be replayed under alternative Courses of Action (COAs), adversary reactions and degraded-environment assumptions.

ISR = Intelligence, Surveillance and Reconnaissance • C2 = Command and Control

COA analysis and AAR

Training value comes from disciplined replay, comparison and assessment



Example indicators



Decision tempo



Cross-domain
synchronisation



Information quality



C2 resilience



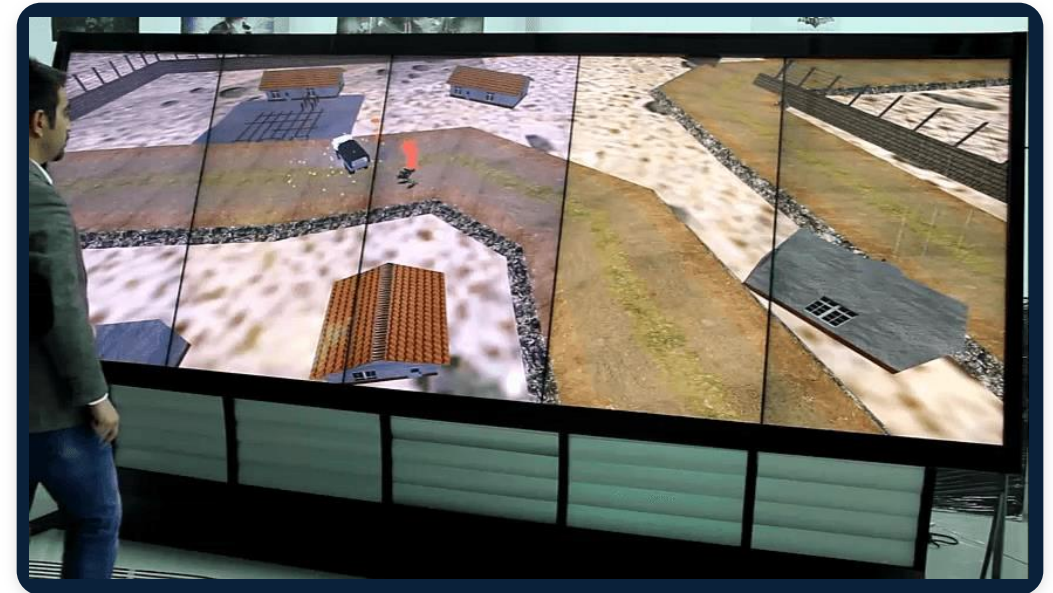
Operational risk



Learning closure

AAR should explain not only what happened, but which decisions, assumptions and coordination failures produced the outcome.

SCENARIO REPLAY & ASSESSMENT



NATO simulation ecosystem integration

The decisive property is credible federation, data exchange and reuse



Runtime federation

HLA / IEEE 1516 • STANAG 4603



Semantic alignment

AMSP-04 • NETN-FOM v4



Service composition

DIS / RPR FOM where required



Engineering process

DSEEP / IEEE 1730



Scenario + C2 exchange

C2SIM



Maturity evidence required

- ✓ Implemented interface version
- ✓ Run-Time Infrastructure / gateway details
- ✓ FOM / SOM mapping evidence
- ✓ Federation test results
- ✓ Accreditation boundary



Position TACSIM as a constructive node that can mature through tested, standards-based federation evidence.

*HLA = High Level Architecture • DIS = Distributed Interactive Simulation • RPR FOM = Real-time Platform Reference FOM • NETN-FOM = NATO Education and Training Network Federation Object Model
DSEEP = Distributed Simulation Engineering and Execution Process • C2SIM = Command and Control Systems–Simulation Systems Interoperation • AMSP = Allied Modelling and Simulation Publication
IEEE = Institute of Electrical and Electronics Engineers • STANAG = Standardization Agreement • SOM = Simulation Object Model*

Proposed AI capability roadmap

Planned AI extensions that Simsoft can propose while protecting credibility and VV&A discipline



Near-term AI productisation

- AI-assisted scenario drafting
- Automatic scenario variants
- Behaviour parameter templates



Operational AI extensions

- Adaptive OPFOR behaviour
- Intelligent inject recommendations
- EW / cyber / ISR-latency effects



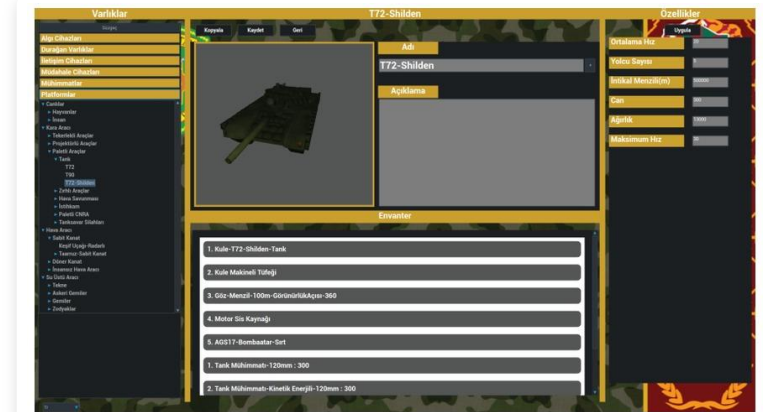
AI-assisted AAR analytics

- Decision-tempo analytics
- Recurring deficiency detection
- Role/team performance summaries



AI credibility controls

- Explainability logs
- SME validation workflow
- VV&A evidence pack



Current capability: behaviour functions, command capabilities, path-finding and script-based control.



Planned AI: doctrine-informed libraries, explainability logs, adaptive OPFOR and AI-assisted AAR.

OPFOR = Opposing Force • EW = Electronic Warfare

VV&A discipline and limitations

Constructive outputs are useful only inside a declared model boundary and validation envelope



Verify

built correctly against specifications



Validate

sufficiently accurate for intended use



Accredit

accepted by authority for defined purpose



Interoperability maturation

HLA / NETN / C2SIM mapping,
federation testing and explicit maturity
evidence



Non-kinetic effects

EW, cyber degradation, ISR latency,
information-related injects



Explainable CGF improvement

doctrinal rules, traceability, controlled
data-driven models



Assessment science

MDO metrics, AAR data models, learning
analytics



Credibility requires explicit capability claims, interoperability maturity and VV&A boundaries.

Closing position

From tactical training product to ecosystem-ready constructive simulation capability

TACSIM is a practical constructive wargaming capability today, with current AI-supported CGF behaviour and a credible maturation path toward interoperable, AI-assisted MDO readiness analytics.



Product value

risk-free, repeatable tactical training



Training value

COA comparison and instrumented AAR



AI value

current AI-supported CGF + planned explainability roadmap



NATO value

HLA/NETN-FOM/C2SIM/DSEEP maturity path

DESIGN. EXECUTE. ASSESS. IMPROVE.



Design

Execute

Assess

Improve

We are ready to cooperate to fully meet NATO's needs with TACSIM

Thank You