



Joint Training Technical Interoperability Strategy

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Joint Training Technical Interoperability (JTTI)

Strategy

"We must relentlessly pursue innovative solutions for ourselves and insurmountable dilemmas for future adversaries. We need institutional processes to generate lethal capabilities with greater affordability at the speed of relevance. The velocity of change required to resolve the operational challenges identified in the National Defense Strategy is far higher than we have attained to date. Our culture must embrace competition, seek higher performance levels, accept greater tolerance for risk, and generate urgency in achieving innovative outcomes."

Hon James N. Mattis
National Defense Strategy, January 2018

- 1.0 **Purpose:** This Strategy promotes an enduring collaboration and coordination effort among JTTI stakeholders needed to achieve shared technical interoperability in order to prepare our forces for Globally Integrated Operations.
- For the purpose of this document, "JTTI stakeholders" are all Department of Defense (DoD) components who design, develop, or acquire training capabilities.
- 2.0 **Background:** The Chairman of the U.S Joint Chiefs of Staff has articulated the Joint Force will face an increasingly complex global security environment, one in which both state and non-state actors will seek to challenge the current international order. This environment will change the manner in which training will be conducted. Advancing and sustaining the DoD's operational readiness for these threats require a portfolio of training capabilities which supports a learning continuum from individual, staff, to collective training. This portfolio must create the training environment which prepares the total force to accomplish a diverse and complex set of missions demanding an ever-changing combination of military engagement, security cooperation and deterrence competencies. However, the current training environment portfolio includes capabilities which lack the interoperable architectural framework and technological approaches for providing accurate, timely, relevant and affordable tools to support these requirements.

Today's advancements in information technology (i.e. cloud technology, data exchange, machine to machine interactions, processing speeds, etc.), presents an opportune time to change the training provisioning paradigm. Decreasing fiscal and man-power resources combined with warfighting co-dependencies across the DoD, has provided us the ideal impetus for changing how we, as stakeholders in interoperability and standards, provide the capabilities for advancing and maintaining readiness across the force.

On 3 June 2016, Lieutenant General Waldhauseur, Joint Staff Director of Joint Force development (DJ7) published JTTI guidance (Reference 13a) to U.S. Combatant Commands, Services and Agencies to partner in advancing Joint interoperability. This strategy takes the next logical step by establishing an agreement and clarifying JTTI responsibilities between the signatory organizations for establishing and adopting common standards and technical approaches for interoperable training capabilities.

"The current bureaucratic approach, centered on exacting thoroughness and minimizing risk above all else, is proving to be increasingly unresponsive. We must transition to a "culture of performance" where results and accountability matter. We have a responsibility to gain full value from every taxpayer dollar spent on defense...."

Hon James N. Mattis
National Defense Strategy, January 2018

3.0 Challenge: Transition the DoD’s training capabilities to a common set of architectures, standards, and technological approaches. This will require the Joint training enterprise to strategically evolve away from current tools and technical infrastructure which often:

- Are built to differing standards, requiring significant time and specialized contract labor to integrate into useful federations capable of executing Joint exercises or training events.
- Use proprietary software which results in vendor lock-in, limited innovation, isolated development efforts, and increased licensing costs. Expensive to operate and sustain.
- Lack rapid adaptability to train for emergent threats.
- Are insufficient for integrating mission partners.
- Lack authoritative data sources provisioned in simulation ready formats and attributes for many of the key environment features.
- Requires bridging solutions in order to bring multiple simulations together which adds cost and limits interoperability.
- Lack the flexibility to implement cybersecurity measures in a timely, cost effective manner.
- Lack security guidance that balances training requirements with protecting capability program data.

4.0 Scope: This agreement supports Office of Secretary of Defense and Joint Staff policy in addressing standards associated with the design, development, operation, and sustainment of the Joint training enterprise, which includes capability integration, data management (e.g., authoritative source selection, terrain, force structure/order of battle, weather, etc.), application program interface (API) development, network configurations, cloud and technical infrastructure, and cybersecurity. It also includes distributed learning standards supporting Joint Knowledge Online and learning management.

5.0 Authorities:

- Title 10 United States Code (Reference 11b):
 - Section 153—Chairman of the Joint Chiefs (CJCS) “...will be responsible for formulating policies and technical standards, and executing actions, for the joint training of the armed forces.”
 - Sections 3013 (Army), 5013 (Air Force), and 8013 (Navy and Marine Corps)—Secretaries of Services are responsible for, and have the authority necessary to conduct, all affairs of their Departments, including: supplying, training, and mobilizing. It also states Secretaries of Services are responsible to the Secretary of Defense for carrying out the functions of their departments to fulfill the current and future operational requirements of the unified and specified combatant commands.
 - Sections 10501 and 10503—National Guard Bureau (NGB) is chartered to prescribe “...the training discipline and training requirements for the Army National Guard and the Air National Guard and the allocation of Federal funds for the training of the Army National Guard and the Air National Guard.” Also, they monitor and assist States in providing “...well-trained and well-equipped units capable of augmenting the active forces in time of war or national emergency.”
- CJCS Instruction (CJCSI) 8510.01C (Reference 13g), Management of Modeling and Simulation, Enclosure A: “Director, J-7, will coordinate simulation policy for joint training...”
- DoD Directive (DoDD) 1322.18, Military Training: CJCS shall “Formulate joint training and military education policies and the professional development of the members of the Armed Forces in coordination with USD(P&R),” “address joint training program and joint training

support deficiencies and trends,” “develop and maintain open, net-centric, interoperable standards and protocols for LVC joint training systems,” and “support use of an open, net-centric, interoperable standard for joint training and facilitate maintenance of the associated metadata within the DoD metadata registry.”

- DoD Instruction (DoDI) 1322.26 (Reference 13d), para 1.2.c. Policy: “[Distributed Learning] will be based on interoperable standards, in accordance with DoDD 1322.18 ...”
- DoDD 5000.59 (Reference 13e), para 5.7: The Heads of Department of Defense (DoD) Components shall ... “maximize the commonality, reuse, interoperability, efficiencies, and effectiveness of Component-specific M&S data, tools, and services.”
- DoDI 5000.70 (Reference 13f), para 4: It is DoD policy in accordance with [DoD Directive 5000.59] “to encourage efficient and effective development, use, and reuse of M&S, particularly Government-owned, non-proprietary M&S assets.”
- DODD 5105.77 (Reference 13l), para 5d.(1)(b): NGB “Prescribes the training discipline and training requirements for the Army National Guard and the Air National Guard, and the allocation of federal funds for the training of the Army National Guard and the Air National Guard, in accordance with DoDD 1322.18.”
- DODD 5134.01, Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)), para 3.35: USD(AT&L) shall: “Ensure that DoD M&S investments support operational needs and the acquisition process; the development of common tools, methodologies, and databases; and the establishment of standards and protocols promoting interoperability, data exchange, open system architecture, and software reusability.”

6.0 Vision: Provisioning interoperable training capabilities and standardized distributed learning systems to fulfill Combatant Command, Service, and National Guard related training requirements to achieve Joint readiness required to execute Globally Integrated Operations.

- Enhance training capabilities based upon common, open, net-centric standards and technical approaches which promote substantive interoperability and integration among DoD and mission partner training systems to include weapon systems in a training mode (i.e. blended training—integrated live-virtual-constructive).
- Adopt Joint training technical standards and approaches which were collaboratively identified and developed by all DoD components.
- Minimize support (operational and sustainment) costs.
- Improve interoperability and information sharing with allies, multinational and coalition partners, agencies, and non-government organizations in the effective support of training.
- Simplify provisioning and use of training capabilities by both trainers and training event participants across the Joint training enterprise.
- Improve reuse of Joint training capabilities (where it meets their needs) among the broader modeling and simulation enterprise (e.g. provide value to experimentation, analysis, acquisition, intelligence, and test and evaluation communities).

7.0 End State—A Joint training environment that has four key components:

- **Environment**—Integrated capabilities which enable training across the full range of military operations when and where needed. Accurately replicating complex operational environments across multiple domains (Land, Maritime, Air, Space, and Cyberspace) at the necessary levels of detail to meet readiness objectives from Tier 1 (CCMD) down to the Tier 4 (tactical).
- **Information**—Visible, shared, common, reusable data and content capable of supporting training scenarios which are based on authoritative data sources.

- **Architecture**—A data-centric enterprise structure of design elements, standards, relationships, principles, and appropriate security measures which promote synchronized capability development and facilitate training across U.S., bilateral and multinational geographies, environments, and missions.
- **Applications**—Tools which aid training collaboration, planning, execution, and data collection by reducing manual processes through automation.

“The success of any strategy, is dependent on the quality of its implementation.”

Deputy Secretary of Defense Memorandum 16 Feb 2018,
National Defense Strategy: From Strategy to Action

8.0 Approach:

Develop and implement a JTTI Framework for identifying, documenting, and governing common standards and enterprise technical approaches for the organization, development, management, and integration of new Joint training capabilities. The JTTI Framework will establish lines of responsibility, authority, and communications for making JTTI decisions across the life-cycle of Joint training capabilities development. DoD components are essential to this effort and will contribute invaluable expertise and perform a critical role in JTTI Framework development and execution. The JTTI Framework will be facilitated and managed by the Joint Training Synthetic Environment Working Group (JTSE WG). The framework will:

- Emphasize use of public or commercial standards and specifications available through domestic and international private sector standards organizations, or existing federally developed standards, rather than develop new standards to meet capability needs.
- Avoid proprietary solutions which increase the cost of development, management, and operation.
- Strive to eliminate redundancy and reduce the number of standards to the minimum required for effective and efficient operation.
- Promote collaborative/cooperative partnering to enable transparency and unity of effort in support of JTTI Framework implementation.
- Document Joint Training Technical Standards Profile and Common Technical Approaches in the DoD IT Standards Registry (DISR) in accordance with DoD Instruction 5000.02, “Operation of the DoD Acquisition System,” (Reference 13k).
- Use Joint Training Technical Standards Profile and Common Technical Approaches documented in the DISR to develop future capabilities or obtain waiver in accordance with Reference 13h.
- Maximize convergence on common standards with the operational Warfighting and Intelligence communities to improve mission rehearsal realism and effectiveness.

9.0 Constraints—Conform to DoD and CJCS policy:

- DoDD 1322.18, “Military Training” (Reference 13c).
- DoDI 1322.26, “Development, Management, and Delivery of Distributed Learning” (Reference 13d).
- DoDI 3020.47, “DoD Participation in the National Exercise Program (NEP)”
- DoDD 5000.59, “DOD Modeling and Simulation Management”
- All applicable DoD policies regarding acquisition, development, and operation of information technology, to include DoDI 8310.01, “Information Technology Standards in the DoD”

(Reference 13h) and DoDI 8320.02, “Sharing Data, Information, and Information Technology (IT) Services in the DoD” (Reference 13i).

- DoDI 8320.07 “Implementing the Sharing of Data, Information, and Information Technology (IT) Services in the Department of Defense”
- DoDI 8330.01, “Interoperability of Information Technology (IT), Including National Security Systems (NSS)”
- CJCSI 3500.01, “Joint Training Policy for the Armed Forces of the United States”
- CJCSN 3500.01, “2015-2018 Chairman’s Joint Training Guidance”
- CJCSM 3500.03, “Joint Training Manual for the Armed Forces of the United States”
- CJCSI 8510.01C, Management of Modeling and Simulation (Reference 13g).
- Joint Information Enterprise (JIE) policy (Reference 13j).

10.0 Deliverables:

- **Interoperability Reference Scale**—A method of estimating the level of interoperability maturity of a training capability during the acquisition process to enable consistent, uniform discussions for making risk-based programmatic decisions during capability development.
- **JTTI Framework (governance, processes)**—A fast and responsive process for identifying and formalizing detailed JTTI standards beyond what acquisition policy enables.
- **JTTI Development Milestones**—A detailed timeline (generated and maintained) to assist in managing JTTI.
- **Joint Training Technical—Common Operational Picture (T-COP)**—A single display of relevant Joint training capability information shared by DoD components for facilitating collaborative/cooperative capability situational awareness, planning and development.
- **Cross-component Joint Training Capabilities Roadmap**—Outlines the enterprise target architecture and capability development activities planned to modernize the “as-is” Joint training environment.
- **Joint Training Technical Standards Profile, Common Technical Approaches, and Developer Guidance**—Enterprise set of open, net-centric, national, international standards, and protocols which promote interoperability, data exchange, open system architecture, and software reusability. Guidance will define use-cases and clarify how developers choose a representational scheme to best support training and readiness objectives for the system under development while also enabling interoperability arising in the broader Joint training context, where different levels of fidelity may be required.

11.0 Organization/Responsibilities: Specific organizational responsibilities for conducting the JTTI effort are delineated below:

- **All DoD components will:**
 - Actively support and where appropriate lead JTTI activities to include the development and staffing coordination of required documentation.
 - Adopt Joint Training Technical Standards and Common Technical Approaches for training capabilities that support Joint Mission Essential Task training and readiness:
 - When designing new capabilities or obtain waiver in accordance with Reference 13h.
 - When updating existing capabilities, where it will not adversely affect cost, schedule, or performance.
 - Test training capabilities for required interoperability before being deployed.
 - Advocate, within their organizations, for:

- Requirements development policies and guidance to ensure desired/required standards and protocols for M&S interoperability, data exchange, open system architecture, and software reusability are specified.
- Acquisition oversight, whether for major ACAT programs or less expensive projects, to ensure program managers develop to the specified standards and protocols for interoperability.
- Identify and refer policy issues to be addressed by relevant bodies.
- Identify and seek to harmonize other on-going standards and development activities with similar objectives to JTTI.
- **Joint Staff Directorate for Joint Force Development, J7 will:**
 - Establish technical standards required for the development and acquisition of joint training systems.
 - Lead the development and formal publishing of all Joint Training Technical Standards documentation.
 - Lead/facilitate the overall development and formal coordination of the JTTI deliverables, to include establishing and managing the necessary working groups to support this effort.
 - Lead and use the JTSE WG as the O-6 level coordinating and nominating body for Joint Training Technical Standard documentation to enter DoD standards registries.
 - Serve as the focal point for Joint training requirements collection.
 - Provide guidance to CCMDs, Services and Agencies on the development, selection, and use of Joint Training Technical Standards to promote interoperability.

12.0 General—This Strategy:

- **Reflects a joint, consensual understanding of interests among the parties in a common project, and may be amended in writing, by any party, with mutual concurrence of all signatory organizations. Amendments to this Strategy necessitated by administrative or organizational changes, i.e., ministerial changes, will not require renegotiation of the basic Strategy.** Any signatory can leave this Strategy upon written notice to the other signatory organizations.
- Is not a legally binding document. All required funding for any described activities for JTTI will be provided by each party for its own activities, unless specifically noted and agreed upon otherwise. The responsibilities described in this Strategy are subject to the availability of appropriated funds.

13.0 References:

- a. Memorandum to U.S. Combatant Commands, Services and Agencies from LtGen Thomas D. Waldhauser, USMC, Director, U.S. Joint Staff J7, subject “Joint Training Technical Interoperability,” dated 3 June 2016.
- b. Title 10 United States Code.
- c. DoDD 1322.18, “Military Training,” dated 13 January 2009 incorporating Change 1 effective 23 February 2017.
- d. DoDI 1322.26, “Distributed Learning,” dated 5 October 2017.
- e. DoDD 5000.59, “DoD Modeling and Simulation (M&S) Management,” dated 8 August 2007.
- f. DoDI 5000.70, “Management of DoD Modeling and Simulation (M&S) Activities,” dated May 10, 2012 incorporating Change 1, effective 19 March 2014:

- g. CJCSI 8510.01C, Management of Modeling and Simulation,” dated 17 August 2012.
- h. DoDI 8310.01, “Information Technology Standards in the DoD,” dated 2 February 2015.
- i. DoDI 8320.02, “Sharing Data, Information, and Information Technology (IT) Services in the DoD,” dated 5 August 2013.
- j. DoD Chief Information Officer (CIO) policy and guidance on the JIE.
- k. DoDI 5000.02, “Operation of the DoD Acquisition System,” dated 7 January 2015 incorporating Change 3 effective 10 August 2017.
- l. DoDD 5105.77, “National Guard Bureau (NGB),” dated 30 October 2015.

14.0 Points of Contact: The Joint Staff J7 points of contact for this Strategy are Environment Operations Division Chief, 757-203-6152 and Environment Architecture Division Chief, 757-203-6883.

ENCLOSURE 1 – GLOSSARY

Joint Training – Training, including mission rehearsals, of individuals, units, and staffs, using Joint doctrine and tactics, techniques, and procedures, to prepare Joint forces or Joint staffs to respond to strategic, operational, or tactical requirements considered necessary by the Combatant Commanders to execute their assigned or anticipated missions. (CJCSI 3500.01H, 25 April 2014)

Joint Training Enterprise – The set of Joint training capabilities, associated processes and personnel provisioned for preparing Joint forces or Joint staffs to respond to strategic, operational, or tactical requirements considered necessary by the Combatant Commanders to execute their assigned or anticipated missions.

Technical Standards – For this document, technical standards institute the norm or requirement with regard to developing and operating technical systems in support of Joint training. They establish uniform engineering or technical criteria, methods, processes, and practices for Joint training capabilities.