CTTRA Program Requirements

Table 1. Environment/SUT/TP Focus Group - Assessments

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life Cycle support**
Easy access to other Test/ Training resources/ assets- Common Plug and Play						
•						
•						

•						
•						
•						

Pointers to other assets (JTADS-like) •						

•						
Common treatment for HLA range surrogates						

Rapid scenario generation, modification, and distribution						
•						

Common entity definitions						
•						
Support Joint Vision 2010						
Interoperate with synthetic battle space (STOW)						

***Tables 7/18 from the CTTRA V Workshop Proceedings**

Table 1. Environment/SUT/TP Focus Group - Assessments (concluded)

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life**

					ent	Cycle support
Low overhead interfaces						
Latency, size, power						
Maintain synchronization of distributed assets						
•						
•						
•						

Standard SUT/TP status information (weapons, ammo, health)						
•						

Inputs and outputs which correspond among live, virtual, and constructive simulations						

***Tables 7/18 from the CTTRA V Workshop Proceedings**

Table 2. Environment/SUT Test Assets Needs

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life Cycle support**

Stand/validated targets and threat simulators						
•						

•						
•						

•						

Use existing standards (do not invent new ones unnecessarily)						
•						

Countermeasures						
Simplify inputs to acquisition systems						
SUT/TP needs to be stimulated in easiest manner						
•						

Capability to use national/international assets (satellites) to sppt testing and training						
Capability to use non-DoD simulation capabilities						
More capable transmitters and encryption devices						

Integrate target control/presentation (belongs to Operational Control function)						
Need better data compression techniques (to offset increasing bandwidth requirements)						
•						

***Tables 8/19 from the CTTRA V Workshop Proceedings**

Table 3. Environment/SUT Test Quality Needs

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life Cycle support**
Tailorable, modular products						

by/to individual range needs/distributed final development						
•						

Instrumentation and data processes to support V&V of M&S						
Capability to use synthetic assets for test/training planning and rehearsal						
Dynamic						

terrain/environment/entity models						
Test systems as they are supposed to be used						
Bring real world C4I systems to testing and training						
Realistic/controllable electromagnetic environment						
Process to identify critical						

environments						
Parameterize models						
Parameterize software						
Don't forget nuclear						

***Tables 9/20 from the CTTRA V Workshop Proceedings**

Table 4. Environment/SUT Cost Reduction Needs

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life Cycle support**
Minimize required modifications to existing platforms						
• Maximum use of legacy systems						
Surge capability to support level 3 training and MRC scenarios						

• Borrowed/shared resources						
Use of organic participant instrumentation and communication systems (GPS will be an organic capability that we need to use)						
Process to ID, prioritize and characterize critical environments to represent standard environmental databases/models:						
• Visualization tools						
• Terrain models						
• Coordinate systems and transformations						
Common weapons instrumentation pkgs.						
• Cheaper/more available GPS						

***Tables10/21 from the CTTRA V Workshop Proceedings**

Table 5. Operational Control Focus Group

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life Cycle support**
1. Standard SUT/TP status information						
2. Multiple integrated Ranges						

3. Standard rapid/on-line planning/schedule/budget						
4. Define Master Clock						
5. Real-time visualization of all assets						
6. Real-time status of all assets						
7. Common current assert database						
8. Identify and reserve frequency						
9. Standard hazard criterion						
10. Security						
11. Safety						

***Table 24 and Section 2.4.5 from the CTTRA V Workshop Proceedings**

Table 6. Network Architecture

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life Cycle support**
Requirement 1: Standard Synchronization Techniques						
Requirement 2: Real Time Visualization of All Assets						

Requirement 3: Maximum Platform Independence						
Requirement 4: Common Terrain Data Base Visualization Formats						
Requirement 5: Common 'Plug-and-Play' Inter-range Connections						
Requirement 6: Compatibility with DoD Modeling and Simulation Standards (Distributed Interactive Simulation (DIS)/DIS++/HLA						
Requirement 7: Common Environment Data Base Visualization Formats						
Standard Planning, Scheduling, and Budgeting System						
Individual Range Tailorable Architecture Capabilities						
Life Cycle Management						

*** Figure 8 from the CTTRA V Workshop Proceedings**

Table 6. Network Architecture (concluded)

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life Cycle support**
Standard TSPI/TM Interface						
Night/Adverse Weather TSPI (Instrumentation) Capability						

Standard System Under Test (SUT)/ Training Participant (TP) Status Formats						
Architecture Should Support Multiple Integrated Ranges						
Architecture Should Support Multi-Layered Security						
Standard Access Ports (to/from) for SUT/TP Data						

***Figure 8 from the CTTRA V Workshop Proceedings**

Table 7. Architecture

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life Cycle support**
Exploit "dominant battlefield information"						
To support future requirements that may be considered visionary and that its architecture should be more flexible to support new warfighting concepts						
Comprehensive business model to better capture future test and training range requirements						
The new concepts for maneuver, deep and precision strike, force protection, and logistics						

*** Section 2, Page 11 of the CTTRA V Workshop Proceedings**

Table 8. Standard Databases Working Group Proposed Needs

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life Cycle support**
Live: Standard threat simulators						
Virtual: *Human interaction with virtual simulations - how close to reality? *Standard						

calibration equipment/methods for Electro-Optic (EO) Measurements *Integration with real data						
Constructive: Standard (portable and reusable) terrain databases/models Common object/entity						

definition *Standardize architecture for model of interaction w/ environment						
ACQUISITION						
Instrumentation: Ground truth standardization Higher fidelity TSPI Time Standard (GPS) *Non						

-intrusive instrumentation *Standardized data formats for output from unique filters *Characterization and performance						

*** Table 5 from the CTTRA V Workshop Proceedings**

Table 8. Standard Databases Working Group Proposed Needs (continued)

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life Cycle supp**

						ort
Manual Observation: *Integration of hand recorded data & automated systems						
PROCESSING						
Common set of portable and reusable software based data processing modules. Software						

object repository. *AI applications for pre/real-time/post processing						
Pre-Event						
Real-Time Data fusion standard for range-HLA interface *Standard labels *Common filteri						

ng algorithms (TSPI) *Remote real time monitoring						
Post-event: Standard processed telemetry output formats Integrated TSPI and telemetry data processing Standard Reliability, Availability,						

Maintainability (RAM) processing module *Remote access and manipulation						

*** Table 5 from the CTTRA V Workshop Proceedings**

Table 8. Standard Databases Working Group Proposed Needs (continued)

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life Cycle support**
Archiving: Common format for data archiving						

*Security for classified/sensitive data *Data certification method (identify anomalies) *Format for methods of distribution						
INFORMATION PRESENTATION						
Aural: *Standard						

format for synchronizing multiple Audio, video and virtual information						
Visual: Standard encapsulated data products Common set of portable and reusable software based data presentation mod						

ules Standard hard copy presentation Multi-media reporting standard						

*** Table 5 from the CTTRA V Workshop Proceedings**

Table 8. Standard Databases Working Group Proposed Needs (concluded)

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life Cycle support**
OPERATIONAL CONTROL						
Mission Plan						

ning and Control rapid, on-line access to scheduling information						
Safety Control *Standardize as many of the safety related requirements as possible.						
Asset Control Common asset						

reporting and management						
Scheduling Rapid, on-line access to scheduling information						
Simulation/Stimulation Control						
INFORMATION TRANSFER						
Communications arch. that						

supports C4I at the entity level during battle and training Common RF link protocol Standard high speed file transfer Standard network security Common "plug and play" range/facility interconnectio						

n capability for legacy and new systems, which is compatible with TENA architecture and will meet the needs of near-real-time T&E data transfer.						

*** Table 5 from the CTTRA V Workshop Proceedings**

Table 9. Processing Focus Group Program Assessment

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life Cycle**

						support
Software object repository						
Data Validation/Verification/Certification						
Archiving/Retrieval -						
Multi-State Kalman Filter						
Integrated TSPI/TM Data Processing -						
Standard Reliability						

, Availability, Maintainability (RAM) Processing -						
Maintenance of Run-Time Data Sets -						
Configurable Products - -						
Data/ Site Selectivity						
Standard Event Synchronization Technique						
Maximum Platf						

orm (HW /SW/ OS) Independence.						
Play Back /What if Scenario -						
M&S Compatibility(HLA)						
Data Standardization - Standardized data is data that has been characterized and defined in accordance with						

(IAW) DoD 8320.1-M-1						
Reusable "Plug-n-Play" Software Modules						
Sppt Integration of Data From Mult. Ranges						
Provide Data/Information Security --						
Delivered Products Should be Sustainable						

*** Table 14/22 from the CTTRA V Workshop Proceedings**

Table10. Information Presentation

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life Cycle support**
Simplified Input						
Common Visualization Products						
Standard Software						
•						

•						

•						

*** Table 23 and Section 2.2.4. from the CTTRA V Workshop Proceedings**

Table 10. Information Presentation (concluded)

Needs	Require	Analysis	Architect	Eng.	Full-	Promulgation

	ments		**ure**	**Prototypes**	**Scale Development**			**Life Cycle support**
Standard Synchronization								
•								

Platform Independent						
•						
•						

•						

*** Table 23 and Section 2.2.4. from the CTTRA V Workshop Proceedings**

Table 11. Data Acquisition

Needs	Requirements	Analysis	Architecture	Eng. Prototypes	Full-Scale Development	Promulgation Life Cycl

						e **supp ort**
TSPI						
•						

•						
•						

•						

Engagement Simulation						
•						

•						

*** Sections 2.2.2 and 2.4.2 from the CTTRA V Workshop Proceedings**

Table 11. Data Acquisition (concluded)

Needs	**Requirements**	**Analysis**	**Architecture**	**Eng. Prototypes**	**Full-Scale Development**	**Promulgation Life Cycle support**
Processor supported Instrumentation						

•						
•						
•						
•						
Telemetry System						

ms						
•						

(1) band width						
(2) latency						
(3) security						
(4) access ports						
(5) open systems architecture						
(6) life cycle						

support						
Defense Goal Security Architecture						
Multi-level security when T&E and training systems interoperate with M&S						

*** Sections 2.2.2 and 2.4.2 from the CTTRA V Workshop Proceedings**

BACK TO VOLUME 10

BACK TO TENA