

PERFORMANCE SPECIFICATION
FOR
MARINE CORPS-INSTRUMENTATION TRAINING SYSTEM
VERSION 2
(MC-ITS V.2)



PROGRAM MANAGER TRAINING SYSTEMS
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Performance Specification
For
Marine Corps-Instrumentation Training System Version 2 (MC-ITS V.2)

1. SCOPE

This Performance Specification establishes the system requirements for the development, fabrication, installation, delivery, demonstration and testing of the Marine Corps-Instrumentation Training System Version 2 (MC-ITS V.2). The purpose of the MC-ITS V.2 training system is to significantly enhance the training capability, operational readiness, and tactical proficiency of Marines in tactics, techniques, and procedures through the integration with various new and legacy Marine Corps instrumented training systems.

2. APPLICABLE DOCUMENTS

The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended or additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.1 Government documents

The following specifications, standards, statutes and handbooks of the exact revision listed below form a part of this specification to the extent specified herein.

2.1.1 Specifications, standards, and handbooks

Department of Defense Standard Practices

MIL-STD-130M - Identification Marking of U.S. Military Property
MIL-STD-810G Environmental Test Methods

(Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

United States Code - Defense Standardization Program
Title 10, Section 2451 - 2456

(US Code is downloadable from <http://uscode.house.gov/search/criteria.shtml>)>

Military Handbooks

2.1.2 Other Government documents, drawings, and publications

The following Government documents, drawings, and publications of the exact revision level shown form a part of this document to the extent specified herein.

Performance Specifications

US Army PEO STRI

LT2-2006-0001

CTIA Compliance Definition Document

Live Training Transformation Product Line (LT2) and Common Training Instrumentation Architecture (CTIA) current data artifacts can be obtained at www.lt2portal.org

Department of US Navy

NASMP FOM 1.3

NASMP Federation Object Model (FOM), Version 1.3 - 25 May 2005

NASMP FAD v1.3

Federation Agreements Document (FAD), Version 1.3 - 25 May 2005

Pub-5239-26

Information Assurance Remittance Security Publication

Department of Defense Security Manuals

DoD 5220.22-M Chapter 8

National Industrial Security Program Operating Manual (NISPOM) date Feb 2001

(Copies of this document are downloadable from <http://www.dss.mil/ise/nispom.pdf>)

Department of Defense (DoD)

DOD/DMSO OMT 1.3

High Level Architecture Object Model Template, Version 1.3 - 5 February 1998

DOD/DMSO HLA IF 1.3

High Level Architecture Interface Specification, Version 1.3 - April 1998

National Security Telecommunications and Information Systems Security Committee

NSTISSP No. 11

National Policy Governing the Acquisition of Information Assurance (IA) and IA-enabled Information Technology (IT) products dated January 2000, fact sheet dated July 2003

2.2 Non-Government publications

The following documents of the exact revision listed below form a part of this document to the extent specified herein.

Institute of Electrical and Electronics Engineers (IEEE)

IEEE Std 1516-2000	Standard for Modeling and Simulation (M&S) High Level Architecture (HLA) – Framework and Rules
IEEE Std 1516.1-2000	Standard for Modeling and Simulation (M&S) High Level Architecture (HLA) – Federate Interface Specification
IEEE 1278-1A-1998	Standard for Distributed Interactive Simulation—Application Protocols

American National Standards Institute (ANSI)

ANSI Z35.1-72	Accident Prevention Signs
ANSI Z35.4-73	Informational Signs Complementary/ANSI Z35.1-1972
ANSI Z53.1-79	Safety Color Code for Marking Physical Hazards
ANSI/NFPA 70-02	National Electric Code National Fire Protection Association

2.3 National Order of precedence

In the event of a conflict between the text of this specification and the references cited herein, the text of this specification takes precedence. Nothing in this specification, however, supersedes applicable laws and regulations, unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 MC-ITS V.2 System Requirements

The MC-ITS V.2 system shall build upon the MC-ITS Version 1 hardware and software to provide additional features in the following functional areas:

- a. Exercise After Action Review (AAR) & Playback
- b. Interfaces with Range Information Systems
- c. Exercise Control & Situational Awareness
- d. Visualization
- e. Video and Audio Control
- f. Fields of View
- g. Mapping
- h. Data Filtering Component
 - a. MC-ITS Portal
 - i. Battlefield Effects Simulation (BES) Interoperability
 - j. Area Weapon Effects Simulations (AWS)

3.1.1 Exercise After Action Review (AAR) & Playback

The MC-ITS V.2 shall provide additional features to the MC-ITS Version 1 After Action Review (AAR) and Playback as stated in paragraphs 3.1.1.1 through 3.1.1.4.

3.1.1.1 Debriefing Material Presentation

The MC-ITS V.2 presentation of debriefing material shall provide time synchronized 2D and 3D Position Location Information (PLI), time-synchronized video selected and retrieved from any selected video data file associated with the Tactical Video Capture System (TVCS) servers, time-synchronized audio clips selectable from audio data files associated with the Tactical Audio Capture System (TACS) Virtual Tactical Monitoring (VTM) component.

3.1.1.2 Collaboration Environment

The MC-ITS V.2 shall incorporate collaborative remote server/client interactions for AAR, remote server interactions with data searching and analysis for data-set mining. The MC-ITS V.2 shall provide data structures, data handling algorithms, and the user interface for AAR presentation.

3.1.1.3 Data Mining Component

The MC-ITS V.2 shall provide component used to extract data patterns based on filtering input. The MC-ITS V.2 shall verify and validate component utilized to verify and validate mined data over data samples, and across previously mined data. The MC-ITS V.2 shall also provide long-term results storage with ability to build reporting and cross-reference mined data over extended time frames. The MC-ITS V.2 shall allow usage of a common framework and message protocols to enable the sharing of mined data and results of pattern extraction across multiple interoperable systems.

3.1.1.4 Weapon Danger and Surface Danger Zones (WDZ/SDZ)

The MC-ITS V.2 shall integrate WDZ/SDZ overlay builder and display WDZ/SDZ on MC-ITS V.2 display and utilize WDZ/SDZ overlay in observation, and hot wash/AAR. The MC-ITS V.2 shall also display the WDZ/SDZ overlay dynamically and automatically by the system, without user direction, as directed by the filtering capability.

3.1.2 Interfaces with Range Instrumentation Systems (RIS)

The MC-ITS V.2 shall provide additional features and enhancements to the MC-ITS Version 1 Interfaces with RIS as stated in paragraphs 3.1.2.1 and 3.1.2.2.

3.1.2.1 Standard Communication Protocols

The MC-ITS V.2 shall interface with current and future PM TRASYs Range Information Systems (RIS) to support range operations and control. The MC-ITS V.2 shall exchange data information and command messages (status and control) with Range Instrumentation Systems using standard communication protocols. The MC-ITS V.2 shall develop the capability to enhance the distribution, registration and association of range instrumentation equipment by automating the process. **At a minimum**, the MC-ITS V.2 shall provide interface to the following RIS:

- Integrated GPS Radio System (IGRS)
- Instrumented-Tactical Engagement Simulation System I/II (I-TESS I/II)
- Tactical Video Capture System (TVCS)
- Tactical Audio Capture System (TACS)
- Reactive Information Planning and Propagation for Lifelike Exercises (RIPPLE)
- Integrated Range Status System (IRSS)

- Multi-status Dependent Surveillance (MDS) system
- Combined Arms Planning Tool (CAPT)
- Command and Control Personal Computer (C2PC)
- Joint After Action Review – Resource Library (JAAR-RL)

3.1.2.2 Commands Performance

The MC-ITS V.2 shall interface with and perform all commands on all current and future Range Instrumentation Systems without the need for:

- a. external permissions,
- b. external equipment dependencies,
- c. proprietary system permissions and,
- d. proprietary system dependencies.

3.1.3 Exercise Control & Situational Awareness

The MC-ITS V.2 shall provide additional features to the MC-ITS Version 1 Exercise Control & Situational Awareness as stated in paragraphs 3.1.3.1 through 3.1.3.4

3.1.3.1 Live, Virtual, and Constructive (LVC) Simulation Interoperability

The MC-ITS V.2 shall provide interoperability with Live, Virtual and Constructive systems/architectures for exercise control and situational awareness. The LVC systems/architectures shall include common architectures, frameworks, platforms, languages, policies, messages and message formats, bridging and/or gateways, Information Assurance concerns, currently available paths, and recommendations.

3.1.3.2 Distributed Interactive Simulation (DIS) Protocol Compatibility

The MC-ITS V.2 shall be DIS compatible to the extent required for system interoperability. The MC-ITS V.2 system software design shall be based on DoD, commercial, and other industry standards, such as IEEE 1278-1A-1998.

3.1.3.3 High Level Architecture (HLA) Protocol Compatibility

The MC-ITS V.2 system software shall operate in a customer specified HLA federation using that federation's operating agreements in accordance with IEEE 1516-2000 and IEEE 1516.1-2000. The MC-ITS V.2 system HLA interfaces shall be implemented, documented, and shall function in compliance with DOD/DMSO OMT 1.3, DOD/DMSO HLA IF 1.3, NASMP FOM 1.3, and NASMP FAD v1.3.

3.1.3.4 Test and Training Enabling Architecture (TENA) Compatibility

The MC-ITS V.2 shall provide Test and Training Enabling Architecture (TENA) compatibility for providing distributed test command and control capabilities for USMC RIS.

3.1.4 Visualization

The MC-ITS V.2 shall provide additional features to the MC-ITS Version 1 Visualization as stated in paragraphs 3.1.4.1 and 3.1.4.2.

3.1.4.1 Animation Models

The MC-ITS V.2 shall provide animation models to support indoor trainee tracking for large quantities of entities in both aggregate and de-aggregate modes in both 2-D and 3-D visualization, and articulation models for weapon systems and vehicle orientation. .

3.1.4.2 Display Format

At a minimum, MC-ITS V.2 display hardware shall display an exercise area of 3.5 x 11 Km with 1:25,000 ARC Digitized Raster Graphics ([ADRG](#)) map at a 2.5X zoom-in. Graphics cards shall provide 3D graphics (e.g. rendering, texturing, and Z- buffering) using COTS graphics formats (e.g. DirectX, OpenGL. Non- COTS graphics development shall use JTA-A Graphic Services). The display system shall also display two Letter size (8.5 x 11 inch) documents using a minimum font size of 8 points, and support dual monitors.

3.1.5 Video and Audio Control

The MC-ITS V.2 shall provide additional features to the MC-ITS Version 1 Video and Audio Control as stated in paragraphs 3.1.5.1 through 3.1.5.6.

3.1.5.1 Video Streams Control

The MC-ITS V.2 shall provide the user to control and view of video streams selectable from any TVCS or IP addressed camera for presentation at the MC-ITS V.2 work station.

3.1.5.2 Video Replay

The MC-ITS V.2 shall provide a fast video replay feature based on time stamps, that can be displayed and viewed on the MC-ITS V.2 display, from any TVCS camera.

3.1.5.3 Video Editing

The MC-ITS V.2 shall provide video-editing feature with Situational Awareness (SA) “auto-tracking” regions that can be filtered upon entry and exit of selectable single entity or multiple entities, and generate camera controlling commands to the TVCS system, enabling the dynamic switching, recording, visual observation, CTIA Observation Generation, and control of IP based cameras from the MC-ITS V.2 Exercise Control Console.

3.1.5.4 Player Unit Identification

The MC-ITS V.2 shall enable the output of captured data in a common, standard communications protocol, so as to provide Range Instrumentation Systems (RIS) with Live, Virtual, or Constructive Entity identification for tracking and overlaying onto maps or overlays, providing an overhead/look down view of the training area.

3.1.5.5 Audio Streams

The MC-ITS V.2 shall incorporate audio streams for presentation that shall be selectable by the user from each VTM radio channel file.

3.1.5.6 Time Stamped Video/Audio Clips

MC-ITS V.2 shall incorporate the time stamped tactical audio and video clips into a time synchronized video/audio clip object.

3.1.6 Fields of View (FOV)

The MC-ITS V.2 shall provide additional features to the MC-ITS Version 1 Fields of View as stated in paragraphs 3.1.6.1 through 3.1.6.3.

3.1.6.1 View-Shed

The MC-ITS V.2 shall provide “View-Shed” function to show dynamic fields of view for individual Marines with features to turn it on and off both during an exercise, and during a replay of the exercise (using the playback of recorded data).

3.1.6.2 Overlapping FOV Highlight

The overlapping fields of view shall be highlighted to show cross-coverage, and allow for the manual highlight of areas that have no coverage, due to terrain and other features.

3.1.6.3 Weapons Firing

The FOV shall allow for weapons firing field of view to show whether a near-miss fire was due to the inability to see BLUFOR, or unsafe firing occurred purposefully. Weapons firing fields of view shall dynamically superimpose, and be recorded and not shown live, on 2D display, via filter, whenever a weapon is fired to allow for the capture of the weapons firing field of view.

3.1.7 Mapping

The MC-ITS V.2 shall provide additional features to the MC-ITS Version 1 Mapping as stated below.

- a) Multi-map feature, to provide fully-integrated and fully-functional display utilizing FalconView, Commercial Joint Mapping Toolkit (C/JMTK), and other common mapping toolkits
- b) Ability to integrate with Live Terrain Format (LTF) and OneSAF Terrain Format (OTF)
- c) Conversions between the different maps, map formats, and terrain formats.
- d) Overlay terrain formats on selected map
- e) Add, delete, and display any training area specific overlay dynamically and automatically by the system, without user direction, as directed by the filtering capability.
- f) Map overlay builder capability to create overlay quickly and “on-the-fly”, that is specific to the area that will be utilized for training from a generic “template” and add overlay into “library.”

3.1.8 Data Filtering Component

The MC-ITS V.2 shall provide additional features to the MC-ITS Version 1 Data Filtering Component as stated in paragraphs 3.1.8.1 through 3.1.8.2.

3.1.8.1 Filter Creation

The MC-ITS V.2 shall incorporate an advanced filtering component, allowing the dynamic “on-the-fly” creation of filters to capture objective occurrences, allowing the MC-ITS V.2 system to work in a more automated fashion that shall allow the following features:

- a) Create, save, and remove filters from the filtering component.
- b) Create filter templates, which can be used to aid in the development of filters in the field, or “on-the-fly”

- c) The generation of observations and other automated events as well as allowing the system to auto-capture objective exercise events with little to no user interaction, such as identification of an insurgent and anytime the insurgent comes within 25m of a BLUFOR, send a GPLI alarm to command the nearest camera that has field of view, and swing to capture the potential engagement, while generating an auto-observation.

3.1.8.2 Evaluation Generation

The MC-ITS V.2 shall provide an ability to dynamically generate an evaluation function to filter on behavior states of each participant. It shall establish the combination of states required to produce the “time tagged event” from a given list of behavior states.

3.1.9 Portal

The MC-ITS V.2 shall provide a portal that allows the following features:

- a) Users in remote locations have access to all MC-ITS V.2 operational and maintenance documentation and instructions.
- b) Upload of patches, fixes, etc. for end-user to pull down and install, ensuring system remains updated.
- c) Frequently asked questions threading with history to allow users to look up and post questions and answers.
- d) Interactive user friendly & self guided New Equipment Training (NET) hosted on portal to allow users to refresh their training at their leisure.
- e) Update of NET as necessary.
- f) Users to interact with servers to browse libraries (i.e. maps/overlay library, Trusted Third Party (TTP), etc.) to access the required data instantaneously.
- g) Ability to “pass through” information, retrieve information or tools, or post/retrieve questions and information from the Live Training Transformation (LT2) Portal.

3.1.10 Battlefield Effects Simulation (BES) Inter-Operability

The MC-ITS V.2 shall provide additional features to the MC-ITS Version 1 BES Inter-operability as stated in paragraphs 3.1.10.1 through 3.1.10.2

3.1.10.1 Simulated and Real Improvised Explosive Device (IED) Mesh.

The MC-ITS V.2 shall mesh simulated and real IED/BES in MC-ITS V.2 to alleviate visual differences between the two, to the user.

3.1.10.2 Mobile, Visual/Pan Tilt Zoom

The MC-ITS V.2 shall also provide Pan Tilt Zoom (PTZ) commands to the IP addressed camera system allowing the MC-ITS V.2 operator the ability to see the BES before detonation, providing critical safety element.

3.1.11 Communication System Operation

The MC-ITS V.2 Communication System shall operate within the frequency band, Land Mobile Service, as defined and allocated by the National Telecommunications and Information Administration (NTIA) for Department of Defense training systems.

3.1.12 Reports Creation Component (RCC)

MC-ITS V.2 shall provide a Report Creation Component to allow the quick creation of reports and observations as stated in paragraphs 3.1.12.1 through 3.1.12.3.

3.1.12.1 Dynamic Modification of Reports

The RCC will allow commanders in the field the opportunity to capture and fine-tune information, and display the information in observations and reports, dynamically.

3.1.12.2 Report Creation

The RCC shall allow creation of reports both before, during, and after an exercise. During the reports creation process, the RCC shall display the information that can be captured by the system, to allow for the ease of report and/or observation creation.

3.1.12.3 Saving Report

The RCC shall allow the newly created report to be saved as a template.

3.1.13 Built-In Test (BIT)

The MC-ITS V.2 computational system shall provide a Built-In-Test (BIT) that consists of pass and fail testing. BIT shall be initiated:

- a. manually,
- b. remotely, and
- c. at the beginning of each power-on cycle.

The results of BIT shall be displayed at the MC-ITS V.2 display.

3.1.14 Availability, Reliability, and Maintainability

The MC-ITS V.2 shall incorporate reliability and maintainability program based upon best commercial practices to ensure that the MC-ITS V.2 system is reliable and maintainable to support USMC planned training exercises.

3.1.14.1 System Operational Performance

The Availability, Reliability and Maintain requirements shall be based upon an operational performance for the MC-ITS V.2 system of 14 hours per day for a 14 day cycle or a total of 196 days per year.

3.1.14.2 System Operational Availability

The MC-ITS V.2 design shall consider reliability, maintainability, and logistics times when computing operational availability. The operational availability for the MC-ITS V.2 system shall be at least 0.95 (95%) during the exercise period stated in paragraph 3.1.3.1.

3.1.14.3 Reliability Requirements

The Mean-Time-Between-Failures (MTBF) for all MC-ITS V.2 equipment shall be 911 hours (threshold) and 1871 hours (objective).

3.1.14.4 Maintainability Requirements

All MC-ITS V.2 equipment shall have a Mean-Time-To-Repair (MTTR) of 120 minutes (threshold) and 30 minutes (objective) to the 90th percentile.

3.1.15 Operating Environment

All MC-ITS V.2 components shall comply with the following environmental conditions

3.1.15.1 Operating Temperatures

Operate without degradation in temperatures from -17 °C (0 °F) to +40.5°C (+105.0 °F) in accordance with MIL-STD 810G 502.5 Procedure II & 501.5 Procedure II.

3.1.15.2 Storage Temperatures

Store in temperatures from -33.0°C (-28.0°F) to +63°C (+145.0°F) in accordance with MIL-STD 810G 502.5 Procedure I & 501.5 Procedure I.

3.1.15.3 Humidity

Operate without degradation in 15 to 90 percent, non-condensing humidity in accordance with MIL-STD 810G 507.5 Procedure II.

3.1.15.4 Drop

Operate without degradation after completion of the MIL-STD 810G 516.5 drop test. (48" drop on each corner)

3.1.15.5 Dust

Operate without degradation during blowing dust for a short period of time in accordance with MIL-STD 810G 510.5 Procedure I blowing dust test.

3.1.15.6 Blowing Sand

Operate without degradation during blowing sand for a short period of time in accordance with MIL-STD 810G 510.5 Procedure II, blowing sand test.

3.1.15.7 Rain

Operate without degradation during dripping rain for a short period of time in accordance with MIL-STD 810G 506.5 Procedure III – Drip test.

3.1.16 Transportability

The MC-ITS V.2 system components shall require no more than a two man lift, or a four man lift when contained in shipping or storage cases used for transportation, installation, assembly, disassembly, and maintenance. Lift limits for devices shall be: One person (Male & Female - assuming 5 ft lift) - 37 pounds, Two-persons - 74 pounds, Three-persons 101.75 pounds, Four-persons - 129.5 pounds. Devices exceeding one person lift limits shall be prominently labeled with the total weight and required number of handlers. All MC-ITS V.2 components, when

packed in their transit cases, shall withstand damage due to stresses incidental to movement, handling in transit, and tie-down aboard common carrying vehicles such as aircraft or trucks.

3.1.17 Materials and Processes

Materials and processes shall be in accordance with the following requirements. The MC-ITS V.2 shall fulfill the requirements of the contract through acquisition of CaNDI to the maximum extent practicable. The Government reserves the right to perform inspections and tests as deemed necessary to verify the practicability of items proposed as CaNDI for off-the-shelf use in the MC-ITS V.2 systems. Materials selected for these systems shall meet the primary design requirements of their application and the following additional performance requirements:

- a. Except in the case of consumable items, materials used in the construction of equipment shall preclude deterioration in performance and appearance over the design service life of the equipment.
- b. When it is commercially practicable, materials selected shall allow MC-ITS V.2 parts to be repairable by commonly applied commercial processes.
- c. Materials selected shall preclude exposure of personnel, facilities, and the environment to toxic, explosive, and fire hazards.

3.1.17.1 Flammable Materials

Materials shall be noncombustible or fire retardant in the most hazardous conditions of atmosphere, pressure, and temperature to be expected in their application. Non-permanent fire retardant additives shall not be used to achieve fire retardance.

3.1.17.2 Fungus-Inert Materials

When the specified environment is conducive to fungus growth, the equipment shall be fabricated using fungus-inert materials.

3.1.17.3 Hazardous Materials

The equipment shall not expose personnel or the environment to excessive levels of toxic, carcinogenic, teratogenic, and otherwise hazardous materials as defined by OSHA and the Environmental Protection Agency (EPA). If hazardous materials must be used in order to meet the performance requirements of this specification, only Government-authorized materials shall be used, the hazardous items shall be suitably marked, and all due precautions shall be taken to prevent whatever harm the hazardous material may cause.

3.1.17.4 Metals

Metals shall be corrosion-resistant, or shall be coated or metallurgically processed to resist corrosion. The environmental conditions to which the equipment will be exposed shall not cause corrosion and shall not cause deterioration of metal parts.

3.1.17.5 Wood Products

Wood products shall be treated for preservation, fire-retardance, and termite protection, and shall conform to commercial Grade B or better.

3.1.17.6 Radioactive Material

Radioactive materials shall not be utilized.

3.1.17.7 Processes

Processes shall be in accordance with established industry standards (e.g., American Society for Testing and Materials (ASTM), ANSI, IEEE). The following additional requirements shall apply to the fabrication of Special Purpose Equipment (SPE), unless otherwise specified.

3.1.17.8 Painting, and Preparation for Painting

Surfaces to be painted shall be prepared and painted in accordance with the paint manufacturer's recommendations.

3.1.17.9 Parts

The MC-ITS V.2 shall comply with the Defense Standardization Program (U.S. Code Title 10, Section 2451 - 2456), which requires the achievement of the highest practicable degree in the standardization of items and practices used through the Department of Defense. The parts standardization program defines the management controls to minimize the number of unique parts in the design and maximize the use of Government standard parts. No proprietary hardware shall be designed into the system. The use of custom designed microelectronic devices shall be avoided unless no reasonable alternative exists. All power supplies to be used in the system shall be Commercial Items to the maximum extent practicable.

3.1.18 Electrostatic Discharge (ESD) Sensitive Assemblies and Equipment

The MC-ITS V.2 shall ensure that ESD sensitive electrical and electronic parts, assemblies, and equipment are protected from damage due to ESD. Applicable functions where ESD control elements are to be applied are design, production, inspection and test, storage and shipment, installation, maintenance, and repair.

3.1.19 Nameplates and Product Markings

MC-ITS V.2 equipment and cables shall be identified and marked in accordance with the following requirements. A nameplate shall be permanently affixed to the systems in a prominent location designated by the contracting officer. Methods of applying, type of lettering, permanency, and legibility of markings shall be IAW MIL-STD-130M.

3.1.20 Item Unique Identification Description (IUID)

If the MC-ITS V.2 equipment value is at or above \$5000.00, mission critical, or serially managed, then the equipment shall be marked with an IUID.

The equipment IUID shall include a two-dimensional (2-D) Data Matrix bar code.

The IUID markings shall consist of:

- a. Device Nomenclature,
- b. Manufacturer of the Training System
- c. Year Manufactured,
- d. Part Number,
- e. Serial Number,
- f. Original Equipment Manufacturer (OEM), and
- g. Contract Number.

Methods of applying, type of lettering, permanency, and legibility of this nameplate shall be IAW MIL-STD-130M. All IUID shall be permanently affixed to the equipment.

3.1.20.1 Marking of Units, Assemblies, Subassemblies, and Parts

Units, assemblies, subassemblies, and parts, as defined in MIL-STD-130M, shall be identified and marked in accordance with the following requirements.

3.1.20.2 Units

Each unit shall be marked with MC-ITS V.2-supplied identification (ID) plates as shown below in Figure 1. The ID plates shall be located in the front and back of the units, at the top center location, and shall be installed so that they are not obscured by other parts. Information on the ID plates shall include the unit reference designator assigned. Unmodified GFE is exempt from the marking requirements of this paragraph.

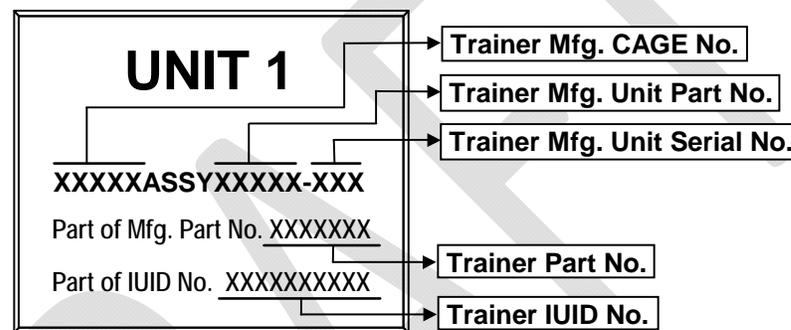


Figure 1 Unit ID Plate

3.1.20.3 Plug-in Assemblies

Plug-in assemblies and subassemblies shall be keyed or permanently color-coded to minimize the probability of incorrect connection and insertion. Where keying or color-coding is impractical, a permanent, legible directory or chart shall be posted conspicuously on or adjacent to the equipment, showing location and orientation of such assemblies and subassemblies.

3.1.20.4 Fuse Holders

The current rating of fuses shall be marked adjacent to the fuse holder. In addition, "SPARE" shall be marked adjacent to each spare fuse holder. This requirement shall apply to CaNDI that is procured using Control Drawing (CD). Unmodified T-IED Commercial items, GFE, and MC-ITS V.2-Acquired Operational Equipment (CAOE) are exempt.

3.1.20.5 Printed Wiring Boards

Markings on printed wiring boards shall not interfere with electrical operation. When ink is used, it shall be non-conductive. CaNDI, unmodified GFE, and CAOE are exempt from the requirements of this paragraph.

3.1.20.6 Terminals, Terminal Blocks and Strips

All terminals, terminal blocks, and terminal strips shall be identified and marked in a clear and permanent manner to facilitate replacement of connections. Where space limitations prohibit marking on the terminal, terminal block, or terminal strip, the marking shall be on the chassis adjacent to the terminal, terminal block, or terminal strip. The requirements of this paragraph shall apply to CaNDI that are procured using Controlled Drawings. Unmodified Commercial items, GFE, and CAOE are exempt from the requirements of this paragraph.

3.1.20.7 ESD Marking

Unless otherwise specified herein, ESD sensitive assemblies and equipment shall be marked as follows.

3.1.20.7.1 ESD Sensitive Assemblies

ESD sensitive assemblies shall be marked with the EIA RS-471 or the military symbol as illustrated below in Figure 2. The symbol shall be located in a position readily visible to personnel when the assembly is incorporated in its next higher assembly. The requirements of this paragraph shall apply to CaNDI. Unmodified GFE is exempt from the requirements of this paragraph.

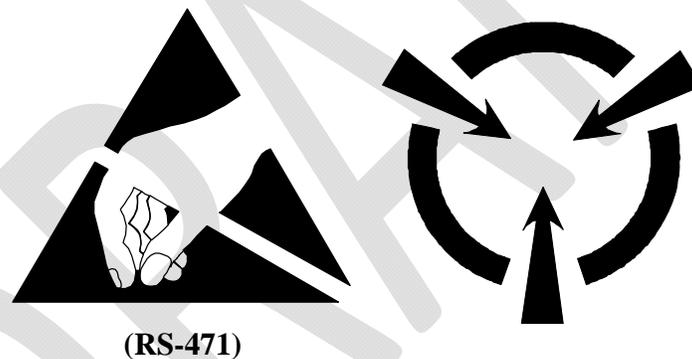


Figure 2 ESD Symbols

3.1.20.7.2 ESD Sensitive Equipment

Equipment containing ESD sensitive parts and assemblies shall be marked with the EIA RS-471 or military symbol. The symbol shall be located on the exterior surface of the equipment and readily visible to personnel prior to gaining access to ESD sensitive parts and assemblies within the equipment. The ESD caution statement shown in Figure 3 below shall be placed adjacent to the ESD sensitive symbol:



Figure 3 ESD Caution Label

3.1.20.8 CaNDI Marking

Where CaNDI equipment external marking or identification of controls, fuses, cables, and connectors is absent, such equipment shall be marked with function or rating. Method of applying, permanency, and legibility of reference designators shall be as specified in MIL-STD-130M. Where the equipment contains plug-in modules that are not keyed to prevent incorrect connection or insertion, a permanent legible directory or chart showing identification number, location, or orientation of such modules, shall be provided and posted conspicuously on or adjacent to the equipment.

3.1.20.9 CaNDI Identification, Nameplates, and Labels

All nameplates, instruction labels, and equipment identification furnished with CaNDI shall be written in the English language and numbering system.

3.1.21 Safety Markings

Danger, caution, and warning signs, labels, and markings shall be used to warn of specific hazards such as voltage, current, thermal, or physical. Method of applying, permanency, and legibility of reference designators shall be as specified in MIL-STD-130M. Guards, barriers, and access doors, covers, or plates shall be marked to indicate the hazard that may be present upon removal of such devices. When possible, marking shall be located such that it is not removed when the barrier or access door is removed. Additionally, hazards internal to units shall be marked adjacent to hazards if they are significantly different from those surrounding items.

- a. Physical hazards shall be marked in accordance with ANSI Z53.1-79.
- b. Voltage hazards shall be marked in accordance with ANSI Z35.1-72, and ANSI Z35.4-73.

3.1.22 Power Requirements

The power requirements for MC-ITS V.2 shall comply with the following requirements:

3.1.22.1 Power-line Monitoring/Protection

The equipment shall be protected against damage and malfunctions resulting from power line abnormalities described herein. Appropriate monitors and indicators shall be provided to reveal the nature of the abnormality detected.

3.1.22.2 Under/Over Voltage

If power line voltage at the system input power distribution panel exceeds the operating limits specified for the system by more than ± 5 percent for a period of 5 seconds or more, automatic shutdown of the system shall occur. When the system is supplied by multiphase line power, automatic shutdown of the system shall occur when these limits are exceeded on one or more of the phases. A visual indication of the condition shall be provided. If operating limits are not specified elsewhere, the limits shall be presumed to be +6 percent and -13 percent of the nominal power line voltage supplied.

3.1.22.3 Voltage Transients

Phase-to-phase or phase-to-neutral voltage transients shall not cause part failures, prevent resumption of normal operation, or require the equipment to recycle when the transients have ceased.

3.1.22.4 Phase Rotation

Equipment supplied by multiphase line power and which is phase sensitive, shall be protected against inadvertent phase-reversal conditions. Means shall be provided in the power distribution system, to prevent the energizing of phase sensitive equipment with incorrect phase sequence.

3.1.22.5 Under-frequency

Equipment powered by mobile electric power generation equipment shall be protected against under-frequency conditions. Means shall be provided to automatically initiate safe shutdown of the system, or critical equipment within the system, when a deviation of more than 15 percent below the nominal operating frequency occurs for a period of five or more seconds.

3.1.22.6 Frequency Transients

The system shall continue operation during transients within ± 3 percent of nominal frequency. A frequency variation of ± 15 percent for periods up to ten seconds, occurring not more than once every five minutes, shall not result in permanent damage, modification of characteristics, and loss or change of computer stored memory information.

3.1.22.7 Power Interruption

The equipment shall be protected from permanent damage, modification of characteristics, and loss or change of computer stored memory information, resulting from a power interruption with power restored within 1 to 30 seconds and occurring not more than once every five minutes.

3.1.23 Logistics

3.1.23.1 Maintenance Concept

The maintenance concept consists of on-site (organizational) maintenance. The on-site maintenance consists of preventive maintenance and corrective maintenance. The on-site corrective maintenance shall include any fault detection, fault isolation, and removal and replacement to the Lowest Replaceable Unit (LRU) in order to restore the MC-ITS V.2 to operational status in minimal time

3.1.23.2 Special Tools

There shall be no need to use special tools for equipment maintenance unless common tools are inadequate.

3.1.23.3 Accessibility

The MC-ITS V.2 shall provide the means to access internal parts, terminals, and wiring, for adjustments, required circuit checking, and the removal and replacement of maintenance parts. Accessibility for testing shall not apply to parts located in non-repairable assemblies. For routine servicing and maintenance, unsoldering of wires, wire harnesses, parts, or subassemblies shall not be required in order to gain access to terminals, soldered connections, mounting screws, and the like. The following additional requirements shall also apply.

3.1.23.4 Cable Slack

The MC-ITS V.2 shall have sufficient cable slack and cable-bending features to assure full extension access to multiple equipment extensions during maintenance without stressing the cables and associated connectors. The MC-ITS V.2 shall provide sufficient slack in the cables behind equipment panels to permit removal of each instrument, display, or control panel and disconnection from associated cables in one maintenance operation from the front of the equipment without stressing the cables and associated connectors. The need for rear access to disconnect or reconnect the equipment from associated mounting shall be prevented.

3.1.23.5 Parts

Replaceable parts shall be readily removable. For example, replaceable parts shall not be permanently mounted by means such as rivets, spot welding, or hard curing compounds. No unsoldering of connections shall be necessary in order to remove front panels or sub-chassis for maintenance purposes.

3.1.23.6 Assemblies

All parts shall be readily accessible for maintenance. Locking devices shall be provided to lock the chassis in the servicing position and in the fully opened and fully closed positions. Each major assembly, subassembly, and unit shall permit access to its interior components and parts for maintenance. It shall not be necessary to displace or remove wires, cables, subassemblies, or assemblies in order to gain access to mounting screws, test points, adjustment points, lubricating points, and the like. Where visual inspection is necessary, and open access is not feasible, transparent access panels shall be used. The placement of parts shall provide space for the use of test probes and maintenance tools. Assemblies subject to replacement or service shall not be permanently fastened.

3.1.23.7 Covers, Panels, and Doors

Hinged covers and doors shall be equipped with means to retain them in their open positions. When opened, hinged covers and doors shall not cause the equipment to become unbalanced. Removable covers for which no convenient location is available during maintenance shall be equipped with a chain or lanyard fastened to the equipment. Front panels containing parts that require maintenance, such as instruments, switches, potentiometers, and the like, shall be hinged. Where parts or assemblies are mounted on hinged doors, on panels, and on covers, the electrical ground return shall not depend on the hinge contact for electrical continuity. Means shall be provided on hinged panels to retain the panels in the open position to permit accessibility to all parts mounted on the panels, to prevent damage to the panels, and to prevent injury to personnel performing maintenance.

3.1.23.8 Handles

Handles and handgrips shall be provided for removing units or chassis from enclosures. Handles on enclosures shall be recessed.

3.1.23.9 Modular Assemblies

Modular assemblies such as circuit boards shall be equipped with connectors so that they may be removed without de-soldering. All modular assemblies shall be designed so that they can be inserted into the equipment in one position only. All sockets within each assembly shall be oriented in the same direction and positioned so that they are visible. Modular circuits shall be grouped in functional units.

3.1.23.10 Circuit Cards

Where practicable, functions shall be apportioned to circuit cards to take advantage of standardization and commonality of components, such that the need for spare parts inventory is minimized.

3.1.23.11 Circuit Card Connectors

Circuit card connectors shall have means of positive connection without diminishing the life of the connector under normal mating and un-mating cycles.

3.1.23.12 Circuit Card Connectors, Power and Ground

Power and ground connections to circuit boards shall be arranged so that inadvertent insertion of a card in the wrong slot shall not result in damage to the card or to other parts of the MC-ITS V.2.

3.1.23.13 Wiring Board Extender Cards

Where connector termination points are not accessible for testing, extender cards shall be provided. Extender cards shall have matching indexing system and shall be identified with their corresponding wiring boards. Insulating materials shall not be applied to the conducting surfaces of extender cards.

3.1.24 MC-ITS V.2 Security

The MC-ITS V.2 shall provide a level of security (physical and information) that is commensurate with the security level of the information handled by these systems, and conform to form DD-Form 254 security requirements. For classified information, if the trainer writes to Electrically Erasable Programmable Read-Only Memory (EEPROM), and EEPROM has a possibility of containing classified data, the trainer shall provide the means to purge or remove the classified data to de-classify the system. Guidance for purging EEPROM, Flash EEPROM, and Electrically Alterable PROM (EAROM) can be found in section 3.2.2 of the Navy Information Assurance (IA) Pub-5239-26.

The MC-ITS V.2 system shall prevent inadvertent disclosure of any sensitive information and provide safeguards to prevent unauthorized access to the system or information used by the system. The system shall:

- Insure the availability, integrity, authentication, confidentiality, and non-repudiation of program and system information

- Limit physical access to equipment for security and protection of sensitive equipment
- Provide physical security devices for remote equipment to deter theft

Classification marking of documents shall conform to the requirements of "Marking Classified National Security Information" booklet and ISOO Implementing Directive No. 1, and shall be used to mark all data output from the system.

3.1.25 Information Security, Software and Operating systems

Software and Operating systems (OSs) that provide Information Assurance (IA) shall be trusted software and OSs as set forth in NSTISSP No. 11. A trusted OS is one that can be secured using Defense Information Systems Agency (DISA)/National Security Agency (NSA)-approved configuration scripts (Security Technical Implementation Guides (STIG)), [or one that can be secured IAW the security requirements of DoD 5220.22-M, Chapter 8]. The DISA configuration scripts (STIGs) are available at <https://iase.disa.mil/documentlib.html#TECHGUIDOCS> and <https://guidespki.ritchie.disa.mil/home.htm>. A .mil or .gov domain (including a PK certificate), obtained through DoD/DISA channels, is required to access these sites. The NSA guides are available at <http://www.nsa.gov/snac> (covers Microsoft OSs: NT, Win2K, XP, and Server 2003).

Note: Widely used Commercial Item OSs such as RedHat Linux and MS Windows OSs may be used in the MC-ITS V.2. Certain types of LINUX/UNIX OSs require the use of third party or middleware to provide security and auditing capabilities when these operating systems support general users or support applications containing user code.

3.1.26 Application Software Integrity

Application software shall function as designed in a properly secured operating system environment. Application software shall be free of elements that might be detrimental to the secure operation of the resource operating system, including:

- a. Malicious code
- b. Trojans, worms, logic bombs, and other computer viruses
- c. Backdoors
- d. Ad-ware, Spy-ware, or web bugs that have the ability to track user behavior
- e. Code that permits functions that are beyond the actual publicized intent of the application software

3.2 Construction

3.2.1 Workmanship

The following requirements shall apply.

3.2.1.1 Cleaning

After fabrication, parts and assembled equipment shall be clean of smudges and scratches; loose, spattered, or excess solder; weld metal; metal chips and mold release agents; or any other foreign material and marks that might detract from the intended operation, function, or appearance of the equipment.

3.2.1.2 Threaded Fasteners

Screws, nuts, and bolts shall show no evidence of cross threading, mutilation, or burrs, and shall be firmly secured.

3.2.1.3 Wiring

Wires and cables shall be positioned or protected to avoid contact with rough surfaces, irregular surfaces and sharp edges, and to avoid damage to conductors and adjacent parts. Harnesses and cable form containment means shall be neat in appearance, uniformly applied, and positioned to retain critical form factors and breakout locations. The containment means (e.g., lacing, ties, tie-down straps, and others) shall not cause the insulation to deform to the point where performance is adversely affected. There shall be no evidence of burns, of abrading, or of pinch marks in the insulation that could cause short circuits or leakage. Sufficient clearance shall be provided between wires or cables and heat generating parts to avoid deterioration of the wires and cables.

3.2.1.4 Shielding

Shielding on wires and cables shall be secured in a manner that shall prevent it from contacting or shorting exposed current-carrying parts. The ends of the shielding or braid shall be secured to prevent fraying.

3.3 Electrical Safety

All MC-ITS V.2 electrical circuitry and installation shall comply with the requirements of the National Electric Code (ANSI/NFPA 70-02).

4. VERIFICATION

4.1 Methods of Verification

The following methods will be utilized to accomplish the verification of requirements:

- a. Analysis
- b. Demonstration
- c. Examination
- d. Test

4.2 Classes of Verifications

The MC-ITS V.2 will be subject to the verification classes listed below in accordance with the Test and Evaluation requirements of the contract. Under each verification class, the MC-ITS V.2 will be subject to the inspections and tests specified in 4.3 below.

- a. In-process inspections
- b. Government Preliminary Inspection (GPI)
- c. Government Final Inspection (GFI), and
- d. Physical Configuration Audit (PCA)

4.3 Inspections and Tests

The MC-ITS V.2 shall be subject to the following inspections and tests.

- a. Visual inspections,
- b. Functional tests,

- c. Computer system tests, and
- d. Software cold start tests.

4.3.1 Visual inspections

The visual inspection shall consist of verification of the availability of trainer system documentation relative to testing requirements, a walk through inspection to determine compliance with safety requirements, and familiarization with emergency power-off procedures.

4.3.2 Functional tests

Functional tests shall include the verification and validation of the training system design.

4.3.3 Computer system tests

Computer system tests shall consist of power-up sequencing, on-line readiness, verification of commercial computer vendor documentation, including the computer operator's manual, and the following.

4.3.4 Software cold start test

Trainer software, including all databases, shall be subject to cold start testing. The cold start test shall commence with all trainer power removed and all main memory and on-line storage media formatted, but otherwise blank. The trainer computer system shall be energized and the cold start, run in accordance with the test procedures. The cold start shall include a complete system generation using only deliverable hardware, software, and documentation. All executable code shall be created from the source programs and command or job control language and database source data. The process by which the cold start is accomplished (e.g., script, batch, job control file/program) shall be considered as software and shall be documented and controlled as such. The cold start process shall not suppress the generation of any error messages nor warnings that occur from the library, assembly, compile, or link processes. There shall be no errors nor abnormal conditions of any kind, including warnings, in either the source or resultant executable or database code prior to the start of testing (e.g., no error indications of any degree from the library, assembly, compile, or link processes). Should compiler or linker warnings be generated, they shall be documented and justified in the cold start procedure. All trainer performance tests during Government verifications shall utilize the executable and database code resulting from the cold start.

4.3.4.1 Training scenarios

Training scenarios shall be conducted to demonstrate that the trainer performance satisfies the specified training requirements under mission oriented integrated operation. Training scenarios will be defined by the Government.

4.3.4.1.1 Stress tests

The stress tests shall consist of a series of tests at the subsystem, system, inter-system and trainer integrated system levels to exercise the design in the worst case loading and most stringent and demanding computation situation where maximum calculations, signal generation, and data transfer is taking place.

4.3.4.1.2 Free play tests

The Government reserves the right to test the trainer performance with procedures other than defined in the Government-accepted Test Procedures and other Government-accepted test plans defined in the contract. The free play tests shall not exceed specified trainer capabilities and shall be conducted within the specified gaming area.

4.3.5 Product assurance tests

The product assurance tests shall determine compliance with the specified performance requirements.

4.3.5.1 ESD tests

All operator accessible electronic equipment shall be subject to ESD tests to verify compliance with the specified trainer ESD requirements.

4.3.5.2 Human factors engineering compliance tests

The human factors engineering compliance tests shall consist of an evaluation of the trainer design characteristics to determine compliance with the specified human factors engineering requirements.

4.3.5.3 Nonfunctional examinations

The trainer shall be subject to the non-functional examinations performed to demonstrate the trainer as-built design satisfies the specified requirements. The examinations shall encompass all areas, major assemblies, and sub-assemblies of the areas of the completely assembled trainer. The examinations, performed with trainer power off, shall verify conformance to the requirements for:

- a. Materials,
- b. Design,
- c. Construction,
- d. Assembly and fit,
- e. Cable markings,
- f. Size, weight and transportability,
- g. Finish (corrosion protection and treatment),
- h. Nameplates and product markings, and
- i. Safety.

4.3.6 Reliability Assessment

The system-level reliability assessment shall demonstrate compliance with the specified quantitative reliability requirements.

a. Failure criteria. All failures occurring during the reliability assessment shall be classified as Relevant or Non-relevant failures. Those failures classified as chargeable shall be used for determining the achieved MTBF Failure criteria shall be defined in the government accepted test plan

b. Reliability test conditions. During the reliability assessment, the MC-ITS V.2 shall be exercised at frequencies and durations typical of those occurring in normally scheduled training operations. The environmental conditions to be applied and their variation with time shall be representative of the actual operational environment at the MC-ITS V.2 training areas. Electrical stresses shall include ON-OFF cycling and operation under the specified operating modes and duty cycles.

4.3.7 Maintainability Assessment

MC-ITS V.2 maintenance actions shall be monitored, recorded, and evaluated to demonstrate compliance with the specified MTTR requirement. MTTR elements subject to tracking during maintenance actions include failure isolation, disassembly, removal and replacement, reassembly, and checkout times.

4.3.8 Nonfunctional Examinations

The MC-ITS V.2 shall be subject to the non-functional examinations performed to demonstrate the MC-ITS V.2 as-built design satisfies the specified requirements. The examinations will encompass all areas, major assemblies, and sub-assemblies of the areas of the completely assembled system. The examinations, which shall be performed with the system power off, shall verify conformance to the requirements for:

- j. Materials
- k. Parts (standard/nonstandard)
- l. Design
- m. Construction
- n. Assembly and fit
- o. Wire markings
- p. Dimensions and tolerances
- q. Size, weight and transportability
- r. Color
- s. Finish (corrosion protection and treatment)
- t. Nameplates and product markings
- u. Safety
- v. Workmanship.

5. PACKAGING

The MC-ITS V.2 shall provide preservation and packaging in accordance with best commercial practice of ASTM D3951. The MC-ITS V.2 shall be packaged to have all of its components into their respective transit cases. All shipments shall be preserved, packaged, and marked.

Transportation

The MC-ITS V.2 shall develop and document in the Operators Manual the processes and procedure required for transporting the MC-ITS V.2 components. This shall include modes of shipment and precaution while the equipment is in transit.

6. NOTES

6.1 Definitions

The following definitions are applicable to this specification.

6.1.1 Commercial Item

Per the Federal Acquisition Regulations, Part 2.101, "Commercial Item" means:

a. Any item, other than real property, that is of a type customarily used by the general public or by non-governmental entities for purposes other than governmental purposes, and--

- (1) Has been sold, leased, or licensed to the general public; or,
- (2) Has been offered for sale, lease, or license to the general public;

b. Any item that evolved from an item described in paragraph a. of this definition through advances in technology or performance and that is not yet available in the commercial marketplace, but will be available in the commercial marketplace in time to satisfy the delivery requirements under a Government solicitation;

c. Any item that would satisfy a criterion expressed in paragraphs a. or b. of this definition, but for--

- (1) Modifications of a type customarily available in the commercial marketplace; or
- (2) Minor modifications of a type not customarily available in the commercial marketplace made to meet Federal Government requirements. Minor modifications mean modifications that do not significantly alter the non-governmental function or essential physical characteristics of an item or component, or change the purpose of a process. Factors to be considered in determining whether a modification is minor include the value and size of the modification and the comparative value and size of the final product. Dollar values and percentages may be used as guideposts, but are not conclusive evidence that a modification is minor;

d. Any combination of items meeting the requirements of paragraphs a., b., c., or e. of this definition that are of a type customarily combined and sold in combination to the general public;

e. Installation services, maintenance services, repair services, training services, and other services if--

- (1) Such services are procured for support of an item referred to in paragraphs a., b., c., or d. of this definition, regardless of whether such services are provided by the same source or at the same time as the item; and
- (2) The source of such services provides similar services contemporaneously to the general public under terms and conditions similar to those offered to the Federal Government;

f. Services of a type offered and sold competitively in substantial quantities in the commercial marketplace based on established catalog or market prices for specific tasks performed or specific outcomes to be achieved and under standard commercial terms and conditions. This does not include services that are sold based on hourly rates without an established catalog or market price for a specific service performed or a specific outcome to be achieved. For purposes of these services--

- (1) "Catalog price" means a price included in a catalog, price list, schedule, or other form that is regularly maintained by the manufacturer or vendor, is either published or otherwise

available for inspection by customers, and states prices at which sales are currently, or were last, made to a significant number of buyers constituting the general public; and

(2) “Market prices” means current prices that are established in the course of ordinary trade between buyers and sellers free to bargain and that can be substantiated through competition or from sources independent of the offerors.

g. Any item, combination of items, or service referred to in paragraphs a. through f. of this definition, notwithstanding the fact that the item, combination of items, or service is transferred between or among separate divisions, subsidiaries, or affiliates of a MC-ITS V.2; or

h. A Non-Developmental Item, if the procuring agency determines the item was developed exclusively at private expense and sold in substantial quantities, on a competitive basis, to multiple State and local governments.

6.1.2 Control Drawing

A drawing disclosing engineering form, fit, and function performance specifications for the acquisition of interchangeable vendor or commercial items of existing designs, and of items specially developed by vendors to the control drawing requirements.

6.1.3 Interchangeable Item

An item which:

a. Possesses such functional and physical characteristics as to be equivalent in performance, reliability, and maintainability, to another item of similar or identical purposes, and

b. Can be exchanged for the other item without selection for fit or performance, and without alteration of the items themselves or of adjoining items, except for adjustment.

6.1.4 Non-Developmental Item (NDI)

Per the Federal Acquisition Regulations, Part 2.101, NDI means:

a. Any previously developed item of supply used exclusively for governmental purposes by a Federal agency, a State or local government, or a foreign government with which the United States has a mutual defense cooperation agreement;

b. Any item described in paragraph a. of this definition that requires only minor modification or modifications of a type customarily available in the commercial marketplace in order to meet the requirements of the procuring department or agency; or

c. Any item of supply being produced that does not meet the requirements of paragraph a. or b., solely because the item is not yet in use.

6.1.5 Scheduled Maintenance

Those maintenance tasks performed at predetermined time intervals in accordance with maintenance documentation prepared by the MC-ITS V.2 to ensure continuous satisfactory operation of the equipment.

6.1.6 Unscheduled Maintenance

Those corrective maintenance tasks performed on-line at the equipment by operators, instructors, or maintenance personnel to remedy malfunctions and return the equipment to an operable status.

6.1.7 Verification Methods

The following defines the verification methods specified in section 4 of this specification.

6.1.7.1 Analysis

An element of verification that utilizes established technical or mathematical models or simulations, algorithms, charts, graphs, circuit diagrams, or other scientific principles and procedures to provide evidence that stated requirements were met.

6.1.7.2 Demonstration

An element of verification that generally denotes the actual operation, adjustment, or reconfiguration of items providing evidence that the designed functions were accomplished under specific scenarios.

6.1.7.3 Examination

An element of verification and inspection that consists of investigation, without the use of special laboratory appliances or procedures, of items to determine conformance to those specified requirements, which can be determined by such investigations. Examination is generally nondestructive and typically includes the use of sight, hearing, smell, touch, and taste; simple physical manipulation; mechanical and electrical gauging and measurement; and other forms of investigation.

6.1.7.4 Test

An element of verification and inspection that generally denotes the determination, by technical means, of the properties or elements of items, including functional operation, and involves the application of established scientific principles and procedures.