CATALOG OF SERVICES AND EQUIPMENT

FOR

MILITARY OPERATIONS ON URBANIZED TERRAIN (MOUT)/ RESTRICTIVE TERRAIN (RT) INDEFINITE DELIVERY/INDEFINITE QUANTITY (ID/IQ) CONTRACT

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Military Operations on Urbanized Terrain (MOUT) / Restrictive Terrain (RT)
Indefinite Delivery/Indefinite Quantity (ID/IQ) Contract
Catalog of Services and Equipment

Introduction

The purpose of this catalog is to define/describe MOUT/RT related services, solutions and hardware/equipment that the U. S. Army, other Department of Defense (DOD) agencies, and other external DOD customers can be able to procure through the use of the MOUT/RT ID/IQ contract. Acquisitions will consist of services and products including hardware, software, applications development, systems integration, prototyping, logistics, and technical support services designed to enhance MOUT/RT training capability.

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MOUT/RT CAPABILITIES:

SCOPE: The scope of this document includes all of the capabilities and services available to enhance MOUT/RT training facilities. The document is broken down into several key conceptual areas:

(1) Studies and Analyses: These allow for the various technical and design studies necessary to plan and produce instrumentation systems for the MOUT/RT environment. These will range from White Papers to detailed Analyses.

(2) Design and Planning: These allow for the early prototyping of conceptual designs, the documentation of infrastructure requirements to support total system, and the design and layout of a yet to be built facility.

(3) Construction: These allow for the construction/modification of buildings to support the requirements of the training activity.

(4) Development and Integration: These efforts will result in the actual fielding of instrumentation equipment to enhance the operational effectiveness of training. These efforts range from the building and modification of structures, to the installation of advanced simulation and instrumentation equipment.

(5) Logistics and Support: These efforts include all aspect of product support, from new equipment training to mission support.

The general concept for the MOUT ID/IQ is to employ, maintain, and field urban and restrictive terrain instrumentation that allows interoperability between training sites and tactical equipment, and is modular in design to allow flexible deployment of assets to meet the particular training needs. The vision is that a backbone architecture can be established that will allow customers to buy their instrumentation suite in a piece meal fashion and have the confidence that additional portions can be procured and integrated in a plug and play approach. The intent is that all systems fielded through this effort either have or can have an HLA gateway.

1.1. Background: In general, U.S. and allied forces do not possess the overwhelming high technology advantages in Military Operations on Urbanized Terrain (MOUT) and the Restrictive Terrain (RT) environment that they do in virtually all other environments. The majority of current U.S. military capabilities is a legacy of the Cold War, designed for large-scale, high intensity mechanized operations, rather than for the current broad ranges of threats our forces now face. Many of the systems, which performed so well in open terrain, will be degraded in the dense urban environment. To correct this deficiency, there is a need to modernize the forces with better equipment, tactics and MOUT/RT training.

The fundamental objective of MOUT/RT training is to improve the operational effectiveness of soldiers operating in urban or built up areas.

Some specific missions of this training are as follows:

- Achieve dominance in MOUT/RT go to war operations utilizing advanced technologies and new operational concepts.
- Improve the operational capabilities of units in a MOUT/RT environment with the associated Tactics, Techniques and Procedures (TTPs).

As a general rule, customers attempting to implement training to achieve the above objectives do so by using locally conceived ideas and plans without reference to the wide range of existing solutions that may have already been developed by industry or military labs. When it comes to providing material solutions to existing or emerging TTPs, STRICOM, on the other hand, has knowledge of, and access to, a wide range of existing analysis services, technology, and ongoing developmental and production programs. Therefore, STRICOM is in a unique position to act as a facilitator to ensure a Service-wide coordination effort is in place with access to the technology required to implement effective MOUT/RT training and to provide an Indefinite Delivery/Indefinite Quantity (ID/IQ) contract vehicle to obtain that technology.

1.2. Goals: STRICOM goals under this ID/IQ contracting effort are to:

- Assist customers in obtaining their MOUT/RT training objectives
- To create common MOUT/RT architecture that allows cross integration (both with respect to logistic support and commonality and compatibility between fielded systems)
- To produce common products that are supportable in the long term
- To produce common products that are supported through a common source

2. Technical and Conceptual Studies:

Studies and analyses can be performed under this ID/IQ contract for the following areas:

2.1 Training

Existing training requirements can be analyzed for impacts based on future training needs and new training concepts. Training capabilities can be defined based on current and future MOUT facilities. This includes identifying and documenting the existing MOUT/RT capabilities throughout the army, and the development of concepts of operation for a given site given the operational needs. These studies could also include the establishment of a starting point for the development and planning of an urban environment (costs, documents, etc). Finally, these studies could establish a checklist of activities, decisions, plans, and documents, which are required for the development of urban and restrictive terrain environments.

2.2 Environment

Existing facilities can be analyzed to determine upgrades required or the requirement for additional construction. Training requirements can be examined to determine location of new facilities. These studies include producing geographical representation of various village types and terrain features to match the requirements/needs.

2.3 Supportability

System and equipment supportability analyses can be conducted to ensure a high level of availability with minimal cost impact. These studies will include comprehensive logistic analyses with focus on life cycle support and costs (total life-cycle ownership cost, supportability issues, etc.).

2.4 Technical Studies/Analyses

Studies can be performed to determine new training requirements based on the impact of changes in the design/changes of military equipment and tactics, impact of new technologies, and linkages of Live, Virtual, and Constructive Simulations. Spectrum Analyses are included within this area.

2.5 Safety and Health Hazard Studies/Analyses

Studies can be performed to assess the safety and environmental concerns and impacts associated with the development of a MOUT/RT training area. These studies can include environmental impact studies (compliance issues with EPA and local regulations), as well as safety assessments and Human Factors Engineering.

2.6 Feasibility and Cost Benefit Analyses

Studies can be performed to determine the technical feasibility of proposed solution to fulfill training requirements; to perform trade-off analyses and determinations; and to perform cost benefit analyses (efficiency and effectiveness).

3 Site Planning and Design

Customers will be able to procure design analysis services for planned and existing MOUT/RT sites/facilities. This design analysis will serve to identify deficiencies that might exist in current site designs and any future enhancements/improvements required to support planned training. If applicable, the design will determine all required modifications and additions to existing hardware components and software in order to allow for required technology refreshments. Analysis will encompass the following areas:

3.1 Planned MOUT/RT Site Facilities/Structures

3.1.1 Site Design.

Selected MOUT/RT sites can be evaluated to determine their full capabilities to support envisioned training requirements. Areas that will be subject to analysis would include area of the world to be replicated, type of building construction, road network, subterranean operations, etc. This design analysis will serve to identify deficiencies that might exist in proposed site design to support planned training and any future enhancements. The site design will take into consideration the usage profile (e.g., live fire) and the unique considerations resulting from this usage (e.g., range safety, targetry, and ammunition requirements/limitations)

3.1.2 Building Design.

Analysis of building construction can be conducted to evaluate and determine the types of training that can be conducted. Suitability/potential of buildings for Live Fire and/or Force-on-Force use will be determined. This design analysis will serve to identify deficiencies that might exist in planned building design to support planned training and any future enhancements/improvements.

3.2 Existing MOUT/RT Site Facilities/Structures

3.2.1 Site Redesign/Modification.

Analysis can be conducted to determine all required modifications and additions to the MOUT/RT site in order to enhance current training capabilities. This design analysis can serve to identify deficiencies that might exist in the current site to support planned training and any future enhancements/improvements.

3.2.2 Building Redesign/Modification Analysis.

Analysis can be conducted to determine all required modifications and additions to existing buildings to enhance training capabilities. Suitability/potential of buildings for Live Fire or Force-on-Force use also can be determined.

4 Instrumentation Planning, Infrastructure Design, and System Design

4.1 Communication Network System

Analysis can be conducted to evaluate planned or existing network systems to verify their planned/current operational capabilities. This evaluation will determine if the network system can support all devices that are currently attached to it or planned to be connected. Upgradability of the communication network system will also be evaluated. An analysis can be conducted to design a communication network system to support planned and future training requirements.

4.2 Audio-Visual System Design

Analysis can be conducted to design an Audio-Visual system to support planned and future training requirements. System design can be undertaken to provide video, audio, or both with the flexibility for upgrade

4.3 Entity Instrumentation and Data Collection

4.3.1 Entity Instrumentation

Analyses can be conducted to design an Entity Instrumentation and Data Collection system. System design will allow the operators of the system to track the position and status of any key element of interest during a training event (human, objects, buildings, etc.).

4.3.2 Casualty Assessment System Design

Analysis can be conducted to design a Casualty Assessment System to enhance Force-On-Forces training requirements (such as Shootback and Shoot-Through-Walls devices) to support planned and future training requirements. System design will incorporate components that will have the flexibility for future upgrade.

4.4 Command and Control Capabilities

Analysis can be conducted to design a MOUT Command & Control environment to ensure constant control functions over all system components.

4.5 After Action Review (AAR)

Analysis can be conducted to design an effective AAR facility that will provide all resources required for the development and presentation of an AAR.

4.6 Targetry

Analysis can be conducted to design an infrastructure to encompass all potential uses of a Targetry system. Analysis will focus on commonality of all infrastructure items.

4.7 Battlefield Effects.

Analysis can be conducted to design an effective, safe, and integrated Battlefield Effects system, to include placement, controls, interlocks, and systems integration

5 Rapid Prototyping/Research and Development

Rapid prototyping and R&D services are available under this contract. Prototyping facilities can be constructed and/or relocated depending on program requirements. New products and technologies can be developed, integrated, and demonstrated under this function. This function can include such efforts as replication of non-lethal weapons in a Force-on-Force environment, or the utilization and replication of breaching tools.

6 Construction/Modifications

6.1 New Construction ($500K Limit).

Additional habitable and non-habitable buildings designed to supplement an existing MOUT/RT site can be constructed. Types of buildings that can be designed include both training and exercise control. Items that could be part of the building design include such infrastructure items as equipment rooms, communication network, cable trays, target and special effects control outlets, mounting space, kits and housings for cameras, sensors and smoke generators, electrical power system, etc. This includes all necessary activities to design and build an active AAR facility.

6.2 Modifications.

Building modification to support the training and mission needs can be performed. Buildings can be modified to accommodate current and anticipated training requirements and can be provided with equipment that interfaces with existing data collection systems. All installed items and modifications will be as unobtrusive as design permits. This includes the necessary efforts to redesign and/or modify the interior of buildings to accommodate AAR theaters (sound soaks, lighting, tiered seating, etc.).

6.3 Non-permanent Training Mock-ups

Additional temporary/non-permanent training facilities designed to supplement the existing capabilities can be fabricated. These facilities include unique training venues to enhance/focus the training received. These facilities may include such items as train cars, airplanes, ships, or

huts. The design/fabrication can be provided with equipment that interfaces with existing data collection systems. All installed items and modifications will be as unobtrusive as design permits.

7 System Engineering/Integration and Installation

System engineering and integration will encompass all activities necessary to develop and deploy a complete and functional system. Systems integration includes the integration of technical components, organizational components, documentation, and verification (acceptance testing). The area of system integration may make use of technical laboratories, prototype systems, and pilot systems. Types of equipment and supplies listed in this section have been selected based on their suitability and performance in a MOUT/RT type environment. The design and development of these systems will include all necessary Safety and Human Factors (person in the loop) considerations.

Wherever possible, the design of the instrumentation equipment will be flexible enough to allow the instrumentation to be either permanently installed, or modularly fielded. The modular design will focus on the ease and flexibility of deployment (plug-n-play), as well as allow the same data gather capabilities.

The instrumentation architecture has three mutually supporting objectives. First, to provide a foundation for the seamless flow of information and interoperability among all training, instrumentation, tactical, or strategic systems that produce, use or exchange information electronically. Second, to mandate standards and guidelines for system development to reduce costs and improve systems. Lastly, to consider the usage of open systems products and implementations.

7.1 Communication Network System

A communication network system (backbone) can be designed, installed, or upgraded that will provide the ability to attach all required instrumentation equipment (to include, but not limited to: video, audio, instrumentation control, and HLA data) into a seamless controllable network. Network will allow for flexibility of growth, and open system architecture.

7.2 Video/Audio/Digital Data Capabilities

7.2.1 Video (interior and exterior)

Video Systems can be designed and installed to provide the capability to monitor player activities under the following conditions: day or night operations, inside or outside, clear or obscured conditions, and in sub-zero or desert environments.

7.2.2 Audio (interior and exterior)

Audio systems can be designed and installed to provide one-way or two-way communication for building interiors and within a limited range on the exterior of the buildings. These systems have the capability of providing audio to selected areas within the MOUT/RT facility. Quantities and types of audio equipment can be investigated and designed to support the environment and the type of training required.

7.2.3 Recording Systems
Video/audio recording and capturing capability can be designed and installed to allow for the real-time storage of data collected. Systems should include both automated and manual modes of operation. Access to data should be available to all portions of the integrated system.

7.2.4 Editing Systems
Equipment, software, and accessories can be designed and installed to support the editing, copying, and/or duplication of video/audio sources. Equipment profile will be based on mission needs.

7.3 Entity Instrumentation and Data Collection

7.3.1 Entity Instrumentation
Entity (includes people and objects) instrumentation systems will be designed and developed to either enhance existing systems or as new systems to meet training requirements. These systems will provide varying degrees of position accuracy, reporting rates, data collection, weapons engagement results, and operation within and exterior to buildings with a seamless transition from outdoors to indoor environments and back. These systems will be designed to be interoperable with the current training systems force-on-force TADDS employed (if applicable) at the training facility.

7.3.2 Casualty Assessment System
An effective Casualty Assessment System to enhance Force-On-Force and Live Fire training can be incorporated into existing designs or can be engineered into new designs. System design will incorporate components that will have the flexibility for future upgrade. These systems will be designed to be interoperable with the current and planned future training systems force-on-force TADDS employed (if applicable) at the training facility.

7.3.3 Observer Controller Data Collection
An Observer Controller Data Collection set of tools will be designed, developed, and integrated with the Command and Control System that supports easier and better data collection from the training monitors in the field.

7.4 Command and Control Capabilities
Command and control consists of two separate, but inter-related functions; 1) control of the scenario and all functions within the training environment and 2) control of the forces being trained. Command and control systems within a MOUT/RT environment must address both of these areas in order to provide effective training. The design provides for an ease of programming automated operation.

7.4.1 Exercise Command & Control
Exercise command and control include the following areas: Indirect Fire Support/Control, Aviation, Intel, Combat Support Services (CSS), Special Operations Forces (SOF), Engineering and Air Defense. Provide the capabilities for the analyst to: monitor all instrumented entities' position, location, and status in near-real time; prepare reports, slides and maps with overlays and/or unit locations (and strengths as required); analyze weapon pairing/engagements in the

battlefield; present a replay of significant events of the battle; and create other graphic training aids for preparation and conduct of the AAR/THP.

7.4.2 Instrumentation Control

Instrumentation control includes room instrumentation, camera controls, lighting controls, motion/Infrared sensors, targetry controls, microphones, speakers, recording controls and shoot-through-wall solutions.

7.4.3 Instrumentation Data Collection

Efficient data collection and analysis is of prime importance to the success of the AAR process. Design efforts will consider collection of data for video, digital and analog data, audio, tactical voice, exercise (live), audio cues, battle damage assessment (BDA) (direct & collateral), casualty assessment (direct & collateral), position and tactical platforms (player or targets)

7.4.4 Battlefield Interfaces

Interfaces to utilize the existing tactical system used by the Unit must be designed and developed. Such interfaces include FBCB2, DIS/HLA Translators and ATACS consisting of MCS, MSE, CSSCS, AFATDS and AMDWS.

7.4.5 Exercise Emergency/Safety Controls

Safety devices such as panic buttons, emergency lighting, public address systems, and system override controls can be located in live fire areas and other areas deemed necessary and can be connected to a system designed to provide audio and visual cues to the control center and soldiers in the immediate area that an emergency has occurred and that training has been halted.

7.4.6 Security Mode/Linkage

A security system/approach can be designed, developed, and integrated to provide a means to protect, secure, and monitor the equipment installed. The solution will be based on the equipment installed, the expected need/threat, and the current site/facility capabilities existing. To the maximum extent possible, the solutions will utilize the installed equipment, and allow for a security mode of operation to be contained within the Data Collection System.

7.5 After Action Review (AAR)

Completely integrated AAR systems can be designed and developed to prepare, present, record, and archive all facets of an After Action Review session are available. These systems will have the capability to produce all products associated with a Take-Home-Package in any multimedia format. AAR archiving is an option available to this system. Some features include AAR generation, video editing, audio editing, map and chart plotting, slide creation, presentation, 3-D visualization/models, AAR Theater video, audio and lighting and take home package (THP).

7.6 Visual Recognition Skills

A visual recognition training skill system can be designed and developed to support monitor, test and evaluate visual recognition skills and capabilities vice IFF.

7.7 Experimentation Support

Required mission operation support labor, engineering services, interface controls and modifications, hardware/software systems, data collection units, system configuration changes, and any required additional training to support identified experimentation requests planned for a developed MOUT/RT environment can be provided. It is expected that the experimentation goals and data requirements will be provided, and this effort will entail ensuring that given the instrumentation on site, that the system/people will be capable of conducting a successful testing event.

7.8 Scenario Generation

Scenario Generation tools can be designed and developed to support Mission Planning & Rehearsal, and Exercise Planning.

7.8.1 Mission Planning & Description

Mission Planning & Description tools can be designed and developed to support or use the following types of products: Map/NIMA products, Graphic Overlays, Aerial photos/maps, Word Processing/Office suite, Tactical Message Generation (Intel, Unit Orders, etc.), and Archive/Retrieval Scenario Database systems. These tools will also allow for the generation of exercise control products, such as: Role Play/Civilians on the battlefield scripts, Props to support the exercise, and Plans for the installation of props within the buildings. These tools will be designed to consider the ease of operation and ease of program dynamics as key features.

7.8.2 Exercise Planning

Exercise Planning tools can be designed and developed to support the Instrumentation Layout to include: Graphical Configuration, Configuration Verification, Configuration Scripting, and Cause (Case) Statement Lists. Exercise Planning tools will also be capable of supporting Battlefield Effects Scripting to include: Automated Effects, Target Responses, and Cause (Case) Statement Lists.

7.9 Computer Based Simulation

7.9.1 Mission Rehearsal

An important function dealing with MOUT/RT training is the use of Mission Rehearsal to enhance the training and operational capabilities of a unit. Mission Rehearsal systems shall be designed and developed for use in classroom environments or as deployable systems.

7.9.2 Terrain Database Generation

The systems can import various types of terrain and map information to generate 2 and 3 dimensional terrain visualization databases within a limited period of time. The systems will be capable of displaying “line of sight” aspects from any location in the database and will have virtual “fly through” capability to allow commanders to scout the terrain. The system will be able to display proposed avenues of advance and troop positions for use by all echelons of command.

7.9.2.1 Scenario Rehearsal

The Mission Rehearsal system can be designed and developed to allow the users to execute multiple iterations of the same mission to determine the best courses of action based on a given

situation and various inputs from the users. These inputs shall include the placement of computer-generated forces in the scenario, the preplanned movements of these forces, the threat to be engaged and the varying levels of response. The Mission Rehearsal system will be able to execute the scenario in an autonomous mode or with real time input from the user. The system will be capable of determining the outcome of each mission and storing the scenario for later examination.

7.9.3 Constructive/Virtual Simulation

Constructive and Virtual Simulation systems can be designed and developed to allow the users to be immersed into the training mission. These systems can be capable of being used in a laboratory environment, home station areas, or as deployed systems. When connected to a network of simulators, the Constructive and Virtual Simulation systems can be able to see and interact with each other in real time.

7.9.3.1 Computer Generated Forces

Systems can be designed, developed and, if required, integrated into other MOUT/RT systems to provide computer-generated forces (CGF). The CGF can be able to be inserted in a scenario, either inside or outside of buildings and in varying terrain and environmental conditions. The CGF can include OPFOR and BLUFOR: personnel, vehicles, aircraft, and weapon systems. The CGF can also include non-combatants and civilian vehicles and aircraft. The CGF can have some level of artificial intelligence (AI) built in to meet the training requirements. The level of AI can range from simple movements based on direct real time user control and input through autonomous doctrinally correct actions. The system will be able to have additional weapon systems, vehicles, and behaviors inserted into the AI.

7.9.3.2 Immersive Simulation

Immersive Simulation systems can be designed and developed to allow the users to be placed in a virtual computer generated environment. The level of immersion (from complete sensory feedback to simply operating a computer system) can be driven by the training requirements. These systems can be designed with an open architecture to support prototype hardware and software development of new weapon systems or new tactics. The immersive simulation systems will be capable of being networked with similar systems or with other training systems through a DIS or HLA link.

8 Targetry

Advanced targetry systems can be designed, fabricated, and integrated to incorporate the following attributes: target controls (Human and Vehicles), raise/lower, two-way audio communication, thermal signature controls, animation controls (swivel target), shoot-back capability (e.g., Laser), vehicle direction controls/pre-programmable and hit detection (mortal/non-mortal). Hit placement recording will allow for the gathering of mortal (head/chest) hit data, as well as, non-mortal (rest of torso and limbs). Targets must be programmable to respond to pre-programmed limits (i.e., lower target if hit once in the mortal area, or three times in the non-mortal area).

9 Battlefield Special Effects/Sound Effects

All battlefield effects and systems will be designed and fabricated to ensure that all safety

requirements are met. The fielded systems will have all required safety documentation available prior to installation.

9.1 Battlefield Special Effects

Special effects can be incorporated in buildings and the surrounding areas. These battlefield effects will include, but are not limited to: ability to be manually controlled or pre-programmed, bullet strikes (outside and inside areas), mines (with MILES kill capability), roof-top explosions, incoming rounds, AT4 rockets, concussion gun, MILES Grenade, AK-47 gas gun, direct/indirect fire cue (DIFCUE), link to interior MILES transmitter (shoot-through-wall solution) and smoke generators.

9.2 Advanced Battlefield Special Effects

Advance Battlefield Special Effects can be design, developed, and installed to replicate scenario specific special effects. These effects are unique type events, and not associated with the normal expected operation of an exercise. These effects include, but are not limited to: Weapons of Mass Destruction/Accident simulation, Simulation of disease exposure, and Simulation of smell and other “horrors of war”.

9.3 Sound effects

Realistic studio created and recorded sound effects are available to enhance training environments. Categories of sound effects that could be provided include small arms, artillery, explosions, tanks, trucks, planes, helicopters, voices, and animal noises.

9.4 Advanced Sound Effects

Advanced realistic multichannel sound effects, novel effects synthesis, and audio processing sound effects are also available to replicate such effects as city noises, elevated trains, city traffic, construction, aircraft sounds. Note, these sound effects are not suited for every environment, and an analysis can/will be provided to determine the cost effectiveness and viability of a proposed solution.

10 Life Cycle Sustainment

10.1 Logistics Engineering

10.1.1 New Equipment Training (NET)

Vendors that are part of the MOUT/RT ID/IQ contract can provide training on newly installed or updated equipment. The customer has the option of requesting new equipment training for: any service or product procured through the use of the MOUT/RT ID/IQ contract, for existing systems, or to support special training operations or experiments.

10.1.2 System, Operator and Maintenance Manuals

Manuals detailing integrated system operations and maintenance will be available for systems that require them. Operator manuals on integrated systems will be available for systems that require them.

10.1.3 Spares and Expendables

Initial spares, expendables, repair of repairables, and tools and test equipment can be purchased at the same time as the equipment and will be made available if desired. Follow-on spares can be provided as part of the MOUT/RT ID/IQ contract. Detailed analysis of the spares and expendables can be provided based on the usage profiles, to include expected funding profiles.

10.1.4 Follow-on Maintenance

Where a vehicle is not in place to provide the required follow-on maintenance, the MOUT/RT ID/IQ contract can be utilized to accomplish this function.

10.1.5 Mission Support

Where needed, provide the required mission operation support labor, to cover the day-to-day operations of the systems.

10.1.6 Sustainment Training

The customer has the option of requesting sustainment training for: any service or product procured through the use of the MOUT/RT ID/IQ contract, for existing systems, or to support special training operations or experiments.