

OneSAF Objective System (OOS) Behavior Model Verification



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Executive Summary

The Army's One Semi-Automated Forces (OneSAF) Objective System (OOS) is a composable, next-generation computer generated forces (CGF) that has been designed to represent a full range of operations, systems, and control processes from the entity level to brigade level. Its development has leveraged the ever-increasing computing power available today to represent highly-complex battlefield phenomena, particularly entity and unit behaviors.

In the fall of 2005, the Product Manager (PM) OneSAF (then-LTC John Surdu) asked the US Army Training and Doctrine Command (TRADOC) Analysis Center (TRAC) in Monterey, California (TRAC-MTRY), to develop and execute quantitative and qualitative tests to verify the orderable, composite behaviors within OOS. As a result, we developed and executed a unique process to verify those behaviors under tight resource constraints. We developed an overall behavior verification methodology, a test design construct, a verification tracking database, and a detailed reporting procedure. We then executed the verification process on OOS behavior models and provided valuable feedback to PM OneSAF. Our methodology and test designs allowed us to evaluate the behaviors thoroughly with a minimum number of scenarios. Additionally, we devised a process to verify traceability within the documentation from requirements to implementation. Our work led to a follow-on effort to automate the verification process for OOS.

As the Army's simulation of choice for brigade-and-below operations, the use of OOS throughout the Army will continue to increase. Since OOS is designed to support all Army modeling and simulation (M&S) communities, its impact on the warfighter cannot be overstated and will directly affect the equipment, support, and training warfighters receive. Ensuring that the behavior representations within OOS execute properly, the focus of this study, is essential to the successful implementation of the system.

The methodology and tools developed as part of this effort have a number of desirable characteristics. First, they are interoperable, both within the Army and across Joint M&S. The methodology and tools are not specific to OOS and can be used to facilitate the verification of behaviors within simulations throughout the Department of Defense. By design, the methodology and tools are reusable for behavior representations within any model or simulation.

Our effort was innovative and advanced the state-of-the-art for verification and behavior modeling. While there is a large compendium of best-practices for verification, there was not

anything specific for the application to behavior modeling, a relatively new concept in simulation development. Thus, a unique methodology had to be developed to meet this niche need.

Finally, our effort saved, and can continue to save, government resources. First, our process demonstrated sound behavior test designs using a minimum number of scenarios, thus saving both time and money. Additionally, our work facilitated improvements to OOS early in its development lifecycle that would be much more costly if done later. Feedback from PM OneSAF and others involved throughout the course of the project praised this work for providing a clear path forward, saving time and manpower, and providing useful insights into improving OOS.

Section 1 – Introduction

1.1. Overview

The One Semi-Automated Forces (OneSAF) Objective System (OOS) is the first set of simulation products to be developed through the formalized Army acquisition process. Randolph and Sagan (2003) provide a concise general description of OOS in the following quote.

OneSAF is a next-generation Computer Generated Force (CGF) that can represent a full range of operations, systems, and control processes from individual combatant level and platform level to fully automated BLUFOR battalion level and fully automated OPFOR [opposing forces] brigade level. OneSAF is not a single product or system, but rather, a set of products each consisting of a set of interacting components and tools. These components provide overlapping functionalities, which meet the various Object Oriented System (OOS) compositions. They also interact with data and meta-data housed in repositories. (p. 6)

At the initiation of this research effort, the OOS main development phase was drawing to a close with the program preparing for project release. Prior to its release, the program was required to pass the government acceptance testing (GAT), scheduled for summer, 2006. In October, 2005, in advance of the GAT, LTC John Surdu, PM OneSAF, requested that the US Army Training and Doctrine Command (TRADOC) Analysis Center in Monterey, CA (TRAC-MTRY), develop and execute quantitative and qualitative test designs to verify that the orderable composite behavior models in OOS performed according to their design specifications.

In this report, we begin with a description of the problem background, including a general overview of the OOS model with focus on its behavior modeling functionality; more detail concerning our problem scope; and a summary of related efforts. The subsequent portion of the report will lay out the methodology we developed to conduct our verification and will include examples. We then briefly describe our general results and the challenges we faced. At the conclusion of the report, we describe the direction of our continued work and conclude with a summary of our efforts.

1.2. Problem Statement

One of the unique aspects of OOS is its behavior models. Although the behavior model functionality is designed to allow the user to develop his own behaviors as necessary, the OOS development team created a set of 51 orderable composite behaviors representative of the most-likely tasks that a unit or entity might be required to perform within a normal mission. Our task was to evaluate and report on the performance of these composite behavior models. Initially, our guidance was to evaluate as many composite behaviors as possible in advance of the GAT, originally scheduled for January, 2006. With the postponement of the GAT, we were given an extension to continue work until June, 2006. Even with the extension, the timeline and our available resources severely constrained the scope of our research.

The PM OneSAF was asking us to conduct a *verification* of the composite behavior models. According to Department of the Army Pamphlet 5-11 (1999), verification is defined as “the process of determining that an M&S [model and simulation] accurately represents the developer’s conceptual description and specifications” (p. 7). Thus, we were not to conduct validation, which is “the process of determining the extent to which an M&S is an accurate representation of the real world from the perspective of the intended use of the M&S” (p. 7). As we will discuss later, making that distinction proved to be challenging when information about the behavior’s “conceptual description and specifications” was insufficient.

1.3. Problem Scope

1.3.1. Limitations

- TRAC-Monterey did not have enough resources to verify all 51 composite behaviors.
- Documentation of behavior implementation was incomplete, which limited our ability to determine with certainty the required behavior performance.
- For any given behavior, there were too many potential inputs to test each possible combination.
- The data collection functionality within OOS was not mature enough to collect all of the output data required.

1.3.2. Assumptions

- Developing a behavior verification methodology and verifying a subset of the original 51 behaviors would provide value to the PM OneSAF team and the necessary foundation to continue behavior verification beyond our efforts.
- Documentation, in conjunction with OOS development team consultations, provided sufficient information to verify behavior performance.
- Testing a representative sample of scenarios for each composite behavior is sufficient to verify behavior performance.

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Section 2 – Background

2.1. OOS Behavior Modeling Functionality

OOS behavior models implement typical decision processes used within a military framework, and thus “provide command and control of equipment and unit models during simulation execution” (Henderson & Granger, 2002, p. 1). Therefore, they provide a means to automate standardized decision processes in order to reduce or remove user input during simulation execution. The models are able to evaluate environmental and situational stimuli and cause the entities or units to react accordingly.

There are generally two main types of behavior models – primitive and composite. Henderson and Granger (2002) define primitive behaviors as “simple chunks of doctrinal functionality from which more complex behavior models are built” (p. 1). These are coded behavioral aspects that directly control the simulation’s physical models and agents. They define composite behaviors, on the other hand, as “complex behavior models and are composed of primitive behaviors and other composite behaviors” (p. 2). Composite behaviors are not code themselves, but “are defined in data files that conform to a [pre-defined] syntax” (p. 2). It is the *composite* behavior models that were the focus of this research.

The graphical user interface (GUI) that allows a user to develop composite behaviors is called the Behavior Composer Tool, shown in Figure 1. Henderson and Granger (2002) describe the Behavior Composer as:

...a novel graphical user interface paradigm that enables users to construct composite behaviors by selecting composition elements from a toolbar, and then placing them on a drawing canvas. The Behavior Composer does not require the user to write source code or even understand the XML [extensible markup language] file format of the behavior descriptions it produces” (p. 7).

While our research did not require actual behavior construction, we often explored the Behavior Composer to learn more about the intent behind the implementations of particular behaviors.

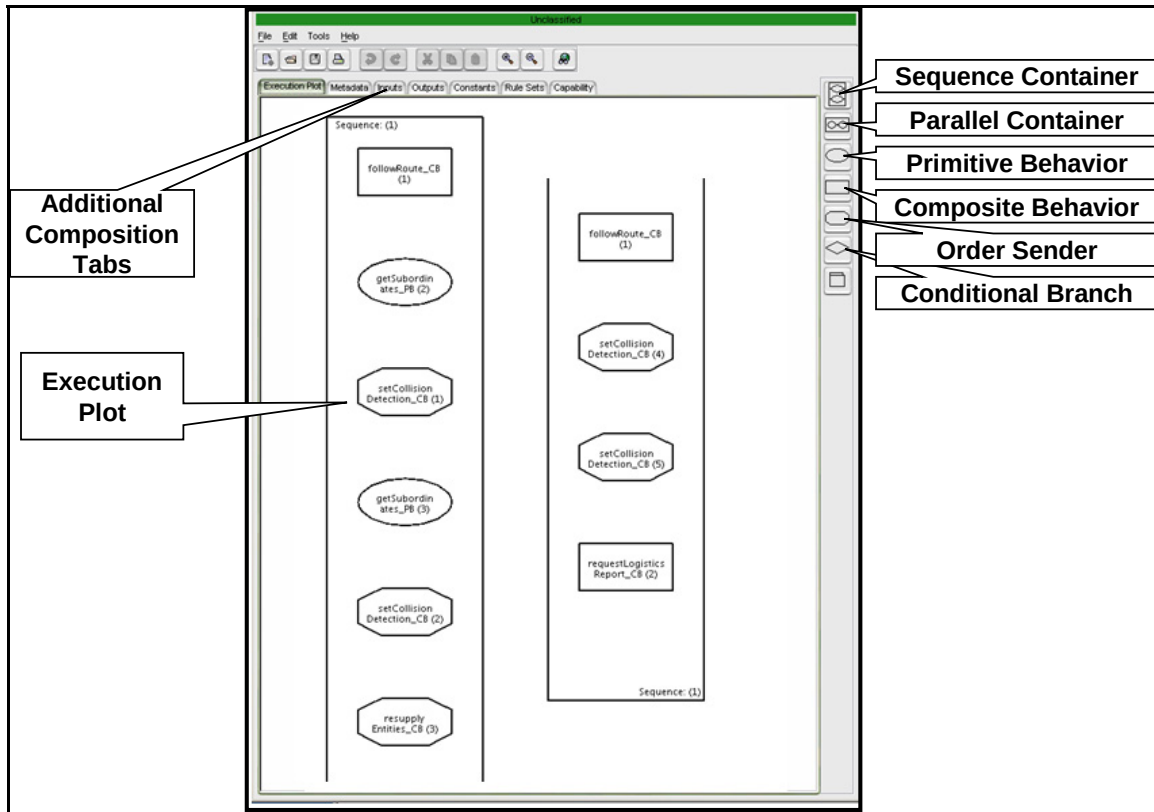


Figure 1. OOS Behavior Composer Tool.

Another aspect of the OOS behavior model implementation is the use of behavior models in the simulation. First, we must differentiate between orderable and reactive behaviors. Orderable behaviors are those behaviors that can be assigned to a unit or entity by the user during scenario development. A reactive behavior cannot be assigned, but can be enabled or disabled within an orderable behavior. Reactive behaviors define a standard reaction to particular stimuli (e.g., reacting to enemy fire). Because the occurrence of these situations cannot be predicted, reactive behaviors cannot be guaranteed to occur within a normal mission sequence, as orderable behaviors can. These two types of behaviors provide the capability to define the mission from start to finish, while still allowing simulation entities to react to unpredictable events.

When creating a scenario in OOS, the user assigns each unit a set of orderable behaviors by mission phase in the Mission Editor portion of the main interface, known as the plan view display (PVD), which is shown in Figure 2. When a behavior is assigned, the user edits its parameters through a set of GUIs, which will be discussed later in the report.

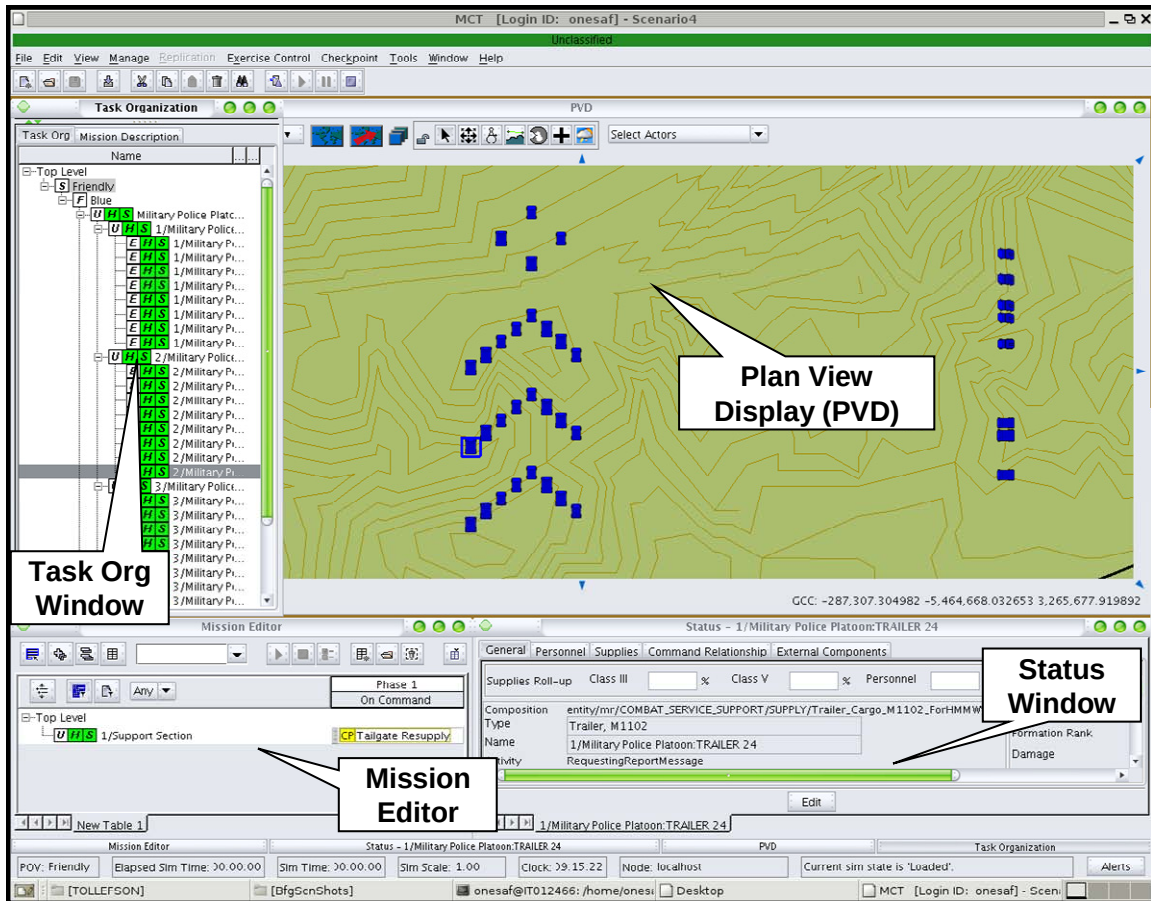


Figure 2. OOS Plan View Display (PVD).

2.2. Background Research

While previous combat simulations have had some behavior modeling capability, we could find no established verification processes specific to behavior models. Additionally, behavior model verification had not received the attention during OOS development that physical model verification had. In fact, only one other organization was working on a similar task. TRAC-White Sands Missile Range (TRAC-WSMR) initiated a primitive behavior model verification effort in late summer, 2005, at nearly the same time we had. Thus, our first step was to develop a methodology that we could use to conduct the verification. While there was little documentation concerning behavior model verification, we did find literature and previous research that addressed verification principles in general.

In October, 2005, an OOS development and training team traveled to our site to install the software and provide training. The training team brought with them a recommended approach for the verification effort that had been developed internally by PM OneSAF. Their

input was quite valuable for determining the types of information that would be most useful to their development effort and served as the foundation upon which we built our methodology.

Our second source of information was the *VV&A Recommended Practices Guide* (2000) downloaded from the Defense Modeling and Simulation Office (DMSO) website. The acronym VV&A stands for verification, validation, and accreditation. The guide describes the verification (and validation) processes and best practices from industry, the Department of Defense, and academia, with particular application to combat models and simulation. From this document, we were able to survey the large number of techniques available and extract those that were applicable to our work.

Our third reference was the *Models Development Behavior Verification Test Plan* (2004) developed by the Science Applications International Corporation (SAIC). Unfortunately, while the document did give a general framework for the conduct of verification, it provided little information concerning the methodology for selecting the test scenarios, nor what the outputs should be for each of the scenarios. In fact, when we tried to run these test scenarios and collect the data, we were not even able to load the files that were designed to be used in conjunction with the document. Additionally, the list of behaviors did not correspond to the list given to us by the OOS team, largely because the last update to the document occurred during the Block C release, not the Block D release we were testing initially. Therefore, while we did use the document to provide some information about potential testing scenarios, we based very little of our methodology on it.

Our fourth source of information was the work being done simultaneously by TRAC-WSMR. Their effort centered on the verification of the primitive behaviors, whereas our effort focused on the composite behaviors. Their selection of composite behaviors to execute in scenarios was based upon the primitives they contained, not the composite behaviors themselves. We referred to their methodology to make sure we accounted for overlapping aspects, and compared our results to identify significant differences; however, we were unable to base our methodology on theirs.

Finally, we consulted the US Army Materiel Studies Analysis Agency (AMSAA), which was simultaneously conducting verification of the *physical models* within OOS. While the focus of their effort was on an entirely different aspect of the simulation, their approach for selecting the design points in their test designs was valuable.

Section 3 – Methodology

We developed a methodology that would ensure a thorough verification of the composite behavior models, while still allowing us to address as many behaviors as possible within our resource constraints. After our initial development of the methodology, we continued to refine its processes even after we had begun verifying individual behavior models. Nonetheless, the overall methodology remained unchanged and is shown in Figure 3.

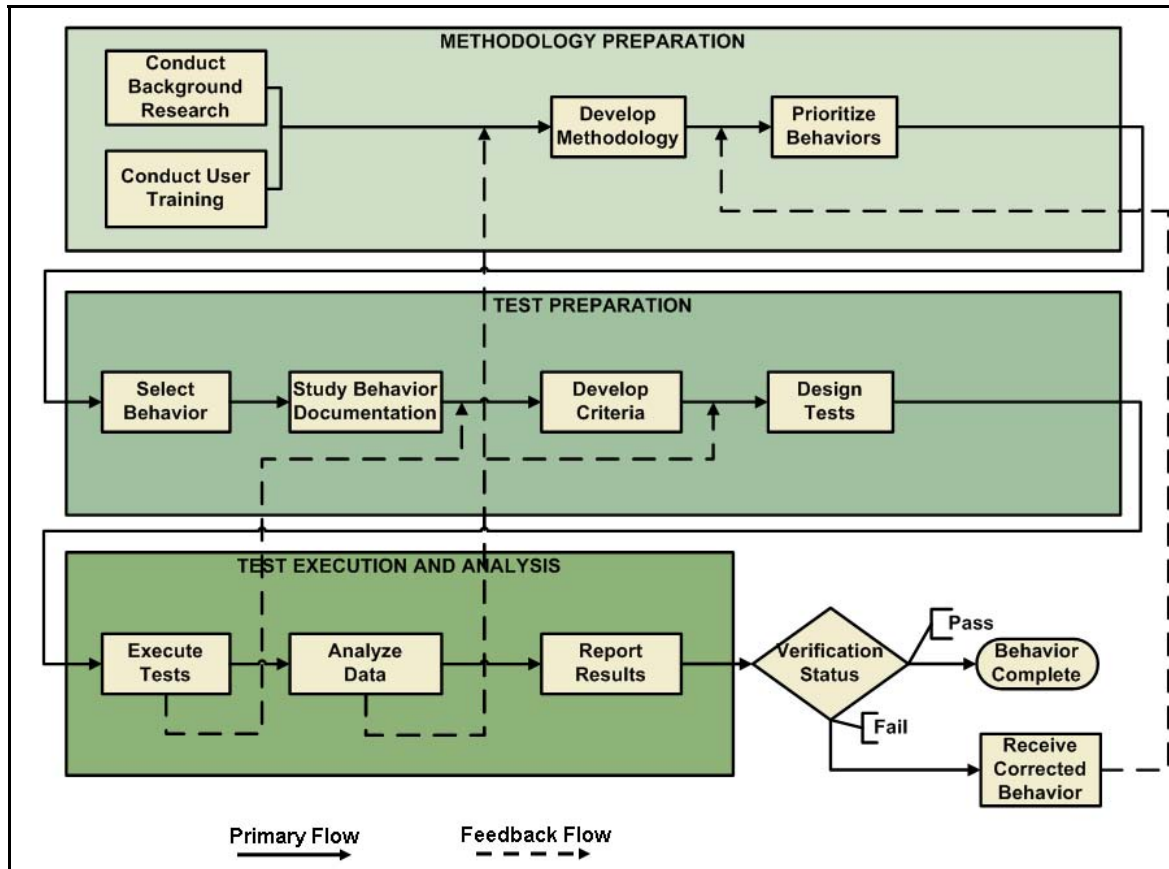


Figure 3. Behavior Model Verification Methodology.

3.1. Behavior Prioritization

Our first step was to prioritize the list of composite behaviors for verification and to update the list as required. The OOS team, during their onsite training visit, provided us an initial prioritized list of 51 composite behaviors, included in Appendix A, which served as our base document. The prioritized list did not change throughout the conduct of our research; however, we had to omit some behaviors whose documentation was not sufficient enough to conduct verification.

3.2. Behavior Selection and Documentation

We selected a behavior from the prioritized list and then reviewed its source documentation. The documentation review was essential, since verification requires a complete understanding of the developer's conceptual description and specifications in order to evaluate its implementation.

3.2.1. Documentation Description

Our primary source of information was the behavior model documentation. The OOS developers created these documents as part of their knowledge acquisition / knowledge engineering (KAKE) process. Behavior model KAKE documents attempt to capture behaviors in terms of the problem space (the description of the real world) in a way that facilitates the conversion of reality into software models (the solution space). While it is beyond the scope of this report to describe the OOS KAKE process, we will briefly describe the key documents that were central to our research. The reader can find more information about the KAKE process in Randolph and Sagan (2003).

The primary problem-space documents were the Task Descriptions (TDs). These documents describe the Army Universal Task List (AUTL) tasks in a way that facilitates their representation in composite behavior models. The AUTL is a comprehensive list of tasks that the Army is required to perform in support of its mission. There is a one-to-one mapping of TDs to AUTL tasks, but not from composite behaviors to TDs. In other words, one cannot necessarily trace an implemented composite behavior in OOS directly to a single TD. The TD is a problem-space document, meaning that it attempts to describe actual behaviors in a detailed manner that can then be implemented in software. Therefore, it cannot serve as a primary reference document for verification because it does not necessarily match how the behaviors it supports are actually implemented. We did refer to the TDs occasionally to see if they could clarify gaps or misunderstandings encountered in the solution-space documentation, particularly in terms of nomenclature.

Another set of problem-space documents are the Process Step Descriptions (PSDs), which further decompose and describe component sub-tasks of the AUTL tasks. A single PSD may describe a sub-task which is shared by multiple AUTL tasks. Although the PSDs seem to represent the basic 'building blocks' of the AUTL tasks, there is no one-to-one mapping of PSDs to the OOS primitive behaviors, as might be expected.

The Behavior Process Documents (BPDs) represent the final set of problem-space documents. They describe real-world behaviors that may require representation as composite behaviors but have no associated AUTL tasks. Thus, they are used to fill the modeling gaps left by the AUTL. Again, these do not necessarily have a one-to-one correspondence with the implemented composite behaviors.

Modeling Notes are used by the software engineering team to record questions concerning the problem-space documentation and to request clarification from the behavior subject matter experts (SMEs). The answers are then recorded as well. This class of documents was sometimes useful for determining the intent behind the implementation of particular composite behaviors.

The primary solution-space documents are the Use Cases. These documents describe the actual implementation of the composite behaviors, and, thus, there is a one-to-one mapping of Use Cases to composite behaviors. Although titled “Use Case” on the actual documents, the OneSAF team often referred to them as “Design Documents,” which is more descriptive of their function. The Use Cases can be considered the “developer’s conceptual descriptions” of the composite behaviors and were thus the primary source of information for our verification efforts. They have as their sources the TDs, but may or may not reflect the same logic as that included in the TDs. Since there is not a one-to-one mapping of TDs to composite behaviors and their Use Cases, most Use Cases referred to numerous TDs. Unfortunately, the actual implementation of the composite behavior models was often not sufficiently documented in the Use Cases, which led to some significant challenges, which we will discuss later in the report.

3.2.2. Other Sources

If the documentation failed to present a conceptual model complete enough to conduct verification, we consulted members of the OOS development team. If necessary, we were able to consult directly with the software engineer who implemented the behavior. We preferred to do this via email in order to maintain a written log of the questions we asked and the answers we received for future reference. Another source of information was our own expertise in Army operations and combat simulations; however, we had to be very careful not to make assumptions about how the behavior *should* perform, which is a validation issue.

3.3. Evaluation Criteria

Once we felt that we had a sufficient understanding of the intended implementation of the composite behavior model, we selected the criteria that we would use to evaluate performance. Throughout the following discussions, we will use the Tailgate Resupply composite behavior as our example to highlight the application of our methodology. In that behavior, the unit that is given the task, called the supplying unit, moves to a logistics release point (LRP – the location where the resupply operation will take place); supplies each of the designated vehicles there; and then moves to a return location (which is not necessarily its original location).

3.3.1. Behavior Model Input Parameters

Before we discuss the actual selection of criteria, we first provide a brief overview of the behavior model parameter inputs. When a user assigns a composite behavior to a unit or entity, a dialogue window opens prompting the user to enter three types of parameters: required, optional, and rules of engagement (ROE). An example of the Tailgate Resupply behavior dialogue windows for each of the three types of parameters is shown in Figure 4.

Figure 4. Example Behavior Input Parameter GUI for the Tailgate Resupply Behavior.

In our Tailgate Resupply example, the required inputs are the LRP location, the unit to resupply, and the return location. The only optional parameter is the formation in which the resupplying unit will move. The ROE parameters are identical for all behaviors and include settings for weapons control status (WCS), mission priorities, and fire control measures.

3.3.2. Criteria Selection

To select the behavior evaluation criteria, we first looked to the input parameters. At a minimum, each input parameter was a criterion to be evaluated to ensure that the input value properly affected behavior execution. Thus, for the Tailgate Resupply behavior, we were interested in ensuring that the supply vehicles moved to proper location and in the correct formation, and that the proper units were resupplied (particularly in cases where multiple units are located in the vicinity of the LRP). Additionally, there were often other criteria that were not suggested by the inputs, but were still critical to evaluate. In our example, we were also interested in the amount of supplies delivered and received, as well as the time it took to execute the transfer.

To evaluate the criteria, we used both qualitative and quantitative measures. Many of our measures were qualitative for two reasons. The first is that the data collection functionality of the simulation (including basic data logging) did not work properly in the model releases we used. The second is that many of the criteria could be evaluated visually on the PVD during execution (e.g., the formation in which the unit moved). Despite the fact that the data collection functionality was not working, we were still able to collect quantitative data from the Status Window in the PVD (see Figure 2). The Status Window shows, for each unit or entity, nearly real-time information, such as speed, orientation, levels of supply, location, etc. Thus, we were able to pause the simulation at a point of interest and collect data from that window.

In the Tailgate Resupply behavior, we evaluated the following criteria visually: movement formation and movement to the correct locations. Quantitatively, we collected data on the types and amounts of supplies transferred, as well as the specific units and entities that participated in the operation. However, there was at least one criterion that we were unable to collect – the time it took to transfer supplies from one vehicle to another. This was a result of the fact that the Status Window had update delays that significantly impacted our ability to determine the relatively-short transfer times.

3.4. Test Design

To create our test design, we developed a set of scenarios that would evaluate the critical aspects of the behavior. Each scenario can be thought of as a single design point in the overall test design. The specific methodology for choosing the number of, and settings for, the scenarios varied by behavior, because the behaviors differed in complexity. For example, the Move Tactically behavior had 16 required and optional inputs. Those inputs aligned well with the critical aspects of the behavior that we wished to test. Tailgate Resupply, on the other hand, had only four required and optional inputs, but there were other aspects of the behavior that we wished to test that did not correspond to inputs. Thus, we had to take each behavior as a unique case and create the test design uniquely, instead of using a ‘cookie cutter’ approach.

3.4.1. Conditions

The following is a general description of the types of conditions we tested.

Inputs: Since each parameter the user enters should have an effect on the performance, or output, of the behavior, we needed to test each unique setting for each input to ensure that the settings created the desired effects. We also had to test behavior performance in the absence of an input for the optional parameters. Additionally, there were other potential inputs that were independent of the behavior itself (e.g., unit type and echelon assigned the behavior). We needed to test a representative sample of those inputs as well. When determining the unit type and echelon, we ensured that they were varied between the scenarios, but did not try to test every possible input. For example, the Tailgate Resupply behavior can be assigned to any type of unit at any echelon (entity, team, squad, company, battalion, etc.). Testing all of those would be infeasible.

Special Cases: In addition to the inputs that the user can choose, we also wanted to test the robustness of the behavior. For this, we tested cases that would involve the behavior performing at the extremes or under unusual circumstances. For some behaviors, testing only the range of parameter inputs was sufficient; however, in most cases, we considered such additional aspects. Special cases in our Tailgate Resupply example included testing what would happen if the supply vehicles had the wrong supplies, had an excess or shortage of required supplies, had unnecessary supplies, or had to resupply multiple units. Additionally we wanted to test different classes of supplies (e.g., ammunition, fuel, medical supplies, etc.).

Combinations: Given the large number of potential inputs and variations the behavior could take, we did not try to test every possible combination of input parameters. For example, the Move Tactically behavior had 16 required and optional parameters, with some having as many as 13 choices, resulting in almost a million unique combinations of parameters. We instead tried to ensure that each critical aspect was tested at least once. For instance, if an input had seven potential unique settings, we would have at least seven scenarios. Thus, the parameter with the largest number of potential choices tended to drive the total number of scenarios. Since we were testing only a small subset of the possible combinations, we had to design each scenario carefully to ensure that each special case was tested as well. Consideration of special cases usually added one or two scenarios to the final number.

Final Designs: For each of the test designs, we kept the number of scenarios between six and ten. We found that range to be sufficient to test any of the behaviors we verified without taking an excessive amount of time. In some cases, we had to combine inputs. For instance, in the Move Tactically test, we only tested only one variation of each movement formation (e.g., echelon right but not echelon left). Our Tailgate Resupply behavior test design consisted of six scenarios. A portion of that test design is shown in Table 1. The columns represent each scenario and the rows represent each parameter or special case.

Table 1. Example Behavior Test Design for Tailgate Resupply.

SCENARIO #	1	2	3	4	5	6
GENERAL SETTINGS						
Resupply Unit Type	Armor	Infantry	Mech Infantry IFV	Military Police	Medical	Field Arty
Resupply Unit Echelon	Platoon	Fire Team	Platoon	Platoon	Section	Platoon
SCENARIO CHARACTERISTICS						
Classes of Supply Delivered	Class III and V	Class V	Class III	Class III & V	Class III & VIII	Classes III & V
Units Near the LRP	Multiple	Single	Multiple	Single	Multiple	Single
Units to be Resupplied	Single	Single	Single	Single	Multiple	Single
Level of Resupply	Subunit(s)	Unit(s)	Subunit(s)	Unit(s)	Unit(s)	Subunit(s)
Req'd Supplies Available?	Yes, all	Yes, some	None	Yes, some	Yes, all	Yes, all
Unreq'd Supplies Available?	Yes	Yes	Yes	No	No	No
Supply Amounts	Sufficient for All Types	Sufficient for All Types	Insufficient for All Types	Sufficient for Some Types	Sufficient for All Types	Sufficient for Some Types
Unit to Resupply	Section A, Armor Platoon 1	Fire Team	Section 2, Mechanized Infantry Platoon 1	Military Police Platoon	Medical Section to receive Class III and VIII. Transport Platoon to receive Class III only.	Section 2, Artillery Platoon
Formation	Vee	Wedge	Column	Line	EchelonLeft	EchelonRight

3.5. Test Execution and Analysis

With the test design and evaluation criteria determined, we then set up the scenarios in the simulation. We attempted to keep the scenarios simple and to configure them in a way that would provide unambiguous results, instead of being concerned about tactical validity. In many cases, each composite behavior we tested required us to learn a particular functionality that we had not used previously. Thus, this initial portion of execution often consumed a significant amount of time. Often, we would identify conditions that were not, in fact, testable, leading to minor modifications of the design.

Once we created the scenarios, we simply observed and collected data. Sometimes, an interesting or ambiguous result would lead us to run additional excursions with minor variations to understand what was happening. As with scenario development, we sometimes encountered situations during execution that would lead us to alter the overall test design. While we usually ran each scenario numerous times to ensure that it was set up properly, we normally used only the data from the last run for reporting purposes, unless we noticed large variations in output during our trial runs. All behaviors we examined were deterministic, although the stochastic nature of other aspects of the model still caused variations in output between runs. The average time consumed by scenario development and execution was typically five to seven days.

3.6. Result Documentation

Our primary concern in this verification effort was to ensure that we thoroughly recorded everything we did throughout the process, especially since our resource constraints limited the number of unique cases we could observe. We kept very detailed records in spreadsheet form that delineated our test design, the evaluation criteria, and results. As part of that, we often took screenshots of particularly interesting phenomena that would be difficult to explain otherwise. Additionally, we saved all of the scenario files we used, to include any excursions we ran, so that we could include those with our reports.

Our documentation consisted of two primary types of spreadsheets – an overall verification summary spreadsheet and a set of individual behavior verification spreadsheets (one per behavior). Each tab (worksheet) in the *verification summary spreadsheet* contains summary results from the verification of a particular behavior and includes details such as the overall assessment of the behavior, the summary results for each scenario, our references to

documentation, the particular OOS build we used in the verification, and other administrative details.

We recorded the detailed results for each behavior in the *individual behavior verification spreadsheets*. Each of these spreadsheets includes a series of worksheets, one per scenario in the test design. In each scenario worksheet, we recorded general descriptions of the scenario and the terrain, simulation entities and units involved, special cases examined, overall rating for the behavior in that scenario, and the detailed results for each evaluation criterion. Table 2 shows the portion of the worksheet we used to record the detailed results. The visual and data verification *plan* columns in that table identify the results we expected, and the visual and data *results* columns identify the actual results from scenario execution. In the status column, we recorded our assessment of the behavior model's performance for each evaluation criterion (as green, amber, red, or unverified). We used the discussion column to provide additional detail about the results and our assessment.

Table 2. Verification Collection Plan and Recording Spreadsheet.

VERIFICATION PLAN & RESULTS		Visual Verification Plan	Visual Results	Data Verification Plan	Data Results	Status	Discussion
TASK DIALOGUE SETTINGS							
REQUIRED PARAMETERS							
LRP Location	See Scenario File						
Unit to Resupply	Section A, Armor Platoon 1						
Return Location	See Scenario File						
OPTIONAL PARAMETERS							
Formation	Vee						
OTHER							
Resupply Time	N/A						
Supplies Delivered	N/A						
Supplies Received	N/A						
Supply Accuracy	N/A						

The individual behavior verification spreadsheets also contained a summary worksheet that includes the overall results for each scenario. An excerpt from that spreadsheet was shown in Table 1, and the final versions of each summary worksheet are included in Appendix B. Each annex in that appendix represents a particular behavior. In Appendix C, we include the individual behavior verification spreadsheet for the Clear Room behavior, with each annex representing each of the scenarios in the test design.

After the completion of each behavior verification, we compiled the information collected in the spreadsheets, along with the scenario files, and sent them directly to the OOS development team. In addition to reporting the results of the behavior verification itself, we also

reported any documentation errors or shortcomings, as well as any general software performance issues we had encountered.

Section 4 – Results

We must first note that the following results are specific to the particular versions of OOS that we used for the verification, many of which were developmental releases prior to the official release of the model. Thus, many of the problems found during the initial verification and re-verification processes have since been fixed in later releases. OOS developers were continually adding new functionality and making significant changes to the model during our verification process. The results shown in Table 3 should be understood within that context as a logical progression of the methodology we developed, and not the final stamp of pass/fail for the composite behavior model functionality within OOS.

Table 3. Behavior Verification Test and Retest Results.

Behavior	Initial Test	Retest
Move tactically	Red	Red
Tailgate re-supply	Green	N/A
Mount / dismount	Amber	Amber
Attack by fire	Amber	Red
Occupy position	Amber	Amber
Clear room	Red	Red
Tow to location	Red	Red
Conduct air reconnaissance	Red	Red
FWA platform follow route	Red	Amber
FWA unit follow route	Amber	Amber
Drop cargo	Red	N/A
Prepare for re-supply	Red	Red
Transfer cargo to basic load	Amber	N/A

Overall, we were able to conduct initial verification of 13 composite behaviors and retesting of ten. Each behavior verification test design included a number of scenarios that were evaluated based upon the developed criteria. For *each* of those criteria within the scenario, we assessed the behavior performance according to Table 4.

Each scenario was then assessed a green, amber, or red rating based upon a holistic view of the simulation's performance with respect to the criteria. Similarly, the behavior itself was assessed an overall rating based upon its performance across the entire test design (all scenarios). Table 5 shows the rating schema at the scenario and behavior levels. In the table's "description" field, the word to the left of the "/" applies to the evaluation of the *scenarios* and the word to the right of the "/" applies to the overall *behavior* evaluation.

Table 4. Criterion Ratings.

Rating	Meaning	Description
Green	Passed	Performed as expected
Amber	Unable to verify/ inconclusive	Performance could not be assessed, either because the data resolution was not fine enough to do so (making the results inconclusive), or because the documentation was unclear as to what exactly should occur
Red	Failed	Did not perform as expected
None	Unverified	No means to evaluate performance, due either to the failure of another criterion that altered behavior execution or to a deliberate choice to ignore the criterion based upon the conditions in the particular scenario

In the end, our assessments were necessarily subjective. Unlike physical models for which there is a defined set of parameters and performance expectations, composite behaviors involve sub-behaviors and other dependencies which prevent the development of concrete rule sets for ratings. However, we mitigated against such subjectivity by being meticulous in our recording of the precise observed performance for every criterion, scenario, and composite behavior. Thus, another individual or team could update the assessment based upon their interpretation of the significance of the resulting performance without having to re-run the model across the test design.

Table 5. Scenario/Behavior Ratings.

Rating	Meaning	Description
Green	Passed	Green for all criteria/scenarios, or primarily green for most criteria/scenarios with one or two amber ratings due to inconclusive data
Amber	Unable to verify/ inconclusive	Amber for a majority of the criteria/scenarios, or if there was mostly green ratings with one or two red ratings
Red	Failed	Failed one or more significant criteria/scenarios, or had one or more red ratings with a majority of amber ratings for the remainder of the criteria/scenarios
None	Unverified	No means to evaluate performance of the scenario/behavior

Section 5 – Challenges.

5.1. Documentation

One of the primary challenges the team encountered during this process was insufficient or incorrect documentation, represented graphically in Figure 5. The fundamental shortcoming in the documentation was that there was no clear mapping between the problem-space and the solution space. Thus, when we encountered questions regarding the specifications in the Use Case, we could not refer to the problem-space documents to resolve them.

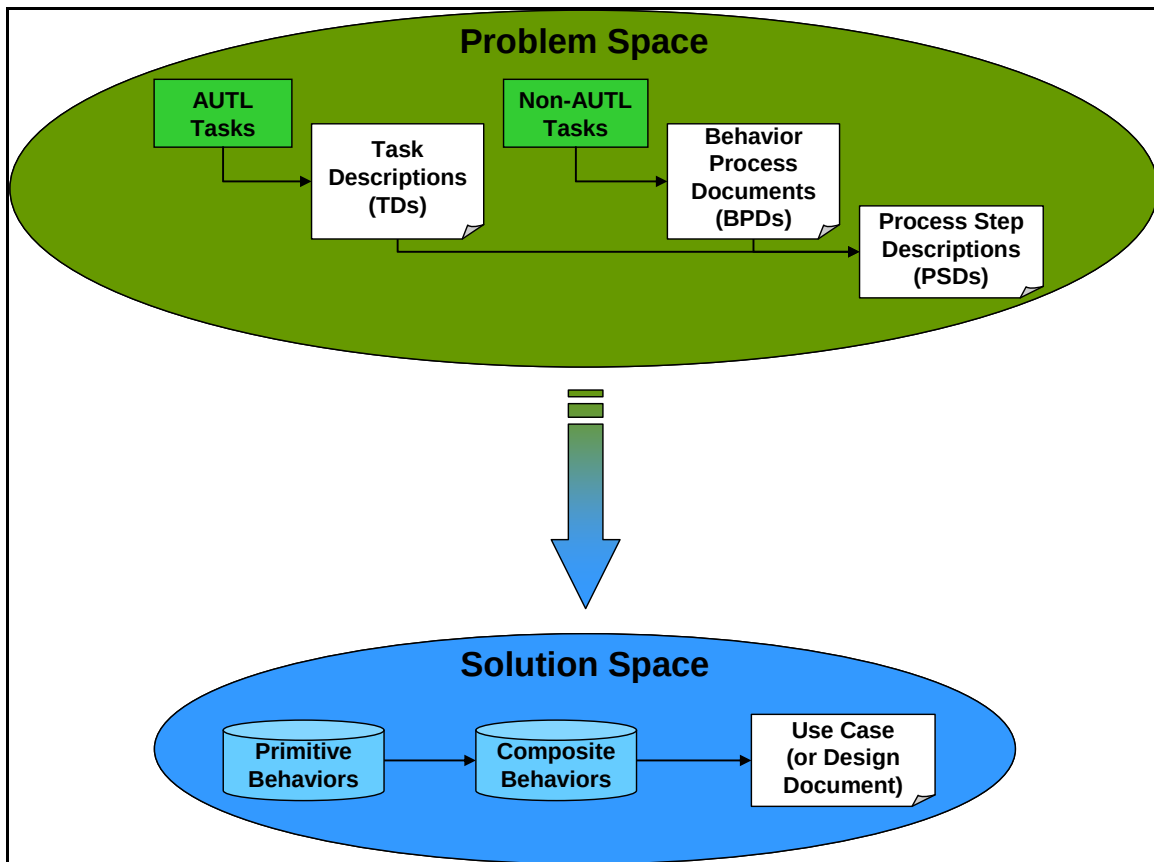


Figure 5. Figurative Representation of Documentation Deficiencies.

As we discussed previously, when we were unable to obtain the required information from the documentation, we sometimes had to rely upon our own operational expertise to understand what the model should do. However, we had to take great care not to draw conclusions about behavior performance based upon our assumptions. Thus, when a behavior failed to perform in accordance with our assumptions, we had to avoid using the following reasoning: “Based upon our experience (or our inferences about intent from XML or problem space documents), behavior X should do Y; thus, because it did not do Y, it fails.” When the

team encountered these situations, we made note of what we assumed should happen and what did happen and then labeled the behavior performance as “inconclusive” or “unable to verify”.

5.2. Data Collection Functionality

The failure of the data collection functionality severely restricted our ability to collect quantitative data. While we were able to work around that by using the Status Window, the accuracy of our results was impacted. For instance, while location was reported in the Status Window, to verify the distance between two vehicles we would have to determine the location of the two vehicles in the Status Window and calculate the distance manually. However, because the distance may vary over time due to terrain, we needed an average of values, making the process very tedious. In some cases, such as supply transfer times in the Tailgate Resupply behavior, we were unable to collect the data at all.

5.3. Software Development Cycle

Our final challenge had to do with the phase of the OOS software development in which we were working. In advance of the initial OOS release, the software developers were continuing to fix errors and add required functionality. However, the software still had bugs and inefficiencies that caused fairly frequent lock-ups or tedious work-arounds. Additionally, our sponsor, PM OneSAF, wanted us to conduct behavior model verification on the latest releases. Therefore, before we progressed to another behavior, we downloaded the newest release of the software, if one was available. Unfortunately, these releases sometimes had new functionalities or changes to the composite behaviors that were not reflected in the documentation. Thus, for each behavior, we had to check the software against the documentation before we got too far into our process.

5.4. Recommendations

The following are some recommendations we developed to help alleviate the challenges we encountered during our efforts.

5.4.1. Documentation

Software development must ensure a complete conceptual description of the behavior models. The implications of insufficient documentation extend beyond verification to validation and even to the users themselves, who must understand exactly how the behavior model will

respond to given set of inputs. Documentation standards must be developed early in the development process and adhered to throughout. The standards must address traceability from the real-world behavior itself through the final implementation, by ensuring that the documentation provides a clear link between the knowledge acquisition and engineering processes and the model implementation. While it is understandable that documentation may lag behind development to some degree, the program should take significant steps to ensure that traceability is maintained throughout, particularly before entering the verification stage.

5.4.2. *Data Collection*

A working data collection functionality is a requirement for verification. If the organic data collection functionality in the model is insufficient, the program should pursue external tools capable of collecting the required data. While significant strides can be made toward verification using other techniques, model generated data must be examined in order to truly verify many aspects of the implementation.

5.4.3. *Software Development Cycle*

Little can be done to prevent challenges resulting from multiple releases of the model; however, some techniques may mitigate the adverse impacts. First, the developers should ensure that any relevant changes to the behavior models being verified are documented, or at least noted, for the verification team. Second, they should ensure that the model release is stable before attempting to integrate it into the verification process. A third alternative is to choose a particular stable release of the model for a phase of the verification. Once the verification team is ready to begin retesting, a new release can then be used. The goal should be to minimize the model changes facing the verification team, instead of sending updated models as they are developed.

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Section 6 – Current and Future Efforts

Following our initial behavior verification effort, TRAC-MTRY began to develop concepts and tools in order to automate portions of the behavior verification process, thereby significantly reducing time and manpower requirements. We used a spiral software engineering approach in the development of appropriate tools. The process involved additional background research, followed by a sequence of development phases. Each spiral iteration included problem definition, methodology review and update, and concept/software development.

Development of automated behavior verification concepts and tools required a thorough understanding of the OOS software architecture. In order to automate the correlation between inputs and outputs, we needed access to internal software data structures and an understanding of the algorithms applied to the data. We focused our background research on those aspects.

The team then reviewed the generic requirements for verification, and re-evaluated our behavior verification methodology. Problem definition was a recurring part of the spiral development process, providing us the flexibility required in an open-ended research and development effort. Inputs into the problem definition process came from background research and previous tool iterations.

We successfully created a working prototype of the OneSAF Behavior Verification Automation tool. In its prototype form, the software developed auto-generates executable OOS scenarios and checks the output of the data files collected during the execution against pre-specified parameter characteristics. Figure 6 shows a flow chart representation of the prototype operation.

This prototype demonstrates the fundamental concepts which make the automation of behavior verification possible. TRAC-MTRY has been able to take a simple scenario; use it as a baseline scenario template; auto-generate varied test scenarios based on the baseline scenario; collect data in extensible markup language (XML) files using OOS' organic data collection tools; and conduct parameter checks to evaluate behavior performance using Ruby scripts. These scripts were capable of checking data files over 25 MB in size in less than five seconds. Future work focused on creating "linking software" which binds the significant pieces of software in this prototype together in a user-friendly manner. Future work also focused on developing a means of producing more significant parameter characteristic tests based on

expectations extracted from the developer’s documentation. The reader can find more details about this effort in a separate report to be published.

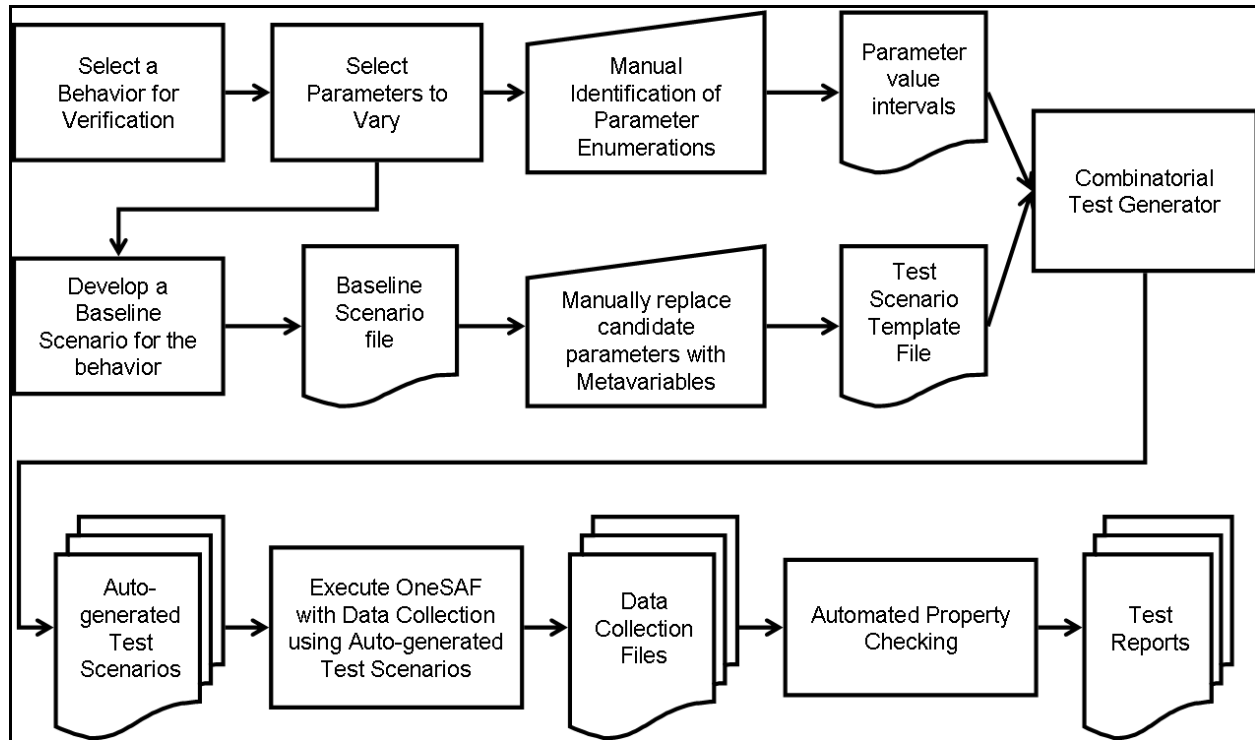


Figure 6. Prototype Automated Behavior Verification Tool Flow Diagram for OOS.

Section 7 – Conclusion

We developed and executed a unique process to verify OOS composite behavior models under tight resource constraints. We developed an overall behavior verification methodology, a test design construct, a verification tracking database, and a detailed reporting procedure. We then executed the verification process on OOS behavior models and provided valuable feedback to PM OneSAF. Our methodology and test designs allowed us to evaluate the behaviors thoroughly with a minimum number of scenarios. Additionally, we devised a process to verify traceability within the documentation from requirements to implementation. Our work has led to a follow-on effort by TRAC-Monterey and the Naval Postgraduate School to automate the verification process for OOS.

As the Army's simulation of choice for brigade and below operations, the use of OOS throughout the Army will continue to increase. As OOS is designed to support all Army modeling and simulation (M&S) communities, its impact on the warfighter cannot be overstated and will directly affect the equipment, support, and training warfighters receive. Ensuring that the behavior representations within OOS execute properly, the focus of this study, is essential to the successful implementation of the system.

Our effort was innovative and advanced the state-of-the-art for verification and behavior modeling. While there is a large compendium of best-practices for verification, there was not anything specific for the application to behavior modeling, a relatively new concept in simulation development. Thus, a unique methodology had to be developed to meet this niche need.

Finally, our effort saved, and can continue to save, Army resources. First, our process demonstrated sound behavior test designs using a minimum number of scenarios, thus saving both time and money. Additionally, our work facilitated improvements to OOS early in the development lifecycle that would be much more costly if done later. Feedback from PM OneSAF and others involved throughout the course of the project praised this work for providing a clear path forward, saving time and manpower, and providing useful insights into improving OOS.

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Appendix A – Original Prioritized List of Composite Behaviors

Table 6. Original Prioritized List of OOS Composite Behaviors for Verification.

Priority	Behavior
1	Move tactically
2	Attack by fire
3	Mount / dismount
4	Tailgate resupply
5	Occupy position
6	Clear room
7	Send call for fire
8	Move tactically (rotary wing aircraft)
9	Attack by fire (rotary wing aircraft)
10	Tow to location
11	Attack built up area
12	Conduct raid
13	Execute sniper mission
14	Conduct ambush
15	Conduct air reconnaissance
16	Conduct ground reconnaissance
17	Platform follow route (fixed wing aircraft)
18	Unit follow route (fixed wing aircraft)
19	UAV conduct surveillance
20	Conduct repair
21	Conduct casualty movement
22	Conduct MEDEVAC
23	Conduct entity RWA MEDEVAC
24	Conduct entity treatment
25	Passage of lines forward
26	Passage of line rearward

Priority	Behavior
27	Provide treatment
28	Cross level supply
29	Drop cargo
30	Load/unload supply
31	FARP resupply
32	Prepare for resupply
33	Service station resupply
34	Transfer cargo to basic load
35	Conduct capture rescue
36	Conduct interview
37	Breach wall
38	Clear and mark lane
39	Construct HVIED
40	Construct obstacle
41	Cue radar
42	Emplace bridge
43	Emplace minefield
44	Employ smoke
45	Fire and relocate
46	Hitch/unhitch
47	Maneuver and occupy fire support position
48	Perform river crossing
49	Prepare fighting position
50	Retrieve bridge
51	Withdraw

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Appendix B – Summary Results for Each Composite Behavior

This appendix shows the summary tables for each of the composite behavior model initial verifications and reverifications (if appropriate), organized in the order that they were completed. The summary tables show both the test design and the summary results for the entire set of scenarios.

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Move Tactically Verification Summary Tables

Table 7. Move Tactically Initial Verification Test Design.

SCENARIO #	R2	R3	R5	R6	R7
GENERAL SETTINGS					
General Unit Type 1	DM Infantry (Mech)	Anti-Tank	Armor	Infantry	Military Police
General Unit Type 2	Mech Infantry IFV	0	0	#REF!	0
Echelon	Company	Platoon	Company	Squad	Company
Specific Unit Type(s)	../mr/COMBAT/INFANTRY/CO_MechInf_M2A2_Vehicles_And_Dismounts_US.xml	../mr/COMBAT/ANTI_ARMOR/PLT/PLT_AntiArmorTowers_M1045A1_Lt_Inf_Bn_US.xml	../unit/mr/COMBAT/ANTI_ARMOR/CO/CO_M1A1_Armor_Tank_US.xml	../mr/COMBAT/INFANTRY/SQD/SQD_Wpns_Light_InfPlt_RS_IC.xml	../mr/UA-MNVR-ENHANCED_UNITS/CO/CO_MILITARY_POLICE-UA_ME_BDE_US.xml
Enemy Unit Type(s)	NA	../mr/TERRORIST/SEC/SEC_Vehicle_IED_OPFOR_BombCell.xml	N/A	0	../mr/COMBAT/INFANTRY/SQD/SQD_Guerilla_AGL_OPFOR.xml
TASK DIALOGUE SETTINGS					
Header Parameter Tab					
Trigger	On Command	On Command	On Command	On Command	On Command
WCS Summary	Free	Free	Free	Free	Free
Enable Reactions for this Task	No	No	No	No	No
Required Parameter Tab					
Movement Technique	Traveling Overwatch	Bounding (Successive)	Traveling	Bounding (Alternating)	Traveling
Optional Parameter Tab					
Route (Line Ctrl Measure)	No	Yes	Yes	Yes (does not apply to the excursion)	No
Destination	Yes	No	No	Yes (applies to the excursion only)	Yes
Speed	75	25	25	4	25
Formation	Column	Line	Wedge	Vee	Column
Formation Spacing	100	200	100	10	100
Final Orientation	No	Yes	No	No	Yes
Mount	Yes	No	No	No	No
Dismount	Yes	No	No	No	Yes
Halt Duration	0	0	0	0	5
planRoute	Yes	No	No	No	Yes
Aperture to Enter or Exit	No	No	No	Yes	No
Rules of Engagement Tab					
General	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
Weapon Control Status	Free	Free	Free	Free	Free

Table 8. Move Tactically Initial Verification Results.

VERIFICATION RESULTS					
OVERALL VERIFICATION STATUS	Red (Failed)				
VERIFICATION STATUS BY SCENARIO					
SCENARIO #	2	3	5	6	7
Scenario Verification Status	Red	Red	Red	Red	Red
Trigger	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Movement Technique	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Route (Line Ctrl Measure)	Unverified	Red (Failed)	Red (Failed)	Green (Passed)	Unverified
Destination	Red (Failed)	Unverified	Unverified	Red (Failed)	Green (Passed)
Speed	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Green (Passed)	Amber (Unable to Verify)
Formation	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
FormationSpacing	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Final Orientation	Unverified	Red (Failed)	Unverified	Unverified	Red (Failed)
Mount	Green (Passed)	Unverified	Unverified	Unverified	Unverified
Dismount	Amber (Unable to Verify)	Unverified	Unverified	Unverified	Red (Failed)
Halt Duration	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
planRoute	Red (Failed)	Unverified	Unverified	Unverified	Green (Passed)
Aperture to Enter or Exit	Unverified	Unverified	Unverified	Red (Failed)	Unverified
Weapon Control Status	Unverified	Red (Failed)	Unverified	Unverified	Amber (Unable to Verify)

Table 9. Move Tactically Re-verification Test Design.

SCENARIO #	R2	R3	R5	R6	R7
GENERAL SETTINGS					
General Unit Type 1	DM Infantry (Mech)	Anti-Tank	Armor	Infantry	Military Police
General Unit Type 2	Mech Infantry IFV	0	0	#REF!	0
Echelon	Company	Platoon	Company	Squad	Company
Specific Unit Type(s)	../mr/COMBAT/INFANTRY/CO_MechInf_M2A2_Vehicles_And_Dismounts_US.xml	../mr/COMBAT/ANTI_ARMOR/PLT/PLT_AntiArmorTow_M1045A1_Lt_Inf_Bn_US.xml	../unit/mr/COMBAT/ARMOR/CO/CO_M1A1_Armor_Tank_US.xml	../mr/COMBAT/INFANTRY/SQD/SQD_Wpns_Light_InfPlt_RS_IC.xml	../mr/UA-MNVR-ENHANC-UNITS/CO/CO_MILITARY_POLICE-UA_ME_BDE_US.xml
Enemy Unit Type(s)	NA	../mr/TERRORIST/SEC/SEC_Vehicle_IED_OPFOR_BombCell.xml	N/A	0	../mr/COMBAT/INFANTRY/SQD/SQD_Guerilla_AGL_OPFOR.xml
TASK DIALOGUE SETTINGS					
Header Parameter Tab					
Trigger	On Command	On Command	On Command	On Command	On Command
WCS Summary	Free	Free	Free	Free	Free
Enable Reactions for this Task	No	No	No	No	No
Required Parameter Tab					
Movement Technique	Traveling Overwatch	Bounding (Successive)	Traveling	Bounding (Alternating)	Traveling
Optional Parameter Tab					
Route (Line Ctrl Measure)	No	Yes	Yes	Yes (does not apply to the excursion)	No
Destination	Yes	No	No	Yes (applies to the excursion only)	Yes
Speed	75	25	25	4	25
Formation	Column	Line	Wedge	Vee	Column
Formation Spacing	100	200	100	10	100
Final Orientation	No	Yes	No	No	Yes
Mount	Yes	No	No	No	No
Dismount	Yes	No	No	No	Yes
Halt Duration	0	0	0	0	5
planRoute	Yes	No	No	No	Yes
Aperture to Enter or Exit	No	No	No	Yes	No
Rules of Engagement Tab					
General	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
Weapon Control Status	Free	Free	Free	Free	Free

Table 10. Move Tactically Re-verification Results.

VERIFICATION RESULTS					
OVERALL VERIFICATION STATUS	Red (Failed)				
VERIFICATION STATUS BY SCENARIO					
SCENARIO #	2	3	5	6	7
Scenario Verification Status	Red	Red	Red	Red	Red
Trigger	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Movement Technique	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Route (Line Ctrl Measure)	Unverified	Red (Failed)	Red (Failed)	Green (Passed)	Unverified
Destination	Red (Failed)	Unverified	Unverified	Red (Failed)	Green (Passed)
Speed	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Green (Passed)	Amber (Unable to Verify)
Formation	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
FormationSpacing	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Final Orientation	Unverified	Red (Failed)	Unverified	Unverified	Red (Failed)
Mount	Green (Passed)	Unverified	Unverified	Unverified	Unverified
Dismount	Amber (Unable to Verify)	Unverified	Unverified	Unverified	Red (Failed)
Halt Duration	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
planRoute	Red (Failed)	Unverified	Unverified	Unverified	Green (Passed)
Aperture to Enter or Exit	Unverified	Unverified	Unverified	Red (Failed)	Unverified
Weapon Control Status	Unverified	Red (Failed)	Unverified	Unverified	Amber (Unable to Verify)

Tailgate Resupply Verification Summary Tables

Table 11. Tailgate Resupply Initial Verification Test Design.

SCENARIO #		1	2	3	4	5	6
GENERAL SETTINGS							
Resupply Unit 1	General Type	Armor	Infantry	Mech Infantry IFV	Military Police	Medical	Field Arty
	Echelon	Platoon	Fire Team	Platoon	Platoon	Section	Platoon
	Specific Type	0	0	0	0	0	0
Resupply Unit 2	General Type	0	0	0	0	Transportation	0
	Echelon	0	0	0	0	Platoon	0
	Specific Type	0	0	0	0	0	0
Supply Unit 1	General Type	General Supply	General Supply	General Supply	General Supply	General Supply	General Supply
	Echelon	Section	Section	Section	Section	Platoon	Section
	Specific Type	0	0	0	0	0	0
Supply Unit 2	General Type	0	0	0	0	0	0
	Echelon	0	0	0	0	0	0
	Specific Type	0	0	0	0	0	0
Enemy Unit Type(s)		0	0	0	0	0	0
OTHER SCENARIO CHARACTERISTICS							
Classes of Supply Delivered		Class III and V	Class V	Class III	Class III & V	Class III & VIII	Classes III & V
Units Near the LRP		Multiple	Single	Multiple	Single	Multiple	Single
Units to be Resupplied		Single	Single	Single	Single	Multiple	Single
Level of Resupply		Subunit(s)	Unit(s)	Subunit(s)	Unit(s)	Unit(s)	Subunit(s)
Req'd Supplies Available?		Yes, all	Yes, some	None	Yes, some	Yes, all	Yes, all
Unreq'd Supplies Available?		Yes	Yes	Yes	No	No	No
Supply Amounts		Sufficient for All Types	Sufficient for All Types	Insufficient for All Types	Sufficient for Some Types	Sufficient for All Types	Sufficient for Some Types
TASK DIALOGUE SETTINGS							
Header Parameters							
Trigger		On Command	On Command	On Command	On Command	On Command	On Command
WCS Summary		Free	Free	Free	Free	Free	Free
Enable Reactions for this Task		No	No	No	No	No	No
Required Parameters							
LRP Location		See Scenario File	See Scenario File	See Scenario File	See Scenario File	See Scenario File	See Scenario File
Unit to Resupply		Section A, Armor Platoon 1	Fire Team	Section 2, Mechainzied Infantry Platoon 1	Military Police Platoon	Medical Section to receive Class III and VIII. Transport Platoon to receive Class III only.	Section 2, Artillery Platoon
ReturnLocation		See Scenario File	See Scenario File	See Scenario File	See Scenario File	See Scenario File	See Scenario File
Optional Parameters							
Formation		Vee	Wedge	Column	Line	EchelonLeft	EchelonRight
Rules of Engagement							
General		Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
Weapon Control Status		Free	Free	Free	Free	Free	Free
Fire Control Measures		N/A	N/A	N/A	N/A	N/A	N/A
OTHER							
Resupply Time		N/A	N/A	N/A	N/A	N/A	N/A
Supplies Delivered		N/A	N/A	N/A	N/A	N/A	N/A
Supplies Received		N/A	N/A	N/A	N/A	N/A	N/A
Supply Accuracy		N/A	N/A	N/A	N/A	N/A	N/A
Other 5		N/A	N/A	N/A	N/A	N/A	N/A

Table 12. Tailgate Resupply Initial Verification Results.

VERIFICATION RESULTS						
OVERALL VERIFICATION STATUS	Green					
VERIFICATION STATUS BY SCENARIO						
SCENARIO #	1	2	3	4	5	6
Scenario Verification Status	Green	Green	Green	Green	Green	Green
Trigger	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Enable Reactions for this Task	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
LRP Location	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Unit to Resupply	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
ReturnLocation	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Formation	Green (Passed)	Amber (Unable to Verify)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
General	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Weapon Control Status	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Fire Control Measures	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Resupply Time	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Supplies Delivered	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Supplies Received	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Supply Accuracy	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Other 5	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified

Mount/Dismount Verification Summary Tables

Table 13. Mount/Dismount Initial Verification Test Design.

SCENARIO #		1	2	3	4	5	6	7
GENERAL SETTINGS								
Mounting Unit(s)	General Type	DM Infantry (Mech)	DM Infantry (Mech)	Dismounted Infantry / Attachments	DM Infantry (Mech)	Engineer/Mortar	Infantry	Infantry / Attachments
	Echelon	Platoon	Entity	Platoon / Squad of Attachments	Squad	Entity	Platoon	Platoon / Fire Team of Attachments
	Specific Type	unit/mr/COMBAT/INFANTRY/PLT/PLT_MechInf_IC_US.xml	entity/mr/COMBAT/INFANTRY/PitLdr_Mech_Inf_US_IC	unit/mr/COMBAT/INFANTRY/PLT/PLT_MechInf_IC_US.xml and unit/mr/UA_MNVR_ENHANC_UNITS/SQD/SQD_DISMOUNTS_ENGR_PLT_LT_ENGR_CO_US.xml	unit/mr/COMBAT/INFANTRY/SQD/SQD_MechInf_IC_US.xml	entity/mr/COMBAT/ENGINEER/Bulldozer_D7G_Armored_Engr_US and entity/mr/COMBAT/INFANTRY/Mortar_M252_81mm_Fixed_Baseplate	unit/mr/COMBAT/INFANTRY/PLT/PLT_Light_Infantry_US_IC.xml	unit/mr/COMBAT/INFANTRY/PLT/PLT_Light_Infantry_US_IC.xml and unit/mr/COMBAT/INFANTRY/FT/FT_AA_full_LT_Inf_Co_US_IC.xml
Transporter Unit(s)	General Type	Mech Inf IFV	Mech Infantry IFV	Mech Infantry IFV / LMTV	Mech Infantry IFV	Engineer	UH60	CH47
	Echelon	Platoon	Entity	Platoon / Entity	Entity	Entity	Platoon	Entity
	Specific Type	unit/mr/COMBAT/INFANTRY/PLT/PLT_MechInf_M2A2_US.xml	entity/mr/COMBAT/INFANTRY/IFV_PL_WngmnA_M2A2_MechInf_US	unit/mr/COMBAT/INFANTRY/PLT/PLT_MechInf_M2A2_US.xml and entity/mr/COMBAT/ENGINEER/TRANSPORTATION/TrkCgo_LMTV_M1078_US	entity/mr/COMBAT/INFANTRY/IFV_PL_WngmnA_M2A2_MechInf_US	entity/mr/COMBAT/ENGINEER/TRANSPORTATION/TrkTractor_r, entity/mr/COMBAT/ENGINEER/TRANSPORTATION/SemiTrailer_25Ton_LowBoy_US, entity/mr/COMBAT/ENGINEER/TRANSPORTATION/SemiTrailer_40TonM870A1_LoBoy_US, and entity/mr/COMBAT/ENGINEER/TRANSPORTATION/TrkCgo_LMTV_M1078_US	unit/mr/COMBAT/AVIATION/PLT/PLT_UH60L_Asit_TWA_US.xml	entity/mr/COMBAT/AVIATION/ROTA_RY_WING/RWA_CH47D_Chinook_US
OTHER SCENARIO CHARACTERISTICS								
Transport Type	Ground vehicle	Ground vehicle	Ground vehicle	Ground vehicle	Ground vehicle	Ground vehicle	Aircraft	Aircraft
Number of Transports	Unit	Entity	Both	Entity	Unit	Unit	Entity	Entity
Mounter Type	Indiv Combatant	Indiv Combatant	Indiv Combatant	Indiv Cmbt / Litter	Ground vehicle	Indiv Combatant	Indiv Combatant	Indiv Combatant
Number of Mounters	Unit	Single	Both	Part of a Unit	Multiple (3)	Unit	Unit	Unit
Capacity of Transporters	Insufficient	Sufficient	Sufficient	Sufficient	One Insufficient	Sufficient	Insufficient	Insufficient
Dismounter Type	N/A	N/A	Indiv Combatant	N/A	Ground vehicle	Indiv Combatant	Indiv Combatant	Indiv Combatant
Dismount Location	N/A	N/A	Ground	N/A	Ground	Roof (one w/ space; one w/o)	Ground	Ground
TASK DIALOGUE SETTINGS								
Header Parameters								
Trigger	At Time	On Command	Completion of Previous	On Command	Phase Line Crossed	On Command	On Command	On Command
WCS Summary	Free	Free	Free	Free	Free	Free	Free	Free
Enable Reactions for this Task	No	No	No	No	No	No	No	No
Required Parameters								
Mount	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dismount	No	No	Yes	No	Yes	Yes	Yes	Yes
Optional Parameters								
Unit Transport to be Mounted	Yes	No	Yes	No	No	Yes	No	No
Entity Transport to be Mounted	No	Yes	Yes	Yes	Yes	No	Yes	Yes
PickUpDropOffMounter Behavior	No	No	No	Yes	Yes (for one)	No	No	No
Rules of Engagement								
General	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
Weapon Control Status	Free	Free	Free	Free	Free	Free	Free	Free

Table 14. Mount/Dismount Initial Verification Results.

VERIFICATION RESULTS							
OVERALL VERIFICATION STATUS	Amber						
VERIFICATION STATUS BY SCENARIO							
SCENARIO #	1	2	3	4	5	6	7
Scenario Verification Status	Amber	Green	Amber	Amber	Amber	Amber	Amber
Trigger	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Enable Reactions for this Task	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Mount	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Dismount	Unverified	Unverified	Green (Passed)	Unverified	Green (Passed)	Green (Passed)	Green (Passed)
Unit Transport to be Mounted	Green (Passed)	Unverified	Green (Passed)	Unverified	Unverified	Green (Passed)	Unverified
Entity Transport to be Mounted	Unverified	Green (Passed)	Unverified	Unverified	Green (Passed)	Unverified	Green (Passed)
PickUpDropOffMounter Behavior	Unverified	Unverified	Unverified	Green (Passed)	Green (Passed)	Unverified	Unverified
General	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Weapon Control Status	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Fire Control Measures	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Mount and/or Dismount Time	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)
Egress Location	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)
Staging Location	Unverified	Unverified	Green (Passed)	Unverified	Green (Passed)	Green (Passed)	Green (Passed)
Load Plan	Amber (Unable to Verify)	Green (Passed)	Amber (Unable to Verify)	Amber (Unable to Verify)	Green (Passed)	Green (Passed)	Amber (Unable to Verify)
Capacity	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Roof Dismount	Unverified	Unverified	Unverified	Unverified	Unverified	Amber (Unable to Verify)	Unverified

Table 15. Mount/Dismount Re-verification Test Design.

SCENARIO #		R3	R7
GENERAL SETTINGS			
Mounting Unit(s)	General Type	Dismounted Infantry / Attachments	Infantry / Attachments
	Echelon	Platoon / Squad of Attachments	Platoon / Fire Team of Attachments
	Specific Type	unit/mr/COMBAT/INFANTRY/PLT/PLT_MechInf_IC_US.xml and unit/mr/UA_MNVR_ENHANC_UNITS/SQD/SQD_DISMOUNTs_ENGR_PLT_LT_ENGR_CO_US.xml	unit/mr/COMBAT/INFANTRY/PLT/PLT_Light_Infantry_US_IC.xml and unit/mr/COMBAT/INFANTRY/FT/FT_AA_full_LT_Inf_CO_US_IC.xml
Transporter Unit(s)	General Type	Mech Infantry IFV / LMTV	UH60
	Echelon	Platoon / Entity	Platoon
	Specific Type	unit/mr/COMBAT/INFANTRY/PLT/PLT_MechInf_M2A2_US.xml and entity/mr/COMBAT_SERVICE_SUPP_ORT/TRANSPORTATION/TrkCgo_LMTV_M1078_US	unit/mr/COMBAT/AVIATION/PLT/PLT_UH60L_Aslt_TWA_US.xml
OTHER SCENARIO CHARACTERISTICS			
Transport Type		Ground vehicle	Aircraft
Number of Transports		Both	Entity
Mounter Type		Indiv Combatant	Indiv Combatant
Number of Mounters		Both	Unit
Capacity of Transporters		Sufficient	Insufficient
Dismounter Type		Indiv Combatant	Indiv Combatant
Dismount Location		Ground	Ground
TASK DIALOGUE SETTINGS			
Header Parameters			
Trigger		Completion of Previous	On Command
WCS Summary		Free	Free
Enable Reactions for this Task		No	No
Required Parameters			
Mount		Yes	Yes
Dismount		Yes	Yes
Optional Parameters			
Unit Transport to be Mounted		Yes	No
Entity Transport to be Mounted		Yes	Yes
PickUpDropOffMounter Behavior		No	Yes
Rules of Engagement			
General		Use Default ROE Only	Use Default ROE Only
Weapon Control Status		Free	Free
OTHER			
Mount and/or Dismount Time		N/A	N/A
Egress Location		N/A	N/A
Staging Location		0	0
Load Plan		N/A	N/A
Capacity		N/A	N/A
Roof Dismount		N/A	N/A

Table 16. Mount/Dismount Re-verification Results.

VERIFICATION RESULTS		
OVERALL VERIFICATION STATUS	Amber	
VERIFICATION STATUS BY SCENARIO		
SCENARIO #	R3	R7
Scenario Verification Status	Amber	Amber
Trigger	Green (Passed)	Green (Passed)
Mount	Green (Passed)	Amber (Unable to Verify)
Dismount	Green (Passed)	Green (Passed)
Unit Transport to be Mounted	Green (Passed)	Unverified
Entity Transport to be Mounted	Unverified	Green (Passed)
Mount and/or Dismount Time	Amber (Unable to Verify)	Amber (Unable to Verify)
Egress Location	Green (Passed)	Amber (Unable to Verify)
Staging Location	Green (Passed)	Green (Passed)
Load Plan	Amber (Unable to Verify)	Amber (Unable to Verify)
Capacity	Green (Passed)	Green (Passed)

Attack by Fire Verification Summary Tables

Table 17. Attack by Fire Initial Verification Test Design.

SCENARIO #		1	2	3	4	5	6	7	8
GENERAL SETTINGS									
Attacking Unit	General Type	Armor	Infantry	Engineer	Military Police	Mech Infantry	Engineer	Armor	Mech Infantry
	Echelon	Company	Fire Team	Platoon	Platoon	Platoon	Squad	Platoon	Platoon
	Specific Type	See Scenario File	See Scenario File	See Scenario File	See Scenario File	See Scenario File	unit/mr/COMBAT/ENGINEER/SQD/SQD_Dismounts_EngSpt_Plt_IC.xml	See Scenario File	See Scenario File
Enemy Unit	General Type	Armor	Infantry	Infantry	Maintenance	Mech Infantry	Infantry	Armor	Field Arty
	Echelon	Platoon	Entity	Squad	Platoon	Section	Fire Team	Section	Platoon
	Specific Type	See Scenario File	See Scenario File	See Scenario File	See Scenario File	See Scenario File	unit/mr/COMBAT/INFANTRY/FT/FT_Basic_riflemen_withinut_NVG.xml	See Scenario File	See Scenario File
OTHER SCENARIO CHARACTERISTICS									
Enemy wrt Assault Area		Inside	Outside	Both	N/A	N/A	N/A	N/A	N/A
Enemy wrt Sectors of Fire		N/A	N/A	N/A	Inside	Outside	Both	Both	Both
Line of Sight		Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
TASK DIALOGUE SETTINGS									
Header Parameters									
Trigger		On Command	On Command	On Command	On Command	On Command	On Command	On Command	On Command
WCS Summary		Tight	Free	Free	Free	Free	Tight	Hold	Free
Enable Reactions for this Task		No	No	No	No	No	No	No	No
Required Parameters									
Target Location		See Scenario	See Scenario	See Scenario	See Scenario	See Scenario	See Scenario	See Scenario	See Scenario
Combat Position		See Scenario	See Scenario	See Scenario	See Scenario	See Scenario	See Scenario	See Scenario	See Scenario
Optional Parameters									
Speed		100	5	25	50	No	250	75	50
Traveling Formation		Staggered Column	Vee	Line	None	Wedge	Column	EchelonLeft	EchelonRight
Assault Area		Yes	Yes	Yes	No	No	No	No	No
Perceived Enemy Location		No	No	No	No	No	No	No	No
Rules of Engagement									
General		Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
Weapon Control Status		Tight	Free	Free	Free	Free	Tight	Hold	Free
Fire Control Measures		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OTHER									
Sectors of Fire		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Line of Site		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other 3		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other 4		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other 5		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 18. Attack by Fire Initial Verification Results.

VERIFICATION RESULTS								
OVERALL VERIFICATION STATUS	Amber							
VERIFICATION STATUS BY SCENARIO								
SCENARIO #	1	2	3	4	5	6	7	8
Scenario Verification Status	Green	Red	Green	Green	Green	Green	Amber	Green
Trigger	Green	Green	Green	Green	Green	Green	Green	Green
Enable Reactions for this Task	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Target Location	Green	Green	Green	Green	Green	Green	Green	Green
Combat Position	Green	Red (Failed)	Green	Green	Green	Green	Green	Green
Speed	Green	Green	Green	Green	Unverified	Green	Green	Green
Traveling Formation	Green	Green	Green	Green	Green	Green	Green	Green
Assault Area	Green	Green	Green	Unverified	Unverified	Unverified	Unverified	Unverified
Perceived Enemy Location	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
General	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Weapon Control Status	Amber (Unable to Verify)	Unverified	Unverified	Unverified	Unverified	Amber (Unable to Verify)	Red (Failed)	Unverified
Fire Control Measures	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Sectors of Fire	Unverified	Unverified	Unverified	Green (Passed)	Green (Passed)	Amber (Unable to Verify)	Green (Passed)	Unverified
Line of Sight	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Green
Other 3	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Other 4	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Other 5	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified

Table 19. Attack by Fire Re-verification Test Design.

SCENARIO #		R6	R7
GENERAL SETTINGS			
Attacking Unit	General Type	Engineer	Armor
	Echelon	Squad	Platoon
	Specific Type	unit/mr/COMBAT/ENGINEER/SQD/SQD_Dismounts_EngrSpt_Plt_RS_IC.xml	unit/mr/COMBAT/ARMOR/PLT/PLT_M1A1_Armor_US.xml
Enemy Unit	General Type	Infantry	Armor
	Echelon	Fire Team	Section
	Specific Type	unit/mr/COMBAT/INFANTRY/FT/FT_Basic_riflemen_wihout_NVG.xml	unit/mr/COMBAT/ARMOR/SEC/SEC_B_M1A1_ARMOR_PLT_US.xml
OTHER SCENARIO CHARACTERISTICS			
Enemy wrt Engagement Area		N/A	Both
Enemy wrt Sectors of Fire		Both	N/A
Line of Sight		Yes	Yes
TASK DIALOGUE SETTINGS			
Header Parameters			
Trigger		On Command	On Command
WCS Summary		Tight	Tight
Enable Reactions for this Task		No	No
Required Parameters			
Target Location		See Scenario	See Scenario
Combat Position		See Scenario	See Scenario
Optional Parameters			
Speed		250	75
Traveling Formation		Vee	EchelonLeft
Engagement Area		No	Yes
Perceived Enemy Location		No	No
Rules of Engagement			
General		Use Default ROE Only	Use Default ROE Only
Weapon Control Status		Tight	Tight
OTHER			
Line of Site		N/A	N/A

Table 20. Attack by Fire Re-verification Results.

VERIFICATION RESULTS		
OVERALL VERIFICATION STATUS	Red	
VERIFICATION STATUS BY SCENARIO		
SCENARIO #	R6	R7
Scenario Verification Status	Red	Red
Trigger	Green (Passed)	Green (Passed)
Enable Reactions for this Task	Unverified	Unverified
Target Location	Green (Passed)	Green (Passed)
Combat Position	Green (Passed)	Green (Passed)
Speed	Green (Passed)	Amber (Unable to Verify)
Traveling Formation	Green (Passed)	Green (Passed)
Engagement Area	Unverified	Red (Failed)
Perceived Enemy Location	Unverified	Unverified
General	Unverified	Unverified
Weapon Control Status	Red (Failed)	Amber (Unable to Verify)
Sectors of Fire	Red (Failed)	Red (Failed)
Line of Sight	Unverified	Red (Failed)

Occupy Position Verification Summary Tables

Table 21. Occupy Position Initial Verification Test Design.

SCENARIO #	1	2	3	4	5	6
GENERAL SETTINGS						
Occupying Unit(s)	General Type	Armor	Infantry	Mech Infantry	Armor	Infantry
	Echelon	Platoon (2)	Squad	Company	Platoon	Squad
	Specific Type	Both are unit/mr/COMBAT/ARMOR/PLT/PLT_M1A1_Armor_US.xml	unit/mr/COMBAT/INFANTRY/SQD/SQD_LtInf_IC_US.xml	unit/mr/COMBAT/INFANTRY/CO_MechInfM2A2_NoDisMounts_US.xml	unit/mr/COMBAT/INFANTRY/PLT/PLT_M1A1_Armor_US.xml	unit/mr/COMBAT/INFANTRY/SQD/SQD_LtInf_IC_US.xml
OTHER SCENARIO CHARACTERISTICS						
Number of Fighting Positions	N/A	N/A	N/A	Exact	Insufficient	Excess
Enemy Location Excursions	No	Yes	No	No	Yes	Yes
Occupy Area Size	Large	Large	Small	Large	Large	Small
Number of Units	Multiple	Single	Single	Single	Single	Single
Starting Position	Outside	Outside	Outside	Inside	Outside	Outside
TASK DIALOGUE SETTINGS						
Header Parameters						
Trigger	On Command	On Command	On Command	On Command	On Command	On Command
WCS Summary	Free	Free	Free	Free	Free	Free
Enable Reactions for this Task	No	No	No	No	No	No
Required Parameters						
Occupy Area	See Scenario File	See Scenario File	See Scenario File	See Scenario File	See Scenario File	See Scenario File
Position Type	Assembly Area	Hasty Position	Deliberate Position	Battle Position	Battle Position	Battle Position
Orientation	See Scenario File	See Scenario File	See Scenario File	See Scenario File	See Scenario File	See Scenario File
Optional Parameters						
Enemy Locations	No	Yes	No	No	Yes	Yes
Entry Location	No	Yes	Yes	No	Yes	No
Constrain to Area	Yes	No	Yes	Yes	No	Yes
Occupy Spacing	No	50 m	50	No	50 m	No
Occupy Formation	Column	EchelonRight	Wedge	EchelonLeft	Vee	Line
Travel Formation	Wedge	Column	Vee	Line	EchelonLeft	EchelonRight
Rules of Engagement						
General	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
Weapon Control Status	Free	Free	Free	Free	Free	Free
Fire Control Measures	N/A	N/A	N/A	N/A	N/A	N/A
OTHER						
Repeatability	N/A	N/A	N/A	N/A	N/A	N/A

Table 22. Occupy Position Initial Verification Results.

VERIFICATION RESULTS						
OVERALL VERIFICATION STATUS	Amber					
VERIFICATION STATUS BY SCENARIO						
SCENARIO #	1	2	3	4	5	6
Scenario Verification Status	Amber	Amber	Red	Amber	Amber	Red
Trigger	Green	Green	Green	Green	Green	Green
Enable Reactions for this Task	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Occupy Area	Green	Green	Green	Green	Green	Green
Position Type	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)
Orientation	Green	Green	Red (Failed)	Green	Green	Green
Enemy Locations	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)
Entry Location	Green	Green	Green	Green	Green	Green
Constrain to Area	Green	Green	Red (Failed)	Green	Green	Red (Failed)
Occupy Spacing	Unverified	Green (Passed)	Green (Passed)	Unverified	Amber (Unable to Verify)	Unverified
Occupy Formation	Green	Green	Green	Green	Green	Green
Travel Formation	Green	Green	Green	Green	Green	Green
General	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Weapon Control Status	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Fire Control Measures	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Repeatability	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified

Table 23. Occupy Position Re-verification Test Design.

SCENARIO #		R5	R6
GENERAL SETTINGS			
Occupying Unit(s)	General Type	Infantry	Infantry
	Echelon	Squad	Squad
	Specific Type	unit/mr/COMBAT/INFANTRY/SQD/SQD_LtInf_IC_US.xml	unit/mr/COMBAT/INFANTRY/SQD/SQD_LtInf_IC_US.xml
OTHER SCENARIO CHARACTERISTICS			
Number of Fighting Positions		Insufficient	Excess
Enemy Location Excursions		Yes	Yes
Occupy Area Size		Large	Small
Number of Units		Single	Single
Starting Position		Outside	Outside
TASK DIALOGUE SETTINGS			
Header Parameters			
Trigger		On Command	On Command
WCS Summary		Free	Free
Enable Reactions for this Task		No	No
Required Parameters			
Occupy Area		See Scenario File	See Scenario File
Position Type		Battle Position	Battle Position
Orientation		See Scenario File	See Scenario File
Optional Parameters			
Enemy Locations		Yes	Yes
Entry Location		Yes	No
Constrain to Area		No	Yes
Occupy Spacing		50 m	No
Occupy Formation		Line	Line
Travel Formation		Staggered Column	Staggered Column
Rules of Engagement			
General		Use Default ROE Only	Use Default ROE Only
Weapon Control Status		Free	Free
Fire Control Measures		N/A	N/A
OTHER			
Repeatability		N/A	N/A

Table 24. Occupy Position Re-verification Results.

VERIFICATION RESULTS		
OVERALL VERIFICATION STATUS	Amber	
VERIFICATION STATUS BY SCENARIO		
SCENARIO #	R5	R6
Scenario Verification Status	Amber	Amber
Trigger	Green (Passed)	Green (Passed)
Occupy Area	Green (Passed)	Green (Passed)
Position Type	Amber (Unable to Verify)	Amber (Unable to Verify)
Orientation	Green (Passed)	Green (Passed)
Enemy Locations	Amber (Unable to Verify)	Amber (Unable to Verify)
Entry Location	Green (Passed)	Green (Passed)
Constrain to Area	Green (Passed)	Green (Passed)
Occupy Spacing	Green (Passed)	Unverified
Occupy Formation	Green (Passed)	Green (Passed)
Travel Formation	Green (Passed)	Green (Passed)

Clear Room Verification Summary Tables

Table 25. Clear Room Initial Verification Test Design.

SCENARIO #	1	2	3	4	5a	5b
GENERAL SETTINGS						
Attacking Unit	General Type	Infantry	Infantry	Infantry	DM Infantry (Mech)	DM Infantry (Mech)
	Echelon	Fire Team	Fire Team	Fire Team	Fire Team	Fire Team
	Specific Type	unit/mr/COMBAT/INFANTRY/FT/FT_LtInf_IC_US.xml	unit/mr/COMBAT/INFANTRY/FT/FT1of2_Light_Inf_Plt_RS_IC.xml	unit/mr/COMBAT/INFANTRY/FT/FT_SPF_Company_TeamA_Dismounted_RS_IC.xml	unit/mr/COMBAT/INFANTRY/FT/FT_A_MechInf_IC_US.xml	unit/mr/COMBAT/UA_INF_U NITS/FT/FT_Infantry_Dismounts_UA_INF_PLT_US_IC.xml
Enemy	General Type	Infantry	None	Noncombatant	Infantry	None
	Echelon	Entity	N/A	Entity	Entity	N/A
	Specific Type	entity/mr/COMBAT/INFANTRY/RM_AK74_GP30_Lt_InfPlt_RS_IC	N/A	entity/mr/NONCOMBATANT/IC_With_Hand_Weapon	entity/mr/COMBAT/INFANTRY/IC_FullyLoaded_OPFOR_Basic_rifleman	N/A
OTHER SCENARIO CHARACTERISTICS						
Location of Fire Team wrt Room	Outside	Inside	Outside	Outside	Outside	Outside
Room to Stack on Right	N/A	Yes	N/A	No	Yes	N/A
Stack Point Locations	Not Too Close Together	N/A	Too Close Together	N/A	N/A	Not Too Close Together
Stack Location wrt Doorway	Close to Doorway	N/A	Close to Doorway	N/A	N/A	Too Far from Doorway
Stack Consistency Excursion	No	No	No	Yes	No	No
Multi-Room Scenario	No	No	No	No	Yes	Yes
Room too Small	Yes	No	No	No	No	No
Closet in Room (along Entry Path)	No	No	Yes	No	No	No
Grenade Type	Fragmentary	Fragmentary	Stun/Flash-Bang	No Grenades	Fragmentary	Fragmentary
TASK DIALOGUE SETTINGS						
Header Parameters						
Trigger	On Command	On Command	On Command	On Command	On Command	On Command
WCS Summary	Free	Free	Free	Free	Free	Free
Enable Reactions for this Task	No	No	No	No	No	No
Required Parameters						
None	N/A	N/A	N/A	N/A	N/A	N/A
Optional Parameters						
Room ID	Yes	Yes	Yes	Yes	No	Yes
Stack Positions	Yes	No	Yes	No	No	Yes
Enemy Expected	Yes	No	Yes	Yes	No	Yes
Rules of Engagement						
General	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
Weapon Control Status	Free	Free	Free	Free	Free	Free
Fire Control Measures	N/A	N/A	N/A	N/A	N/A	N/A
OTHER						
Stack Position Consistency	N/A	N/A	N/A	Check	N/A	N/A
Movement into Room	Check	Check	Check	Check	Check	Check
Grenade Status	Check	N/A	Check	N/A	N/A	Check
Enemy Engagement	Check	N/A	Check	Check	N/A	N/A

Table 26. Clear Room Initial Verification Results.

VERIFICATION RESULTS						
OVERALL VERIFICATION STATUS	Red					
VERIFICATION STATUS BY SCENARIO						
SCENARIO #	1	2	3	4	5	6
Scenario Verification Status	Amber	Amber	Red	Red	Red	Amber
Trigger	Green	Green	Green	Green	Red (Failed)	Green
Enable Reactions for this Task	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
None	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Room ID	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Unverified	Green (Passed)
Stack Positions	Amber (Unable to Verify)	Amber (Unable to Verify)	Green (Passed)	Amber (Unable to Verify)	Unverified	Amber (Unable to Verify)
Enemy Expected	Green	Green	Red (Failed)	Unverified	Unverified	Green
General	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Weapon Control Status	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Fire Control Measures	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Stack Position Consistency	Unverified	Unverified	Unverified	Red (Failed)	Unverified	Unverified
Movement into Room	Green	Green	Green	Green	Unverified	Green
Grenade Status	Amber (Unable to Verify)	Unverified	Amber (Unable to Verify)	Unverified	Unverified	Amber (Unable to Verify)
Enemy Engagement	Amber (Unable to Verify)	Unverified	Green (Passed)	Red (Failed)	Unverified	Unverified

Table 27. Clear Room Re-verification Test Design.

SCENARIO #		R1	R2	R3	R4	R5a	R5b
GENERAL SETTINGS							
Attacking Unit	General Type	Infantry	Infantry	Infantry	DM Infantry (Mech)	DM Infantry (Mech)	DM Infantry (Mech)
	Echelon	Fire Team	Fire Team	Fire Team	Fire Team	Fire Team	Fire Team
	Specific Type	unit/mr/COMBAT/INFANTRY/FT/FT_LtInf_IC_US.xml	unit/mr/COMBAT/INFANTRY/FT/FT1of2_Light_Inf_Plt_RS_IC.xml	unit/mr/COMBAT/INFANTRY/FT/FT_SPF_Company_TeamA_Dismounted_RS_IC.xml	unit/mr/COMBAT/INFANTRY/FT/FT_A_MechInf_IC_US.xml	unit/mr/COMBAT/UA_INF_U NITS/FT/FT_In fantry_Dismou nts_UA_INF_PLT_US_IC.xml	unit/mr/COMBAT/UA_INF_U NITS/FT/FT_In fantry_Dismou nts_UA_INF_PLT_US_IC.xml
Enemy	General Type	Infantry	None	Noncombatant	Infantry	None	None
	Echelon	Entity	N/A	Entity	Entity	N/A	N/A
	Specific Type	entity/mr/COMBAT/INFANTRY/RM_AK74_GP30_Lt_InfPlt_RS_IC	N/A	entity/mr/NONCOMBATANT/IC_With_Hand_Weapon	entity/mr/COMBAT/INFANTRY/IC_FullyLoaded_OPFOR_Basic_rifleman	N/A	N/A
OTHER SCENARIO CHARACTERISTICS							
Location of Fire Team wrt Room		Outside	Inside	Outside	Outside	Outside	Outside
Room to Stack on Right		N/A	Yes	N/A	No	Yes	N/A
Stack Point Locations		Not Too Close Together	N/A	Too Close Together	N/A	N/A	Not Too Close Together
Stack Location wrt Doorway		Close to Doorway	N/A	Close to Doorway	N/A	N/A	Too Far from Doorway
Stack Consistency Excursion		No	No	No	Yes	No	No
Multi-Room Scenario		No	No	No	No	Yes	Yes
Room too Small		Yes	No	No	No	No	No
Closet in Room (along Entry Path)		No	No	Yes	No	No	No
Grenade Type		Fragmentary	Fragmentary	Stun/Flash-Bang	No Grenades	Fragmentary	Fragmentary
TASK DIALOGUE SETTINGS							
Header Parameters							
Trigger		On Command	On Command	On Command	On Command	On Command	On Command
WCS Summary		Free	Free	Free	Free	Free	Free
Required Parameters							
None		N/A	N/A	N/A	N/A	N/A	N/A
Optional Parameters							
Room ID		Yes	Yes	Yes	Yes	No	Yes
Stack Positions		Yes	No	Yes	No	No	Yes
Enemy Expected		Yes	No	Yes	Yes	No	Yes
Rules of Engagement							
General		Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
Weapon Control Status		Free	Free	Free	Free	Free	Free
OTHER							
Stack Position Consistency		N/A	N/A	N/A	Check	N/A	N/A
Movement into Room		Check	Check	Check	Check	Check	Check
Grenade Status		Check	N/A	Check	N/A	N/A	Check
Enemy Engagement		Check	N/A	Check	Check	N/A	N/A

Table 28. Clear Room Re-verification Results.

VERIFICATION RESULTS						
OVERALL VERIFICATION STATUS	Red					
VERIFICATION STATUS BY SCENARIO						
SCENARIO #	R1	R2	R3	R4	R5a	R5b
Scenario Verification Status	Amber	Amber	Red	Red	Red	Amber
Trigger	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Red (Failed)	Green (Passed)
Room ID	Amber (Unable to Verify)	Amber (Unable to Verify)	Green (Passed)	Green (Passed)	Unverified	Green (Passed)
Stack Positions	Amber (Unable to Verify)	Amber (Unable to Verify)	Green (Passed)	Amber (Unable to Verify)	Unverified	Amber (Unable to Verify)
Enemy Expected	Green (Passed)	Green (Passed)	Red (Failed)	Unverified	Unverified	Green (Passed)
Weapon Control Status	Green (Passed)	Unverified	Green (Passed)	Green (Passed)	Unverified	Unverified
Stack Position Consistency	Unverified	Unverified	Unverified	Red (Failed)	Unverified	Unverified
Movement into Room	Green (Passed)	Amber (Unable to Verify)	Green (Passed)	Green (Passed)	Unverified	Green (Passed)
Grenade Status	Green (Passed)	Unverified	Amber (Unable to Verify)	Unverified	Unverified	Green (Passed)
Enemy Engagement	Green (Passed)	Unverified	Green (Passed)	Green (Passed)	Unverified	Unverified

Tow to Location Verification Summary Tables

Table 29. Tow to Location Initial Verification Test Design.

SCENARIO #			1	2	3	4	5	6	7
GENERAL SETTINGS									
Supporting Unit	General Type	Maintenance HEMMT Wrecker	Infantry (Mech) M113 APC	Maintenance (M88 Recovery)	Maintenance 5 Ton Wrecker	Armor (M1A2 Abrams)	Infantry (HMMWV)	Maintenance HEMMT Wrecker	
	Echelon	Entity	Entity	Entity	Entity	Entity	Entity	Entity	
	Specific Type	entity/mr/COMBAT_SERVICE_SUPPORT/MAINTENANCE/Trk_HEMMTWreckerReco v_M984_US	entity/mr/COMBAT/INFANTRY/INFANTRY/APC/APC_M13A3_Infantry	entity/mr/COMBAT_SERVICE_SUPPORT/MAINTENANCE/Recovery_V eh_M88A2_US	entity/mr/COMBAT_SERVICE_SUPPORT/MAINTENANCE/Trk_Wrecke rRecov_5T_M TV_M1089_US	entity/mr/COMBAT/ARMOR/ Tank_M1A2_A brams_Armor	entity/mr/COMBAT/INFANTRY/HMMWV_M 998_TrkUtil	entity/mr/COMBAT_SERVICE_SUPPORT/MAINTENANCE/Trk_HEMMTWreckerReco v_M984_US	
Supported Unit	General Type	Infantry (Light) HMMWV	Infantry (Mech) M113 APC	Transportation (HEMMT Cargo)	Armor (M1A2 Abrams)	Armor (M1A2 Abrams)	Transportation (5 Ton Cargo)	Infantry (Light) HMMWV	
	Echelon	Entity	Entity	Entity	Entity	Entity	Entity	Entity	
	Specific Type	entity/mr/COMBAT/INFANTRY/HMMWV_M 998_TrkUtil	entity/mr/COMBAT/INFANTRY/APC/APC_M13A3_Infantry	entity/mr/COMBAT_SERVICE_SUPPORT/MAINTENANCE/Trk_HEMMTWreckerReco v_M984_US	entity/mr/COMBAT/ARMOR/ Tank_M1A2_A brams_Armor	entity/mr/COMBAT/ARMOR/ Tank_M1A2_A brams_Armor	entity/mr/COMBAT/INFANTRY/TRANSPORTATION/Truck Cargo_5Ton_M928	entity/mr/COMBAT/INFANTRY/HMMWV_M 998_TrkUtil	
OTHER SCENARIO CHARACTERISTICS									
Low Tow Rating		N/A	N/A	N/A	N/A	N/A	Yes	N/A	
Two vehicles tasked to tow		N/A	N/A	Yes	N/A	N/A	N/A	N/A	
Low Classification of Bridge		N/A	Yes	N/A	N/A	N/A	N/A	N/A	
Towee Vehicle in No/Go Terrain		N/A	N/A	N/A	N/A	Yes	N/A	N/A	
TASK DIALOGUE SETTINGS									
Header Parameters									
Trigger		On Command	On Command	On Command	On Command	On Command	On Command	On Command	
WCS Summary		Free	Free	Free	Free	Free	Free	Free	
Enable Reactions for this Task		No	No	No	No	No	No	No	
Required Parameters									
Towee Vehicle		HMMWV	M113-2	HEMMT	M1A2	M1A2	Truck	HMMWV	
Optional Parameters									
Ingress Route		Yes	N/A	N/A	N/A	N/A	N/A	N/A	
Egress Route		Yes	Yes	N/A	N/A	Yes	N/A	N/A	
Destination		N/A	N/A	Yes	Yes	N/A	Yes	Yes	
Final Destination		N/A	N/A	N/A	Yes	Yes	Yes	Yes	
Rules of Engagement									
General		Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	
Weapon Control Status		Free	Free	Free	Free	Free	Free	Free	
Fire Control Measures		N/A	N/A	N/A	N/A	N/A	N/A	N/A	
OTHER									
Low Tow Rating		N/A	N/A	N/A	N/A	N/A	Yes	N/A	
Two vehicles tasked to tow		N/A	N/A	Yes	N/A	N/A	N/A	N/A	
Low Classification of Bridge		N/A	N/A	N/A	N/A	Yes	N/A	N/A	
Towee Vehicle in No/Go Terrain		N/A	0	N/A	N/A	N/A	N/A	N/A	

Table 30. Tow to Location Initial Verification Results.

VERIFICATION RESULTS							
OVERALL VERIFICATION STATUS	Amber						
VERIFICATION STATUS BY SCENARIO							
SCENARIO #	1	2	3	4	5	6	7
Scenario Verification Status	Red (Failed)	Green (Passed)	Amber (Unable to Verify)	Red (Failed)	Green (Passed)	Red (Failed)	Green (Passed)
Trigger	Green (Passed)	Green (Passed)	Green (Passed)	Red (Failed)	Green (Passed)	Red (Failed)	Green (Passed)
Enable Reactions for this Task	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Towee Vehicle	Green (Passed)	Green (Passed)	Green (Passed)	Unverified	Green (Passed)	Unverified	Green (Passed)
Ingress Route	Red (Failed)	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Egress Route	Green (Passed)	Green (Passed)	Unverified	Unverified	Green (Passed)	Unverified	Unverified
Destination	Unverified	Unverified	Green (Passed)	Unverified	Unverified	Unverified	Green (Passed)
Final Destination	Unverified	Unverified	Unverified	Unverified	Green (Passed)	Unverified	Green (Passed)
General	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Weapon Control Status	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Fire Control Measures	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Low Tow Rating	Unverified	Unverified	Unverified	Unverified	Unverified	Amber (Unable to Verify)	Unverified
Two vehicles tasked to tow	Unverified	Unverified	Amber (Unable to Verify)	Unverified	Unverified	Unverified	Unverified
Low Classification of Bridge	Unverified	Unverified	Unverified	Unverified	Amber (Unable to Verify)	Unverified	Unverified
Towee Vehicle in No/Go Terrain	Unverified	Amber (Unable to Verify)	Unverified	Unverified	Unverified	Unverified	Unverified

Table 31. Tow to Location Re-verification Test Design.

SCENARIO #		R1	R3	R6	R8
GENERAL SETTINGS					
Supporting Unit	General Type	Maintenance HEMMT Wrecker	Maintenance (M88 Recovery)	Infantry (HMMWV)	Maintenance HEMMT Wrecker
	Echelon	Entity	Entity	Entity	Entity
	Specific Type	entity/mr/COMBAT_SERVICE_SUPPORT/MAINTENANCE/Trk_HEMMT_WreckerRecov_M984_US	entity/mr/COMBAT_SERVICE_SUPPORT/MAINTENANCE/Recovery_Veh_M88A2_US	entity/mr/COMBAT/INFANTRY/HMMWV_M998_TrkUtil	entity/mr/COMBAT_SERVICE_SUPPORT/MAINTENANCE/Trk_HEMMT_WreckerRecov_M984_US
Supported Unit	General Type	Infantry (Light) HMMWV	Transportation (HEMMT Cargo)	Transportation (5 Ton Cargo)	Infantry (Light) HMMWV
	Echelon	Entity	Entity	Entity	Entity
	Specific Type	entity/mr/COMBAT/INFANTRY/HMMWV_M998_TrkUtil	entity/mr/COMBAT_SERVICE_SUPPORT/MAINTENANCE/Trk_HEMMT_WreckerRecov_M984_US	entity/mr/COMBAT_SERVICE_SUPPORT/TRANSPORTATION/Truck_Cargo_5Ton_M928	entity/mr/COMBAT/INFANTRY/HMMWV_M998_TrkUtil
OTHER SCENARIO CHARACTERISTICS					
Low Tow Rating		N/A	N/A	Yes	N/A
Two vehicles tasked to tow		N/A	Yes	N/A	N/A
TASK DIALOGUE SETTINGS					
Header Parameters					
Trigger		On Command	On Command	On Command	On Command
WCS Summary		Free	Free	Free	Free
Enable Reactions for this Task		No	No	No	No
Required Parameters					
Towee Vehicle		HMMWV	HEMM-T	5 Ton Cargo	HMMWV
Optional Parameters					
Ingress Route		Yes	N/A	N/A	N/A
Egress Route		Yes	N/A	N/A	N/A
Dropoff Point		N/A	Yes	Yes	Yes
Destination		N/A	N/A	N/A	Yes
Ingress Point		N/A	N/A	N/A	Yes
Rules of Engagement					
General		Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
Weapon Control Status		Free	Free	Free	Free
Fire Control Measures		N/A	N/A	N/A	N/A
OTHER					
Low Tow Rating		N/A	N/A	Yes	N/A
Two vehicles tasked to tow		N/A	Yes	N/A	N/A

Table 32. Tow to Location Re-verification Results.

VERIFICATION RESULTS				
OVERALL VERIFICATION STATUS	Red			
VERIFICATION STATUS BY SCENARIO				
SCENARIO #	R1	R3	R6	R8
Scenario Verification Status	Green (Passed)	Red (Failed)	Amber (Unable to Verify)	Red (Failed)
Trigger	Green (Passed)	Green (Passed)	Amber (Unable to Verify)	Green (Passed)
Towee Vehicle	Green (Passed)	Green (Passed)	Unverified	Unverified
Ingress Route	Green (Passed)	Unverified	Unverified	Unverified
Egress Route	Green (Passed)	Unverified	Unverified	Unverified
Dropoff Point	Unverified	Red (Failed)	Unverified	Unverified
Destination	Unverified	Unverified	Unverified	Unverified
Ingress Point	Unverified	Unverified	Unverified	Red (Failed)
Low Tow Rating	Unverified	Unverified	Amber (Unable to Verify)	Unverified
Two vehicles tasked to tow	Unverified	Amber (Unable to Verify)	Unverified	Unverified

Conduct Air Reconnaissance Verification Summary Tables

Table 33. Conduct Air Reconnaissance Initial Verification Test Design.

SCENARIO #		1	2	3	4	5	6	7
GENERAL SETTINGS								
Recon Unit	General Type	RWA Attack	Any	RWAReconnaissance Attack	RWA Utility	RWA Reconnaissance	Any	FWA Reconnaissance
	Echelon	Company	Platoon	Troop	Section	Team	Platoon	Team
	Specific Type	unit/mr/COMBAT/AVIATION/CO/CO_AH64D_Longbow_Atk_RWA_US.xml	unit/mr/UA_AVN_UNITS/PLT/PLT_CH47_H_VY_RWA_CO_GSAB_Avn_Bde_RWA_US.xml	unit/mr/COMBAT/AVIATION/CO/CO_OH58D_ReconAttack_RWA_US.xml	unit/mr/COMBAT/AVIATION/PLT/PLT_UH60L_AsLt_RWA_US.xml	unit/mr/COMBAT/AVIATION/TEAM/TM_OH58D_for_ReconAttack_Plt_RWA_US.xml	unit/mr/UA_AVN_UNITS/PLT/PLT_CH47_H_VY_RWA_CO_GSAB_Avn_Bde_RWA_US.xml	unit/mr/COMBAT/AVIATION/SEC/SEC_F16C_Falcon2_Aircraft_US.xml
Enemy	General Type	Air Defense	N/A	Infantry	N/A	Infantry	N/A	Air Defense
	Echelon	Team		Platoon		Company		Section
	Specific Type	unit/mr/COMBAT/AIR_DEFENSE/FT/TM_MANPADS_BTR_SA18_ADA_RS_IC.xml		unit/mr/COMBAT/INFANTRY/PLT/PLT_AGL_Dismounts_and_Vehs_RS.xml		unit/mr/COMBAT/INFANTRY/CO/CO_Motorized_Inf_Dismounted_RS_IC.xml		unit/mr/COMBAT/AIR_DEFENSE/PLT/PLT_2S6M_ADA_GunMissileBtry_RS.xml
OTHER SCENARIO CHARACTERISTICS								
Aircraft Type		Apache - AH64D	CH-47 Chinook	Kiowa - OH58D	UH-60 BlackHawk	Kiowa - OH58D	CH-47 Chinook	F-16
Number of Aircraft		6	4	8	2	2	4	2
Environmental Conditions		Night	Night	Day	Night	Night	Day	Day
TASK DIALOGUE SETTINGS								
Header Parameters								
Trigger	On Command	On Command	On Command	On Command	On Command	On Command	On Command	On Command
WCS Summary	FREE	HOLD	FREE	TIGHT	TIGHT	HOLD	TIGHT	
Enable Reactions for this Task	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Required Parameters								
Recon Mission Type	Zone	Zone	Route	Zone	Area	Route	Area	
Optional Parameters								
Ingress Route	NO	YES	NO	YES	NO	YES	NO	
Egress Route	NO	NO	NO	YES	NO	YES	YES	
Recon Area	YES	YES	NO	YES	YES	NO	YES	
Recon Route	NO	NO	YES	NO	NO	YES	NO	
Enemy Contact	Expected	Not Likely	Expected	Not Likely	Possible	Not Likely	Possible	
Formation Spacing	100 meters	100 meters	80 meters	150 meters	100 meters	50 meters	50 meters	
Formation	Combat Trail	Trail	Combat Spread	Staggered Column	Combat Spread	Column	Column	
Movement Technique	Bound and Overwatch Successive	Bound and Overwatch Alternating	Bound and Overwatch Alternating	Traveling Overwatch	Bound and Overwatch Successive	Traveling	Traveling	
Recon Speed	Default	Default	Default	Default	Default	Default	Default	
Commanded Speed	Default	Default	60 Km/hr	50 Km/hr	Default	Default	300 Km/hr	
Recon Altitude	Default	Default	Default	Default	Default	Default	Default	
Commanded Altitude	Default	50 meters	50 meters	Default	Default	70 meters	200 meters	
Should Land	YES	YES	NO	YES	NO	NO	YES	
Rules of Engagement								
General	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	
Weapon Control Status	FREE	HOLD	FREE	TIGHT	TIGHT	HOLD	TIGHT	
Fire Control Measures	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
OTHER								
Reaction to Enemy	YES	N/A	YES	N/A	YES	YES	YES	
Recons Feature(s) IAW Default Time Value	YES	YES	YES	YES	YES	YES	YES	
Primary Feature to Recon	Bridge	Obstacles All	Obstacles Vehicle	Buildings	Obstacles Infantry	Route	Bridge	
Report Features upon Detection	YES	YES	YES	YES	YES	YES	YES	

Table 34. Conduct Air Reconnaissance Initial Verification Results.

VERIFICATION RESULTS							
OVERALL VERIFICATION STATUS	Red						
VERIFICATION STATUS BY SCENARIO							
SCENARIO #	1	2	3	4	5	6	7
Scenario Verification Status	Red	Red	Red	Red	Red	Red	Red
Trigger	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Red (Failed)	Green (Passed)	Red (Failed)
Enable Reactions for this Task	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Recon Mission Type	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Number of Features to Recon	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Unverified	Amber (Unable to Verify)	Unverified
Ingress Route	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Unverified	Green (Passed)	Unverified
Egress Route	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Unverified	Green (Passed)	Unverified
Recon Area	Green (Passed)	Green (Passed)	Unverified	Green (Passed)	Unverified	Unverified	Unverified
Recon Route	Unverified	Unverified	Green (Passed)	Unverified	Unverified	Green (Passed)	Unverified
Enemy Contact	Amber (Unable to Verify)	Unverified	Amber (Unable to Verify)	Unverified	Unverified	Unverified	Unverified
Formation Spacing	Red (Failed)	Red (Failed)	Red (Failed)	Red (Failed)	Unverified	Red (Failed)	Unverified
Formation	Red (Failed)	Green (Passed)	Red (Failed)	Green (Passed)	Unverified	Green (Passed)	Unverified
Movement Technique	Green (Passed)	Green (Passed)	Amber (Unable to Verify)	Green (Passed)	Unverified	Green (Passed)	Unverified
Recon Speed	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Unverified	Green (Passed)	Unverified
Commanded Speed	Green (Passed)	Green (Passed)	Amber (Unable to Verify)	Green (Passed)	Unverified	Green (Passed)	Unverified
Recon Altitude	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Unverified	Green (Passed)	Unverified
Commanded Altitude	Green (Passed)	Green (Passed)	Amber (Unable to Verify)	Green (Passed)	Unverified	Green (Passed)	Unverified
Should Land	Red (Failed)	Red (Failed)	Green (Passed)	Green (Passed)	Unverified	Green (Passed)	Unverified
General	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Weapon Control Status	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Fire Control Measures	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Reaction to Enemy	Amber (Unable to Verify)	Unverified	Amber (Unable to Verify)	Unverified	Unverified	Unverified	Unverified
Recons Feature(s) IAW Default Time Value	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Unverified	Amber (Unable to Verify)	Unverified
Primary Feature to Recon	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Unverified	Amber (Unable to Verify)	Unverified
Report Features upon Detection	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Unverified	Amber (Unable to Verify)	Unverified

Table 35. Conduct Air Reconnaissance Re-verification Test Design.

SCENARIO #		R2	R3	R4	R5	R7
GENERAL SETTINGS						
Recon Unit	General Type	Any	RWAReconnaissance Attack	RWA Utility	RWA Reconnaissance	FWA Reconnaissance
	Echelon	Platoon	Troop	Section	Team	Team
	Specific Type	unit/mr/UA_AVN_UNITS/PLT/PLT_ATK_ACFT_AH64A_ATK_RECON_CO_RWA_US.xml	unit/mr/COMBAT/AVIATION/CO/CO_OH58D_ReconAttack_RWA_US.xml	unit/mr/COMBAT/AVIATION/PLT/PLT_UH60L_Aslt_RWA_US.xml	unit/mr/COMBAT/AVIATION/TEAM/TM_OH58D_for_ReconAttack_Plt_RWA_US.xml	unit/mr/COMBAT/AVIATION/SEC/SEC_F16C_Falcon2_Aircraft_US.xml
Enemy	General Type	N/A	Infantry	N/A	Infantry	Air Defense
	Echelon		Platoon		Company	Section
	Specific Type		unit/mr/COMBAT/INFANTRY/PLT/PLT_AGL_Dismounts_and_Vehs_RS.xml		unit/mr/COMBAT/INFANTRY/CO/CO_Motorized_Inf_Dismounted_RS_IC.xml	unit/mr/COMBAT/AIR_DEFENSE/PLT/PLT_2S6M_ADA_GunMissileBtry_RS.xml
OTHER SCENARIO CHARACTERISTICS						
Aircraft Type		Apache - AH64A	Kiowa - OH58D	UH-60 BlackHawk	Kiowa - OH58D	F-16
Number of Aircraft		5	8	2	2	2
Environmental Conditions		Night	Day	Night	Night	Night
TASK DIALOGUE SETTINGS						
Header Parameters						
Trigger		On Command	On Command	On Command	On Command	On Command
WCS Summary		HOLD	FREE	TIGHT	TIGHT	TIGHT
Enable Reactions for this Task		N/A	N/A	N/A	N/A	N/A
Required Parameters						
Required Parameters		Zone	Route	Zone	Area	Area
Optional Parameters						
Ingress Route		YES	NO	YES	NO	NO
Egress Route		NO	NO	YES	NO	YES
Recon Area		YES	NO	YES	YES	YES
Recon Route		NO	YES	NO	NO	NO
Enemy Contact		Not Likely	Expected	Not Likely	Possible	Possible
Formation Spacing		100 meters	80 meters	150 meters	100 meters	50 meters
Formation		Trail	Combat Spread	Staggered Column	Combat Spread	Column
Movement Technique		Bound and Overwatch Alternating	Bound and Overwatch Alternating	Traveling Overwatch	Bound and Overwatch Successive	Traveling
Recon Speed		Default	Default	Default	Default	Default
Commanded Speed		Default	60 Km/hr	50 Km/hr	Default	300 Km/hr
Recon Altitude		Default	Default	Default	Default	Default
Commanded Altitude		50 meters	50 meters	Default	Default	200 meters
Should Land		YES	NO	YES	NO	YES
Rules of Engagement						
General		Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
Weapon Control Status		HOLD	FREE	TIGHT	TIGHT	TIGHT
OTHER						
Reaction to Enemy		N/A	YES	N/A	YES	YES
Recons Feature(s) IAW Default Time Value		YES	YES	YES	YES	YES
Primary Feature to Recon		Obstacles All	Buildings	Buildings	Obstacles Infantry	Bridge
Report Features upon Detection		YES	YES	YES	YES	YES

Table 36. Conduct Air Reconnaissance Re-verification Results.

VERIFICATION RESULTS					
OVERALL VERIFICATION STATUS	Red				
VERIFICATION STATUS BY SCENARIO					
SCENARIO #	R2	R3	R4	R5	R7
Scenario Verification Status	Red	Red	Red	Red	Red
Trigger	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Number of Features to Recon	Green (Passed)	Unverified	Green (Passed)	Green (Passed)	Green (Passed)
Ingress Route	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Egress Route	Green (Passed)	Unverified	Green (Passed)	Green (Passed)	Green (Passed)
Recon Area	Green (Passed)	Unverified	Green (Passed)	Green (Passed)	Green (Passed)
Recon Route	Unverified	Red (Failed)	Unverified	Unverified	Unverified
Enemy Contact	Unverified	Green (Passed)	Unverified	Green (Passed)	Amber (Unable to Verify)
Formation Spacing	Red (Failed)	Red (Failed)	Red (Failed)	Amber (Unable to Verify)	Red (Failed)
Formation	Green (Passed)	Green (Passed)	Green (Passed)	Amber (Unable to Verify)	Green (Passed)
Movement Technique	Green (Passed)	Unverified	Green (Passed)	Green (Passed)	Green (Passed)
Recon Speed	Red (Failed)	Unverified	Green (Passed)	Red (Failed)	Red (Failed)
Commanded Speed	Amber (Unable to Verify)	Red (Failed)	Green (Passed)	Amber (Unable to Verify)	Red (Failed)
Recon Altitude	Green (Passed)	Unverified	Green (Passed)	Green (Passed)	Red (Failed)
Commanded Altitude	Green (Passed)	Red (Failed)	Green (Passed)	Green (Passed)	Red (Failed)
Should Land	Red (Failed)	Unverified	Green (Passed)	Green (Passed)	Green (Passed)
Weapon Control Status	Unverified	Green (Passed)	Unverified	Green (Passed)	Amber (Unable to Verify)
Reaction to Enemy	Unverified	Green (Passed)	Unverified	Green (Passed)	Amber (Unable to Verify)
Recons Feature(s) IAW Default Time Value	Amber (Unable to Verify)	Unverified	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)
Primary Feature to Recon	Green (Passed)	Unverified	Green (Passed)	Green (Passed)	Green (Passed)
Report Features upon Detection	Green (Passed)	Unverified	Green (Passed)	Green (Passed)	Green (Passed)

FWA Platform Follow Route Verification Summary Tables

Table 37. FWA Platform Follow Route Initial Verification Test Design.

SCENARIO #		1A	1B	2	3	4	5	6
GENERAL SETTINGS								
Recon Unit	General Type	FWA	FWA	FWA	FWA	FWA	FWA	FWA
	Echelon	Entity	Entity	Entity	Entity	Entity	Entity	Entity
	Specific Type	entity/mr/COMBAT/AVIATION/FIXED_WIN/G/FWA_Harrier	entity/mr/COMBAT/AVIATION/FIXED_WIN/G/FWA_Harrier	entity/mr/COMBAT/AVIATION/FIXED_WIN/G/FWA_A10_Thunderbolt_US	entity/mr/COMBAT/AVIATION/FIXED_WIN/G/FWA_F16C_Fighting_Falcon_US.xml	entity/mr/COMBAT/AVIATION/FIXED_WIN/G/FWA_SU24_D_Fencer.xml	entity/mr/COMBAT/AVIATION/FIXED_WIN/G/FWA_AC130H_SPECTRE_GunShip_US.xml	entity/mr/COMBAT/AVIATION/FIXED_WIN/G/FWA_SU-17_FitterK.xml
Enemy	General Type	Air Defense	Air Defense	Infantry	Mounted Infantry	Air Defense	N/A	FWA
	Echelon	Crew	Crew	Platoon	Unit	Unit	0	Entity
	Specific Type	unit/mr/COMBAT/AIR_DEFENSE/PLT/PLT_265M_ADA_GunMissileBtry_RS	unit/mr/COMBAT/AIR_DEFENSE/PLT/PLT_265M_ADA_GunMissileBtry_RS	unit/mr/COMBAT/INFANTRY/PLT/PLT_Guerilla_Inf_OPFOR.xml	unit/mr/COMBAT/INFANTRY/PLT/PLT_MechInf_M2A2_Angd_lcs_US.xml	unit/mr/COMBAT/AIR_DEFENSE/PLT/PLT_265M_ADA_GunMissileBtry_RS.xml	0	entity/mr/COMBAT/AVIATION/FIXED_WIN/G/FWA_F16C_Fighting_Falcon_US.xml
OTHER SCENARIO CHARACTERISTICS								
Aircraft Type		FWA Harrier	FWA Harrier	FWA A-10 Thunderbolt	FWA F-16	FWA SU-24	AC-130	FWA SU-17
Number of Aircraft		1	1	1	1	1	1	1
Environmental Conditions		Night	Night	Day	Day	Night	Night	Day
Enemy Contact		Likely	Likely	Unlikely	Very Likely	Very Likely	Unlikely	Likely
TASK DIALOGUE SETTINGS								
Header Parameters								
Trigger		On Command	On Command	On Command	On Command	On Command	On Command	On Command
WCS Summary		HOLD	HOLD	FREE	FREE	HOLD	TIGHT	TIGHT
Enable Reactions for this Task		YES	YES	NO	YES	NO	NO	YES
Required Parameters								
Flight Mode		Low	Low	Very Low	Low	Very Low	High	Medium
Optional Parameters								
Route Type		Air	Air	Air	Air	Air	Air	Air
Route Point Type		Waypoints	Waypoints	Destination Point	Waypoints	Destination Point	Waypoints	Destination Point
Final Orientation		YES	NO	NO	NO	NO	NO	NO
Commanded Speed		Default	Default	User Input	Default	User Input	Default	User Input
Take off Speed		Default	Default	User Input	Default	User Input	User Input	Default
Landing Speed		Default	Default	Default	User Input	User Input	User Input	Default
Commanded Altitude		User Input	User Input	Default	User Input	Default	User Input	Default
Should Land		YES	YES	YES	NO	NO	YES	NO
Delay Time		NO	NO	YES	YES	YES	NO	NO
Rules of Engagement								
General		Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
Weapon Control Status		HOLD	HOLD	FREE	FREE	HOLD	TIGHT	TIGHT
OTHER								
Reaction to Enemy		YES	YES	YES	YES	NO	NO	YES
Type of Enemy Contact		S.A.M.	S.A.M.	Direct Fire	Direct Fire	S.A.M.	N/A	Air to Air
Multiple Routes during flight		YES	YES	YES	NO	YES	NO	NO

Table 38. FWA Platform Follow Route Initial Verification Results.

VERIFICATION RESULTS							
OVERALL VERIFICATION STATUS	Red						
VERIFICATION STATUS BY SCENARIO							
SCENARIO #	1A	1B	2	3	4	5	6
Scenario Verification Status	Red	Green	Amber	Amber	Amber	Amber	Amber
Trigger	Red (Failed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Flight Mode	Amber (Unable to Verify)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Route Type	Amber (Unable to Verify)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Route Point Type	Amber (Unable to Verify)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Final Orientation	Red (Failed)	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Commanded Speed	Amber (Unable to Verify)	Amber (Unable to Verify)	Red (Failed)	Red (Failed)	Amber (Unable to Verify)	Red (Failed)	Amber (Unable to Verify)
Take off Speed	Amber (Unable to Verify)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Landing Speed	Amber (Unable to Verify)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Commanded Altitude	Amber (Unable to Verify)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Should Land	Amber (Unable to Verify)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Delay Time	Amber (Unable to Verify)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Reaction to Enemy	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Unverified	Amber (Unable to Verify)
Type of Enemy Contact	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Green (Passed)	Unverified	Amber (Unable to Verify)
Multiple Routes during flight	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Green (Passed)	Red (Failed)	Green (Passed)	Green (Passed)

Table 39. FWA Platform Follow Route Re-verification Test Design.

SCENARIO #		R1A	R1B	R2	R3	R4	R6
GENERAL SETTINGS							
Recon Unit	General Type	FWA	FWA	FWA	FWA	FWA	FWA
	Echelon	Entity	Entity	Entity	Entity	Entity	Entity
	Specific Type	entity/mr/COMBAT/AVIATION/FIXED_WING/FWA_Harrier	entity/mr/COMBAT/AVIATION/FIXED_WING/FWA_Harrier	entity/mr/COMBAT/AVIATION/FIXED_WING/FWA_A10_Thunderbolt_US	entity/mr/COMBAT/AVIATION/FIXED_WING/FWA_AC130H.xml	entity/mr/COMBAT/AVIATION/FIXED_WING/FWA_SU24D_Fencer.xml	entity/mr/COMBAT/AVIATION/FIXED_WING/FWA_SU-17_FitterK.xml
Enemy	General Type	Air Defense	Air Defense	Infantry	Infantry	Air Defense	FWA
	Echelon	Crew	Crew	Platoon	Unit	Unit	Entity
	Specific Type	unit/mr/COMBAT/AIR_DEFENSE/PLT/PLT_265M_ADA_GunMissileBtry_RS	unit/mr/COMBAT/AIR_DEFENSE/PLT/PLT_265M_ADA_GunMissileBtry_RS	unit/mr/COMBAT/INFANTRY/PLT/PLT_Guerilla_Inf_OPFOR.xml	unit/mr/COMBAT/INFANTRY/PLT/PLT_Guerilla_Inf_OPFOR.xml	unit/mr/COMBAT/AIR_DEFENSE/PLT/PLT_265M_ADA_GunMissileBtry_RS.xml	entity/mr/COMBAT/AVIATION/FIXED_WING/FWA_F16C_Fighting_Falcon_US.xml
OTHER SCENARIO CHARACTERISTICS							
Aircraft Type		FWA Harrier	FWA Harrier	FWA A-10 Thunderbolt	AC-130	FWA SU-24	FWA SU-17
Number of Aircraft		1	1	1	1	1	1
Environmental Conditions		Night	Night	Day	Day	Night	Day
Enemy Contact		Likely	Likely	Unlikely	Very Likely	Very Likely	Likely
TASK DIALOGUE SETTINGS							
Header Parameters							
Trigger		On Command	On Command	On Command	On Command	On Command	On Command
WCS Summary		HOLD	HOLD	FREE	FREE	HOLD	TIGHT
Enable Reactions for this Task		YES	YES	NO	NO	NO	YES
Required Parameters							
Flight Mode		Low	Low	Very Low	High	Very Low	Medium
Optional Parameters							
Route Type		Air	Air	Air	Air	Air	Air
Route Point Type		Waypoints	Waypoints	Destination Point	Destination Point	Destination Point	Destination Point
Commanded Speed		Default	Default	User Input	Default	User Input	User Input
Commanded Altitude		User Input	User Input	Default	User Input	Default	Default
Should Land		YES	YES	YES	YES	NO	NO
Delay Time		NO	NO	YES	YES	YES	NO
Rules of Engagement							
General		Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
Weapon Control Status		HOLD	HOLD	FREE	FREE	HOLD	TIGHT
Fire Control Measures		N/A	N/A	N/A	N/A	N/A	N/A
OTHER							
Reaction to Enemy		YES	YES	NO	NO	NO	YES
Type of Enemy Contact		S.A.M.	S.A.M.	Direct Fire	Direct Fire	S.A.M.	Air to Air
Multiple Routes during flight		YES	YES	YES	YES	YES	NO

Table 40. FWA Platform Follow Route Re-verification Results.

VERIFICATION RESULTS						
OVERALL VERIFICATION STATUS	Amber					
VERIFICATION STATUS BY SCENARIO						
SCENARIO #	R1A	R1B	R2A	R2B	R4	R6
Scenario Verification Status	Not Applicable	Green	Amber	Amber	Amber	Amber
Trigger	Unverified	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Enable Reactions for this Task	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Flight Mode	Unverified	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Route Type	Unverified	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Route Point Type	Unverified	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Commanded Speed	Unverified	Amber (Unable to Verify)	Red (Failed)	Red (Failed)	Red (Failed)	Red (Failed)
Commanded Altitude	Unverified	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Should Land	Unverified	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Delay Time	Unverified	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Weapon Control Status	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Reaction to Enemy	Unverified	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Green (Passed)	Green (Passed)
Type of Enemy Contact	Unverified	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Green (Passed)	Green (Passed)
Multiple Routes during flight	Unverified	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Green (Passed)

FWA Unit Follow Route Verification Summary Tables

Table 41. FWA Unit Follow Route Initial Verification Test Design.

SCENARIO #	1	2	3	4	5	6
GENERAL SETTINGS						
Recon Unit	General Type	FWA	FWA	FWA	FWA	FWA
	Echelon	Unit	Unit	Entity	Unit	Unit
	Specific Type	unit/mr/COMBAT/AVIATION/FLT/FLT_SU25_FrogFoot_4_Aircraft_RS.xml	unit/mr/COMBAT/AVIATION/SEC/SEC_A10_Thunderbolt_2_Aircraft_US.xml	unit/mr/COMBAT/AVIATION/SEC/SEC_F16C_Falcon_2_Aircraft_US.xml	unit/mr/COMBAT/AVIATION/SEC/SEC_SU24D_Fencer_2_Aircraft_RS.xml	unit/mr/COMBAT/AVIATION/SEC/SEC_AC130H_SPECTRE_Gunship_2_Aircraft_US.xml
Enemy	General Type	Air Defense	Infantry	Mounted Infantry	Air Defense	Air Defense
	Echelon	Crew	Platoon	Unit	Unit	Crew
	Specific Type	unit/mr/COMBAT/AIR_DEFENSE/PLT/PLT_265M_ADA_GunMissileBtry_RS.xml	unit/mr/COMBAT/INFANTRY/PLT/PLT_Light_Infantry_US_IC.xml	unit/mr/COMBAT/INFANTRY/PLT/PLT_MechInf_M2A2_Angd_ICs_US.xml	unit/mr/COMBAT/AIR_DEFENSE/PLT/PLT_265M_ADA_GunMissileBtry_RS.xml	N/A
OTHER SCENARIO CHARACTERISTICS						
Aircraft Type	FWA SU25	FWA A-10 Thunderbolt	FWA F-16	FWA SU-24	AC-130	FWA SU-17 Fitter K
Number of Aircraft	4	2	4	2	2	2
Environmental Conditions	Night	Day	Day	Night	Night	Day
Enemy Contact	Likely	Unlikely	Very Likely	Very Likely	Unlikely	Likely
TASK DIALOGUE SETTINGS						
Header Parameters						
Trigger	On Command	On Command	On Command	On Command	On Command	On Command
WCS Summary	HOLD	FREE	FREE	HOLD	TIGHT	TIGHT
Enable Reactions for this Task	YES	YES	YES	NO	NO	YES
Required Parameters						
Flight Mode	Low	Very Low	Low	Very Low	High	Medium
Optional Parameters						
Route Type	Air	Air	Air	Air	Air	Air
Route Point Type	Waypoints	Destination Point	Waypoints	Destination Point	Waypoints	Destination Point
Final Orientation	N/A	N/A	N/A	N/A	N/A	N/A
Commanded Speed	Default	User Input	Default	User Input	Default	User Input
Take off Speed	Default	User Input	Default	User Input	User Input	Default
Landing Speed	Default	Default	User Input	User Input	User Input	Default
Commanded Altitude	User Input	Default	User Input	Default	User Input	Default
Should Land	YES	YES	NO	NO	YES	NO
Delay Time	NO	YES	YES	YES	NO	NO
Rules of Engagement						
General	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
Weapon Control Status	HOLD	FREE	FREE	HOLD	TIGHT	TIGHT
OTHER						
Reaction to Enemy	YES	NO	YES	NO	NO	YES
Type of Enemy Contact	S.A.M.	Direct Fire	Direct Fire	S.A.M.	N/A	Air to Air
Multiple Routes during flight	YES	YES	NO	YES	NO	NO

Table 42. FWA Unit Follow Route Initial Verification Results.

VERIFICATION RESULTS						
OVERALL VERIFICATION STATUS	Red					
VERIFICATION STATUS BY SCENARIO						
SCENARIO #	1	2	3	4	5	6
Scenario Verification Status	Red	Red	Red	Red	Red	Red
Trigger	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Enable Reactions for this Task	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Flight Mode	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Red (Failed)	Red (Failed)
Route Type	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Route Point Type	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Final Orientation	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Commanded Speed	Amber (Unable to Verify)	Amber (Unable to Verify)	Red (Failed)	Red (Failed)	Red (Failed)	Red (Failed)
Take off Speed	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)
Landing Speed	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)
Commanded Altitude	Red (Failed)	Green (Passed)	Red (Failed)	Green (Passed)	Red (Failed)	Red (Failed)
Should Land	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Delay Time	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Weapon Control Status	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Reaction to Enemy	Amber (Unable to Verify)	Amber (Unable to Verify)	Green (Passed)	Green (Passed)	Unverified	Amber (Unable to Verify)
Type of Enemy Contact	Amber (Unable to Verify)	Amber (Unable to Verify)	Green (Passed)	Green (Passed)	Unverified	Amber (Unable to Verify)
Multiple Routes during flight	Amber (Unable to Verify)	Amber (Unable to Verify)	Unverified	Red (Failed)	Unverified	Unverified

Table 43. FWA Unit Follow Route Re-verification Test Design.

SCENARIO #		R1	R2	R3	R4	R5	R6
GENERAL SETTINGS							
Recon Unit	General Type	FWA	FWA	FWA	FWA	FWA	FWA
	Echelon	Unit	Unit	Entity	Unit	Unit	Unit
	Specific Type	unit/mr/COMBAT/AVIATION/FLT/FLT_SU25_FrogFoot_4_Aircraft_RS.xml	unit/mr/COMBAT/AVIATION/SEC/SEC_A10_Thunderbolt_2_Aircraft_US.xml	unit/mr/COMBAT/AVIATION/SEC/SEC_F16C_Falcon_2_Aircraft_US.xml	unit/mr/COMBAT/AVIATION/SEC/SEC_SU24D_Fencer_2_Aircraft_RS.xml	unit/mr/COMBAT/AVIATION/SEC/SEC_AC130H_SPECTRE_Gunship_2_Aircraft_US.xml	unit/mr/COMBAT/AVIATION/SEC/SEC_SU17_FitterK_2_Aircraft_RS.xml
Enemy	General Type	Air Defense	Infantry	Mounted Infantry	Air Defense	Air Defense	FWA
	Echelon	Crew	Platoon	Unit	Unit	Crew	Unit
	Specific Type	unit/mr/COMBAT/AIR_DEFENSE/PLT/PLT_265M_ADAGunMissileBtry_RS.xml	unit/mr/COMBAT/INFANTRY/PLT/PLT_Light_Infantry_US_IC.xml	unit/mr/COMBAT/INFANTRY/PLT/PLT_MechInf_M2A2_Angd_ICs_US.xml	unit/mr/COMBAT/AIR_DEFENSE/PLT/PLT_265M_ADAGunMissileBtry_RS.xml	N/A	unit/mr/COMBAT/AVIATION/SEC/SEC_F16C_Falcon_2_Aircraft_US.xml
OTHER SCENARIO CHARACTERISTICS							
Aircraft Type		FWA SU25	FWA A-10 Thunderbolt	FWA F-16	FWA SU-24	AC-130	FWA SU-17 Fitter K
Number of Aircraft		4	2	2	2	2	2
Environmental Conditions		Night	Day	Day	Night	Night	Day
Enemy Contact		Likely	Unlikely	Very Likely	Very Likely	Unlikely	Likely
TASK DIALOGUE SETTINGS							
Header Parameters							
Trigger		On Command	On Command	On Command	On Command	On Command	On Command
WCS Summary		HOLD	FREE	FREE	HOLD	TIGHT	TIGHT
Enable Reactions for this Task		YES	YES	YES	NO	NO	YES
Required Parameters							
Flight Mode		Low	Very Low	Low	Very Low	High	Medium
Optional Parameters							
Route Type		Air	Air	Air	Air	Air	Air
Route Point Type		Waypoints	Destination Point	Waypoints	Destination Point	Waypoints	Destination Point
Final Orientation		N/A	N/A	N/A	N/A	N/A	N/A
Commanded Speed		Default	User Input	Default	User Input	Default	User Input
Commanded Altitude		User Input	Default	User Input	Default	User Input	Default
Should Land		YES	YES	NO	NO	YES	NO
Delay Time		NO	YES	YES	YES	NO	NO
Formation		Combat Trail	Combat Spread	Echelon Left	Default	Diamond	Default
Formation Spacing		User Input	User Input	Default	User Input	User Input	Default
Rules of Engagement							
General		Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
Weapon Control Status		HOLD	FREE	FREE	HOLD	TIGHT	TIGHT
Fire Control Measures		N/A	N/A	N/A	N/A	N/A	N/A
OTHER							
Reaction to Enemy		YES	NO	YES	NO	NO	YES
Type of Enemy Contact		S.A.M.	Direct Fire	Direct Fire	S.A.M.	N/A	Air to Air
Multiple Routes during flight		YES	YES	NO	YES	NO	NO

Table 44. FWA Unit Follow Route Re-verification Results.

VERIFICATION RESULTS						
OVERALL VERIFICATION STATUS	Red					
VERIFICATION STATUS BY SCENARIO						
SCENARIO #	R1	R2	R3	R4	R5	R6
Scenario Verification Status	Red	Red	Red	Red	Red	Amber
Trigger	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Flight Mode	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Route Type	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Route Point Type	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Red (Failed)	Green (Passed)
Final Orientation	Unverified	Unverified	Unverified	Unverified	Unverified	Unverified
Commanded Speed	Amber (Unable to Verify)	Amber (Unable to Verify)	Amber (Unable to Verify)	Red (Failed)	Amber (Unable to Verify)	Amber (Unable to Verify)
Commanded Altitude	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Should Land	Red (Failed)	Red (Failed)	Green (Passed)	Green (Passed)	Red (Failed)	Green (Passed)
Delay Time	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Formation	Amber (Unable to Verify)	Green (Passed)	Red (Failed)	Green (Passed)	Red (Failed)	Green (Passed)
Formation Spacing	Red (Failed)	Red (Failed)	Red (Failed)	Red (Failed)	Red (Failed)	Green (Passed)
Weapon Control Status	Unverified	Unverified	Green (Passed)	Unverified	Unverified	Red (Failed)
Reaction to Enemy	Amber (Unable to Verify)	Amber (Unable to Verify)	Green (Passed)	Amber (Unable to Verify)	Unverified	Amber (Unable to Verify)
Type of Enemy Contact	Amber (Unable to Verify)	Amber (Unable to Verify)	Green (Passed)	Green (Passed)	Unverified	Amber (Unable to Verify)
Multiple Routes during flight	Amber (Unable to Verify)	Amber (Unable to Verify)	Unverified	Amber (Unable to Verify)	Unverified	Unverified

Drop Cargo Verification Summary Tables

Table 45. Drop Cargo Initial Verification Test Design and Results.

SCENARIO #		1	2	3	4
GENERAL SETTINGS					
Supply Unit	General Type	General Supply	Medical	Field Artillery	General Supply
	Echelon	Vehicle	Section	Platoon	Vehicle
	Specific Type	entity/mr/COMBAT_SERVICE_SUPP ORT/SUPPLY/TruckCargoHEMTT_M977	unit/mr/UA_SUSTAINMENT_UNITS/ SQD/SQD_AmbSqd_AmbPlt_MedCo_SUA_US.xml	unit/mr/COMBAT/ FIELD_ARTILLERY/PLT/PLT_M109 A6_155m_Artillery_US.xml	entity/mr/COMBAT_SERVICE_SUPP ORT/TRANSPORTATION/Truck_Cargo_HEMTT_M977.xml
OTHER SCENARIO CHARACTERISTICS					
Classes of Supply Delivered		Class I	Class I	Class V	Class III
Type of Vehicle		HEMTT	HMMWV	FAAS-V	HEMTT
Number of Vehicles to Unload		1	2	8	1
TASK DIALOGUE SETTINGS					
Header Parameters					
Trigger		On Command	On Command	On Command	On Command
Enable Reactions for this Task		No	No	No	No
Required Parameters					
Cargo Type		MRE (5000)	Bottled Water	Ammunition 120MM (Tank)	Fuel JP8 Bulk
Optional Parameters					
N/A		N/A	N/A	N/A	N/A
Rules of Engagement					
General		Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
OTHER					
Cargo Dropped IAW Set Values		Yes	No	No	Yes
Obstacle type		N/A	N/A	N/A	River
VERIFICATION RESULTS					
OVERALL VERIFICATION STATUS		Red			
VERIFICATION STATUS BY SCENARIO					
SCENARIO #		1	2	3	4
Scenario Verification Status		Green	Red	Red	Green
VERIFICATION RESULTS					
Trigger		Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Cargo Type		Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Cargo Dropped IAW Set Values		Green (Passed)	Red (Failed)	Red (Failed)	Green (Passed)
Obstacle type		Unverified	Unverified	Unverified	Green (Passed)

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Prepare for Resupply Verification Summary Tables

Table 46. Prepare for Resupply Initial Verification Test Design and Results.

SCENARIO #		1	2	3	4
GENERAL SETTINGS					
Unit to Prepare	General Type	Armor	Maintenance	Mech Infantry IFV	Medical
	Echelon	Platoon	Company	Vehicle	Section
	Specific Type	unit/mr/COMBAT/ARMOR/PLT/PLT_M1A1_Armor_US.xml	unit/mr/COMBAT_SERVICE_SUPP_ORT/Co_FwdSptCo_Armor_BN_US.xml	entity/mr/COMBAT/INFANTRY/INFANTRY_IFV/IFV_M2A2_Bradley_Infantry	unit/mr/UA_SUSTAINMENT_UNITS/SEC/SEC_MedTre atPltHq_MedCo_SUA_US.xml
Enemy Unit Type(s)	General Type	N/A	N/A	N/A	N/A
	Echelon	N/A	N/A	N/A	N/A
	Specific Type	N/A	N/A	N/A	N/A
OTHER SCENARIO CHARACTERISTICS					
Terrain Surrounding the Resupply Location		Unobstructed	River	Unobstructed	Built-up Area
TASK DIALOGUE SETTINGS					
Header Parameters					
Trigger		On Command	On Command	On Command	On Command
WCS Summary		Free	Free	Free	Free
Required Parameters					
Resupply Location		User Input	User Input	User Input	User Input
Optional Parameters					
N/A		N/A	N/A	N/A	N/A
Rules of Engagement					
General		Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
OTHER					
Formation		Check	Check	N/A	Check
VERIFICATION RESULTS					
OVERALL VERIFICATION STATUS		Red			
VERIFICATION STATUS BY SCENARIO					
SCENARIO #		1	2	3	4
Scenario Verification Status		Red	Red	Amber	Green
Trigger		Green (Passed)	Green (Passed)	Green (Passed)	Green (Passed)
Resupply Location		Green (Passed)	Green (Passed)	Amber (Unable to Verify)	Green (Passed)
Formation		Red (Failed)	Red (Failed)	Unverified	Green (Passed)

Table 47. Prepare for Resupply Re-verification Test Design and Results.

SCENARIO #		R1	R2
GENERAL SETTINGS			
Unit to Prepare	General Type	Armor	Maintenance
	Echelon	Platoon	Company
	Specific Type	unit/mr/COMBAT/ARMOR/PLT/PLT_M1A1_Armor_US.xml	unit/mr/COMBAT_SERVICE_SUPP ORT/Co_FwdSptCo_Armor_BN_US.xml
Enemy Unit Type(s)	General Type	N/A	N/A
	Echelon	N/A	N/A
	Specific Type	N/A	N/A
OTHER SCENARIO CHARACTERISTICS			
Terrain Surrounding the Resupply Location		Unobstructed	River
TASK DIALOGUE SETTINGS			
Header Parameters			
Trigger		On Command	On Command
WCS Summary		Free	Free
Enable Reactions for this Task		No	No
Required Parameters			
Resupply Location		See PVD	See PVD
Optional Parameters			
N/A		N/A	N/A
Rules of Engagement			
General		Use Default ROE Only	Use Default ROE Only
OTHER			
Formation		Check	Check
VERIFICATION RESULTS			
OVERALL VERIFICATION STATUS		Red	
VERIFICATION STATUS BY SCENARIO			
SCENARIO #		R1	R2
Scenario Verification Status		Red	Red
Trigger		Green (Passed)	Green (Passed)
Resupply Location		Green (Passed)	Green (Passed)
Formation		Red (Failed)	Red (Failed)

Transfer Cargo to Basic Load Verification Summary Tables

Table 48. Transfer Cargo to Basic Load Initial Verification Test Design and Results.

SCENARIO #		1	2	3	4
GENERAL SETTINGS					
Entity Type	General Type	Individual Combatant	Vehicle	RWA	RWA
	Echelon	Entity	Entity	Entity	Entity
	Specific Type	entity/mr/COMBAT/FIELD_ARTILLERY/DISMOUNT/OIC_FIST_SBCT_inf_Co_US_IC	entity/mr/COMBAT_SERVICE_SUPPORT/TRANSPORTATION/Truck_Cargo_HEMTT_M977	entity/mr/COMBAT/AVIATION/ROTARY_WING/RWA_AH64_Apache_US	0
OTHER SCENARIO CHARACTERISTICS					
Specific Entity Type		Infantry Soldier	Fuel HEMM-T	AH-64 Apache	UH-60 Blackhawk
Environmental Conditions		Night	Day	Night	Day
Enemy Contact		Very Likely	Unlikely	Very Likely	Unlikely
TASK DIALOGUE SETTINGS					
Header Parameters					
Trigger		On Command	On Command	On Command	On Command
WCS Summary		FREE	HOLD	FREE	HOLD
Enable Reactions for this Task		YES	NO	YES	NO
Required Parameters					
Supplies to Transfer		Class V	Class III	Class V	Class III
Rules of Engagement					
General		Use Default ROE Only	Use Default ROE Only	Use Default ROE Only	Use Default ROE Only
Weapon Control Status		FREE	HOLD	FREE	HOLD
Fire Control Measures		N/A	N/A	N/A	N/A
OTHER					
Entity Moving		NO	YES	YES	YES
VERIFICATION RESULTS					
OVERALL VERIFICATION STATUS		Amber			
VERIFICATION STATUS BY SCENARIO					
SCENARIO #		1	2	3	4
Scenario Verification Status		Amber	Green	Amber	Amber
Trigger		Unverified	Green (Passed)	Unverified	Unverified
Supplies to Transfer		Unverified	Green (Passed)	Unverified	Unverified
Entity Moving		Unverified	Green (Passed)	Unverified	Unverified

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Appendix C – Detailed Results for the Clear Room Behavior

This appendix shows the detailed results of the initial verification of the Clear Room composite behavior. Each section includes the completed tracking spreadsheet from a single scenario within the overall test design.

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Clear Room, Initial Verification, Scenario 1

Table 49. Clear Room Initial Verification Results, Scenario 1, Page 1.

General Scenario Description		A four-man fire team is tasked to clear a small room. The room selected is a closet with a single opposing entity hiding inside. Four stack positions (labelled Position1 through Position4) are provided close to the closet door and the fire team expects enemy inside. The fire team is initially located outside the building.					
General Terrain Description		The scenario occurs primarily inside the building.					
Scenario Path/Filename		Linux2 scenarioTests/ClearRoom/Scenario1/Scenario03.xml					
Analyst		Harold Yamauchi					
GENERAL SETTINGS							
Attacking Unit		General Type	Infantry				
		Entity	Fire Team				
Enemy		Specific Type	unit/mr/COMBAT/INFANTRY/FT_LtInf_IC_US.xml				
		Entity	Infantry				
		General Type	Entity				
		Specific Type	entity/mr/COMBAT/INFANTRY/RSI_AK74_GP30_LT_InfPIL_RS_IC				
OTHER SCENARIO CHARACTERISTICS							
Location of Fire Team wrt Room		Outside					
Room to Stack on Right		N/A					
Stack Point Locations		Not Too Close Together					
Stack Location wrt Doorway		Close to Doorway					
Stack Consistency Excursion		No					
Multi-Room Scenario		No					
Room too Small		Yes					
Closet in Room (along Entry Path)		No					
Grenade Type		Fragmentary					
OVERALL VERIFICATION RESULTS							
Scenario Verification Status		Amber					
Summary		The fire team approached the closet and each team member occupied one of the designated stack positions. A grenade was thrown into the closet and the entire team entered the closet after the grenade detonated. The Use Case does not explain how small rooms are handled, although the Developer mentioned that fire teams are not split to clear small rooms and would skip small rooms. It is not known what criteria are used to determine whether a room is too small to clear. Although the closet selected to be cleared was one of the smallest enclosures found, it could not be determined whether it qualifies as too small for clearing. In addition, it was observed that in consecutive runs, team members did not stack in the same order. Also, the grenade and round count of the soldier did not decrement to indicate expended ammo. Finally, the team does not engage the enemy in all runs.					
VERIFICATION PLAN & RESULTS							
TASK DIALOGUE SETTINGS							
Header Parameters							
Trigger	On Command	Does the Mission Editor indicate that the ClearRoom process is triggered on command?	Yes	N/A	N/A	Green (Passed)	The fire team moves in file formation, enters the building, and makes its way towards the designated stack positions. Each member of the team selects a position in the stack. (The same team member may not choose the same stack position in consecutive runs, however.) All members are armed with two fragmentation grenades, so the team member closest to the door always throws a grenade into the closet. After the grenade detonates, the entire team moves into the closet. In one run, the team did not fire a shot. The image at the bottom of this worksheet is from this run and shows the team at their final positions in the closet. In two additional runs, the team and the enemy exchanged shots. In all runs, the enemy was incapacitated but this was not immediately apparent visually. The enemy's Damage status in the Status window, didn't change to "incapacitated" until some time after the team members had reached their final positions and the task had ended (about 10 - 20 seconds past task completion).
Trigger (Cont'd)	On Command	Does the Mission Editor indicate that the ClearRoom process is triggered on command?	Yes	N/A	N/A	Green (Passed)	This was also the case with the enemy's icon on the screen - it changed from standing to prone at the time the Damage status was updated.
MCS Summary	Free	N/A	N/A	N/A	N/A	Unverified	
Enable Reactions for this Task	No	N/A	N/A	N/A	N/A	Unverified	
Required Parameters	N/A	N/A	N/A	N/A	N/A	Unverified	
Optional Parameters	N/A	N/A	N/A	N/A	N/A	Unverified	

Table 50. Clear Room Initial Verification Results, Scenario 1, Page 2.

Room ID	Yes	Given a "small" room to clear, does the team clear or skip the closet?	The entire team enters and clears the closet.	N/A	N/A	Amber (Unable to Verify)	The Use Case does not explain how small enclosures are handled. The Developer mentioned that fire teams are not split in order to clear small rooms. It is not known if the team was split in order to clear a room to be cleared in this scenario would be considered too small for clearing.
Stack Positions	Yes	Are all four designated stack positions occupied by a team member?	Yes, but in consecutive runs the order of the team members in the stack may not be the same.	N/A	N/A	Amber (Unable to Verify)	Developer indicated that the stack order should be the same in each run of the same scenario.
Enemy Expected	Yes	Does the team member closest to the closet door throw a grenade into the closet?	Yes	N/A	N/A	Green (Passed)	
Rules of Engagement							
General	Use Default ROE Only	N/A	N/A	N/A	N/A	Unverified	
Weapon Control Status	Free	N/A	N/A	N/A	N/A	Unverified	
Fire Control Measures	N/A	N/A	N/A	N/A	N/A	Unverified	
OTHER							
Stack Position Consistency	N/A	N/A	N/A	N/A	N/A	Unverified	
Movement into Room	Check	1. Does the fire team wait for the grenade to detonate before entering? 2. Does the fire team follow the pattern illustrated in the Use Case?	1. Yes. 2. Yes to the extent that the closet's limited space allows.	N/A	N/A	Green (Passed)	
Grenade Status	Check	Since the lead entity in the stack threw a grenade, does the number of grenades in his basic load decrease by 1?	The entity's Status window shows no decrease in the number of grenades.	N/A	N/A	Amber (Unable to Verify)	If shots were fired, or a grenade was thrown, the run was allowed to continue several minutes after the task ended. The Status windows of the entities were then checked to see if the ammunition levels were updated. All ammunition remained unchanged. This indicates that the status window did not error, not an error specific to the behavior.
Enemy Engagement	Check	Do team members engage the enemy as they move towards their set positions in the room?	Out of three runs, no one fired a shot in one run, while shots were exchanged between the team and the enemy in the other two runs. The grenades were fired as the team entered the closet.	N/A	N/A	Amber (Unable to Verify)	
Other 5	N/A	N/A	N/A	N/A	N/A	Unverified	
DATA COLLECTION							
DCST Input Filename	None						
Data Producers							
Data Element							
DC Sub-Category							
Name							
Output Filename	None						
NOTES							
Two of the fire team's members, FIRE TEAM LEADER1 and RIFLEMAN4, were initially unnamed. Therefore, ammunition was added to their basic loads - each received 200 rounds of 5.56mm Ball, M193, and two Grenade, Hand, Frag, M67.							

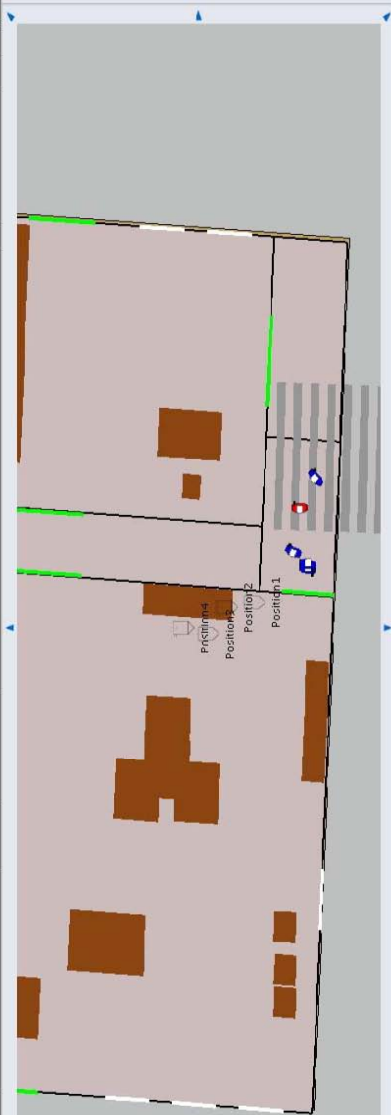


Table 51. Clear Room Initial Verification Results, Scenario 2, Page 1.

C-5

Table 52. Clear Room Initial Verification Results, Scenario 2, Page 2.

[illegible]

Table 53. Clear Room Initial Verification Results, Scenario 3, Page 1.

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Table 54. Clear Room Initial Verification Results, Scenario 3, Page 2.

Optional Parameters						
Room ID	Yes	Does the team clear the room?	Yes, but see Discussion.	N/A	N/A	Amber (Unable to Verify) As the fire team enters the hallway, the first two entities in the formation (TM LDR and RIFLEMAN) enter the hallway through the doorway of the room they are leaving. After RIFLEMAN passes through the doorway, the remaining entities (GRENADE, SNIPER and RPG GUNNER) suddenly jump out of the building and enter the hallway by passing through the building's exterior wall. This anomaly occurred in every run. This is amber b/c it appears it is an error with the environmental representation, not the behavior itself.
Stack Positions	Yes	The five designated stack positions are placed at the same coordinate. Does each team member go to that coordinate when the stack is formed?	Yes	N/A	N/A	Green (Passed) The Use Case does not mention whether a minimum distance must be maintained between stack positions. If there is no minimum distance, this function passes. Not sure if there is an anti-collision setting that should prevent this convergence at one point.
Enemy Expected	Yes	Does the team member closest to the doorway throw a stun grenade into the room?	No grenades were thrown.	N/A	N/A	Red (Failed) The Developer mentioned that stun grenades could be thrown, only that their lethality effects are modeled, not their stunning effects. Three runs were completed, but no grenade was thrown in each run.
Rules of Engagement						
General	Use Default ROE	N/A	N/A	N/A	N/A	Unverified
Weapon Control Status	Only	N/A	N/A	N/A	N/A	Unverified
Fire Control Measures	Free	N/A	N/A	N/A	N/A	Unverified
OTHER	N/A	N/A	N/A	N/A	N/A	Unverified
Stack Position Consistency	Check	Does the fire team follow the pattern illustrated in the Use Case?	Yes	N/A	N/A	Green (Passed)
Movement into Room	Check	No grenades were thrown, so this was not checked, however, see Discussion	N/A	N/A	N/A	Amber (Unable to Verify)
Grenade Status	Check	Do team members engage the enemy as they move towards their set positions in the room?	Yes	N/A	N/A	Green (Passed)
Enemy Engagement	Check	Do team members engage the enemy as they move towards their set positions in the room?	Yes	N/A	N/A	Green (Passed)
Other 5	N/A	N/A	N/A	N/A	N/A	Unverified
DATA COLLECTION						
DCST Input Filename	None					
Data Producers						
Data Element						
DC Sub-Category						
Name						
Output Filename	None					
NOTES						
1. This scenario specified the use of stun grenades, but no one in the fire team was armed with these. Therefore two "grenade_Sun_LVB_1" were added to each team member's basic load. No one carried fragmentary grenades.						
2. Two of the fire team's members, RIFLEMAN and RPG GUNNER, were initially unarmed. Therefore, in addition to the stun grenades mentioned in Note 1, these two members each received 200 rounds of "5.45x39 Ball, 7N6".						
3. This scenario specified a room with a closet located along the path of at least one of the fire team members. This was to test whether the team member would pause by the closet while moving to its set position. Although we found rooms with closets, none of the closets were located along the expected paths of the team members. Therefore this part of the ClearRoom behavior could not be verified.						

Clear Room, Initial Verification, Scenario 4

Table 55. Clear Room Initial Verification Results, Scenario 4, Page 1.

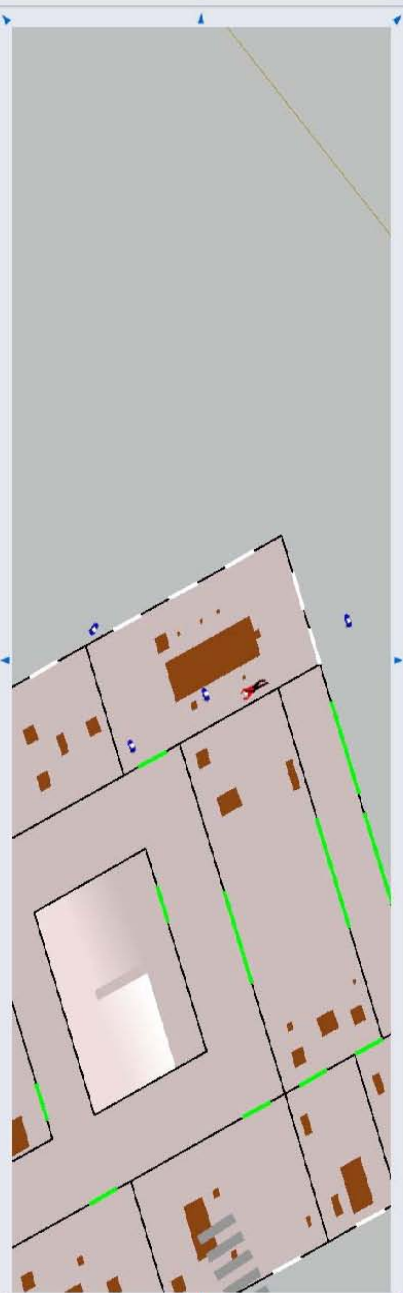
OTHER							
Stack Position Consistency	Check	Do the team members position themselves in the stack in the same order regardless of where the team is initially located?	No	N/A	N/A	Red (Failed)	This is red here b/c this scenario was designed specifically to test this condition. Other scenarios received an amber for Stack Positions b/c stack order is only one of many aspects tested in that criterion.
Movement into Room	Check	Does the fire team follow the pattern illustrated in the Use Case?	Yes, except in one Case 3 run, two of the team members were positioned outside the building.	N/A	N/A	Green (Passed)	In one Case 3 run, the one run in which the fire team engaged the enemy, the team followed the pattern illustrated in the Use Case except the two team members furthest from the door jump out of the building to the positions shown in the image at the bottom of this worksheet. Since the pattern was still correct, the amber rating is reflected in the Room ID criterion above.
Grenade Status	N/A	See Discussion for other ammunition expended.	N/A	N/A	N/A	Unverified	Shots were fired in one Case 3 run. The run was allowed to continue several minutes after the task ended. The Status windows of the entities were then checked to see if the ammunition levels were updated. All ammo levels remained unchanged.
Enemy Engagement	Check	Do team members engage the enemy as they move towards their set positions in the room?	No engagement occurs in any of the Case 1 and Case 2 runs. Only one run in Case 3 had an engagement.	N/A	N/A	Red (Failed)	Three runs were completed for each case resulting in a total of nine runs. The fire team never engaged the enemy in the three runs made for Case 1 and the three runs made for Case 2. The team engaged, and incapacitated, the enemy in one of the three runs made for Case 3.
Other 5	N/A	N/A	N/A	N/A	N/A	Unverified	
DATA COLLECTION							
DCST Input Filename	None						
Data Producers							
Data Element							
DC Sub-Category							
Name							
Output Filename	None						
NOTES							
This scenario specified that the individual combatant at the lead of the stack was not to carry fragmentary or stun grenades. This assumed that stack order would be maintained from run to run and case to case, but as previous scenarios have shown, there is no guarantee that the fire team members will line up in the stack in the same order from run to run. The effect of the lead IC not having grenades should be the same as when all of the ICs in the stack don't carry grenades: the fire team enters the room without the benefit of using a grenade. In order to preserve this effect for every run, it was decided to remove any fragmentary or stun grenades carried by the team. Three of the fire team's members, AR M249-IC2, GRENADE-IC3 and ANTIARMOR-IC14, were initially armed with two Grenade, Hand, M67, each. These were removed from their basic loads. The fourth member of the team, FT-LDR-IC1, was unarmed and remained unarmed.							
							



Table 56. Clear Room Initial Verification Results, Scenario 4, Page 2.

General Scenario Description		A four-man fire team is tasked to clear a room in a multi-story building. The room is located on the first floor on the southeast corner and is occupied by a single opposing entity. The fire team is not provided stack positions and there is no room to assemble the stack to the right side of the door, but there is to the left of the door. The team expects a enemy inside this room. Three cases are provided to test the team's ability to clear the room. The team starts south of the building, enters the building through one of the south doorways, and approaches the target room from the west. In the first case, the team starts north of the building, enters the building through the north doorway, and approaches the target room from the north. In the second case, the team starts south of the building, enters the building through one of the south doorways, and approaches the target room from the west. In the third case, the team starts on the second floor, moves down the stairwell to the first floor, and when it exits the stairwell, approaches the target room from the west.				
General Terrain Description		The scenario occurs primarily on the ground floor of the building.				
Scenario Path/Filename		Linux2 scenarioTests/ClearRoom/Scenario4/Scenario.xml, Scenario1.xml, and Scenario2.xml for, respectively, Case 1, Case 2, and Case 3				
Analyst		Harold Yamauchi				
GENERAL SETTINGS						
Attacking Unit		General Type	DM Infantry (Mech)			
		Echelon	Fire Team			
Enemy		Specific Type	unit/mr/COMBAT/INFANTRY/TFT_A_MechInf_IC_US.xml			
		General Type	Infantry			
Enemy		Echelon	Entity			
		Specific Type	entity/mr/COMBAT/INFANTRY/IC_FullyLoaded_OPFOR_Basic_Rifleman			
OTHER SCENARIO CHARACTERISTICS						
Location of Fire Team wrt Room		Outside				
Room to Stack on Right		No				
Stack Point Locations		N/A				
Stack Location wrt Doorway		N/A				
Stack Location wrt Doorway		Yes				
Stack Consistency Excursion		No				
Multi-Room Scenario		No				
Room too Small		No				
Closest in Room (along Entry Path)		No				
Grenade Type		No Grenades				
OVERALL VERIFICATION RESULTS						
Scenario Verification Status		Red				
Summary		The fire team has a consistent problem engaging the enemy when it enters the room. Of nine runs (three runs for each case), the fire team engaged the enemy just once. In that run, there was a problem positioning the team members in the room. The image at the bottom of this worksheet shows the final positions taken by the team. Two of the positions fall outside the building. In addition, it was observed that in consecutive runs, team members did not stack in the same order and that stack order was not maintained when the fire team's initial location was changed.				
VERIFICATION PLAN & RESULTS						
TASK DIALOGUE SETTINGS						
Header Parameters						
Trigger	On Command	Does the Mission Editor indicate that the ClearRoom process is triggered on command?	Yes	N/A	N/A	Green (Passed)
MCS Summary		Free				
Enable Reasons for this Task		No		N/A		Unverified
Required Parameters						
None		N/A	N/A	N/A	N/A	Unverified
Optional Parameters						
Room ID	Yes	Does the team clear the proper room? Yes.	Yes	N/A	N/A	Amber (Unable to Verify)
	No	There is not enough room to the right of the doorway, but there is room to the left of the doorway. Does the team stack to the left of the doorway?	N/A	N/A	N/A	Unverified
Stack Positions	Yes	This was not verified (See Notes).	N/A	N/A	N/A	Unverified
Enemy Expected	Use Default ROE Only	N/A	N/A	N/A	N/A	Unverified
General	Weapon Control Status	Free	N/A	N/A	N/A	Unverified
Fire Control Measures		N/A	N/A	N/A	N/A	Unverified

Clear Room, Initial Verification, Scenario 5a

Table 57. Clear Room Initial Verification Results, Scenario 5a, Page 1.

General Scenario Description		A four-man fire team is tasked to clear two rooms. The mission is divided into two phases where the team clears the first room during Phase 1 and then clears the second room during Phase 2. Phase 1 is evaluated as Scenario 5a (this scenario) and the Phase 2 is evaluated as Scenario 5b. For Phase 1, no room is specified, stack positions are not provided, and no enemy is expected. The fire team is initially located in a hallway and no opposing entities are present in the building.														
General Terrain Description		The scenario occurs entirely inside the building.														
Scenario Path/Filename		Linux2 scenario\tests\ClearRoom\Scenario5\Scenario1.xml														
Analyst		Harold Yamauchi														
GENERAL SETTINGS																
Attacking Unit	General Type	DM Infantry (Mech)														
	Echelon	Fire Team														
	Specific Type	unit/mr/COMBAT/UA_INF_UNIT/SF/FT_Infantry_Dismounts_UA_INF_PL														
Enemy	General Type	None														
	Echelon	N/A														
	Specific Type	N/A														
OTHER SCENARIO CHARACTERISTICS																
Location of Fire Team w/rt Room																
Room to Stack on Right																
Stack Point Locations																
N/A																
Stack Location w/rt Doorway																
No																
Stack Consistency Excursion																
No																
Multi-Room Scenario																
Room too Small																
No																
Closest in Room (along Entry Path)																
No																
Grenade Type																
Fragmentary																
OVERALL VERIFICATION RESULTS																
Scenario Verification Status		Red														
Summary		When a room is not specified, the fire team is expected to clear the room with the closest doorway. However, the task cannot be triggered unless a room is specified. No further verification of this scenario was made.														
VERIFICATION PLAN & RESULTS																
TASK DIALOGUE SETTINGS		Visual Verification Plan		Visual Results		Data Verification Plan		Data Results		Status		Discussion				
Header Parameters							Visual Verification Plan		Visual Results		Data Verification Plan		Data Results		Discussion	
Trigger	On Command	Does the Mission Editor indicate that the ClearRoom process is triggered on command?		No		N/A		N/A		N/A		Red (Failed)		Unless a room is specified in the ClearRoom dialog, this task cannot be triggered. There is a discrepancy between the Use Case and the ClearRoom dialog. The Use Case says the RoomID is a mandatory input while the dialog treats the RoomID as an optional input.		
	Free	N/A		N/A		N/A		N/A		N/A		Unverified				
	To	N/A		N/A		N/A		N/A		N/A		Unverified				
None							N/A		N/A		N/A		Unverified			
Optional Parameters							N/A		N/A		N/A		Unverified			
Room ID	Room ID	Does the fire team clear the room with the closest doorway?		Unable to verify because the task cannot be triggered		N/A		N/A		N/A		Unverified				
	Stack Positions	Does the fire team stack to the right of the closest doorway if there is room? If there isn't enough in room, does the team stack to the left?		Unable to verify because the task cannot be triggered		N/A		N/A		N/A		Unverified				
	Enemy Expected	A grenade should not be thrown into the room. Is this the case?		Unable to verify because the task cannot be triggered		N/A		N/A		N/A		Unverified				
Rules of Engagement		Use Default ROE		N/A		N/A		N/A		N/A		Unverified				
General																

Table 58. Clear Room Initial Verification Results, Scenario 5a, Page 2.

[illegible]

Clear Room, Initial Verification, Scenario 5b

Table 59. Clear Room Initial Verification Results, Scenario 5b, Page 1.

General Scenario Description		This is the second phase of a two-phase mission. The first phase was evaluated as Scenario 5a and this phase will be evaluated as Scenario 5b. For the second phase, the fire team is tasked to clear a room. Four stack positions (labelled Position1 through Position4) are specified and are placed a distance from the room's doorway. The fire team expects enemy inside the room although there are actually no opposing entities in the building.					
General Terrain Description		The scenario occurs entirely inside the building.					
Scenario Path/Filename		Linux2 scenario\tests\ClearRoom\Scenario5\Scenario1.xml					
Analyst		Harold Yamauchi					
GENERAL SETTINGS							
Attacking Unit		General Type	DM Infantry (Mech)				
		Echelon	Fire Team				
		Specific Type	unit/mr/COMBAT/UA_INF_UNITS/F/T/ Infantry_Discounts UA_INF_PL				
Enemy		General Type	None				
		Echelon	N/A				
		Specific Type	N/A				
OTHER SCENARIO CHARACTERISTICS							
Location of Fire Team wrt Room		Outside					
Room to Stack on Right		N/A					
Stack Point Locations		Not Too Close Together					
Stack Location wrt Doorway		Too Far from Doorway					
Stack Consistency Excursion		No					
Multi-Room Scenario		Yes					
Room too Small		No					
Closest in Room (along Entry Path)		No					
Grenade Type		Fragmentary					
OVERALL VERIFICATION RESULTS							
Scenario Verification Status		Amber					
Summary		The fire team approached the room and each team member occupied one of the designated stack positions. A grenade was thrown down the hallway towards the room despite the stack's distance from the room. The grenade doesn't reach the room and instead creates a breach in the wall. The team entered the room after the grenade detonated. It was observed that in consecutive runs, the team members did not stack in the same order. The round count was not decremented to account for the thrown grenade.					
VERIFICATION PLAN & RESULTS							
TASK DIALOGUE SETTINGS		Visual Verification Plan	Visual Results	Data Verification Plan	Data Results	Status	Discussion
Header Parameters							
Trigger							Since the first phase cannot be triggered, the fire team never moves from its initial location in the hallway. When the second phase is triggered, the team simply moves down the hallway in file formation towards the designated stack formations. Each member of the team selects a position in the stack. (The same team member may not choose the same stack position in consecutive runs, however.) All members are armed with two fragmentation grenades, so the team member closest to the door always throws a grenade down the hallway towards the door. However, because of the distance from the door, the grenade does not reach the room and detonates in the hallway, creating a breach hole in the wall. After the grenade detonates, the team moves into the room. The image at the bottom of this worksheet shows the team at their final positions. The breach hole can also be seen between Position1 and the door. See the inserted graphic below.
	On Command	Does the Mission Editor indicate that the ClearRoom process is triggered on command? Note: This task was supposed to be triggered "Upon Completion of Previous" but the initial phase would not execute at all. Thus, this was switched to "On Command" in order to allow us to test the other conditions within this scenario.	N/A	N/A	N/A	Green (Passed)	
WCS Summary		Free					
Enable Reactions for this Task		No	N/A	N/A	N/A	Unverified	
Required Parameters							
None		N/A	N/A	N/A	N/A	Unverified	
Optional Parameters							
Room ID		Yes	Does the team clear the room?	Yes	N/A	Green (Passed)	

Table 60. Clear Room Initial Verification Results, Scenario 5b, Page 2.

Stack Positions	Yes	Are all four designated stack positions occupied by a team member?	Yes, but in consecutive runs the order of the team members in the stack may not be the same.	N/A	N/A	Amber (Unable to Verify)	Developer indicated that the stack order should be the same in each run of the same scenario.
Enemy Expected	Yes	Does the team member closest to the doorway throw a grenade into the room?	The team member throws a grenade from his stack position, but because of his distance from the doorway, the grenade doesn't reach the room and it detonates in the hallway, creating a breach hole in the wall.	N/A	N/A	Green (Passed)	It appears that if a grenade needs to be thrown and the lead in the stack has one available, it will be thrown from the lead's location regardless of where the team stacks from the doorway. If this is the intent, then this passes. Since this isn't specified, this criterion is Green.
Rules of Engagement							
General	Use Default ROE	N/A	N/A	N/A	N/A	Unverified	
Weapon Control Status	Orvy					Unverified	
Fire Control Measures	Free	N/A	N/A	N/A	N/A	Unverified	
OTHER							
Stack Position Consistency	N/A	N/A	N/A	N/A	N/A	Unverified	
Movement Into Room	Check	1. Does the fire team wait for the grenade to detonate before entering? 2. Does the fire team follow the pattern illustrated in the Use Case?	1. Yes. 2. Yes.	N/A	N/A	Green (Passed)	
Grenade Status	Check	Since the lead entity in the stack threw a grenade, does the number of grenades in his basic load decrease by 1?	The entity's Status window shows no decrease in the number of grenades.	N/A	N/A	Amber (Unable to Verify)	Each run was allowed to continue several minutes after the task ended. The Status window of the lead entity was then checked to see if the grenade count was updated. The amount remained unchanged. This is amber b/c it appears to be an update error, not an error specific to the behavior.
Enemy Engagement	N/A	N/A	N/A	N/A	N/A	Unverified	
Other 5	N/A	N/A	N/A	N/A	N/A	Unverified	
DATA COLLECTION							
DCST Input Filename	None						
Data Producers							
Data Element							
DC Sub-Category							
Name							
Output Filename	None						
NOTES							
Two of the fire team's members, FT LDR1 and Rifleman4, were initially unarmed. Therefore, ammunition was added to their basic loads - each received 200 rounds of "5.56mm, Ball, M193" and two "Grenade, Hand, Frag, M67".							



Appendix D – List of References

- Defense Modeling and Simulation Office (DMSO). (2000). *VV&A recommended practices guide*. Washington, DC: Defense Modeling and Simulation Office (DMSO). Retrieved November 2, 2005 from the World Wide Web: <http://vva.dmsso.mil>
- Headquarters, Department of the Army (HQDA). (1999). *Department of the Army pamphlet 5-11: Verification, validation, and accreditation of Army models and simulations*. Washington, District of Columbia.
- Henderson, C. and B. Grainger. (2002). Composable behaviors in the OneSAF Objective System. In *Proceedings of the Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC) 2002*, Orlando, Florida.
- Randolph, W. and D. Sagan. (2003). OneSAF uses a repeatable knowledge acquisition process. In *Proceedings of the Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC) 2003*, Orlando, Florida.
- Science Applications International Corporation. (2004). *Models development behavior verification test plan*. Orlando, Florida.

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Appendix E – Initial Distribution List

1. US Army Training and Doctrine Command Analysis Center
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2. Product Manager – One Semi-Automated Forces (OneSAF)
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Glossary of Acronymns

AMSAA	US Army Materiel Systems Analysis Activity
AUTL	Army Universal Task List
BLUFOR	Blue Forces
BPD	Behavior Process Document
CGF	Computer Generated Forces
DMSO	Defense Modeling and Simulation Office
FARP	Forward Area Refueling Point
FWA	Fixed Wing Aircraft
GAT	Government Acceptance Testing
GUI	Graphical User Interface
HQDA	Headquarters, Department of the Army
HVIED	Human/Vehicle-borne Improvised Explosive Device
I/ITSEC	Interservice / Industry Training, Simulation, and Education Conference
KAKE	Knowledge Acquisition / Knowledge Engineering
LRP	Logistics Release Point
M&S	Modeling and Simulation
MB	Megabyte
MEDEVAC	Medical Evacuation
OneSAF	One Semi-Automated Forces
OOS	OneSAF Objective System
OPFOR	Opposing Forces
PM	Product Manager
PSD	Process Step Descriptions
PVD	Plan View Display
RWA	Rotary Wing Aircraft
SAIC	Science Applications International Corporation
SME	Subject Matter Expert
TD	Task Description
TRAC	TRADOC Analysis Center
TRAC-MTRY	TRAC in Monterey, California

TRAC-WSMR	TRAC at White Sands Missile Range, New Mexico
TRADOC	US Army Training and Doctrine Command
US	United States
VV&A	Verification, Validation, and Accreditation
WCS	Weapons Control Status
XML	Extensible Markup Language