

DEFINING MISSION-BASED TRAINING REQUIREMENTS: CONNECTING THE DOTS

Mr. Robert Guptill and Mr. John Cipparone
Dynamics Research Corporation
Andover, Massachusetts

ABSTRACT

Conducting effective individual and collective training that is based on mission and job requirements is the overall goal of all training. Only when this occurs can there be assurance that individuals and units will be “ready” to perform their mission and associated task requirements. However, attaining this training readiness state has been difficult due to a lack of validated, constructive models that represent: (1) how missions are performed and measured; (2) how units and systems function; and (3) how individuals, crews, and teams perform work. Moreover, there is a lack of integration tools and accepted processes for building these mission-to-task linkages and managing the data.

This paper describes a top-down and bottom-up Mission-based Training Requirements Methodology that evolved from numerous training requirement analyses. This approach initially focuses on missions that are analyzed and defined using the Universal Joint Task List – Joint Mission Essential Task List (UJTL-JMETL) process. This process uses Service-approved taxonomies of strategic, operational, and tactical tasks as well as a comprehensive set of task conditions and performance measures to model mission task requirements. Using the Joint Training Information Management System (JTIMS), an automated capability for developing operational templates of these task requirements is provided.

Central to this methodology is the use of the Military Domain Representation Framework (MDRF) modeling developed by the Defense Modeling and Simulation Office (DMSO) and employed by the Joint Simulation System (JSIMS) program. The MDRF’s Functional Descriptions of the Mission Space (FDMS) process models provide the means for modeling unit and system functional operations and, most important, provide the basis for linking mission task performance requirements to human task performance requirements. Human task requirements are identified using task analysis techniques that have been long-used by training analysts. Task analyses developed using these Instructional Systems Development/Systems Approach to Training (ISD/SAT) techniques constitute the bottom in the overall task analysis hierarchy and provide the basis upon which individual and collective training is developed.

This mission-to-individual task analysis approach provides a means for specifying, acquiring, developing, operating, and managing training systems that directly achieve mission and job task performance requirements. Beyond the training benefits of this approach, the methodology products have implications for supporting simulation-based systems acquisition, live-fire test and evaluation, doctrine development, manpower and personnel requirements analysis, logistics support analysis, business process improvement, and job, unit, and organizational development. Ultimately, the application of such a mission-focused analysis methodology specifies the level of unit and individual “readiness” necessary to accomplish those warfighting task requirements deemed essential by Commanders-in-Chief (CINCs) and their Service component commanders.

Primary Author’s Biographical Sketch

Mr. Robert Guptill has over 20 years experience in the management and performance of training analyses. He served with the U.S. Army and is currently the Training Analysis Systems Program Manager at Dynamics Research Corporation (DRC) in Andover, MA where he manages a multi-disciplinary group of training analysts, curriculum developers and information system professionals. His expertise lies in instructional systems development, educational technology, training front-end analysis, and automated training analysis systems. Mr. Guptill is a graduate of Norwich University with a BS in Mathematics Education and a Masters in Education from Boston University.

Secondary Author’s Biographical Sketch

Mr. John Cipparone is a Staff Systems Analyst at DRC and served over 29 years in the U.S. Marine Corps. In addition to his aviation background, his expertise lies in instructional systems development and training. He holds an MS degree in Management and MA degrees in National Security/Strategic Studies as well as Guidance and Counseling.

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BACKGROUND

The Chairman of the Joint Chiefs of Staff (CJCS), General Henry H. Shelton, in the November 2000 Draft Joint Training Manual, succinctly captured the need for the Services to devise effective methods that enhance warfighting training when he stated:

We must train the way we intend to fight. Our efforts must also ensure that resources are efficiently applied to develop and maintain an integrated and flexible joint force. As a goal, combatant commands and the Services should continue to develop complementary methodologies to better allocate joint training resources, thereby increasing jointness by proving the quality of joint training. Commanders at all echelons should honestly and aggressively define and assess their joint training requirements.”¹

While these words describe a path for combatant commands and the Services to follow, the challenge remains--how to advance such “methodologies” in a fiscally constrained environment while ensuring individuals and units are appropriately trained and ready to perform specified missions across a diverse spectrum of operations.

Implicit in confronting such reality is for “commanders at all echelons...” to view training more holistically by delineating integral mission-based training requirements, that combined, generate an interactive pattern of supporting relationships. Central to this vision is the need to construct a top-down and bottom-up “methodology” which uses a “lens” that identifies, quantifies, and links mission-based training requirements to curricula, support systems development, and acquisition. Defining and assessing mission-based task requirements as the central focus for training can optimize the allocation of joint training resources prescribed by the CJCS to “...train the way we intend to fight.”

If such a training methodology can promote individual-to-unit mission readiness, then why hasn't this paradigm been developed by the Services at the unit level and the schoolhouses as they strive to hone their warfighting expertise? After all, conducting training that assesses and links mission performance to individual and collective task requirements advances, not only joint and Service readiness, but also the desired end state of the Joint Training System (JTS) “...for aligning training strategy with assigned missions while optimizing the application of scarce resources.”² Clearly, the Secretary for Defense saw such a correlation when he stated in his 1997 Annual Report to the President and Congress, “by the end of FY1998, the Services will link their component METLs with the Joint Training System-approved JMETLs and incorporate the JMETLs as the source for guiding Service unit training.”³

Although the Joint Training Information and Management System (JTIMS) “...facilitates the development of an integrated, task-based, ‘thread’ to guide the application of all four JTS phases”⁴ (i.e., requirements, plans, execution, and assessment) for joint operations, measuring and connecting mission performance requirements at the top to individual and crew training development as well as implementation requirements at the bottom has been difficult. In part, the explanation for this lies in the difficulty of constructing models that validate how missions are performed and measured as well as how units and systems function and interact to include how individuals, crews, and teams execute their associated tasks. Moreover, the capability to identify and connect these performance levels is diminished due to a lack of integration tools and accepted processes for making these mission-to-task linkages and managing the large amount of associated data.

This paper proposes a missions-to-functions-to-tasks methodology that enables training

¹ CJCSM 3500.03A (2000), pg xiii

² JTIMS User's Guide (2000), pg 2

³ Paron, J. (1999). Naval Aviation Training Decision Support System Brief

⁴ JTIMS User's Guide (2000), pg 2

developers at all levels of warfighting to integrate their training analysis techniques and products. The proposed framework of the methodology provides the means to conduct training analyses using mature, validated processes and to represent and link the products of these analyses into a hierarchical structure. Before describing this framework, three levels of performance analysis and representation need to be defined and described. For, it is only after performance levels are defined, organized, and assessed that individual and collective training can be linked directly to mission performance requirements for the effective development of those warrior skill sets necessary to prosecute operations across a diverse spectrum of conflict.

PERFORMANCE ANALYSIS LEVELS

Inherent to any mission-based training approach is the requirement to connect mission performance requirements at the top to training development and implementation requirements at the bottom. Currently, the Universal Joint Task List (UJTL)-Joint Mission Essential Task List (JMETL) Process and the supporting Service-level Universal Task List (UTL)-METL Process identify tasks that trace to and through CINC and Service requirements. Conversely, down below the joint and Service staff levels, the Instructional Systems Development (ISD)/System Approach to Training (SAT) process has been used by military trainers for over 30 years to define, develop, and implement individual and collective training requirements.

To be responsive to the CINC and Service mission needs, these tasks down at the unit level need to be fully linked to the mission task requirement at the top since such an approach provides the appropriate alignment of training resources to strategic, operational, and tactical mission requirements. Notwithstanding the need for mission-based requirements to be the foundation for training decision making, the process of connecting tasks at the top to those at the bottom represents one of the biggest challenges for Service component commanders who desire to develop a top-down and bottom-up mission-based training requirements methodology.⁵

Since desired individual and crew warfighting capabilities are transformed into readiness via training, any discussion of a mission-based training requirements methodology, especially one that spans across the levels of war, must be designed to analyze performance at three different levels: Missions, Operational Functions, and Tasks. At the Missions Level, performance is evaluated by how effectively organizations/units, systems, and individuals as well as crews accomplish a defined task that clearly indicates its purpose and related actions. Correspondingly, performance at the Operational Functions Level is measured by how effectively integral activities or processes are achieved in relation to attaining a distinct mission. And critically, performance down at the Tasks Level is measured by how well individual and collective tasks are executed to a defined standard under specified conditions in relationship to achieving a stated mission.

Essential to the development of a mission-based requirements methodology is the acknowledgement that it is at the Tasks Level where individual and collective training requirements are defined and developed.⁶ The relationship among these three performance levels is illustrated in the task performance hierarchy depicted in Figure 1 wherein each of the performance levels is displayed as a series of process phases, tasks, or steps.

The respective performance level approach is used to fully describe and define the temporal (“what” is done “when”) relationship of the processes within each level. For example, the UJTL-JMETL Process developed by the J-7 of the Joint Staff and the supporting Service component UTL-METL Process is used to define missions and correlate associated tasks into operations templates. In turn, task elements of these templates can be fully developed into constructive models using Formalized Data Products (FDPs) developed as part of the Joint Simulation System (JSIMS) program to fully describe the functional operations of systems, equipment, and individuals as well as crews.

⁵ A detailed discussion of the UJTL and JMETL Process is contained in the JMETL Development Handbook (1999)

⁶ DoD Handbook, MIL-HDBK-29612 (1999) describes in detail the ISD/SAT process and the individual and collective task analysis process

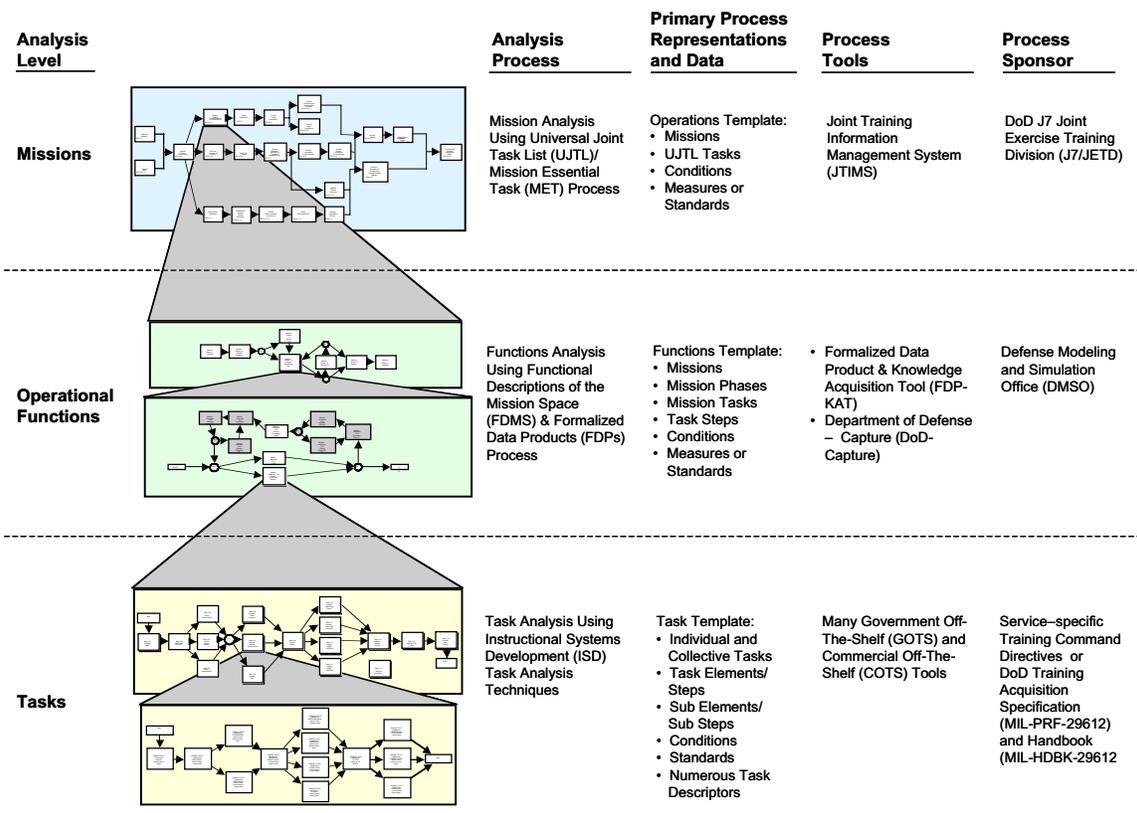


Figure 1. Mission-based Task Hierarchy

Once operational functions have been defined down to the lowest level of performance needed to accomplish a specific mission, the ISD task analysis process, using such techniques as job task analysis, equipment task analysis, and cognitive task analysis, can be employed to define individual and collective tasks.

Organizing performance levels in this manner facilitates a logical, hierarchical breakdown of tasks that can be analyzed within each performance level as well as between performance levels. Since the various process relationships depicted in Figure 1 involving process representations and data as well as process tools are critical components to performance analysis, they will be discussed in the following section that describes the development and validation of a mission-based training requirements methodology.

MISSION-BASED TRAINING REQUIREMENTS METHODOLOGY

Figure 2 illustrates the five steps of the Mission-based Training Requirements Methodology. Using this methodology, performance requirements at the Missions, Operational Functions, and Tasks levels are identified, defined, organized, and reconciled. Application of this methodology results in individual and collective training being linked directly to mission performance requirements for the effective development of those warfighting skills necessary to "...develop and maintain an integrated and flexible joint force."

As shown, Step 1 of the methodology begins at the "top" by determining Mission task requirements. In Step 2, relevant JSIMS constructive process models are identified for each mission task and their associated operational functions are identified and further analyzed. As opposed to the previous two steps, Steps 3 and 4 are performed interactively to

reconcile differences. In Step 3, existing individual and collective task requirements are identified at the “bottom”. Typically, most mission areas and their systems already have a large body of existing, well-defined individual and collective tasks. New systems, which have not been fielded, have comprehensive task analyses that are performed as part of the system acquisition process. In Step 4, the previously

identified individual and collective tasks are aligned to the operational functions. The final step reconciles differences between the performance levels and identifies “missing” individual and collective tasks for development. This final step provides an important opportunity for training analysts at the different performance levels to reconcile doctrinal and levels of indeture problems.

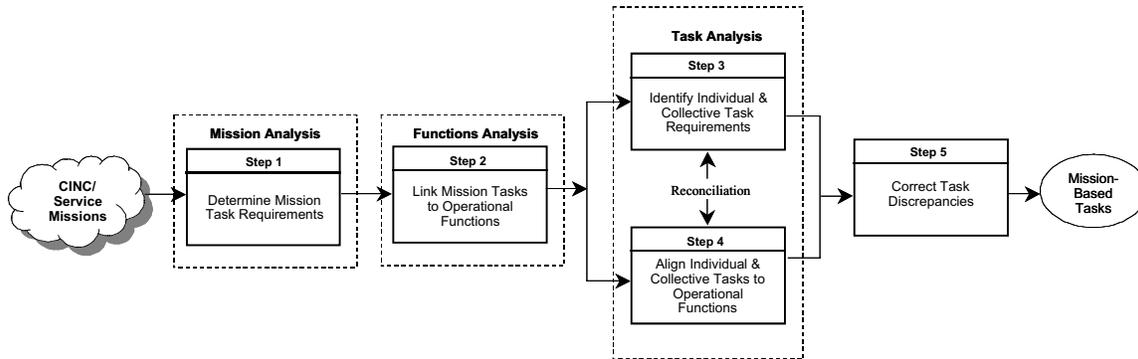


Figure 2. Mission-based Training Requirements Methodology Steps

Step 1: Determine Mission Task Requirements

Essential to the Mission-based Training Requirements Methodology is the need to determine strategic, operational, and tactical mission requirements. Determining how missions are performed and measured is best accomplished using the UJTL-JMETL Process in conjunction with the appropriate supporting Service component UTL-METL Process. The UJTL-JMETL Process employs approved taxonomies of strategic, operational, and tactical tasks as well as a comprehensive set of task conditions and performance measures that are used to develop operations templates for specified mission areas. When applied using the Mission Requirements Module (MRM), a software predecessor to the requirements phase of JTIMS, a functional capability for generating operations templates is provided for developing, planning, executing, and assessing joint training plans.

An operations template shows the tasks from the UJTL and Service component UTL that are required to perform a mission. The MRM is used to display the temporal relationships of these tasks. Figure 3 is a sample operations template for Anti-Submarine Warfare (ASW) Operations,

which illustrates how the MRM is used to determine and display a Service component’s METL. The highlighted tasks in the template represent mission essential tasks (METs), which provide the focal point for defining mission-based training requirements

Step 2: Link Mission Tasks to Operational Functions

Initiatives to align missions and MET requirements to individual and crew performance levels can be modeled using computer simulation. In assessing performance necessary to achieve desired missions, behavioral representations from the National Air and Space Model (NASM) can be employed to derive associated relationships and interactions among missions, functional operations, and individual as well as crew tasks. Developed by the DMSO as part of the JSIMS program, NASM uses Formalized Data Products (FDPs) as its basis for describing what it calls Functional Descriptions of the Mission Space (FDMS). These conceptual models describe how military organizations, equipment, and processes function. Thus, the NASM structure with its FDMS/FDPs provide the “glue” for linking mission-based operational requirements to individual/crew task performance.

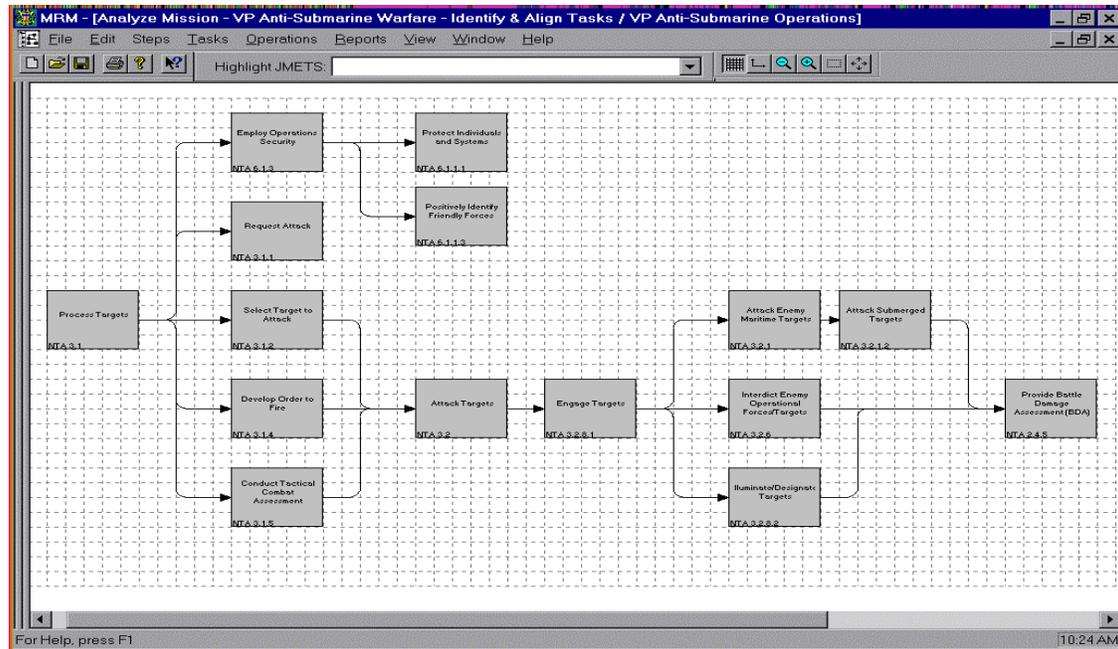


Figure 3. Sample Operations Template: Anti-Submarine Warfare Operations

As shown in Figure 4, NASM's FDMS employs a mission-based approach that decomposes a mission into phases and subsequently, phases into tasks.

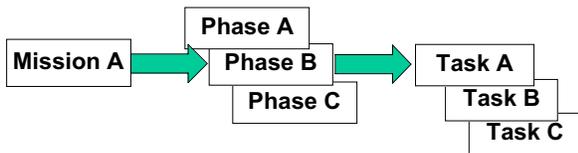


Figure 4. NASM Mission Relationships

Within this construct, specified tasks and task elements from a unit's task list can be aligned with NASM mission phases and tasks as well as sub-tasks in conducting a mission task analysis.

This modeling framework incorporates processes and sub-processes that correspond to a mission, which consists of one or more phases. Correspondingly, each phase consists of one or more tasks. However, the same phase may be repeated in many different missions and the same task may be repeated in many different phases. Moreover, the same phase may be performed

several times within the same mission and the same task may be performed several times within the same phase. Consequently, the numbers of process descriptions, which must be developed by defining missions in terms of a relatively small set of "building blocks" or sub-processes, are minimized since many of the same sub-processes are repeated across missions.

Figure 5 is an example of an ASW mission and its NASM mission phases. As shown, the NASM modeling process captures the dynamics of the operational functions required to perform this mission. Within each phase, one or more mission tasks and numerous sub-steps are used to model each mission phase of flight.

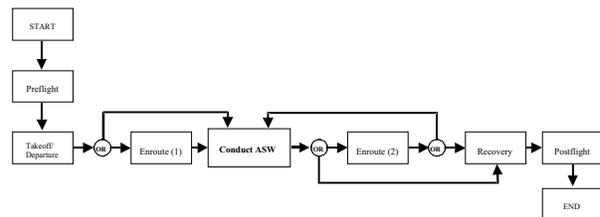


Figure 5. Sample NASM Mission FDP

I. VP Anti-Submarine Warfare (ASW)					
Operations Mission	Naval Mission Essential Task	National Air and Space Model (NASM)			
		Mission	Mission Phase	Mission Task	VP Mission Phase
VP Anti-Submarine Warfare (ASW)	NTA 3.2.1 Attack Enemy Maritime Targets NTA 3.2.1.2 Attack Submerged Targets NTA 5.1 Acquire, Process, Communicate Information & Maintain Status	Anti-Submarine Mission (ASW) (01)	Preflight Phase (1)	Conduct Preflight Briefing (24)	01. Flight Planning
				Develop Mission Plan (09)	02. Mission Planning
			Takeoff/Departure Phase (2)	Conduct Preflight Check (25)	03. Preflight
				Onload PAX and Cargo (38)	04. Start/Taxi
				Start, Taxi, Takeoff, & Accelerate (27)	06. Takeoff/Departure
			Enroute Phase (3)	Rejoin (43)	05. Ground Emergencies
				Employ Surveillance Sensors (49)	07. Airborne Emergencies
				React to Inflight Emergency (R) (45)	08. Enroute
				Hold (50)	11. Return
				Employ Surveillance Sensor/s (49)	900. Common Mission Tasks
				React to Missile (R) (30)	909. Independent ASW Ops vs. Diesel Sub
				React to Air Attack (R) (31)	910. Independent ASW Ops vs. Nuclear Sub
			Anti Submarine Warfare (ASW) Phase (4.1)	React to Other Threats (R) (32)	911. EER ASW
				Evaluate Aircraft Damage/Condition (R) (34)	912. Pounce ASW
				Analyze and Relay Data (13)	918. ASW Coordinated Ops w/ a Single Ship
				Orbit (05)	919. ASW Coordinated Ops w/ a Tail Ship
				Deliver Weapons (06)	920. ASW Coordinated Ops w/ a Friendly Sub
				Employ Reconnaissance Sensor/s (36)	921. ASW Coordinated Ops w/ a Ship & Helo
Employ Surveillance Sensor/s (49)	922. ASW Coordinated Ops w/ a SAG				
Conduct Mission (Weapons Director) (4403)	923. ASW Coordinated Ops w/ a CVBG				
Overcome Electronic Countermeasures (R) (??)	10. NATO/Allied Coordinated Operations				
Analyze and Relay Data (C) (13)	12. Descent/Approach				
Recover Phase (5)	React to Missile (R) (30)	13. Land			
	React to Air Attack (R) (31)	14. Post Landing/Taxi/Shutdown			
Postflight Phase (6)	React to Other Threats (R) (32)	15. Post Flight			
	Update Mission Plan (R) (18)	16. Debrief			
	Conduct CAS (277)	Mission Phase 2, 3, 4, 5			
Reoccurs in more than 2 Phases	Rejoin (43)	Mission Phase 2, 3, 4, 5			
	Hold (50)	Mission Phase 2, 3, 4, 5			
	Offload PAX and Cargo (39)	Mission Phase 2, 3, 4, 5			
Reoccurring in all Phases Except Postflight Phase	Recover (12)	Mission Phase 2, 3, 4, 5			
	Conduct Postflight Check (29)				
Continuous in all Fit Phases	Conduct Postflight Briefings (23)				
	Receive Postflight Debriefing (56)				

Figure 6. Sample Missions-to-NASM Task Table

Figure 6 shows the results of applying the functions analysis process in a recent study involving the Navy's patrol aircraft (VP) community, specifically the P-3 aircraft. Using NASM's FDMS/FDPs, a comparable NASM mission for ASW operations was identified and aligned to a VP mission area which was followed by identifying NASM mission phases and mission tasks.⁷ After these processes were identified, VP mission phases from a P-3 "Mission" Task List were aligned to NASM mission phases. Although such an alignment did not permit a one-to-one relationship between functional operations, (i.e., a NASM mission phase was comprised of many VP mission phases), applying a validated model did provide the necessary structure for aligning METs at the top to individual and crew tasks contained in the P-3 Mission Task List at the bottom.

Step 3: Identify Individual and Collective Task Requirements

After desired missions and their conditions and standards have been identified, the next step is to identify and organize existing individual and

collective tasks within the mission area of the organizations/units performing the mission. Since these tasks are at the "bottom-tier" of the methodology hierarchy, they represent the basis for individual/crew training development and performance assessment. With a large array of training infrastructure (e.g., curricula, training systems, training programs) being associated to these tasks, once they have been identified, these tasks can be categorized by mission area.

In order to preclude task redundancies across individual as well as crew positions and minimize categorization errors of activities (i.e., listing of tasks that may actually be steps or elements of a task), Task Analysis Worksheets (TAWs) should be prepared for each individual and collective task to capture the linkage between the tasks and task performance requirements. This is best accomplished by identifying crew positions and responsibilities for duties identified as well as the level of required task performance and knowledge.

Figure 7 depicts a TAW and provides a sample of how roles as well as performance and knowledge levels can be portrayed and is detailed in the following explanation. Task performance roles include five categories: "M" manage, "Su" supervise, "P" primary, "Se" secondary, and "A"

⁷ Since a NASM mission was not developed for ASW operations, a new mission profile was developed using NASM mission phases and tasks, which is in keeping with the building block architecture of the NASM models.

assist. Additionally, levels of performance encompass four groupings: (1) extremely limited,

P-3 TASK ANALYSIS WORKSHEET (TAW)

TASK: Perform ASW Coordination Ops with Single Ship Procedures (918.01)					
TASK TYPE (IC): Collective					
P-3 PHASES OF FLIGHT: 918 ASW Coordination Ops w/ Single Ship					
SYSTEMS:					
P-3 POSITION					
Position	Position Title	NOBC/NEC	Role	P-Level	K-Level
MC	Mission Commander	1310/15/1320/25	M	4	C
PPC	Patrol Plane Commander	1310/15/1320/25	P	3	C
PPP/PPCP	Patrol Plane Co-Pilot	1310/15/1320/25	P	3	C
FE	Flight Engineer	8251			
PPTC	Patrol Plane Tactical Coordinator	1320/5	P	4	D
PPNC	Navigator/Communicator	1320/5	P	3	C
SS1	Sensor Station One (Acoustic)	7841	P	3	D
SS2	Sensor Station Two (Acoustic)	7841	P	2	B
SS3	Electronic Warfare Operator	7861	P	3	C
IFT	Inflight Technician	8262			
REFERENCES					
Designator	Title	Date			
3500.25 (Mar 99)	Training & Readiness Manual (T&R Man)				
NWP 3-20.5	Tactical Manual (TAC MAN)				
	Air Tasking Order (ATO)				
STANDARDS					
Measure	Title				
0-100%	Training and Readiness Manual				
TASK ELEMENTS					
Designator	Title				
SUPPORTING TASKS:					

Figure 7. Sample Task Analysis Worksheet

(2) partially proficient, (3) competent, and (4) highly proficient. Likewise, levels of knowledge also include four categories: “A” facts, “B” procedures, “C” operating principles, and “D” complete theory. Equally significant, each TAW should include space to indicate specific references as well as detailed standards including the measurement of performance.

Step 4: Align Individual and Collective Task Requirements to Operational Functions

Once associative relationships between missions and phases have been aligned to a modeling structure (i.e., missions, phases, and tasks), the next step begins by correlating existing individual and collective tasks to prescribed modeling tasks (i.e., NASM Mission Tasks). Figure 8 shows these relationships applied to the aviation example involving VP ASW operations.

As shown, the NASM framework permits P-3 individual and collective tasks and task elements to be “linked” or related to NASM mission tasks and task steps. This process of decomposing and connecting task relationships between NASM and P-3 tasks should also include the respective conditions and their associated performance measures.

NASM Mission Task Step		P-3 Task		P-3 Task Element	
Num	Title	Num	Title	Num	Title
49	Employ Surveillance Sensors				
49.1	Bring Sensor Suite On-line	918.13	Employ Non-Acoustic ASW Sensors	918.29 918.31	Adjust ASQ-81 Filter Band Perform In-flight CGA Procedures
49.2	Monitor Sensor for Detection Data	918.08	Employ Search Stores	918.11	Advise SS-1 & SS-2
		918.15	Deploy Search Stores	918.10 918.11	Coordinate SS-1 & SS-2 Advise SS-1 & SS-2
		918.13	Employ Non-Acoustic ASW Sensors	918.17	Alert SS-3 of Impending MAD
49.3	Track Initiation	918.08	Employ Search Stores	918.11	Advise SS-1 & SS-2
		918.15	Deploy Search Stores	918.10 918.11	Coordinate SS-1 & SS-2 Alert SS-3 of Impending MAD
		918.13	Employ Non-Acoustic ASW Sensors	918.17	Alert SS-3 of Impending MAD
49.4	Monitor Sensor for Track Data	918.08	Employ Search Stores	918.11	Advise SS-1 & SS-2
		918.15	Deploy Search Stores	918.10	Coordinate SS-1 & SS-2
		918.13	Employ Non-Acoustic ASW Sensors	918.17	Alert SS-3 of Impending MAD

Figure 8. Sample NASM Task to P-3 Task Table
Step 5: Correct Task Discrepancies

In the final step, any discrepancies between the NASM mission tasks and the individual and collective tasks are further analyzed and, where required, corrective action taken. Discrepancies that are found include: (1) individual and collective tasks that do not relate to any mission tasks, (2) mission tasks that do not have any individual and collective tasks, or (3) one-to-many relationships in which there are levels of indenture problems between either mission tasks or individual and collective tasks. With all of these discrepancies, further analysis is required to determine the cause of the mismatch in tasks. Discrepancies can be due to one or more different reasons including inaccurate doctrine, out-of-date or poorly performed task analyses, etc.

MISSION-BASED TASK ANALYSIS AUTOMATION

In order to develop training support systems, a training system requirements analysis (TSRA) should be used to verify the top-down and bottom-up entity of relationships derived from the mission-based training methodology. A useful means for demonstrating and validating this process is the TSRA Task Analysis Verification (TAV) tool, which has the capability to structure, access, and display missions, operational functions, and task data. Accordingly, the TAV Tool employs the ability to define a task template, create libraries, generate templates, enter data, classify tasks, and display data in graphical and tabular form. Through the use of such capabilities, a mission-based task hierarchy can be developed that links desired missions and corresponding functional operations through a mature behavioral model to individual and collective task performance.

This TAV process is, to some extent, shown in the template depicted in Figure 9, which enables performance levels representing major entities in the mission-based training requirements methodology to be developed. Using the VP ASW example, these levels include the missions, NASM mission phases, NASM mission tasks/steps, and P-3 tasks/task elements.

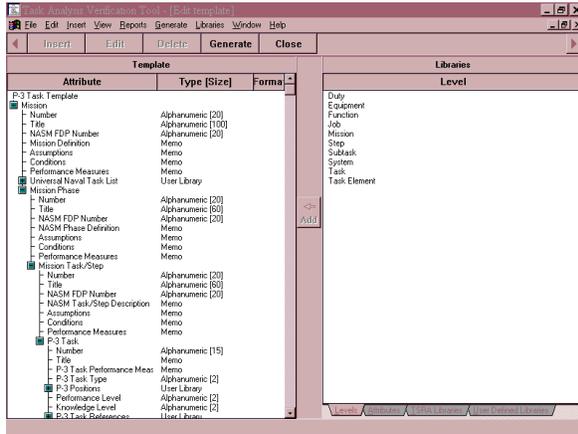


Figure 9. TAV Tool Task Template

Within each level, numerous attributes and libraries can be assigned that comprise the data elements needed to describe each level of analysis. Once this process is complete, the template can be generated with screen entry fields from the created database. Although not represented, the drawing feature can also be used to sequence, define, and access task performance data at all levels of mission, operational functions, and task performance. Inherent to the drawing tool is a “drill” down capability for analyzing dependent and independent hierarchical performance structures between levels.

Once the task analysis has been validated using this TSRA process, these synthesized individual and collective tasks, that have been linked to mission and operational functions requirements, can then be used to perform a variety of training and other supportability analyses. As seen in Figure 10, the mission-based tasks can then be used as a basis for validating existing training products, developing new training systems, and performing other supportability analyses.

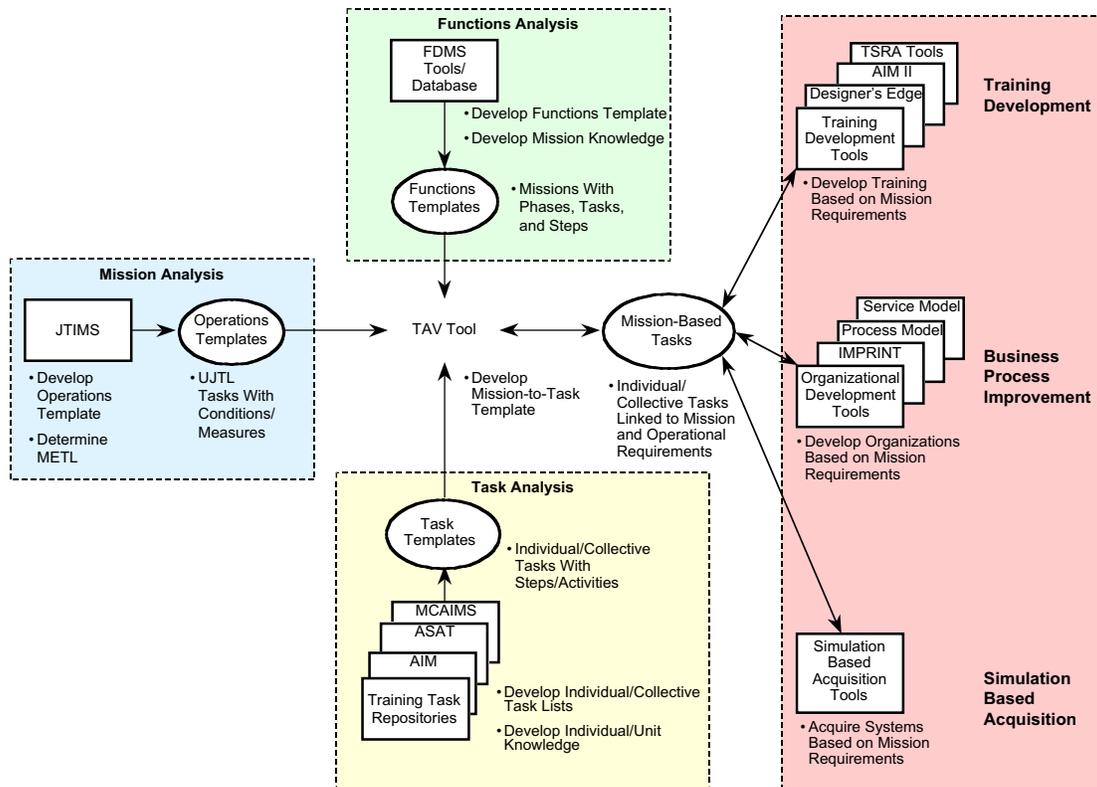


Figure 10. Mission-based Task Analysis Uses

The methodology incorporates the products of three different levels of analysis: mission, operational functions, and task. The TSRA TAV Tool was not designed to explicitly host this methodology construct, but it does provide an initial capability for capturing and organizing these diverse, multi-level data analysis products.

SUMMARY

Employing a Mission-based Training Requirements Methodology that links desired missions and associated functional operations identified from the UJTL-JMETL Process at the top to and through individual/crew task analysis using an ISD/SAT Process at the bottom, can be enhanced by using constructive models as well as automated tools to assess and validate mission and job performance requirements and warfighting performance. Moreover, such a mission-based framework derives three primary benefits for Service component commanders that are in consonance with the CJCS' guidance to "define and assess their joint training requirements."

First, training resource needs can be justified based upon the capabilities of training programs that support mission essential CINC and DoD requirements. Secondly, functional requirements of training systems can be explicitly linked to the individual and collective tasks necessary to meet joint and Service component METLs. And lastly, training curricula development and training management decisions can be optimized based upon satisfying critical mission-based task performance requirements.

Notwithstanding the stand alone value of each benefit, once synchronized through an integrated process of supporting relationships, they promote training "the way we intend to fight." Moreover, the derivative of such a top-down and bottom-up Mission-based Training Requirements Methodology can derive a level of unit and individual "readiness" necessary to accomplish those warfighting tasks across a diverse spectrum of military operations that support the tenants of our National Security Strategy.

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