ABCA ANALYSIS HANDBOOK

Operational Assessment of ABCA Exercises and Experiments

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ABCA Analysis Handbook

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PREFACE

The American, British, Canadian, Australian (ABCA) Armies' Standardization Program holds biennial exercises, to validate existing standardization agreements, identify areas for future standardization efforts, and facilitate information exchange among the ABCA Armies.

The 2004 ABCA Exercise, to be hosted by the U.S. Army, was intended to assess the ability of ABCA forces to lead/participate in coalition operations, with a special emphasis on coalition command and control (C4I systems interoperability).

The 2004 ABCA Exercise was based on employment of an Army Force (ARFOR) Headquarters and ABCA Brigade Headquarters, embedded within a larger United States Joint Forces Command (USJFCOM) sponsored bi-lateral (US/UK) Joint Task Force Exercise (RAPID ALLIANCE). As a result, it was an ambitious undertaking and more complex than the several previous biennial exercises. Due to the national commitments in real world operations the ABCA exercise was cancelled in late 2003.

The experiences of the Project Team for Exercise Planning and Analysis (PT EPA) gained while preparing for ABCA Exercise 2004 led to the development of this handbook. This handbook is not intended to prescribe analysis policy or dictate analytic procedures; rather, it is offered to provide guidelines and suggestions for analytic planning, execution, and reporting based on PT EPA experiences during these events.

Each ABCA Army will approach the analysis process in their own way and one that is best suited to the circumstances of the individual exercise or experiment. In developing this handbook we have attempted to convey an ABCA coalition viewpoint and provide a product that any country may adapt to their needs.

Acknowledgement

The ABCA Program is indebted to the members of the ABCA Exercise 2004 Project Team for Exercise Planning and Analysis, who through their commitment, expertise, and hard work have made the development of this handbook possible. The teams' integration of military personnel, government civilians, and contractors from all the partner nations, represents a coalition enterprise in the best spirit of the ABCA Armies' Program.

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Analytic Essence of the ABCA Program.

The analytic study process for the ABCA Program is composed of several sequential, iterative steps; of which the three major components are planning, execution, and reporting.

Chapters 1 and 2 of the Analysis Handbook provide a frame of reference for understanding the analysis process. The subsequent chapters of this Handbook address the processes, actions, and products within the planning, execution, and reporting components that are required to conduct analysis of an ABCA exercise or experiment. The figure below illustrates the steps of the Study Process that will be addressed throughout this Analysis Handbook.

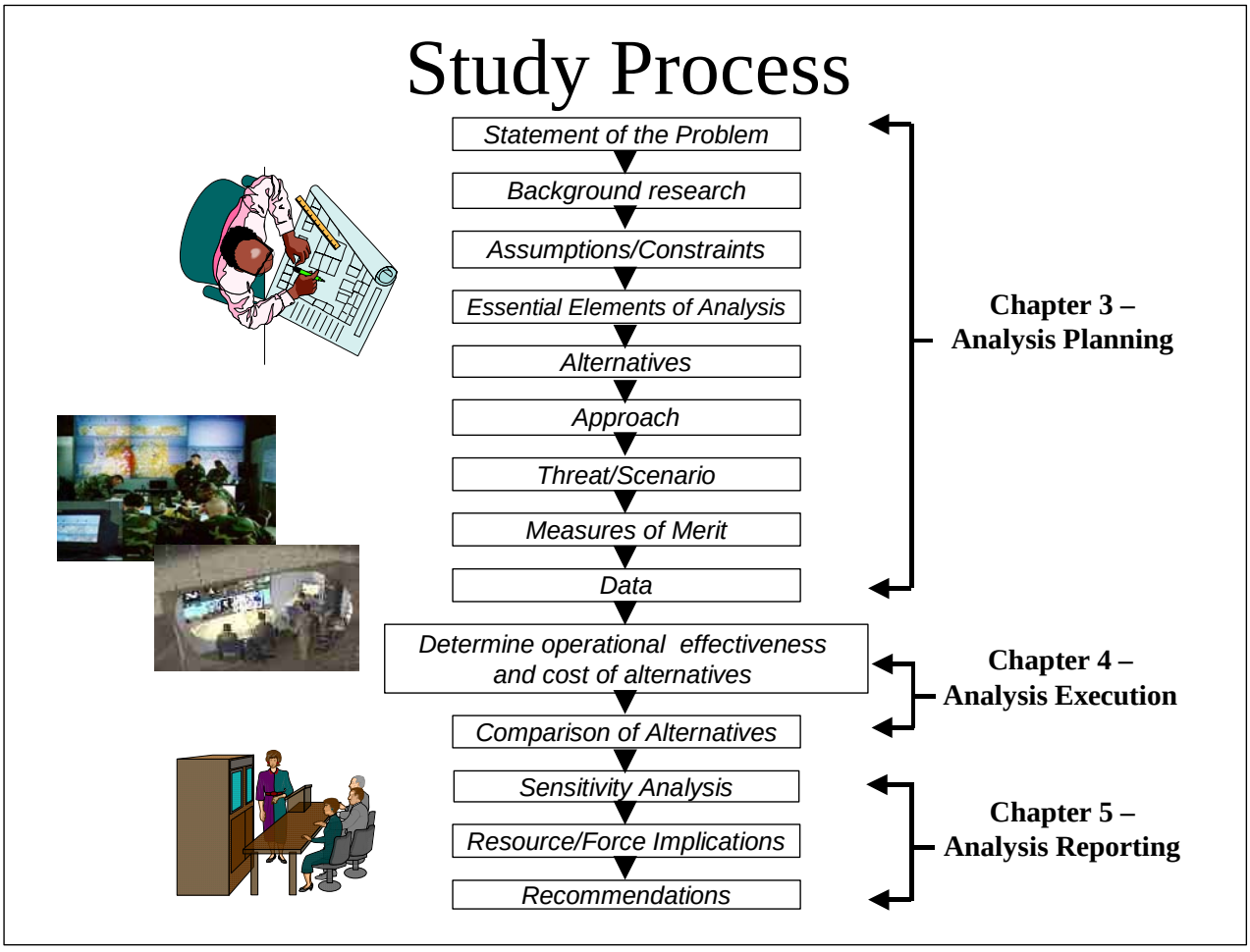


Figure I-1: Study Process – Analysis Planning, Execution, and Reporting

INTRODUCTION

The Analysis Handbook organization:

Chapter 1. American, British, Canadian, Australian Armies' Program. Provides background information on the ABCA Program Plan and Exercises and Experimentation Program.

Chapter 2. **Terms of Reference.** Provides familiarization with the terms and processes used in the operational assessment of ABCA exercises or experiments.

Chapter 3. Analysis Planning. This chapter addresses Study Planning, Exercise and Analysis Integration Planning, and Analysis Support Planning.

Chapter 4. Analysis Execution. This chapter addresses Data Collection Procedures, Command and Control (C2) of Analysts, and Training.

Chapter 5. Analysis Reporting. Emerging Insight Development, the Initial Insight Report, the Post Exercise Analysis, and the Final Operational Report are addressed in this chapter.

Annexes. Following the main body of the Analysis Handbook are a series of annexes that provide examples and greater detail on specific portions of the study process.

Chapter 1. American, British, Canadian, Australian Armies' (ABCA) Program.

Background.

The mission of the ABCA Program is to optimize interoperability through cooperation and collaboration in the continuous pursuit of standardization and mutual understanding in order to integrate the capabilities of the ABCA Armies in coalition operations.

Beyond the political considerations of the different nations, there are core issues confronting the nations' armies when they wish to form a coalition for operations. Principally, these issues relate to differences in how the armies organize, the equipment they use, and how effectively they can operate together to achieve the coalition's objectives. The ABCA Program seeks to identify these differences and levels of interoperability in doctrine, technology, and performance, with the goal of enhancing coalition effectiveness.

Interoperability gap analysis is a key activity within the ABCA Program Planning System. The purpose is to assess the degree of interoperability among the ABCA Armies in specific areas. Within the ABCA Program Planning System, there is an Exercise and Experimentation Program, which assists in the interoperability assessment of the ABCA Armies.

Exercise and Experimentation Program.

The campaign plan for achieving the ABCA vision, illustrated at Figure 1-1, shows *Experimentation* and *Exercises* as two of the eleven lines of operation. The following paragraphs detail an exercise and experimentation framework for the ABCA Armies' Program.

While exercises and experiments may be distinct or closely related activities, in the context of the ABCA Program Planning System, they are simply two tools that serve a similar purpose and often have the same or very similar objectives. Therefore exercises and experimentation are considered an integrated system.

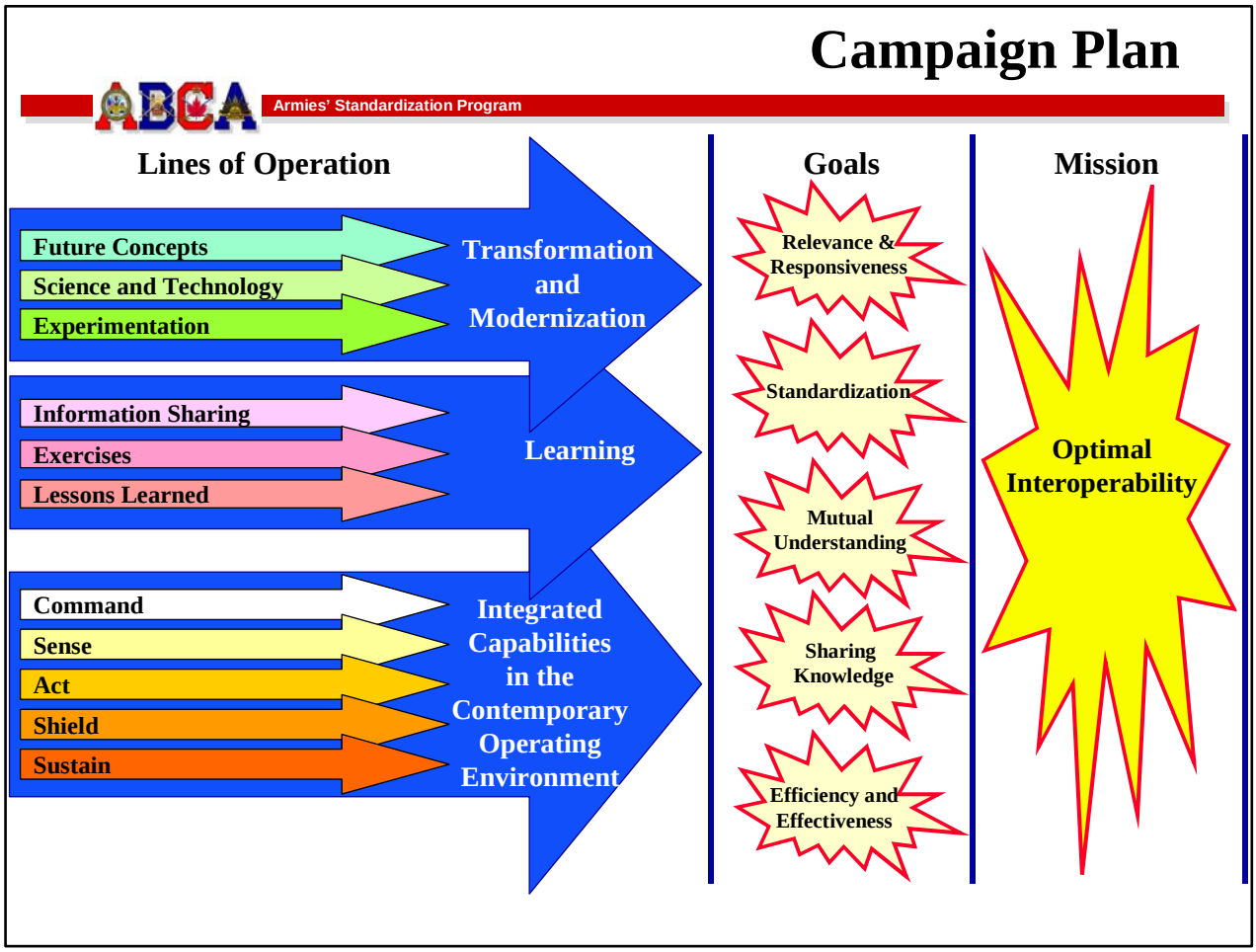


Figure 1-1: ABCA Campaign Plan Lines of Operation

Purpose.

The purpose of the ABCA Exercise and Experimentation Program is to test, analyze and evaluate the interoperability of ABCA Armies in order to promote optimum coalition capabilities.

Objectives.

ABCA exercises and experiments provide a multi-level venue to further the program's objectives for enhancing coalition effectiveness. There is a great benefit to be gained just by the conduct of combined training in a coalition, and fostering greater understanding, cohesion and collaboration among the ABCA armies.

However, most importantly, exercises and experiments provide the opportunity to capture data in a controlled environment for the analysis, evaluation, and measurement of coalition interoperability. Through analysis and evaluation, solutions for closing

interoperability gaps can be tested and validated, and issues requiring further examination can be identified. The resulting analysis then aids in the development of ABCA standards, publications and databases, and the overall improvement of coalition operations.

Benefits.

The ABCA exercise and experimentation program provides a focus for the development of new or updated doctrine, procedures, publications or architectures. It provides the opportunity for cross-cultural exchange, understanding and confidence building. ABCA armies operating together gain experience in their coalition partners' operational procedures and their capabilities. As a result, the armies, governments and other stakeholders can see the evidence and value of coalition interoperability in action.

Limitations.

There are limitations to replicating an actual operational environment within an exercise or experiment. Resources, national priorities, and the armies' current operations can all restrict the level of involvement or fidelity of a given exercise. There also may be difficulties synchronizing the time to plan and conduct activities within the cycle of the ABCA Program Planning System. Therefore, ABCA events must be designed to work within constraints to focus efforts on examining key interoperability issues.

Resources.

An Exercise and Experimentation Support Group (ESG) is responsible for developing the strategy and experimentation plan as a part of the overall ABCA Program Plan. The scope of the plan will include proposed ABCA exercise and experimentation activities in accordance with strategic guidance from the ABCA Executive Council. The exercise and experimentation plan will address in detail the aim and objectives for the conduct of directed biennial activities to include analysis requirements.

One of the responsibilities of the ESG is the establishment, maintenance and application of appropriate analytical methods and standards, to include the simulations used to drive the exercise or experiment. To that end, and with authorization from the ABCA Board, the ESG may form Project and Information Teams dedicated to specific Program activities. One of the principal requirements is a Project Team for Exercise Planning and Analysis (PT EPA)**.**

Project Team for Exercise Planning and Analysis (PT EPA) Mission.

The EPA's mission is to develop a study plan and methodology supporting an ABCA exercise/experiment aim, objectives, environment, characteristics, and schedule. EPA's mission can be further described as follows:

Purpose. Provide an operational assessment of the interoperability of the ABCA Armies operating in a coalition.

Method. Operationally assess a live force exercise or experiment to develop qualitative and quantitative insights through the analysis of data collected by both automated systems and manual observations.

End State. Gain an understanding of the relevant systems and procedures employed by coalition forces and identify insights on interoperability effectiveness or gaps between the ABCA Armies to inform and support the ABCA Program Goals (Be relevant and responsive; strive for standardization, integration and interoperability; enhance mutual understanding; share knowledge; be effective and efficient).

Capability Groups and Interoperability Gap Analysis.

Interoperability gap analysis is the means by which the Capability Groups translate the interoperability objectives articulated by the ABCA Board into potential tasks to be addressed in the Program. Capability Groups are comprised of 'broad national Subject Matter Experts' (SMEs) who will direct, maintain, and monitor the work of the Project Teams who complete the tasks. The result of these tasks will be the delivery of an identified product such as ABCA Standards or Advisory Publications.

Within the scope of exercises/experiments, the Exercise and Experimentation Support Group has a responsibility to coordinate the development of the Exercise and Experimentation Plan with the ABCA Program Plan. In addition, the ESG will support gap analysis by Capability Groups. A linkage exists between the Capability Groups and the PT EPA through the ABCA Chief of Staff (COS) in developing, selecting, and prioritizing issues and initiatives for analysis.

Chapter 2. Terms of Reference.

Background.

The purpose of this section of the Analysis Handbook is to establish a common understanding of basic terms that are used throughout the analysis process.

Terms.

Operational Analysis (OA) – An analytic approach using warfighting scenarios as a context for evaluation of specific issues, as well as future analytic applications. An OA requires scenario development using a realistic coalition operational environment, current and future threat, campaign plans, deployments and actual force structure, and certified weapons and munitions data. It also requires an evaluation of operational plans and/or force capabilities and deficiencies, detailed battle flow and mission threads, identification of interoperability gaps, and insights and findings.

Dendrite –An analytic document that contains the decomposed ABCA designated objective(s) into three parts: issues; Essential Elements of Analysis (EEA); and Measures of Merit (MOM). The dendrite document can be used as a tool to develop the data collection and management plan.

Study Plan –An analytic document that defines the study methodology, the study structure, and assigns responsibilities for the study to be conducted during the ABCA exercise. It is the implementing order that contains all the information necessary to guide the study and organize the ABCA Armies' supporting analysis elements or agencies.

Essential Element of Analysis (EEA) – An EEA is defined as an analytic sub-issue component.

Measure of Merit (MOM) – A MOM is a component of the EEA and is defined as a measurement of analysis (qualitative or quantitative) that enables study issues and EEAs to be answered through integrated data collection.

Analysis Plan – A detailed account of the analytic basis for the exercise or experiment. It defines the problem and alternatives to be analyzed. It identifies the issues, sub-issues, and subsequent EEA and MOM to be addressed during the exercise.

Data Collection and Management Plan (DC&MP) – It is an analytical document that identifies the data collection requirements, quality control processes, and resources needed to execute the analysis plan. It is normally an annex to the analysis plan and details the data sources required to answer the issues and EEA.

Observation – A record or description obtained by the act of recognizing and noting a fact or occurrence. Data generated during the event.

Insight – The synthesis of a set of observations that reveal a capability or a warfighting impact. Insights include new thoughts or patterns that emerge as an analysis team looks at observations and reviews them in light of a larger body of knowledge within an operational context.

Emerging Insights – The evolving insights that are produced on a daily basis during the conduct of the exercise or experiment. They are intended to capture, in real time, what the analysis team is learning and are used to periodically update the Exercise Director.

Initial Insights Report (IIR) – An evolving document that should grow as events are conducted during the exercise. The intent of the IIR is to compile one comprehensive document that ties all insights together from all of the events or phases of the coalition exercise. The IIR is generally produced within 30 days of the end of the exercise or experiment.

Final Operational Assessment (OA) Report –A detailed analytical report containing the final interoperability insights and supporting evidence for the exercise or experiment, based on post-event analysis and synthesis of observations, instrumented data, surveys and interviews obtained throughout the exercise or experiment in order to produce the interoperability insights. The final OA Report is generally produced within six months of the end of the exercise or experiment.

Chapter 3. Analysis Planning.

Background.

Success in planning exercises or experiments is rooted in early establishment of objectives and intent. A synchronized Study Plan and supporting and nested Analysis Plans go a long way toward providing the framework for detailed guidance. If rigor in an exercise or experiment is based on controlling variables, then nothing allows for more control of variables in the design phase than early, firm decision-making. The longer decisions on scenario, participation, funding, technical environment, and study issues are allowed to linger, the more options the exercise planners must keep open and the harder it is to control variables that affect the outcome.

Planning an ABCA exercise or experiment encompasses four major, concurrent development efforts: the exercise/experiment environment, simulation architecture, scenario, and analysis. Each of these four development efforts contains key areas that must be addressed early in the exercise/experiment planning process. Additionally, decisions in each of these areas must be synchronized with one another to ensure the design of the exercise/experiment achieves the intended objectives and the results contribute to the overall body of knowledge. Figure 3-1 illustrates the time line and concurrent activities that must be synchronized leading up to an exercise or experiment.

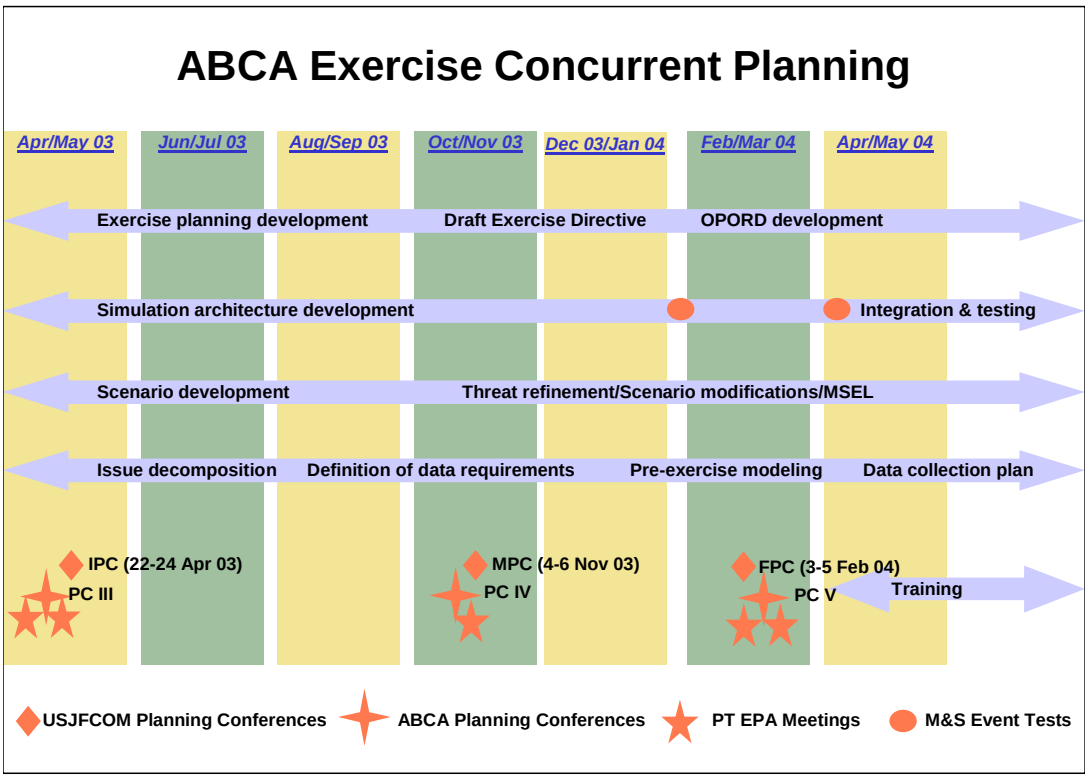


Figure 3-1: An Example from ABCA Ex04 of the Concurrent Exercise, Simulation, Scenario, and Analysis Planning Occurring in the Year Prior to Execution

The tendency, especially in high visibility exercises/experiments, to layer multiple concepts and capabilities into the event over time must be resisted. While refinements can continue to be made throughout the planning of an exercise/experiment, there must be a point early in the planning process when the major components are locked down. This is sometimes called the "Good Idea Cut-off Date" (GICOD).

Exercise/experiment planners should focus on the primary components of the four concurrent development efforts and then employ a synchronized decision-making process to address requests/directives to modify the exercise or experiment construct. This synchronization is especially important for ABCA where the event may be integrated, or an adjunct within one of the armies' existing exercises or experiments.

The objectives and intent that are to be the focus of an exercise/experiment must be stabilized early and must also be clearly defined in sufficient detail. The ABCA Exercise and Experimentation Plan must provide these key elements to the planners of the four development efforts. The Plan drives decisions on forces needed; organizations or equipment and capabilities required and lead to identification of units, location, scope, and other requirements. All other aspects of exercise/experiment planning and design are founded in, and derived from, the objectives and intent.

With early stabilization of objectives and intent:

- Analysts can complete the development of analysis plans with an understanding of the concepts being represented.
- Scenario developers can ensure the exercise/experiment scenario provides the appropriate context within which to analyze the concept or issues.
- Technical developers can ensure that all aspects of the exercise/experiment environment appropriately replicate the concept at the required level of fidelity.

Section 1. Study Process.

In order to develop a synchronous body of knowledge that informs decision points along an exercise/experiment campaign plan timeline, a nested analytic process is required. This process, the study process, establishes the analytic requirements and standards for deriving the required body of knowledge.

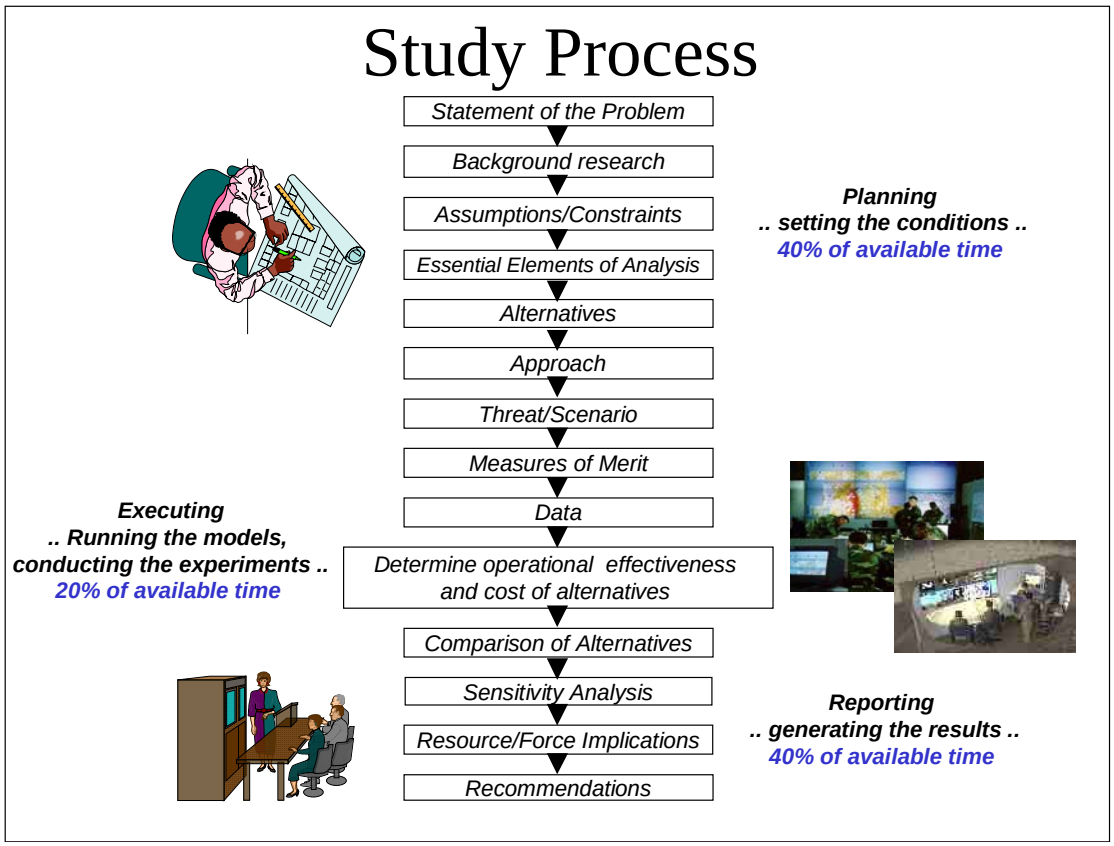


Figure 3-2: Study Process

Building the Study.

The three main component documents that comprise an exercise or experiment study are the Study Plan, the Analysis Plan, and the Data Collection and Management Plan. These are the documents that guide the analysis team in charting their way through the exercise, and planning how they will organize and what methods and techniques they will employ to gather the data. The study process (Figure 3-2) is decomposed into several sequential, iterative steps; of which the major components are planning, execution, and reporting. The study process is applied across the Study Plan and supporting Analysis Plans. It facilitates the linkage of assigned issues ("problem statement") to informing required decisions and future concept and technology development ("recommendations").

Study Plan.

The Study Plan is an analytic document that defines the study methodology, the study structure, and assigns responsibilities for the study to be conducted during the ABCA exercise. The Study Plan, prepared by the PT EPA, is the key document in the entire study process. The Study Director and Project Team Leader design the study plan to ensure the conduct of an orderly study with sound conclusions. Once the study is underway, major study changes will be very difficult to implement within time and resource limits.

The Study Plan is the implementing order that contains all the information necessary to guide the study and organize the ABCA Armies' supporting analysis elements or agencies. The Study Plan should describe the detailed methodologies, models, scenario, and analytic and resource requirements. The Exercise Director should approve the Study Plan. The Study Plan defines:

- Responsibilities within the Study Team
- Detailed study methodology and resource plan
- Assumptions, limitations, and constraints
- Milestone chart
- Decomposition of Issues to Essential Elements of Analysis (EEA)
- Relationship to the applicable Exercise Director
- Coordination with applicable agencies
- Approval by the ABCA Program Executive Council and Exercise Director

Annex C, Appendix 1, Study Document Formats, contains a sample format of a Study Plan for an exercise or experiment. The following paragraphs address components of the Study Plan.

Problem Statement.

The problem statement, or statement of requirement, is articulated in the Study Plan. It usually relates to a deficiency in the force or the achievement of technical innovations on which the Armies wish to capitalize. The problem should be stated in clear language so that everyone can understand and agree on the problem to be addressed.

Problem Statement Characteristics

- One short sentence in length, not a question.
- Should come from (or be approved by) the ABCA Executive Council and Exercise Director.
- Not the same as a study objective or study issue—the basis for them.
- It is the overarching problem to be answered.
- May be expressed as a proposition or hypothesis.
- Can be decomposed into issues and sub-issues.

- Should suggest the variables and relationships of interest.

Impact of the Problem.

This component of the Study Plan is a concise statement on the impact of failure to address the problem or requirement.

As an example, this impact statement is from the ABCA Ex04 Study Plan: ***"Impact of Failure to Address the Requirement. As armies undertake their individual transformation-- modernization processes, their organizational and digital command and control architectures will tend to diverge unless standardization agreements are in place that mitigate the risk by informing national force development."***

Exercise Context.

The exercise aim and objectives are developed through the ABCA Exercise Planning Process (EPP). Once approved, the aim and objectives essentially state the problem and focus the analysis requirements. The objectives are used to establish training events for the ABCA armies during the exercise, and for the PT EPA to identify study issues, and subsequently, assess the ABCA armies' interoperability in coalition operations.

When an ABCA exercise is embedded within a larger event (e.g. a Joint, bi-lateral, or multi-national exercise), it is important to know the overarching tasks that are driving the scenario and training events in that exercise. With that knowledge ABCA tasks may be coordinated with the host events, using those existing conditions, scenarios and assets to achieve ABCA exercise goals. The knowledge can also be used to de-conflict or to create the ABCA unique scenario events necessary to achieve the ABCA Armies' exercise goals.

The Exercise Context section of the study plan (derived from the ABCA aim and objectives) describes who (which ABCA nation) is hosting the exercise and the conditions or scenarios in which it will take place. The exercise context will provide information on the type of ABCA event; ABCA Exercises may be stand-alone exercises or test events or embedded within a larger event. This section might also include the linkages to previous or follow-on exercises or events, exercise and analysis planning information, conference schedules, execution phase information, and information on analysis report writing, post exercise analysis, and other pertinent facts.

Background Research.

The study effort should be informed by what has been examined before, including AARs and Post Exercise Reports (PXRs) from previous ABCA and national exercises and experiments. Sample background information should include a review of commercial literature, operational reports and experiences, or previous coalition army and joint exercises/experiments.

Scope of the Analysis.

The scope of the analysis and the level of effort required depend on the critical decision issues and will vary from study to study. The ABCA Program Chief of Staff acts as the Chief of Analytic Support for the exercise, and the EPA Project Team Leader is the Deputy Chief of Analytic Support and Study Director. The study director must tailor the scope of analysis to the unique requirements of that study effort. As presented in the study plan, the scope is a succinct statement of the breadth and depth of the analysis the study will undertake.

Assumptions.

Assumptions set up the initial framework or boundaries of the analysis. An assumption is an educated guess to replace facts that are not in evidence and which are important to the successful completion of the study. Stating the assumptions enables the reader to understand the context of the study and convey planning considerations. For example, an assumption that *"sufficient soldiers and staff will be available for interview or to be surveyed subsequent to exercise completion"* indicates actions to be included in developing the analysis plans. General assumptions applicable to the overall analysis planning and execution efforts should be included in the study plan.

Assumptions are a key element of the study. Assumptions must be valid, verifiable, and necessary to the study. The analyst must state them properly so the study plan does not assume the problem away. Assumptions of time relationships are particularly important because of their impact on planning and synchronization of efforts.

Limitations.

Limitation factors (such as analysis resources, calendar time, or political realities), which impact upon the scope of the study and the application of the results and conclusions, are described in the study plan. The study must address a real world in which limitations and constraints apply. The study should be conducted with those constraints in mind. Potential limitations are listed below:

Economic. The exercise analysis and the resulting documented insights are central to achieving ABCA goals. As such, the EPA Project Team Leader must work closely with the Exercise Planning and Budgeting agency to ensure adequate funding to support the effort. The analysis team can assist in the budgeting effort through examination of similar exercises, operational analysis, experiments, etc., and scale the study in light of the historical requirements.

Military. The alternatives considered in a study must include recognition of the nations' engagement in on-going military operations and demands on coalition resources. These factors will weigh greatly on the ability of the armies to commit forces and are a major determinant in planning the scope of the exercise and analysis effort. Other

limitations include differences in doctrine, Rules of Engagement (ROE), and security of classified information and technologies.

Technological. The various system types and levels of technology within the coalition armies have implications for both the design and conduct of the exercise/event, and the ability to capture and gather analytic data. Technological considerations for a study will include the impact of equipment systems, hardware and software interoperability of the exercising armies, the exercise modeling and simulation equipment and architecture, as well has hardware and software for analysis data collection.

Manpower. Manpower resources for analysis will include several categories of expertise and level of commitment. It will probably include a mix of military and government personnel and civilian contractors. A dedicated project team, led by the host nation, will be required to support the exercise through the process of developing the analysis plan, execution of the plan, and delivery of the final report and analysis products.

There is also a requirement to augment this core project team with additional analysts and subject matter experts just prior to, and during, the conduct of the exercise. As with other asset requirements, the nations must be given estimates of their expected manpower commitments as early as possible during the exercise planning process. As the exercise concept matures, and the scope of the analysis is further defined, the specific number of augmentees required from the nations can be identified.

Lesson learned: "Command and Control processes are human intensive—which implies data collection is also labor (and manpower) intensive . . ."

Political. There are acknowledged differences of national policies in the conduct of war, rules of engagement, and other sensitivities to be considered when working within a coalition of forces. Those differences that bear on the planning and conduct of the exercise and analysis should be identified so that provisions can be made for addressing them in appropriate ways.

Time. The ABCA Program allows a two-year time span for the biennial exercise or experiment to accommodate national planning and coordination. As an estimate for the study process, about 22 months of the available time will be devoted to planning (setting the conditions), one month to executing (running the models, conducting the experiment/exercise), and one to three months given to reporting (generating the results).

While there is no set limit on how long the reporting and analysis process should take, exercise planners should determine when in the ABCA Program Planning System (PPS) the output is needed so that it can inform interoperability gap analysis at the Annual Meeting. Nations need to plan to commit personnel to analysis and reporting after the exercise not just for planning and execution.

Ensuring timelines are met is key in any project, but this is especially true with a team comprised of analysts dispersed among the member nations and across multiple

time zones. In addition to the formal ABCA Planning Conferences, pre- and post-conference meetings for the analysis team are an effective method for leveraging group synergy, and minimizing travel costs. This technique, coupled with regularly scheduled phone conferences, VTCs, and email exchanges are effective means for managing the team and maintaining momentum on the project. Phone conferences offer an advantage over VTCs since they are less expensive, easily set up, and are the most accessible across the time zones. Analysis products can be shared electronically via email, offsetting the visual advantage offered by VTC.

Constraints.

Constraints are directed restrictions or conditions that must be met and are placed on the agency by a higher authority. They restrict freedom of action by stating what must or must not be done.

A constraint could be a directive that requires the analysts to include force effectiveness comparisons. For example: Will there be the opportunity for repeatable events? Will the fidelity of the data and algorithms in the various training simulations or federation of models, and the fidelity and consistency of the various armies' command post response cells allow for force effective comparisons?

Study Issues.

Study issues are defined as the first-order questions to be answered through the application of investigation and analysis. The study issues are usually derived from the exercise aim, objectives, and problem statement.

For example, ABCA Ex 04 was planned as a Command, Control, Communications, Computers and Intelligence (C4I) interoperability exercise integrated within a larger U.S. joint (USAF, USN, USMC, US Army and US—UK Bilateral) exercise. The exercise was to examine the ability of ABCA armies to lead and/or participate in coalition operations. The ABCA Ex 04 aim and objectives, endorsed in 2001, are shown below in Figure 3-3.

2004 ABCA Exercise Aim

To assess the ability of ABCA forces to lead/participate in coalition operations, with special emphasis on command and control (C4I systems interoperability), in order to identify areas needing attention by the ABCA Program.

2004 ABCA Exercise Objectives

- Evaluate national doctrines and their impacts on coalition capabilities.
- Assess the national and coalition command and staff procedures.
- Identify coalition planning, executing, and support procedures needing improvement.
- Identify future work for the ABCA program.
- Update the Coalition Operations Handbook (COH).

Figure 3-3: ABCA Ex 04 Aim and Objectives

Project Team EPA derived a set of overarching and secondary issues from the ABCA Ex 04 Aim and Objectives, in order to begin the Operational Assessment (OA) process of developing applicable and relevant study issues for decomposition (depicted in Figure 3-4).

An example of primary and secondary issues for analysis

Command and Control Interoperability

***Overarching issue**: How do ABCA forces lead/participate in coalition operations with their existing C4I systems (**C2 interoperability**)?*

***Sub-issue 1**: How does the national doctrine of each Army impact coalition command and control capabilities?*
***Sub-issue 2**: How are national and coalition command and staff procedures executed?*
***Sub-issue 3**: How are coalition planning, execution, and support procedures conducted and what is their impact on command and control interoperability?*

***Secondary Issue** – What is the impact of coalition command and control interoperability on the ability of the ABCA Armies to conduct operations (**force effectiveness**)?*

ENDSTATE: The operational assessment of these study issues will inform future work for the ABCA Program and enable an update to existing ABCA publications (COH, ABCA Standards, ABCA Advisory Pubs)

Operational Impact

Figure 3-4: Example Study Issues from ABCA Exercise 2004

The study effort was organized around five broadly focused analysis areas, each having a designated lead analyst and team assigned to develop analysis and data collection plans (Figure 3-5). This analysis organizational methodology was based on the experiences of previous command and control exercises, and was found to be a very effective means of examining C4I study issues.

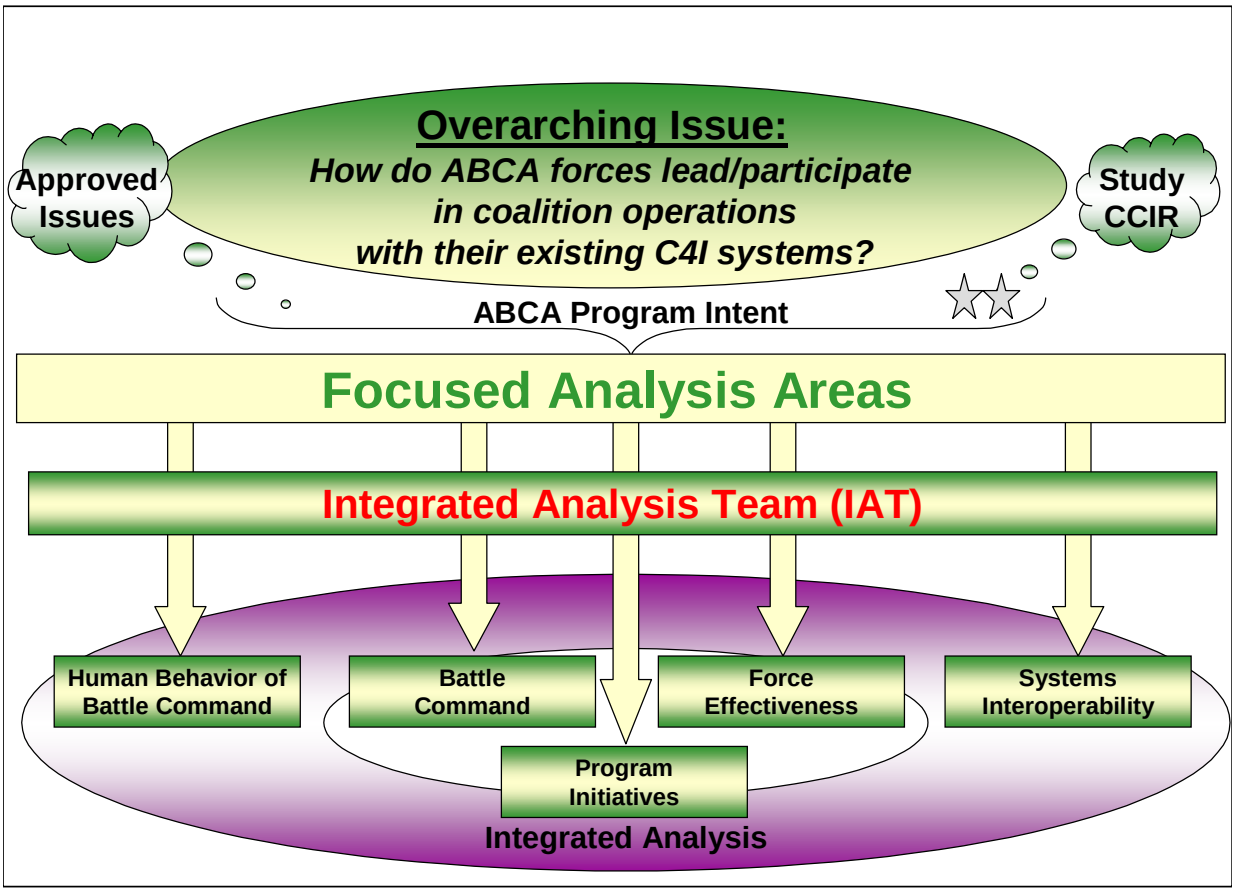


Figure 3-5: Focused Analysis Areas

Allocation of Responsibilities.

In the case of the ABCA Exercise 2004, the U.S. was the host army, and thus, the lead agency for the analysis. Various analytical organizations from the different nations were designated with responsibility for the focused analysis areas and applicable study issues. Figure 3-6 shows the responsible analysis organizations, their key supporting organizations, and the first-order study issues for which they were responsible.

Focused Analysis Area	Lead Organization	Key Supporting Organization(s)	Applicable Study Issues
Systems Interoperability (SI)	Canada, Land Force Doctrine and Training Systems, Kingston, Ontario	US (TRADOC Research and Analysis Center, (TRAC) White Sands Missile Range)	**Overarching Issue**: How do ABCA forces lead/participate in coalition operations with their existing Command, Control, Communications, Computers, and Intelligence (C4I) systems?
Battle Command (BC)	US (TRADOC Research and Analysis Center, (TRAC) Fort Leavenworth, KS	Australia, Defense Science and Technology Organisation (DSTO) Adelaide, SA	**Sub-Issue 1**: How does the national doctrine of each Army impact coalition C2 capabilities? **Sub-Issue 2**: How are national and coalition command and staff procedures executed?
Human Behavior of Battle Command (HB)	US Army Research Laboratory, Aberdeen, MD		**Sub-Issue 3**: How are coalition planning, execution, and support procedures conducted, and what is their impact upon C2 interoperability?
Force Effectiveness (FE)	Australia, DSTO Adelaide, SA	US (TRAC-Ft. Lee) US (TRAC- White Sands Missile Range)	**Secondary Issue**: What is the impact of coalition C2 interoperability on the ability of ABCA armies to conduct operations?
Program Initiatives	UK, Directorate of Land Warfare, Upavon	ABCA Program Office Capability Groups	**Overarching Issue:** How do ABCA forces lead/participate in coalition operations with their existing C4I systems?

Figure 3-6: Focused Analysis Areas, Responsibilities and Study Issues

In the example exercise, each focused analysis area leader used the study issues, ABCA Program guidance, and Program and National Initiatives to derive a proposed set of study sub-issues for their respective area. Based on the guidance given to the focus area leaders, they proposed sub-issues that:

- were linked to shortfalls identified in 2002 ABCA Coalition Interoperability Demonstration (CID BOREALIS);
- were not adequately addressed in CID BOREALIS;
- were relevant to lessons learned and identified shortfalls in current operations, and/or
- emerged as a result of the issues proposed by the ABCA Program offices and agencies.

Explanation of Focused Analysis Areas.

Human Behavior of Battle Command (HB). Provided a lead nation command and control structure, what is the impact of the different armies' command and control systems on commander/staff performance?

Battle Command (BC). Provided a lead nation command and control structure, did all ABCA armies demonstrate the ability to execute effective battle command,

focusing on C2 processes and structures, with 2004 equipped command and control systems?

Force Effectiveness (FE). Provided a lead nation command and control structure, how did the level of interoperability of the armies impact force effectiveness (lethality, survivability, and sustainment)?

Systems Interoperability (SI). How operationally effective and interoperable are the C4I systems of the different armies in a lead-nation command and control structure?

Program and National Initiatives (P&NI). Provided with various P&NI inputs and requirements, what ABCA Standardization Agreements and Advisory Publications require modification and how should they be modified?

Thread Analysis.

An exercise or experiment typically must examine broad and complex sets of study issues. The study plan and subsequent analysis plans have to be designed to balance coverage of all the key issues, along with a sufficiently in-depth and detailed examination of the essential elements.

As described previously, in ABCA Exercise 04, focus areas were used to logically divide certain aspects of the examination. However, many questions or issues crossed or impacted multiple focus areas. Employing a "Mission Thread Analysis" approach is a method to identify these issues, de-conflict between focus areas to prevent duplication of effort, and to see any cause-and-effect relationship across the areas. Within "Mission Threads", there are also "Decision Threads" that likewise may cross focus areas. ***Annex E, Thread Analysis***, provides further information on this approach.

Initiatives Review.

In the process of developing exercise or experiment study issues, the analysis team will want to incorporate the ongoing work and interoperability objectives of the ABCA Program. Principally, these will be drawn from the interoperability gap analysis conducted by the ABCA Capability Groups. An effective methodology for integrating their work is convening a group or board to review critical program issues and determining what can be tested or examined during an ABCA exercise or experiment. The methodology and actions for an IRB are addressed in ***Annex D, Initiatives Review Board (IRB) Concept*** of this handbook.

Prior to 2004, the ABCA Armies' Program used Quadripartite Working Groups (QWGs) to examine interoperability issues within thirteen specific functional areas, such as air defense artillery; communications information systems; doctrine, command and staff procedures; etc. These standing work groups identified issues or tasks to be examined to determine whether or not interoperability gaps existed in these functional

areas, and the extent to which identified gaps would cause problems in conducting coalition operations.

In the case of the ABCA 2004 exercise, the initial QWG tasks and issues were presented to the PT EPA at the second planning conference for incorporation into the Study Plan. For clarity in the analysis process, the EPA adopted the term *"Program and National Initiatives"* to distinguish them from the first-order *study issues*, which were broader, more overarching, and applied to the exercise as a whole.

In a coordinated effort, PT EPA, the ABCA Program Office, and the QWGs began reviewing and revising the initiatives. The purpose was to ensure the EPA team understood the objectives of each individual QWG initiative and that the language was properly phrased to elicit data for analysis.

Once they were in their final format, it was necessary to conduct an Initiatives Review Board (IRB) to examine the QWG and National Issues against a set of criteria to determine their applicability to the exercise. Subsequently, they were prioritized to their "relative importance" to the ABCA Program goals. The set of criteria used to assess the applicability and necessity of the initiatives is illustrated in Figure 3-7 below.

INITIATIVE DEVELOPMENT AND SELECTION CRITERIA

- **Relevance – Issue relevant to ABCA Ex 04 aim and objectives**
- **Venue – Appropriate venue for addressing issue; data obtainable**
- **Cost – No unfunded costs associated with issue**
- **Scenario – Issue addressable within the proposed scenario, or able to be accommodated without cost or penalty in a side activity**
- **Modeling – Simulation facilitates evaluation of the issue**
- **Criticality – How critical is the task/issue to warfighting/peacekeeping operations?**
- **Deficiency – How likely is the task or issue not to be performed to a standard that adequately replicates the real world?**

Figure 3-7: Initiative Development and Selection Criteria

Following the IRB meeting, the consolidated and prioritized list of initiatives was distributed to the EPA Team for correlation and integration within each focused analysis area.

Building the Study: Analysis Plan.

The Analysis Plan is a detailed account of the analytical basis for the exercise or experiment. The Analysis Plan defines:

- The problem and alternatives to be analyzed.
- Details the methodology used to conduct the analysis.
- Identifies the issues, sub-issues, and subsequent EEA and MOM to be addressed.
- Constraints, assumptions, limitations, and challenges
- Alternatives to be analyzed, criteria and methods of evaluation.
- Scenarios and input data requirements.
- Specifies the members of the analyst teams and their assignments and roles.
- Model and data validation
- Specifies the product deliverables expected from the analysts and when they are due.

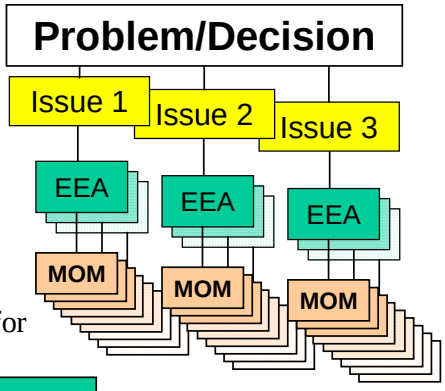
Annex C, Study Document Formats, Appendix 2, contains a sample format of an Analysis Plan for an exercise or experiment.

Developing Data Collection Elements and Procedures.

Within the Study Plan and Analysis Plan(s), approved study issues and sub-issues are decomposed into essential elements of analysis (EEA), measures of merit (MOM), and data elements. An EEA delineates sub-elements of a problem for which answers must be produced. A MOM is defined as a measurement (qualitative or quantitative) that enables study issues and EEAs to be answered through integrated data collection. Data elements are the data measures that must be collected to support the MOM. They are obtained from various sources of data type (observations, interviews, surveys, simulation outputs, etc.). This decomposition of the problem, from issue to data elements, permits analytic rigor and enables a valid analysis of the study issues. The planning definitions are shown in Figure 3-8.

Issues - The principal question(s) that require an answer to solve a specific problem or to inform decision makers in their problem solving processes.

1. What capability is realized by each of the alternative architectures when introduced into the digitized force and how does it impact combat effectiveness in terms of lethality and survivability?



Essential Elements of Analysis (EEA) - Questions that delineate the sub-elements of the issues being studied and for which answers must be produced.

1.a. What system in each alternative has the greatest impact on fratricide reduction?
1.b. How is lethality and combat effectiveness impacted by each alternative?

Measures of Merit (MOM) - A force/system attribute or characteristic for which a quantitative assessment is made for comparison. Measures of merit include measures of performance (which are system attributes) and measures of effectiveness (which are force attributes).

1.a.(1) Percent fratricides on each system;
1.a.(2) System exchange ratio (threat losses/blue losses)
1.b.(1) Loss exchange ratio;
1.b.(2) Battle tempo (losses over time)
1.b.(3) System exchange ratio;
1.b.(4) Successful engagements

Figure 3-8: Definitions Supporting Analytic Decomposition Process

Responsibility for documenting sub-issues rests with the Focused Analysis Area Leader. The PT EPA and the Chief of Analytic Support approve the analysis plans and their associated data collection plans. Figure 3-9 reflects a study sub-issue decomposition.

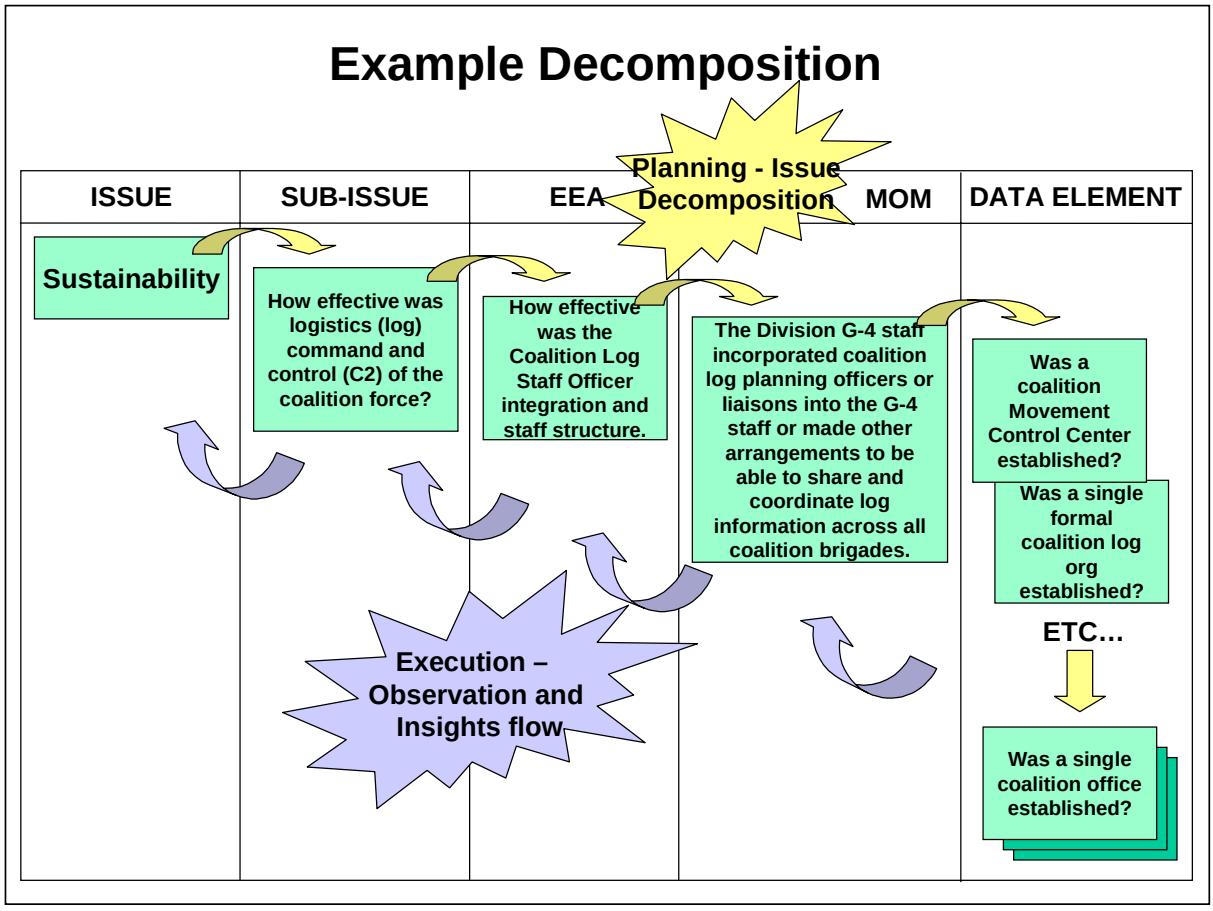


Figure 3-9: Example Study Issue Decomposition Process

On completion of this step, PT EPA determines which data collection method is most appropriate, which event during the exercise/experiment is most suitable for collecting the specific items of data, and where best to collect the data. The decision making process will require the focused analysis area leads to become familiar with the appropriate literature, doctrine, command and control devices, and procedures of each nation involved in the exercise. In parallel, there will need to be coordination with the scenario writers to ensure that suitable events are included that will allow the capture of data elements for each MOM. If the scenario does not permit the collection of data, a different MOM may be developed, a scenario event may be added, or the MOM may be deleted.

Building the Study: Data Collection and Management Plan.

The Data Collection and Management Plan (DC&MP) is an analytical document that identifies the data collection requirements, quality control processes, and resources needed to execute the analysis plan. It is normally an annex to the analysis plan; the DC&MP documents the issue decomposition discussed above and details the data sources

in order to answer the issues and EEA. Figure 3-10 below illustrates the issues, sub-issues, EEA, MOM, and data elements of the DC&MP organized in a spreadsheet format.

BATTLE COMMAND DATA COLLECTION MATRIX												
Overarching Issue: How does the Armies' C4ISR architecture enable the commanders to execute effective battle command?												
Issue #	ISSUE	SUB-ISS#	SUB-ISSUE	EEA#	EEA	MOM#	MEASURE OF MERIT	Data Element #	DATA ELEMENT	DATA SOURCE	LOCATION	EVENT / TIME
BC1	***Situational Awareness:*** Do the Armies' organic sensors enable sufficient coverage and persistent ISR?											
		BC1.1	What coverage is provided over time?	BC1.1.1	How does the coverage compare to the requirements identified in the CCIR and the NAI/TAI requirements identified in the collection plan?	BC1.1.1.1	Identify information obtained by the Armies to satisfy CCIR over time (PIR, FFIR).					
						BC1.1.1.2	Number of CCIR satisfied by the Armies by sensor type over time.					
						BC1.1.1.3	Identify CCIR (PIR, FFIR) shortfalls over time.					
						BC1.1.1.4	Number and type of Red units about which intelligence is available over time.					
						BC1.1.1.5	Number of first detections provided by organic Armies' sensors against CCIR over time.					
BC2	***Mission Assessment:***											

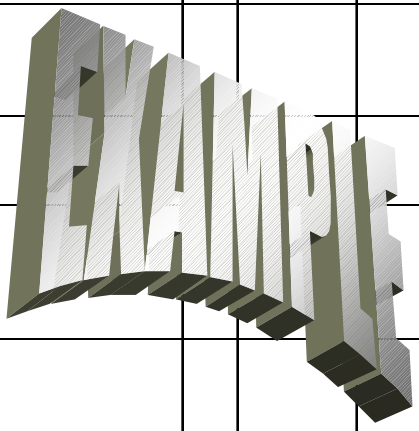


Figure 3-10: Example DC&MP

These considerations include: automated sources (for example, simulation output or network monitors); human observation (data collectors and observing analysts), and participant input (surveys, after action reviews, and interviews). To support analysis, there are several data sources from which to obtain data elements, each with their own set of considerations. The DC&MP describes the elements to be collected, when (Event/Time: e.g., pre-exercise planning; exercise phase, etc.), where (Location: CP/TOC) and how they will be collected (Data Source: e.g., staff planning guidance; order; observer, survey, screen-capture, etc.) The objectives, scenario, simulation architecture, time available and other factors influence the plan.

Annex C, Appendix 3, Study Document Formats, contains a sample format of a Data Collection and Management Plan for an exercise or experiment.

Force Effectiveness Interoperability Factors.

In order to assess the degree of interoperability among the ABCA Armies it is necessary to identify a method for analyzing force effectiveness. To that end, a background investigation must be conducted to identify a method reflecting current issues facing the ABCA Armies, and is flexible enough to be applied to a wide range of scenarios to measure specific aspects of the exercise, and to identify additional improvements in the ABCA Program.

The research approach can be based on a review of unclassified literature to:

- Define force effectiveness, interoperability, and standardization.
- Explore the relationships between force effectiveness, interoperability and standardization from a C2 perspective.
- Identify the interoperability factors that influence force effectiveness.
- Identify methods to measure force effectives and C2 interoperability.

Annex F, Appendix 1, Interoperability Factors for Gap Analysis, provides a more in depth discussion of force effectiveness, capabilities, interoperability, and standardization as they apply to analysis of ABCA exercises or experiments.

Section 2. Exercise and Analysis Integration Planning.

Introduction.

The design of focused analysis plans must be integrated with the exercise or experiment concept. Key components that set conditions for the exercise include scenario development (friendly and threat), a Master Scenario Events List (MSEL), Modeling and Simulation, and in some cases, a Model-Exercise-Model approach.

In order for the study plan and analysis plans to be effective, close coordination is required between the analysts and the concept developers. The importance of analyst involvement is twofold: first to influence development of a plan complementary to both the exercise or experiment training goals and with the analysis goals; and secondly so that the analysts understand constraints limiting or preventing examination of some issues.

This section of the ABCA Analyst Handbook examines the role and process of concept development taking place concurrently with analysis planning.

Scenario.

The scenario defines the operational context for the exercise/experiment. As such, it has a major impact on the design of the exercise/experiment and its results. Therefore, the determination of the base scenario must be made early and must be made with a careful consideration of the exercise/experiment purpose and objectives.

The terrain box and level of detail required; the base force structure and equipment list; and the level to which units must be represented are three key areas requiring early decision because they often require long lead times to implement.

The study director or his representative should be a part of the team that determines the scenario and refines it for use in the exercise/experiment. The analysis team will be able to advise as to how nuances in the scenario will affect the ability to address the analytic issues. Figure 3-11 illustrates the developmental progression for shaping a scenario to support an exercise/experiment.

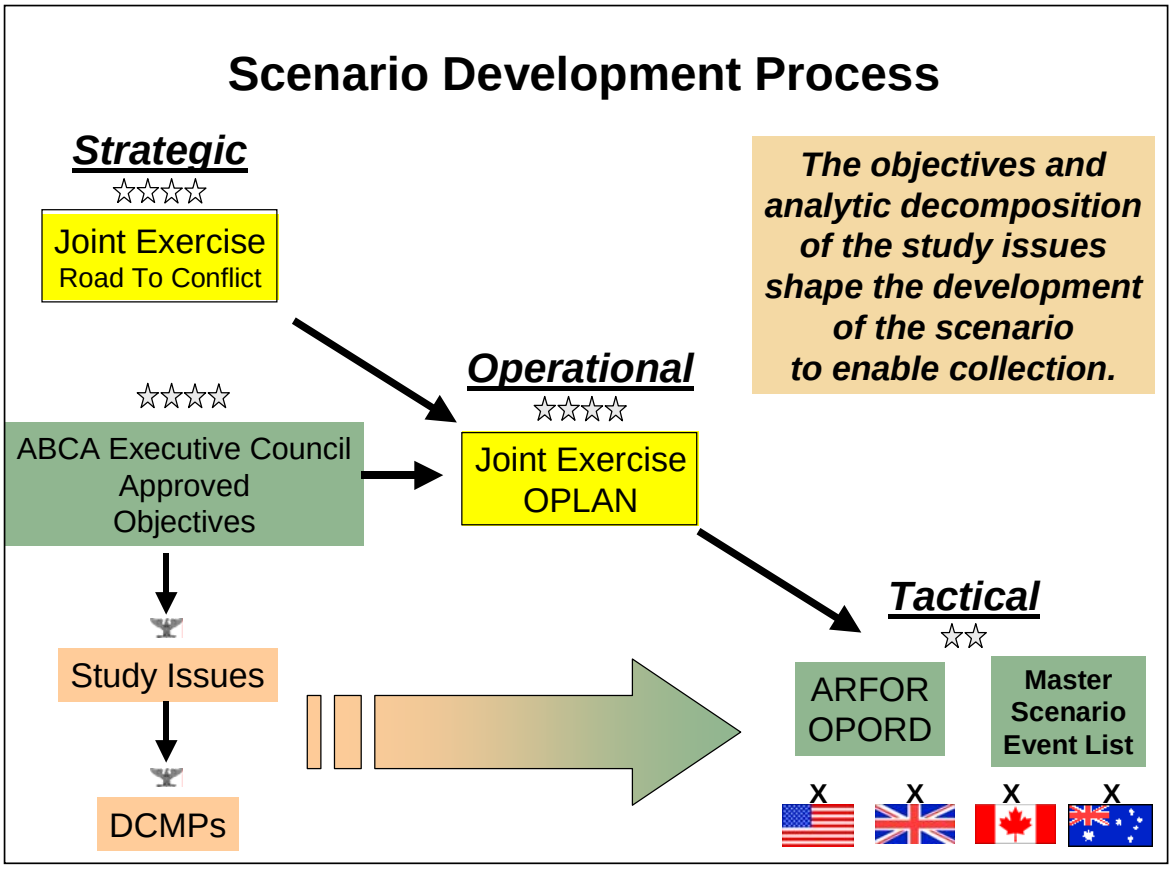


Figure 3-11: Exercise / Experiment Scenario Development Process

Figure 3-12 illustrates the decomposition of top-level tactical tasks for a Joint exercise, mapped to their corresponding subordinate level Army tactical tasks. Through this identification process, the scenario developer can then create exercise/experiment events, which drive the opportunity to gather data for analysis. Not all tactical tasks can be or should be analyzed. See ***Annex F, Appendix 2, STARTEX Data Requirements*** for further information.

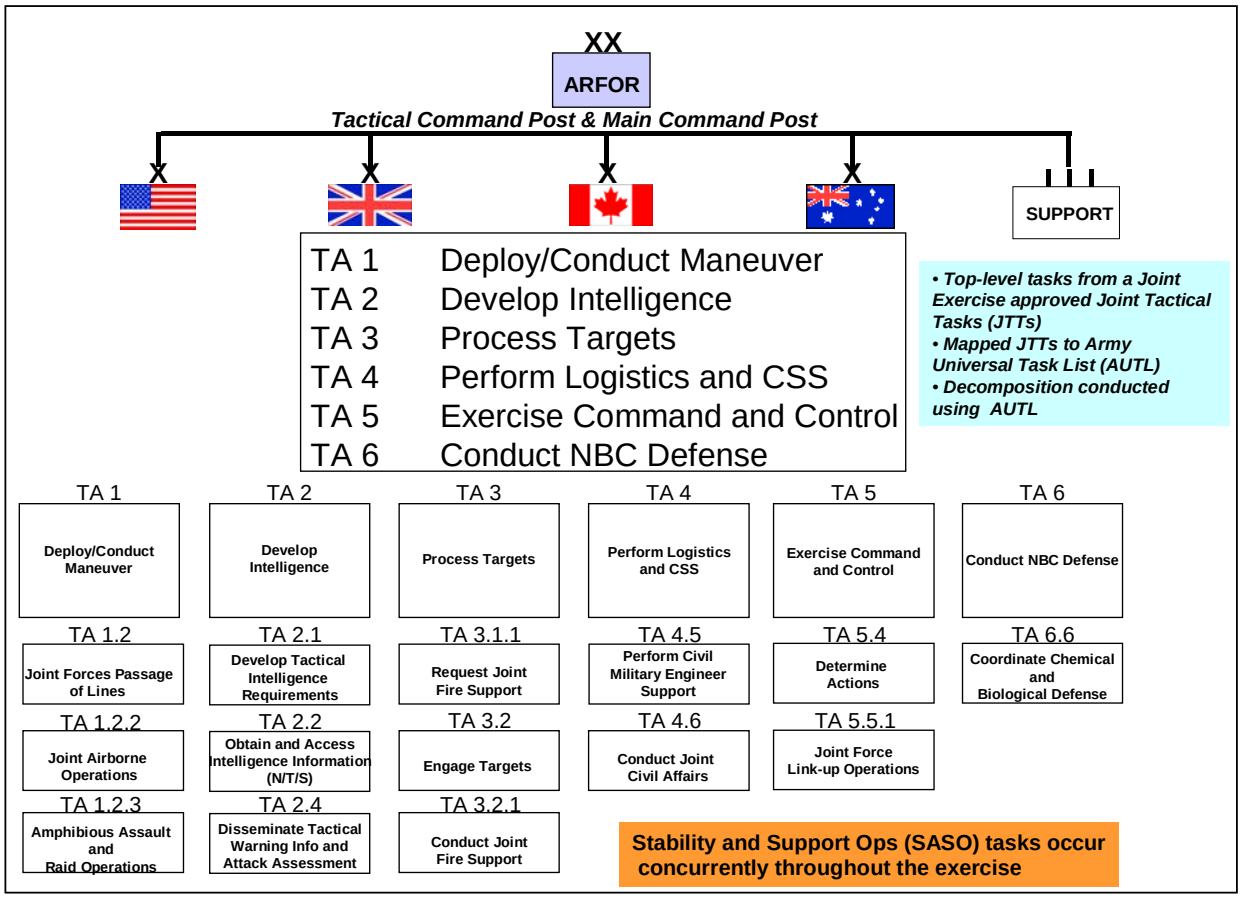


Figure 3-12: Scenario Tactical Task Decomposition

Master Scenario Event List (MSEL).

In cases where a simulation capability does not exist or is not of sufficient fidelity, it may be necessary to introduce actions or events through a human-in-the-loop intervention. Management of the MSEL and introduction of the MSEL inject is the role of an exercise control group or "white cell". An example of documenting events for the white cell is provided in ***Annex F, Appendix 9 White Cell Event Log Requirements***.

In determining the requirement for a MSEL inject, it is first necessary to assess the modeling capability of the simulation being used. If an action is required to stimulate a staff group or function, and is not capable of being modeled, then it is appropriate for an off-line injection (MSEL inject by White Cell or control group) to be introduced into the scenario. The inject can be done in many ways, ranging from a control cell sending a note to a player, to digitized stimulation of a C4ISR device.

Exercise or experiment top-level tasks to be trained or examined are decomposed into their subordinate actions. Subordinate events identified as outside the capability of a simulation become MSEL requirements that the exercise/experiment players still must perform. MSEL *injects* are used as the stimulus to cause actions or reactions that can be observed and can generate data for analysis. Figure 3-13 shows two major exercise tasks with the subordinate actions, and details the portions that cannot be supported by M&S and therefore need an inject.

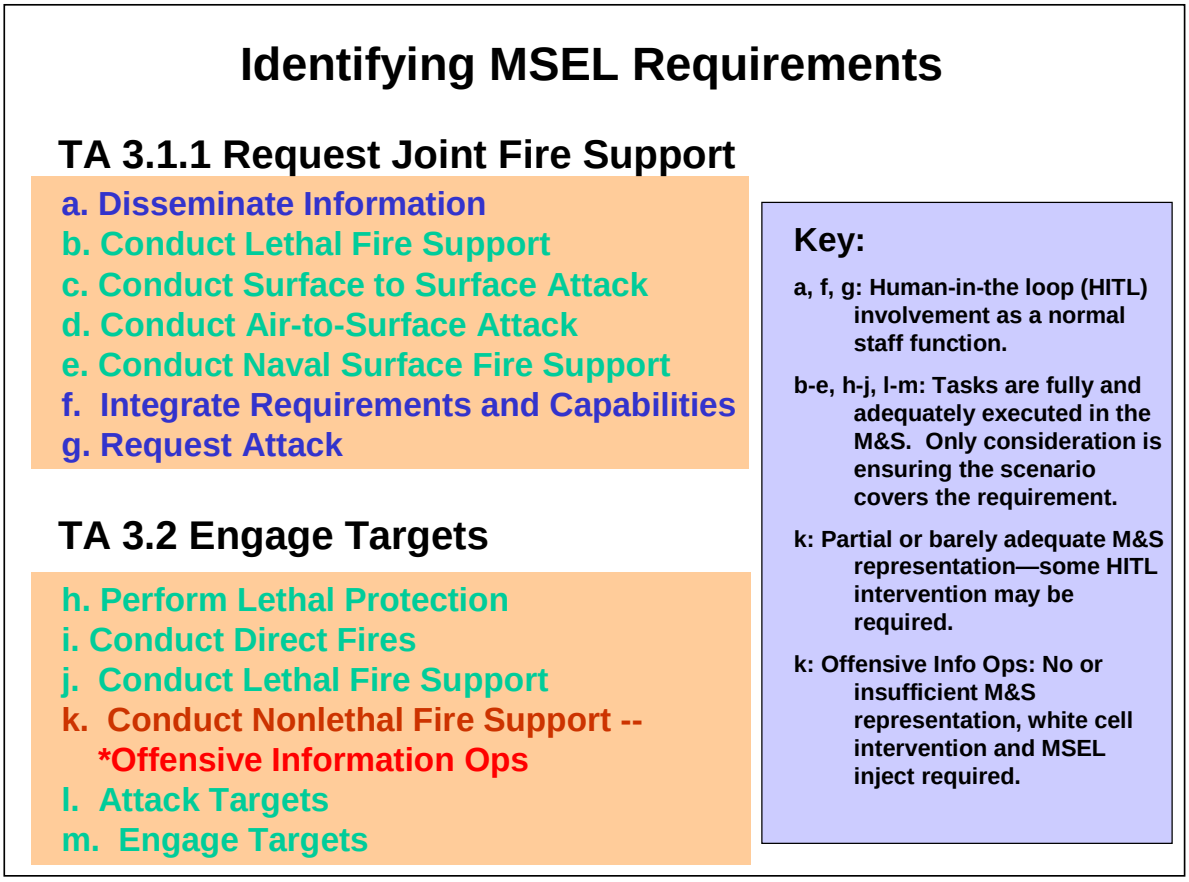


Figure 3-13: Sample MSEL Requirements

The spreadsheet in Figure 3-14 shows a MSEL inject matched with the corresponding Focus Area Initiative (identified by its DC&MP number "FE 1.1.12, etc.") and its subordinate Essential Element of Analysis (EEA). The "Conduct Aerial Resupply or Air Assault mission" MSEL introduced by the white cell at the appropriate time causes the exercise participant's action. Because it is "scripted" the analysts know who, what, when and where the action is taking place giving them an opportunity for observation and for gathering data.

Focus Area MSEL Crosswalk

Focus Area Crosswalk	EEA/DE	MSEL#	MSEL Inject
FE 1.1.1.2	What C2 arrangements and control measures were used to synchronize air movement and reduce fratricide?	1	Conduct Aerial Resupply or Air Assault mission
FE 1.1.1.5; BC 1.6.1.2; BC 1.6.1.3	How did the C2 arrangements and control measures change to accommodate the ROE, when the coalition was required to conduct movement through the urban terrain?	2	Provide an ROE dilemma, or very strict ROE to force a player reaction…. i.e., no indirect fires into urban areas; JTF intelligence identifies enemy ADA battery (SA6) deployed vic XXXXXX using civilian population and church facility as a shield, preventing coalition forces from firing on the target.
FE 1.1.1.7	How does the Coalition synchronize and deconflict the interaction of non-combatants and maneuver (movement) to maintain tactical tempo?	3	Need non-combatants on the battlefield; The local population conducts a food riot and blocks critical roads; Food and water riots - US Army trucks mobbed by locals as soldiers attempt to distribute emergency rations and water.
FE 1.1.1.10	How did the coalition identify key or sensitive areas within the environment? The control or avoidance of which, minimized risk to non-combatants and collateral damage while facilitating ground and air movement?	4	Movement through a populated or "sensitive" area; CSS convoy reports that they are stuck at a roadblock at Grid: xxxxxx. They are surrounded by a mob of people who are throwing rocks and bottles at their vehicles. One "Molotov Cocktail" type bottle was thrown and ignited a vehicle.
FE 1.1.1.12; HB 1.2.1.03.1; HB 1.2.1.03.2; BC1.5.1.5	How does the Coalition Deconflict differences in international agreements (e.g. the Ottawa Treaty) to facilitate maneuver (movement)?	5	Use landmines - hand, aerial, or indirect fire emplaced; ARFOR directs Canadian artillery to fire FASCAM into UK AO for channelization purposes.

Figure 3-14: MSEL Inject Crosswalk with Focus Area Initiatives and EEAs

Figure 3-15 shows an example of a worksheet used to describe and track a MSEL inject. A key activity of MSEL development is determining how well the simulation will support specific tactical tasks. Based on that examination, and the analytic issues, it can then be determined if a MSEL inject is needed.

Exercise MSEL Inject Worksheet							
MSEL Subject	Aerial Resupply/Air Assault			**MSEL Number**	1		
Injecting Cell	White Cell			**Inject Mode**	E-mail		
Command/Organ.	Division HQs			**Location**	Div Main		
Send From	ArFor	**Send To**	ABCA Bdes	**Inject DTG**	TBD	**Inject Lev/Ech**	Div
Subordinate	Bdes	**Classification**	UNCL				
Event Description				**Anticipated Action**			
Conduct Air Assault in support of airfield take-down and expansion of lodgment as FOB.				Air movement coordinated and synchronized to minimize danger of fratricide. Observe arrangements and control measures used to ensure mission success at lowest risk.			
Model Support				**Primary Theme**			
Air Movement conducted in JCATS				Maneuver			
Primary AUTL/JTT				**Primary Training Objective**			

Figure 3-15: Template for a MSEL Inject Worksheet

Modeling and Simulation.

Modeling and simulation, or "M&S", describes the use of computer-generated battlefield models and other simulations used to replicate non-live forces and stimulate live forces or "role-playing" participants.

These systems are used to represent the movement and coordination of forces to provide an operational driver for a staff exercise; or, they may be used to augment "live" forces—actual troops on the ground, sea, and in the air—to simulate a larger operational environment; and, they are used in lieu of field training exercises where training areas are limited by geo-political conditions.

The use of M&S in support of military training is not designed to replace actual experience; rather, it is employed as a cost-effective means to conduct higher-level exercises without the need for deploying forces to a training area or field environment.

The use of these simulations can be distributed across communications networks, allowing commanders, staffs, and units at different locations to participate as a part of a joint, or coalition team.

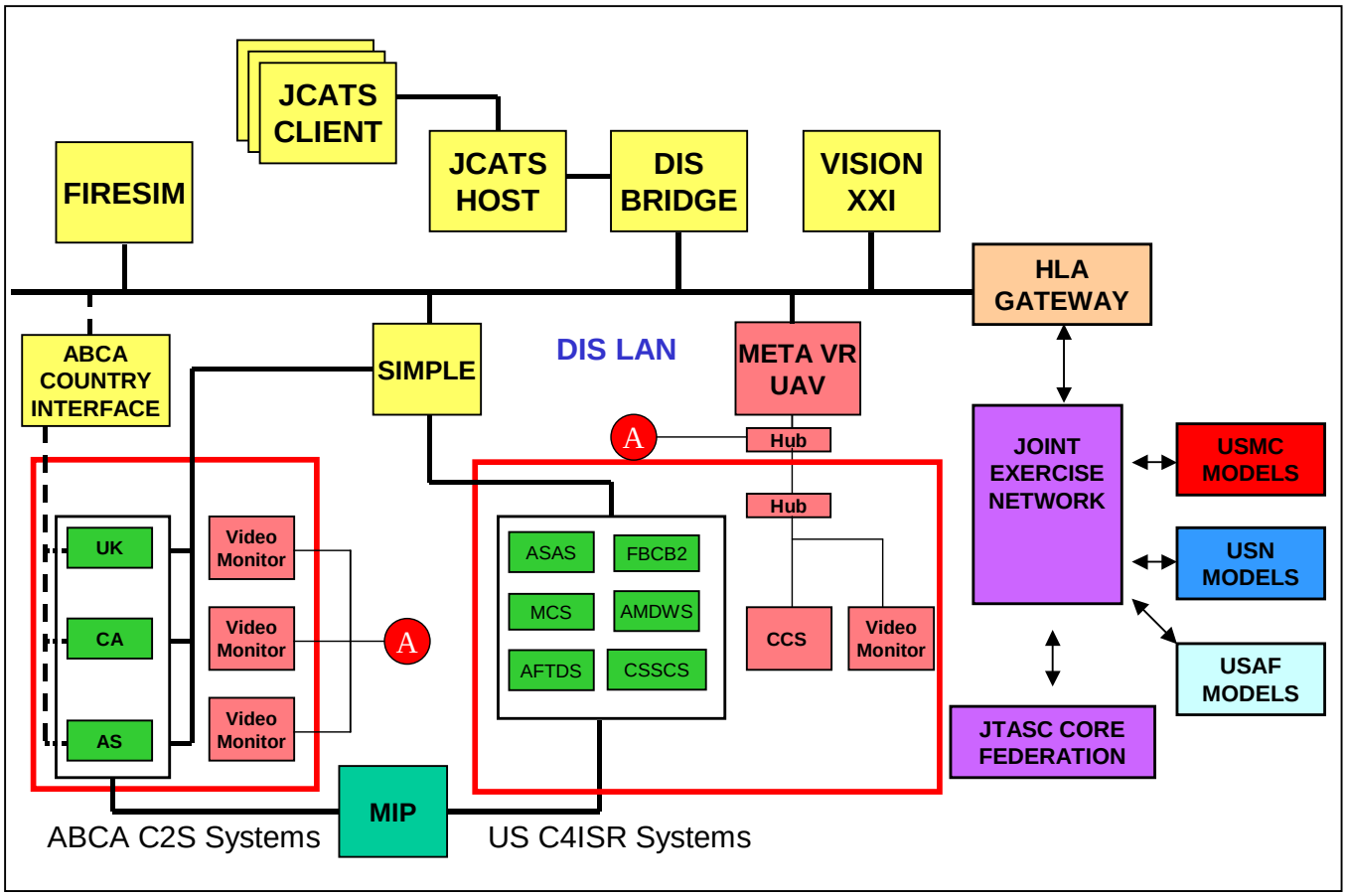


Figure 3-16: ABCA Federation of Simulations Architecture Example

Figure 3-16 illustrates a federation of simulations used to support an ABCA (ARFOR HQs and ABCA Brigade HQs) exercise, embedded within a larger US Joint Exercise. The example depicts an exercise hosted by the US Joint Forces Command at their Joint Training, Analysis, and Simulations Center (JTASC), where a number of simulations are integrated to support the event. In this example, the simulation is remoted from the JTASC and linked to the ABCA ground force portion of the exercise. The architecture uses a Distributed Interactive Simulation (DIS) protocol LAN, a DIS bridge, and a High Level Architecture (HLA) gateway. HLA is a protocol translator for distributed simulations. An explanation of the major simulation components in the example exercise is provided below:

- **FIRESIM.** FIRESIM is an event-sequenced, stochastic simulation of opposing artillery forces. FIRESIM may be executed in either a distributed or closed analytical mode and is played at the division level. It is an analysis/evaluation tool designed primarily to analyze the relative differences between competing artillery systems (target acquisition sensors, automated command and control systems, ammunition, and delivery platforms). Units in FIRESIM move as platoons or as individual weapons systems. Artillery force structure and support relationships are explicitly modeled. Once the simulation begins, there is no man-in-the-loop interaction. Various C2 models feed FIRESIM, including Vector In Command (VIC) and JCATS scenario output. System inputs include weapon and sensor characteristics, ammunition characteristics, and red/blue lethal areas.

- **JCATS.** The Joint Conflict And Tactical Simulation (JCATS) model is a self-contained, high-resolution joint simulation used for entity-level training in open, urban and subterranean environments. In essence, this unique tool gives users the capability to detail the replication of small group and individual activities during a simulated operation. Other features include multi-sided combat, human characteristics – such as secondary suppression, fatigue, fratricide, health, etc., and its capability to mount/dismount entities and the use of linear and area sensors for rear-area operation.

- **Vision XXI.** Vision XXI is an After Action Review and Exercise Control system that provides an integrated view and analysis of the Live, Virtual, and Constructive training environments. Vision XXI derives game/ground truth and commander's perception from a variety of simulation and C3I sources.

  Vision XXI provides analysts with an extensive set of visualization, reports, and analytical tools. These tools provide the analysts the means to rapidly fuse data into high impact AAR and decision support products. It allows the analyst to depict a synchronized view of the battle scenarios, across all the battlefield systems.

- **SIMPLE.** The Simple Network Management Protocol (SNMP) defines a protocol that permits operations on a collection of variables. This set of variables is called the Management Information Base (MIB). The MIB is a database containing the information pertinent to network management.

Model-Exercise-Model.

The Model-Exercise-Model (M-E-M), technique is depicted in Figure 3-17. This technique can be employed to increase the level of analytic rigor within an individual experiment by employing focused modeling efforts before and after a large-scale experiment to refine the design of the exercise, focus the data collection effort, and pinpoint causality with higher confidence. The M-E-M concept should be employed to integrate events within the Analysis Management Plan. A series of focused smaller scale experiments can be utilized to refine the design of large-scale experiments. They can

also assist in focusing the data collection effort of these larger experiments and provide more detailed results for employment in follow-on focused experiments.

Typically, the M-E-M process is employed to examine a specific component of a concept or capability. It is employed to hone in on that component in a detailed manner. The purpose is to isolate that component, control its variables more carefully, and develop a more specific set of results in that area.

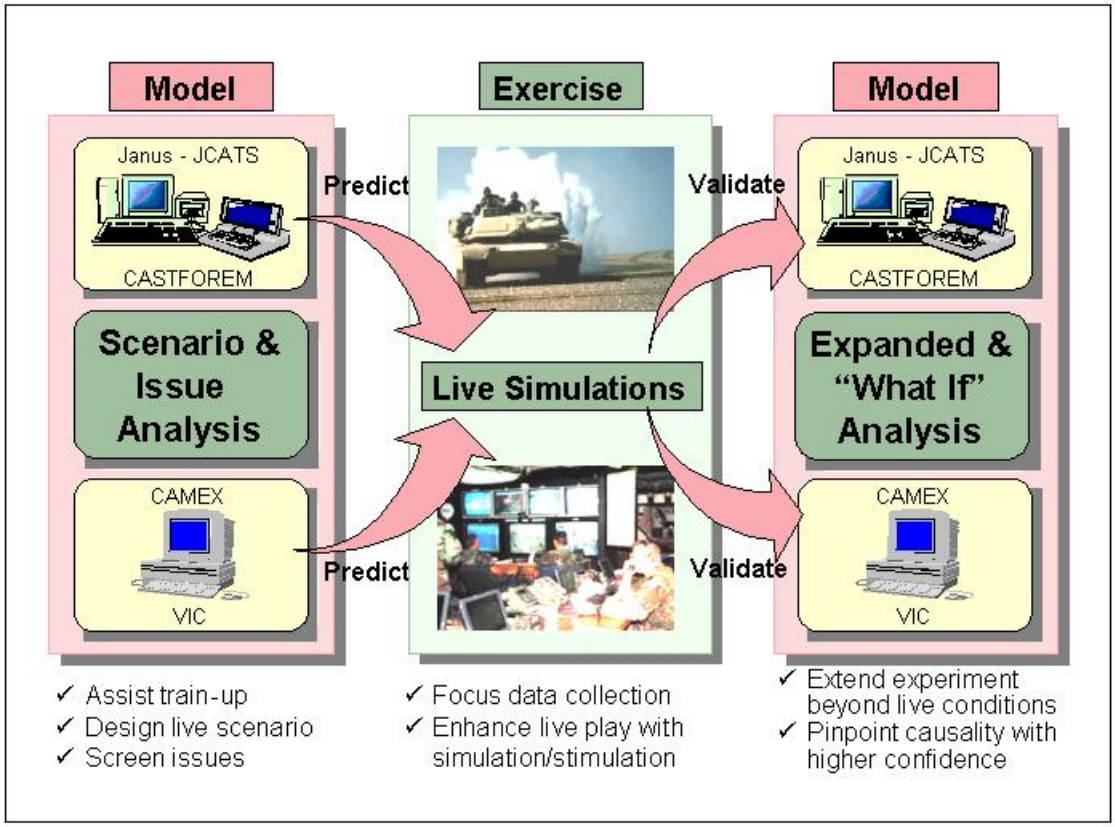


Figure 3-17: Model-Exercise-Model

Battlefield Operating Systems (BOS) Workshop.

When the Analysis Plans are developed, or still in the development process, it may become evident that key areas needing investigation cannot be covered by the actual exercise or experiment, or are limited by the exercise or experiment design. In this case, one approach offering a great deal of flexibility for data collection is through the use of a BOS workshop.

The purpose of a BOS workshop is to bring together exercise participants, such as G-Staff or S-Staff personnel, to explore a specific issue. For example, this could be a forum for how the Armies will handle intelligence sharing, compatibility issues, targeting, or other key issues as they relate to the objectives of the exercise or experiment. This type of workshop can occur prior to the exercise as a means for training

the participating staff in coalition operations or to coordinate procedures they will use in the exercise or experiment. While the exercise participants work though the process of coordinating and establishing protocols, or procedures, the analysts are on-hand to observe and collect data.

The type of workshop, the subjects, and whether they occur before, during, or after the event depend on the exercise or experiment aim and objectives, and an evaluation of what can be adequately examined though other means. ***Annex G, Battlefield Operating Systems Workshop*** provides an example of plans developed to support command and control investigation for the ABCA Exercise 2004.

Section 3. Analysis Support Planning.

The following section describes the key roles and responsibilities for an ABCA exercise or experiment support organization. Figure 3-18 below illustrates the ABCA agency and activity support relationships for an ABCA exercise or experiment.

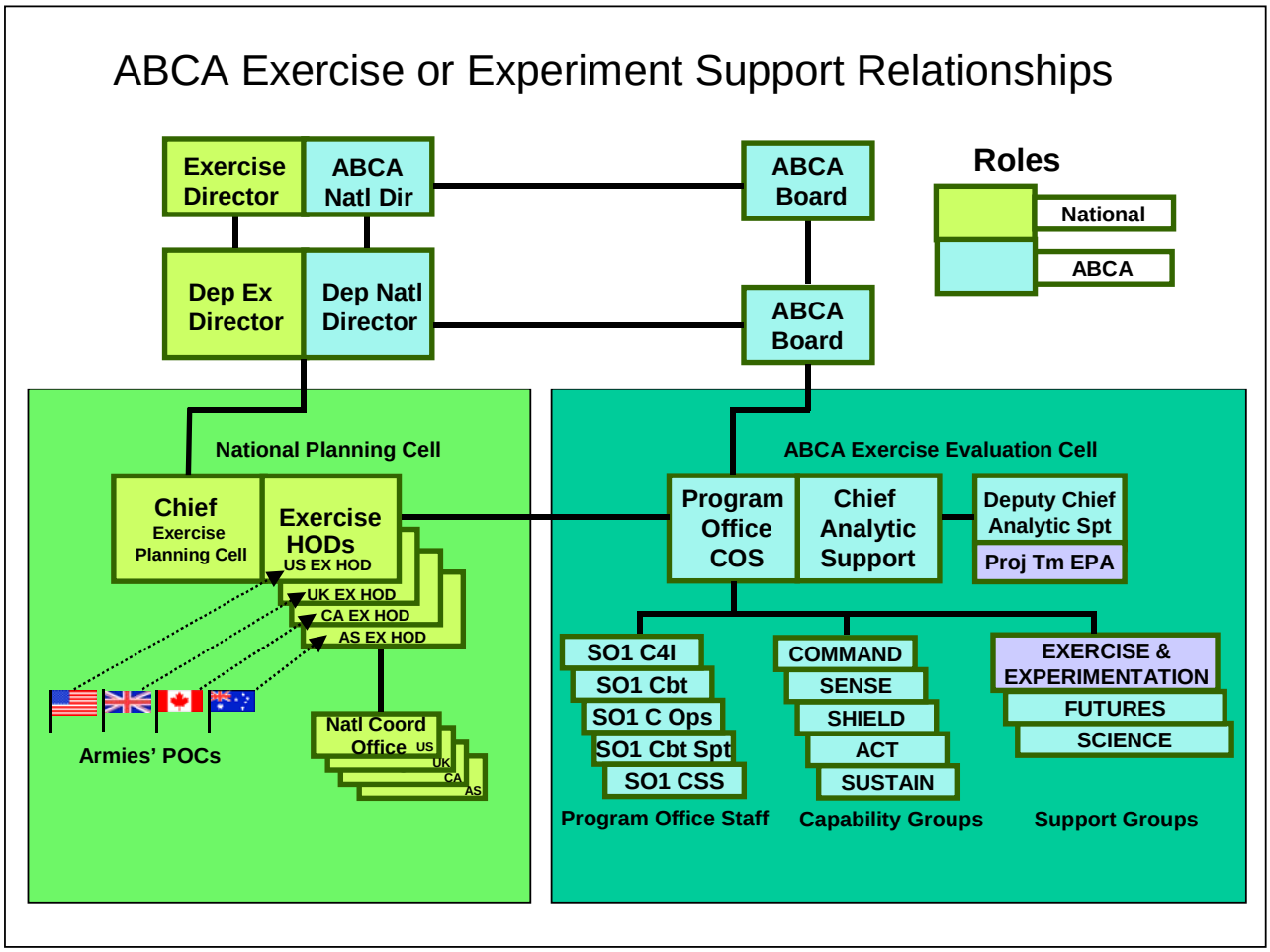


Figure 3-18: ABCA Support Relationships.

ABCA Exercise Director.

- Approve the Final Operational Analysis report.
- Co-chair the Initiatives Review Board (IRB) through the Chief of Analytic Support.

ABCA Chief of Staff and Chief of Analytic Support.

- Approve ABCA Exercise/Experimentation Study Plan.

- Provide leadership and direction for planning and executing the analysis effort for an ABCA exercise or experiment.
- Co-chair the IRB.
- Chair the Insights Authentication Group (IAG).
- Ensure the timely publication of post-exercise products.

Project Team Exercise Planning and Analysis (PT EPA).

- A member of the IRB.
- Present a list of issues and sub-issues with status and recommendations to the Exercise Director for guidance and recommendations.
- Review and approve all analysis and data collection plans.
- Develop exercise products (IIR, final OA report, study plan, analysis plan, DC&MP).
- Identify and provide training requirements for the exercise analysis team (analysts and observers) to the ABCA Exercise Director.
- Coordinate administrative and logistic support requirements as identified by Chief of Analytic Support, in coordination with the focused analysis area leaders, for the analysis effort.
- Coordinate with focused analysis area leaders to identify and develop observer requirements.
- Provide and/or develop data collection software, as required.
- Consolidate and coordinate the administration of questionnaires, interviews and surveys at the exercise.
- Provide a liaison to the special working parties on modeling and simulation and scenario development in order to ensure the feasibility of the operational analysis (OA) plan.
- Identify and advise the Host Nation of analytic support requirements; personnel (including augmentees), equipment, CIS requirements, etc.

Host Nation Responsibilities.

- Serve as the lead for the exercise Operational Assessment (Deputy Chief of Analytic Support)
- Serve as chair for the IAG at the exercise in the absence of the Chief of Analytic Support.
- Identify and coordinate all analysis/assessment meetings in support of exercise analysis planning and execution.
- Develop, staff, and obtain approval of the study plan.
- Provide the lead for a designated focused analysis area.
- In coordination with the focused analysis area leaders, provide the required analysts to support the exercise.
- Develop the study issues, sub-issues, EEA, MOM, data elements and analyst/observer requirements for the designated focused analysis area in accordance with the designated format.
- Develop the analysis plan for the designated focused analysis area in accordance with the designated format.

- Identify all resource requirements for the designated focused analysis area.
- Recommend and present any designated focus area issues at IRB meetings.
- Develop surveys, questionnaires, interviews etc. as required for the designated focused analysis area.
- Fund host nation analysis team members, to include any training.
- Manage all data collection assets for the exercise.
- Consolidate all instrumentation requirements for the exercise as identified by each focused analysis area leader. Establish, coordinate, and manage the common database for the exercise.
- Identify tasking requirements in accordance with projected analysis requirements (e.g. observers, data collectors, instrumentation etc.) and provide to the Exercise Director, as required, for dissemination.
- Provide a member to the Integration Analysis Team (IAT) and IAG.
- Develop initial insights to support PT EPA in the development of the exercise products.

Supporting ABCA Nations.

- Provide a lead for a designated focused analysis area(s).
- Attend applicable analysis/assessment meetings and planning conference coordination meetings as identified by the Deputy Chief of Analytic Support.
- Develop the study issues, sub-issues, EEA, MOM, data elements and analyst/observer requirements for a focused analysis area in accordance with the designated format.
- Develop the analysis plan for a designated focused analysis area in accordance with the designated format.
- Identify and coordinate any analysis team members for a designated focused analysis area, including any identified training requirements.
- Recommend and present any designated focus area issues at IRB meetings.
- Develop surveys, questionnaires, interviews etc. as required for the designated focused analysis area.
- Provide a member to the IAT and IAG.
- Develop initial insights to support PT EPA in the development of the exercise products.
- Fund national analysis team members to attend PT EPA meetings and to exercise execution and AAR phases.

Exercise Host.

- Permit analysts to participate in and observe pre-exercise training. The ABCA Exercise Planning Cell will coordinate the requirements with the host Army Command.
- Permit PT EPA to conduct site visits in order to coordinate analysis requirements.

- Facilitate the analysis process at the exercise, to include:
    - Permitting analysts to enter the exercise training area at selected times.
    - Permitting lead analysts to view and/or listen to After Action Reviews (AAR) with prior coordination.

Administrative Planning.

There is a substantial administrative requirement underpinning the planning, executing, and reporting of the analysis for an ABCA exercise or experiment. This is primarily a responsibility of the nation leading the analysis effort. The major administrative requirements are discussed in the following paragraphs.

Manning.

The core Project Team for Exercise Planning and Analysis is comprised of members from the ABCA nations. In addition to this core, and depending on the exercise design, scope, and other pertinent factors, there is a requirement for the team to be augmented by additional analysts and Subject Matter Experts (SMEs). The augmentee requirements would be identified to the exercise host nation exercise-planning group. ***Annex F, Appendix 3, Augmentee Requirements Request***, contains a checklist of augmentee requirements information.

Annex F, Appendix 4, Manning Spreadsheet, provides is an example of analytic manning requirements. It details the analysts, SMEs, and support personnel needed for an ABCA exercise embedded in a large Joint Exercise, that included an ARFOR headquarters, and subordinate brigade headquarters elements from each ABCA nation. The spreadsheet depicts the by-line tracking numbers used by the Joint management level and the ABCA exercise Personal Identification Numbers (PINs). The PINs are used both as a means of identification for analytic input in the analysis database, and for administrative tracking of the individuals. The PIN is coded to identify the individual as an analyst, SME, or administrator. Each observation entered into the analysis database would use the PIN to identify the person submitting the data.

The sheet also lists information on the status of the individual (military, government civilian, or contractor), their exercise appointment, name, rank, background requirements and experience, and country of origin. Other administrative information that could be listed includes: level of security clearance, lodging location and room number, individual's transportation means, tracking or serial numbers of communications devices (mobile phones or hand-held radios), computer equipment, or other details, as required.

Figure 3-19 below provides an example of the potential augmentation requirements.

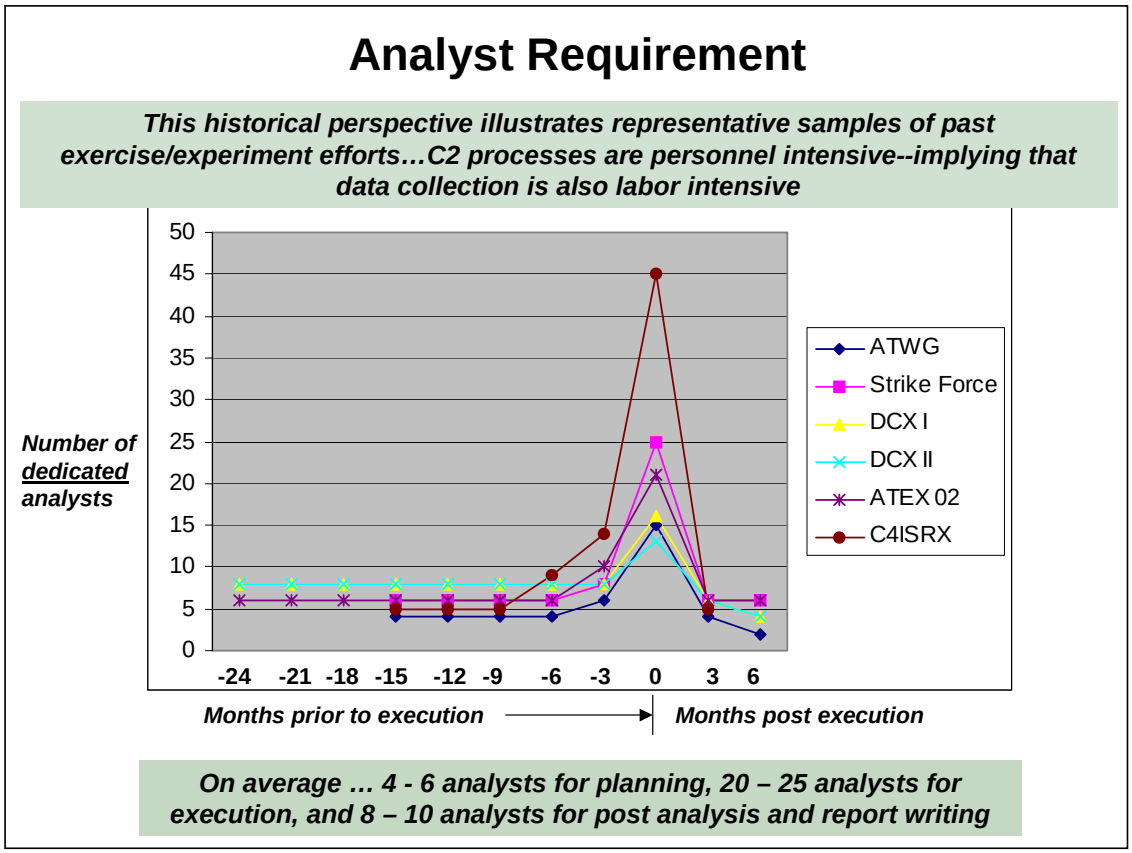


Figure 3-19: Scaling the Analysis Manning Support Requirements

Observation Database and Analysis Automation Requirements.

Analysts, observers, and subject matter experts require a data entry system, adequate automatic data processing equipment (ADPE), and a local area network (LAN) to support data input, processing, and insight development.

Observations undertaken during exercises involve collection of large amounts of raw data. A means for the storage, retrieval, collation, validation, quality assurance, and sorting of this data must be established. Any data entry system must be simple and flexible to use. It must provide the ability to store and sort qualitative information in a standard manner to support a variety of different collection requirements and meet the needs of specific observers.

An observation database entry system should provide options to assist the analyst with standard data input, management of the information, report writing and flexibility of data entry. System options should include standard data input via the use of generic data categories, free form data entry; data management via the use of external file linking options, search flexibility; a status monitoring system for classification, validation and clarification of information, and the ability to check progress of observations through the analytical system.

The basic requirement for the analyst network is to ensure there are adequate quantities of ADPE for the analysts, security and accreditation requirements are met, and there is an adequate staff to operate, maintain and support the system.

Sufficient quantities of individual laptops or desktop PCs should be provided so that there are no delays in entering observations and analytic data. The network should provide the necessary capacity, speed, and flexibility to support the analytic effort. An example of the ADPE and peripheral equipment needed to support analysis of an ABCA division-level exercise (i.e., ARFOR headquarters and subordinate brigade headquarters elements from each ABCA nation) is provided in ***Annex F, Appendix 5, Analysis Network Requirements.***

Figure 3-20 illustrates the physical requirements for setting up a standalone secure analyst LAN. In this example, specific areas have been allocated for the analysts and SMEs to work and upload observation data in order to speed up data entry. The LAN would be supported with a dedicated server, networked printers and scanners.

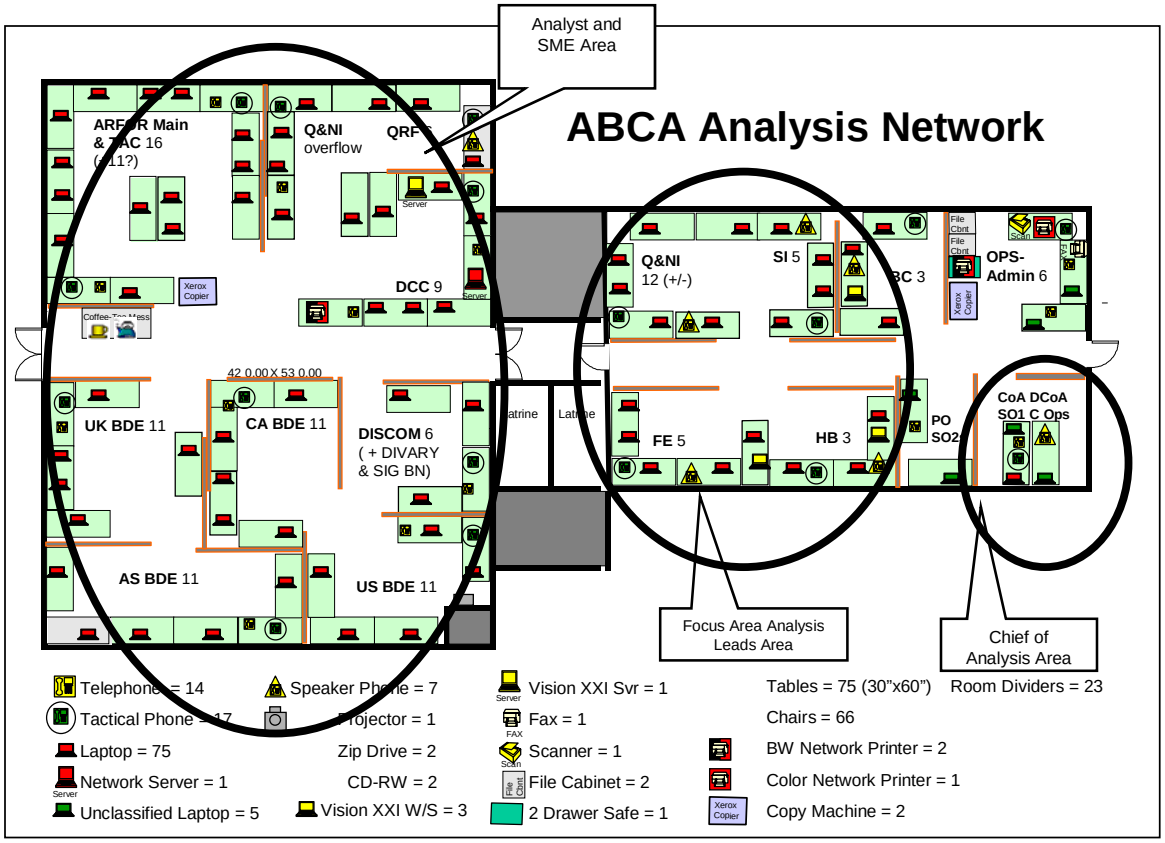


Figure 3-20: ABCA Exercise Analysis ADPE Requirements Example

Automation Security.

In conjunction with planning for the ADPE support for the exercise, the analysis team must also plan, or coordinate for, accreditation of their system. Accreditation is a formal declaration by a designated approving authority that the automated information system (AIS) is approved to operate in a particular security mode using a prescribed set of safeguards. Accreditation is the official management authorization for operation of an AIS and is based on the certification process as well as other management considerations. The accreditation statement affixes security responsibility with the approving authority and shows that due care has been taken for security.

The analysis team may coordinate for accreditation directly with the exercise host, through the exercise planning cell, or via another designated channel. ***Annex F, Appendix 6, Exercise Minimum Security Requirements***, provides background information and a checklist to assist in planning for automation security requirements during an exercise or experiment.

Administrative Support.

As stated in the Analysis Handbook Limitations section, one of the challenges in developing the analysis products for an ABCA exercise or experiment is managing the collaboration efforts of the team.

It is critical to have designated administrative support to maintain a repository of documents created and to implement a methodology for version control of the documents. A system is needed to keep track of changes as analysis plans or other documents are staffed with the team for comment, corrections, or modification.

Other administrative requirements include maintaining milestone lists; action item suspenses; development, production and distribution of documents; meeting, phone conference and VTC coordination, travel planning, and general support.

Analyst Letter of Instruction (LOI).

One of the actions for preparing the augmentees for their work during the exercise or experiment is issuing a Letter of Instruction (LOI). The purpose of the LOI is to provide administrative instructions as a read-ahead for the analysts, SMEs, supporting staff, and augmentees. The LOI provides key information concerning pre-event training, the conduct of the exercise or experiment, and logistic support.

It should also provide a ready reference for information on their travel and lodging arrangements, their work assignments, points of contact, and a calendar of exercise dates and events. ***Annex F, Appendix 7, LOI for Analysts, SMEs, and Staff***, provides a listing of the kinds of information that should be provided to the Exercise Analysis Group.

Exercise Site Survey.

Approximately one year in advance of the ABCA exercise or experiment, key members of the analysis team should conduct a site survey at the exercise or experiment location. At a minimum this should include the Study Director, the team's simulation Point-of-Contact (POC), and administrative support POC.

Analysis team representatives should meet with the exercise host unit (Corps/Division) G3 Plans, the supporting Battle Simulation Center (BSC), and hosting camp/post personnel to coordinate planning and support efforts. As an outcome of the meeting, the analyst team should gain an understanding of the BSC concept of support for the exercise or experiment.

The site visit should include a walk-through examination of the Battle Simulation Center facilities, work and briefing areas to be used by the analysis team, billeting, messing, etc. The team should obtain maps of the post/facility and training areas; obtain blueprints/diagrams of the building, or take measurements of the facilities for use in planning. It is also beneficial to take photographs or video of the work areas facilities.

They should also obtain POC information for the site survey attendees and other key personnel. Follow-on Site Surveys will probably be required prior to the event to make any adjustments to the plans and complete final coordination. ***Annex F, Appendix 8, Exercise Site Survey Checklist***, provides further information on conduct of a site visit.

Chapter 4. Analysis Execution.

Background.

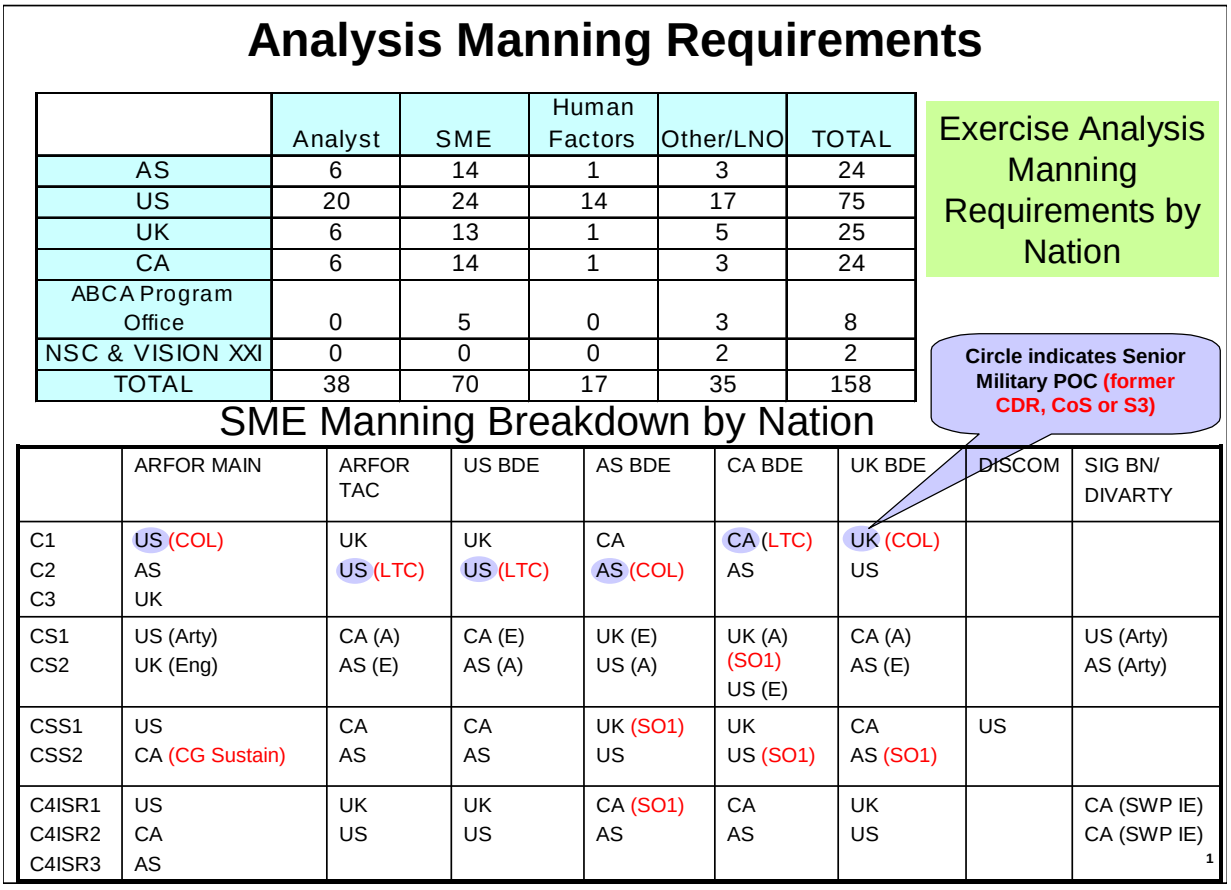
There are many administrative and control functions that are required in the execution of an exercise or experiment. The study director must participate in this process and advise the exercise/experiment director on how decisions made within these functions may impact the analytic results of the exercise/experiment. The NATO Code of Best Practice for C2 Assessment, 2002 revision, is an excellent source for information on administrative and exercise control functions.

As mentioned in the limitations section of this Handbook, the actual execution of an exercise/experiment is the smallest percentage of the overall work effort for the event. During execution, the bulk of the effort is put into the accurate, complete collection of the data required by the analysis plan. Data collection capabilities must be integrated across all available sources (analysts, modeling and simulation, observers, instrumentation of platforms and devices). Additionally, as collection resources are often constrained, the study director must prioritize collection activities during various periods of the exercise/experiment. Typically, some phases of the scenario lend themselves toward focusing on certain issues more than others. A data collection prioritization scheme will assist the study team in leveraging collection resources to maximize their benefit throughout the experiment.

All data collection efforts must come under the command and control of the study director and no data should be taken from the exercise/experiment without the study director's approval. Strict control and integration of data collection is required to underpin analysis and to ensure that other results, based on partial data, are not generated outside the team.

During the course of the exercise/experiment, the study director must oversee a process for conducting drill-down analysis within each focus area, and must also create a process to integrate results, usually in the form of insights, across focus areas. This integrated analysis effort also enables the Study Director, in coordination with the exercise/experiment Director, to refocus collection and analysis efforts for certain periods of the event to more fully illuminate causality in certain areas or to readdress issues for which sufficient data has not been collected.

The Study Director and the EPA team will develop a concept for personnel support of the exercise and will identify the types of expertise needed for exercise or experiment coverage. These personnel will be selected for their qualifications and experience and assigned to appropriate positions within the Exercise Analysis Group. Depending on the requirements they may be military personnel, or government civilians, or civilian contractors. Figure 4-1 below provides an example of manning requirements drawn from the coalition nations and from various disciplines and expertise.



Analysis Manning Requirements

	Analyst	SME	Human Factors	Other/LNO	TOTAL
AS	6	14	1	3	24
US	20	24	14	17	75
UK	6	13	1	5	25
CA	6	14	1	3	24
ABCA Program Office	0	5	0	3	8
NSC & VISION XXI	0	0	0	2	2
TOTAL	38	70	17	35	158

Exercise Analysis Manning Requirements by Nation

Circle indicates Senior Military POC (former CDR, CoS or S3)

SME Manning Breakdown by Nation

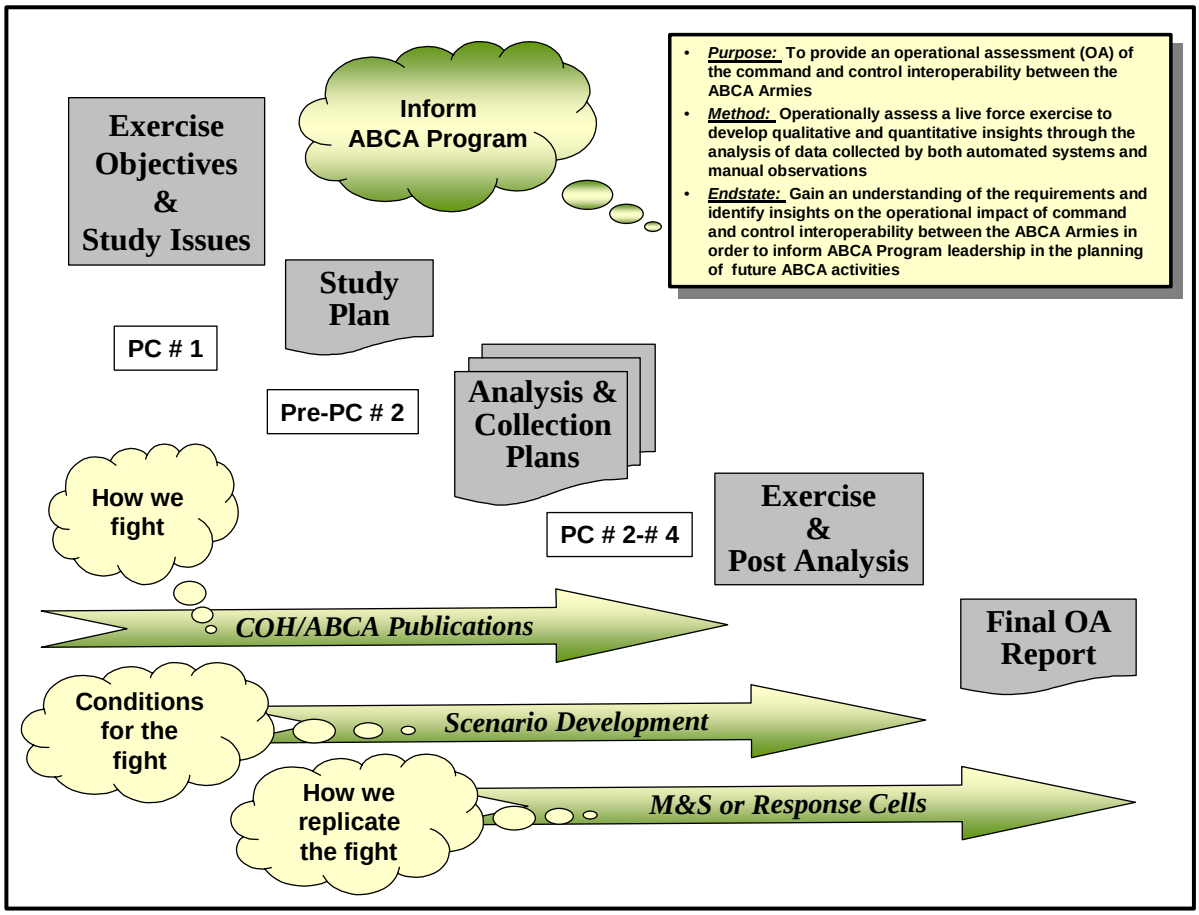
	ARFOR MAIN	ARFOR TAC	US BDE	AS BDE	CA BDE	UK BDE	DISCOM	SIG BN/ DIVARTY
C1 C2 C3	US (COL) AS UK	UK US (LTC)	UK US (LTC)	CA AS (COL)	CA (LTC) AS	UK (COL) US		
CS1 CS2	US (Arty) UK (Eng)	CA (A) AS (E)	CA (E) AS (A)	UK (E) US (A)	UK (A) (SO1) US (E)	CA (A) AS (E)		US (Arty) AS (Arty)
CSS1 CSS2	US CA (CG Sustain)	CA AS	CA AS	UK (SO1) US	UK US (SO1)	CA AS (SO1)	US	
C4ISR1 C4ISR2 C4ISR3	US CA AS	UK US	UK US	CA (SO1) AS	CA AS	UK US		CA (SWP IE) CA (SWP IE)

Note: This example from ABCA Ex04 demonstrates use of Capability Group members and Program Office staff to augment the analysis effort during the exercise or experiment. A greater proportion of the augmentees were to be levied from local U.S. host assets as a means to reduce costs and logistics requirements.

Figure 4-1: Identification of Manning Requirements.

Data Collection and Operational Assessment (OA) Process.

The data collection and OA process begins with the development of the OA approach and culminates with the post-exercise analysis and development of the ABCA exercise/experiment OA products. This multi-step process, shown in Figure 4-2, and defined in the succeeding paragraphs, illustrates the combined efforts of a host nation, the focused analysis team leaders, and each army's analysts and observers.



Note: This example correlates the completion of analysis products (e.g. Exercise Objectives & Study Issues; Study Plan, etc.) with the ABCA schedule of Planning Conferences (PC).

Figure 4-2: Data Collection and OA Process.

Developing the Analysis Approach.

Project Team EPA is responsible for developing the overall analysis approach, which entails identifying the appropriate areas of analysis (the focused analysis areas) and corresponding focused analysis area leaders, determining analysis responsibilities, developing the general conduct of the analysis, and establishing analysis timelines. Specific details of the analysis approach (e.g.. what data should be collected and how) would be identified in the focused area analysis plans and supporting data collection plans.

Conducting Analysis.

Data collection and analysis during the exercise/experiment will be a simultaneous cycle of collection, analysis, synthesis, and development of emerging

insights. A diagram depicting a notional ABCA exercise analysis hierarchy, including the main groupings, is at Figure 4-3.

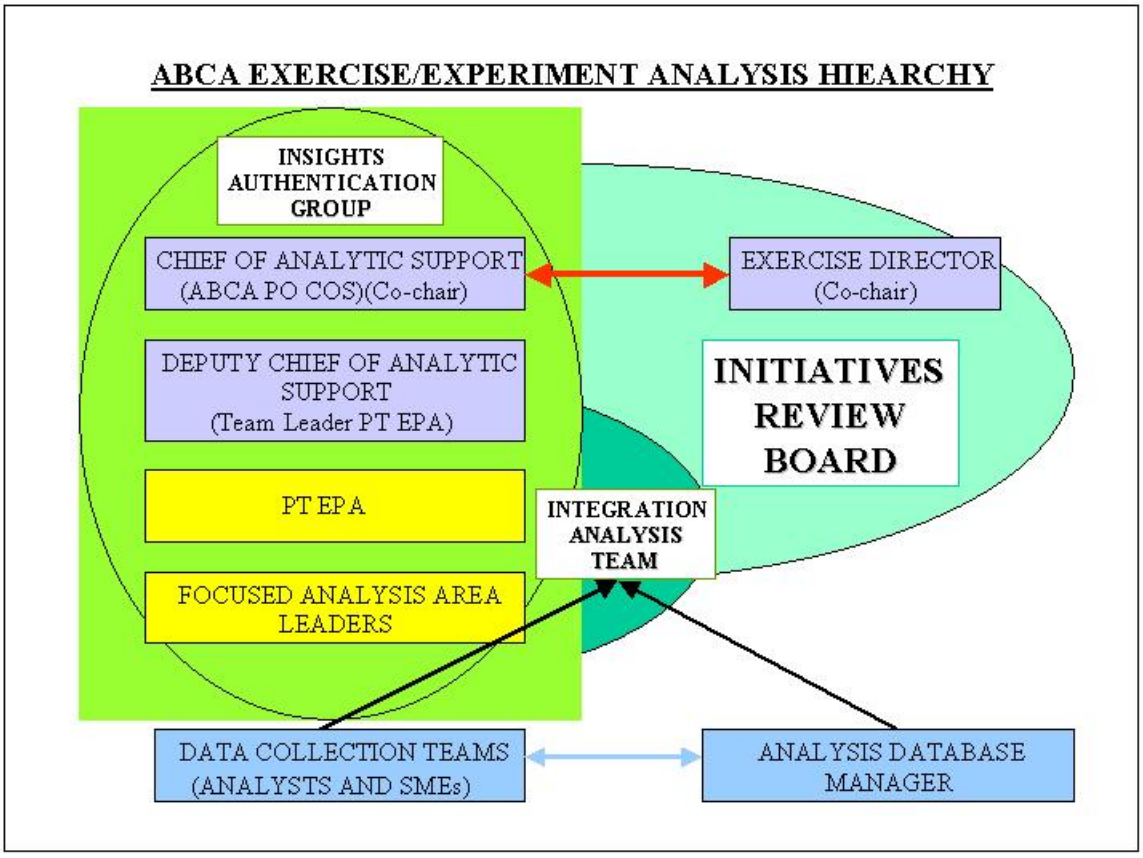


Figure 4-3: Exercise/Experiment Analysis Hierarchy

Organizing for Analysis. The following paragraphs describe the responsibilities and required interactions for an analysis effort supporting an exercise with an ARFOR headquarters and subordinate ABCA brigades.

Exercise Analysis Group (EAG). In order to conduct the actions of observing, recording (gathering data), reviewing, analyzing, and developing insights and findings, an Exercise Analysis Group (EAG) is established. The EAG is comprised of the entire analytic team from observers and SMEs to the Chief of Analytic Support.

Insights Authentication Group (IAG). An insights authentication group (IAG) chaired by the Chief of Analytic Support or the deputy, serves as a forum for verifying and validating emerging insights, highlighting those that are acceptable (having sufficient corroborating evidence), and identifying those that are conflicting. Conflicting insights will be further investigated. The Exercise Director will be briefed on periodic results so that the conduct of the exercise or experiment may be modified, if appropriated. Figure

4-4 depicts the composition of the IAG in support of an ABCA exercise comprised of an ARFOR headquarters and subordinate ABCA nation brigade headquarters and supporting elements.

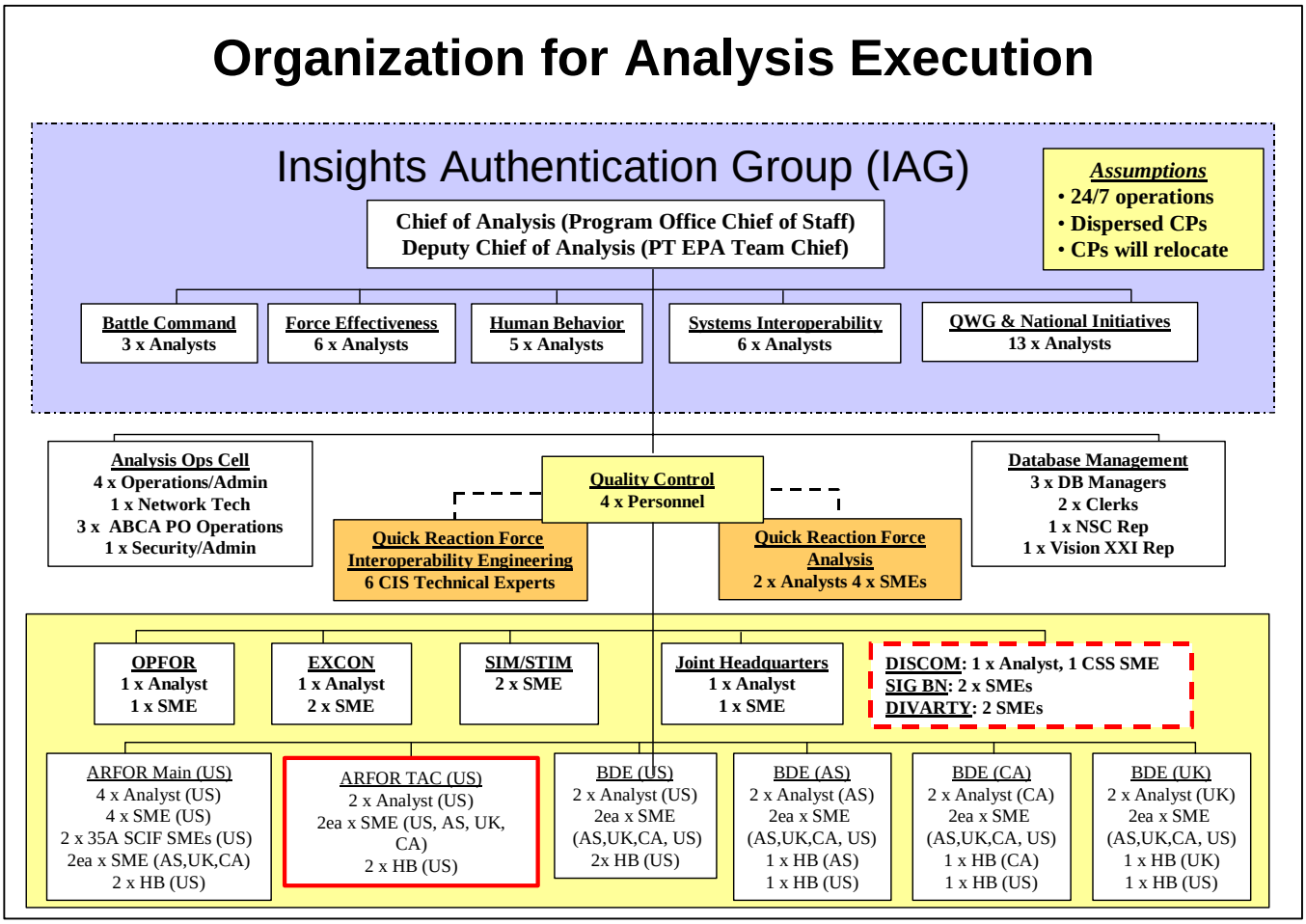


Figure 4-4: IAG Manning and Subordinate Analysis Team Organization

Integration Analysis Team (IAT). A second group within the EAG is an integration analysis team (IAT). It consists of the focused analysis area leaders and PT EPA personnel, who observe the armies' operations and data collection activities. The purpose of the IAT is to ensure analysis integration across the focused analysis areas. They provide information to the ABCA Program decision makers to enable them to assess the conduct of the exercise. The IAT's mission is to address the ABCA exercise objectives—rather than the study sub-issues, which are the responsibility of the focused analysis area teams. The two groups meet routinely to generate and review emerging insights and ensure the emerging insights are provided to the ABCA Program decision makers. The collated insights will provide the foundation for developing the Final OA Report. The IAT will present their emerging insights during daily IAG meetings.

Quick Reaction Force (QRF). As the exercise unfolds there may be situations calling for the analyst team to follow an unplanned line of investigation. A technique to accommodate this requirement quickly is the use of an analysis Quick Reaction Force. By planning ahead for this asset, the primary analysis plan remains stable, and the dedicated analysts continue their focused approach while the QRF manages unexpected requirements. Figure 4-5 illustrates the flow of analysis data, levels of quality control, command, control and supervision of the Exercise Analysis Group (data collection teams of analysts and SMEs).

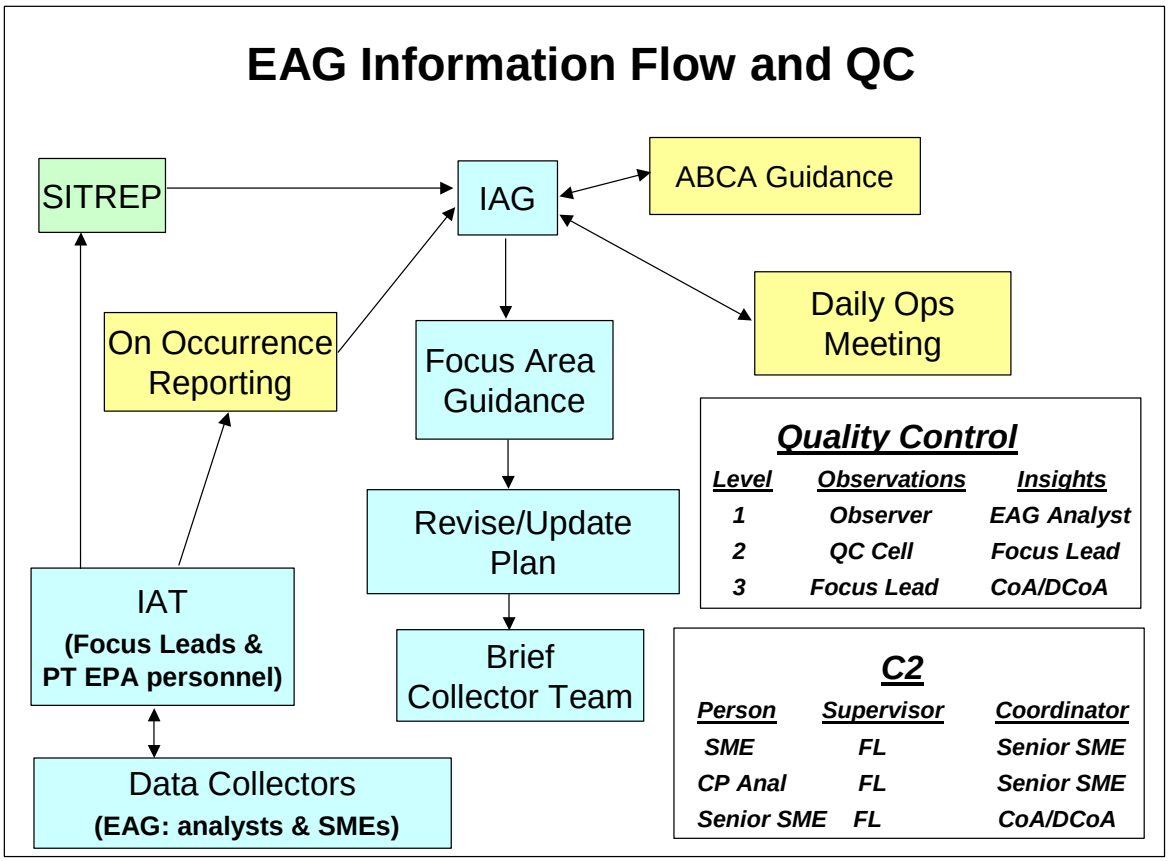


Figure 4-5: Exercise Analysis Group Information Flow and Quality Control Concept

Database Management.

An analysis database manager is needed to collect and harvest data from subject-matter experts (SMEs) and analysts at regular intervals during an exercise, conduct quality control checks on the data, and ensure that data is input into the common data base is accessible only by the analysis team. Other data, such as instrumentation, surveys, and off-line issues, will be collected as it becomes available and also input into the database. The ABCA Program Office may exercise a second level of quality control.

Each focused analysis area leader and supporting team will interrogate the database for relevant information to assist them in evaluating their EEA and MOM and generating emerging insights. Analysis teams will also consult with SMEs, attend After Action Reviews (AARs), and observe unit operations to glean more information. The teams will assess the information to identify trends and resolve data anomalies. Focused analysis area leaders may conduct periodic workshops with other exercise observers to uncover emerging issues from alternate perspectives.

Analyst and SME Responsibilities

	Know issues	Capture obs/data	Serve as Analytic SME	Over-see SMEs	Cross-talk	Develop linkages for insights	Attend daily outbriefs	Enter data into DB	Develop insights	Write IIR & OA Report
Focus Area Analyst	X				X	X	X		X	X
CP Analyst	X	X	X		X	X	X	X		
Senior SME	X	X	X	X	X	X	X	X		
SME	X	X			X	X	X	X		
QC Cell	X				X		X	X		X

Figure 4-6: Matrix of Typical Analysis Responsibilities

Analyst and SME Responsibilities. The following paragraphs detail the tasks and responsibilities for the exercise analysis team members. Figure 4-6 illustrates a crosswalk of the roles and responsibilities.

Focus Area Analyst Responsibilities. (e.g., Battle Command, Human Behavior of Battle Command, Force Effectiveness, Program and National Initiatives, and Systems Interoperability)

- Become familiar with the ABCA Exercise/Experiment analysis objectives, study issues, wargame scenario, and operational environment.

- Working with the proponent, developing Study Issue; Sub-Issue; EEA, and MOM linkages for respective work areas.
- Review and comment on selected input from other focus area lead analysts.
- Develop emerging insights for discussion at daily Integration Analysis Group (IAG) Meetings.
- Participate in daily IAG Meeting.
- Refocus analysts and SMEs, as required – focus on study issues and linkages for developing insights.
- Refine insights and supporting documentation for the ABCA Exercise Initial Insights Report and Final Operational Report.
- Conduct Quality Control (Level 3) of observations and insights (Level 2).

Command Post Analyst Responsibilities. (ARFOR Main, TAC, and Brigade CPs)

- Become familiar with ABCA Exercise/Experiment analysis objectives, research issues and data collection responsibilities, scenario, and operational environment.
- Capture observations (e.g., key discussion points, positions, arguments, quotes, evidence, opinions, decisions) and collect data.
- Provide input to Focus Area Lead Analyst – focus on study issues and linkages for developing emerging interoperability insights.
- Serve as analytic subject matter expert – facilitate SME data collection efforts to ensure completeness and sufficiency of observations.

Senior Subject Matter Expert Responsibilities.

- Become familiar with ABCA Exercise/Experiment analysis objectives, research issues and data collection responsibilities, scenario, and operational environment.
- Capture observations (e.g., key discussion points, positions, arguments, quotes, evidence, opinions, decisions) and collect data.
- Provide input to Focus Area Lead Analyst – focus on study issues and linkages for developing emerging interoperability insights.
- Coordinate SME collection efforts and interaction with exercise players in the CP.
- Participate in SME/Analysts Outbrief with Focus Area Analyst at shift change.
- Attend daily Operations meeting.

Subject Matter Expert Responsibilities.

- Become familiar with ABCA Exercise/Experiment analysis objectives, research issues and data collection responsibilities, scenario, and operational environment.
- Capture observations (e.g., key discussion points, positions, arguments, quotes, evidence, opinions, decisions) and collect data.
- Collaborate with other SMEs and Analysts in the CP to share expertise and observations.
- Interact with exercise players, as required, to facilitate data collection.

- Upload observations and data into observation database.
- Participate in SME/Analysts Outbrief with Focus Area Analysts at shift change.

Quality Control (QC) Cell Responsibilities.

- Become familiar with ABCA Exercise/Experiment analysis objectives, research issues and data collection responsibilities, scenario, and operational environment.
- Conduct Level 2 QC on observations.
- Collaborate with other SMEs and Analysts in the CP to share expertise and observations.
- Initiate "clarification actions" on observations.
- Participate in SME/Analysts Outbrief with Focus Area Analysts at shift change.

The QC cell provides database management of the analysis data input system. The cell/team members would train the analysts, SMEs, and observers on how to use the data input system prior to the exercise/experiment. The cell conducts data harvesting at the end of each shift and transferring the observations from each of the observers, and insights from each of the analysts, into a centralized database on the analyst LAN server. At least once a day, they would receive any unsolicited observations from the senior SME and enter them into the database.

They maintain and update a backup database that is not accessible to anyone outside the Quality Control/Management Cell. Backups should be made twice a day, immediately after the database is updated with the end of shift data, and prior to being made accessible on the analyst LAN. They would also be the source for technical assistance for using the data base tool, as requested. This support would be provided to all users (observers, analysts, SME, etc.) of the data collection tool.

A method or process should be established to provide tracking and quality control in the development of an observation from initial data entry to completed action. For example, a simple Quality Assurance (QA) system might be designed as follows: Level 1 (QC1) is the raw data entered into the system by the collector (observer, SME, analyst, etc.); upon entry, the observer checks for syntax and completeness. Level 2 (QC2) represents a review by the QC cell to verify all required information is included in the observation.

Level 3 (QC3) review is conducted by the Focus Lead Analysts; this QA check ensures completeness and appropriateness as the observation relates to the Data Collection and Management Plan and enables the synthesis and analysis of this information for developing insights. If desired, a Level 4 (QC4) status could be the designation for "action completed".

Level 4 would also involve the tracking of analyst requests for information (RFI) back to the observer in support of Level 3. The data collection cell, which would most likely be doing the QC4 would monitor the RFIs and ensure the observer's were responding accordingly. Once the analyst was satisfied with the observer's response to

the RFI, he would then perform the follow-up QC3 noting that the observation was sufficient; then, the QC4 could be completed. Figure 4-7 reflects the QA process described above and the process that was developed for ABCA Exercise 2004.

Quality Control Levels			
QC Level	**Actions**	**Responsibility**	**Insight Development**
1	**Raw data entered into the system by the collector. Checks for syntax and completeness.**	**Observer, SME, Analyst**	**EAG Analyst**
2	**Review to verify all required information is included in the observation.**	**QC Cell**	**Focus Lead**
3	**Ensure observation is complete and relevant to DC&MP, and enables synthesis and analysis for developing insights.**	**Focus Lead**	**Chief / Deputy Chief of Analysis**
4	**Tracking of analyst requests for information (RFI) back to the observer as required; or "Action Complete".**	**QC Cell**	

Figure 4-7: Example Quality Assurance Process

Battle Rhythm.

Each exercise or experiment will have a Battle Rhythm that reflects the sequence of events from pre-exercise briefings and orientation, through the train-up period, communications and simulation testing, and the exercise phases. Figure 4-8 illustrates an example calendar of events.

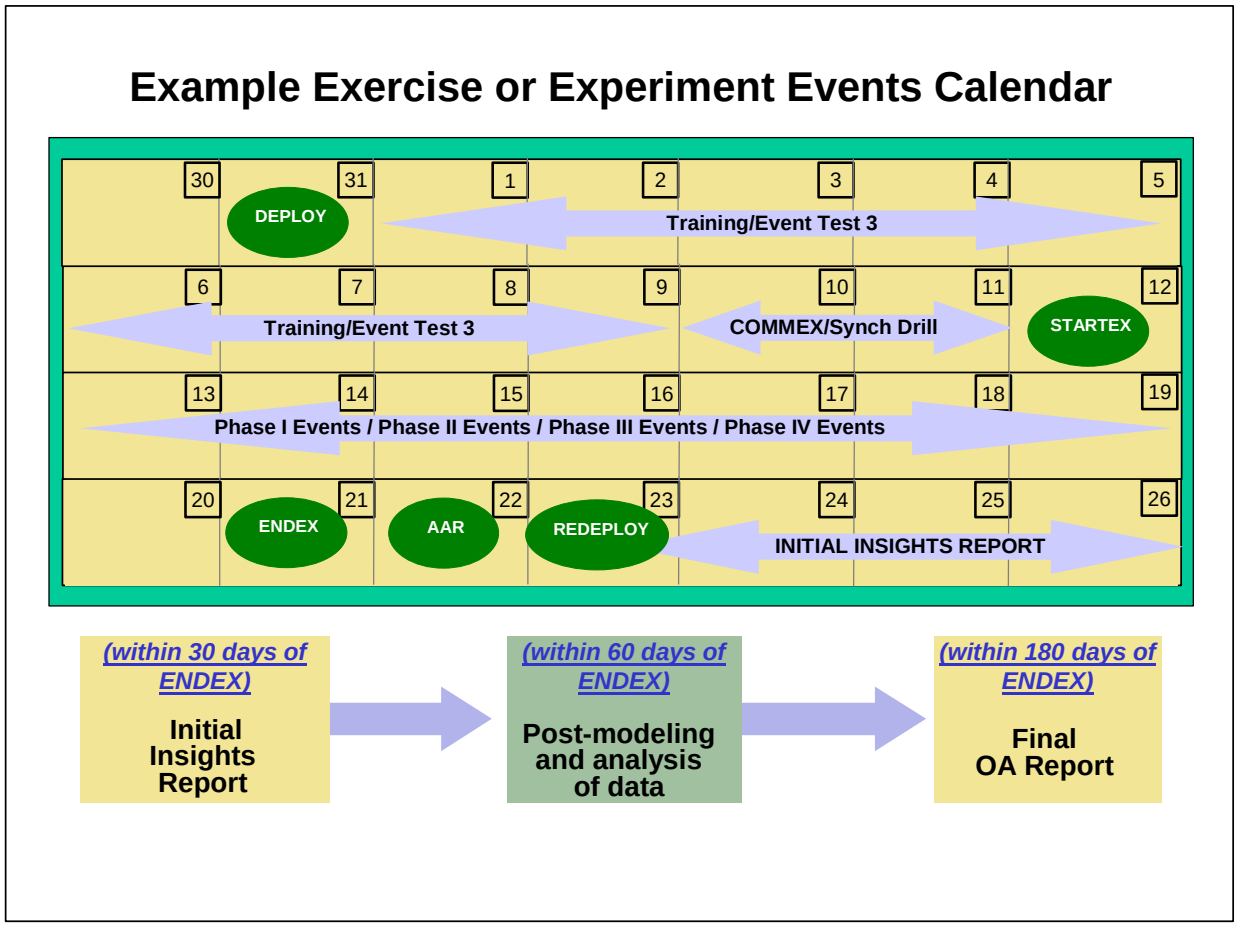


Figure 4-8: Example of Exercise or Experiment Calendar of Events

The Exercise Analysis Group will need to develop its own battle rhythm in order to synchronize and overlay its activities with the exercise/experiment cycle of events. Figure 4-9 illustrates some potential daily events, briefings, meetings, and activities for the EAG during the course of the exercise/experiment.

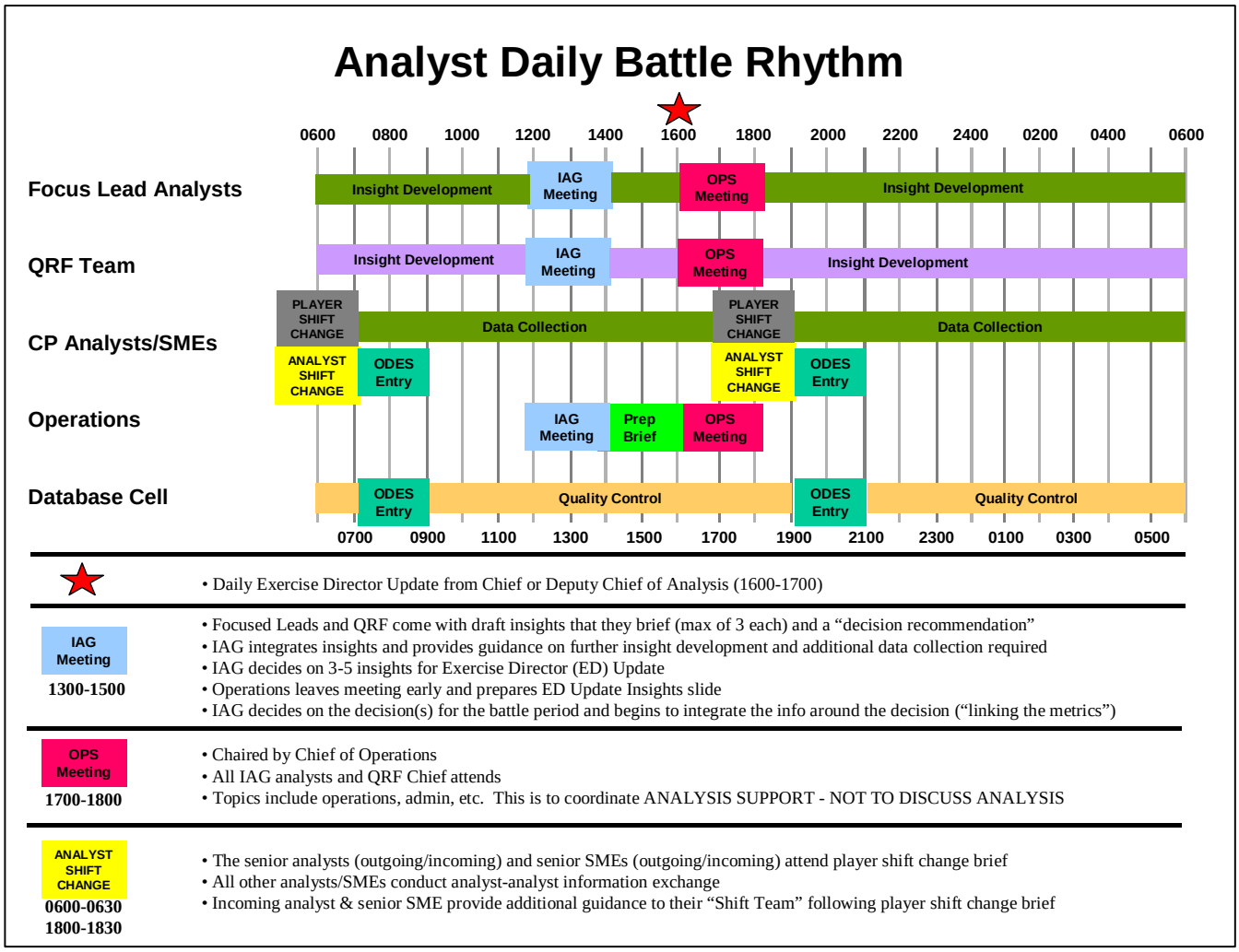


Figure 4-9: Battle Rhythm—The Sequence of Events for Analysts Over a 24-Hour-Period

Daily Briefings.

The EAG team should plan on presenting periodic briefings on the data collection and analysis status. The briefing could include update information on personnel status, key events, current issues, performance of models and sensors, simulation interfaces, communications networks, digital threads, or other critical information. Figure 4-10 is an example slide used to present an update on analytic activities over a 24-hour period.

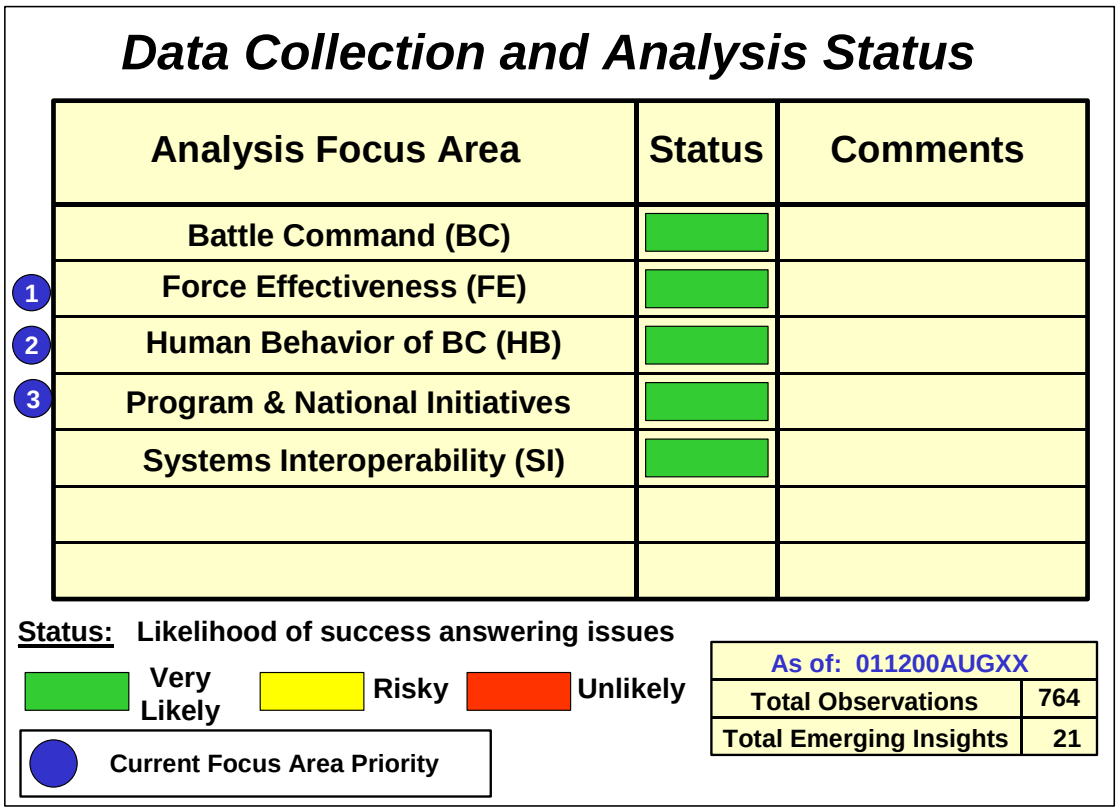


Figure 4-10: Daily Briefing of Analysis Efforts.

Analyst and SME Training.

Prior to the start of the exercise (STARTEX) specialized training must be conducted for members of the Exercise Analysis Group so that everyone will be prepared to perform their analytic tasks. Some of the training can begin weeks or months ahead if the analyst and SME augmentees are identified early enough. That training can be in the form of read-ahead packets, a "Smart Book", and preparatory training on the observation database entry system. For the observation data entry system, the aim is to give sufficient familiarity so that once the augmentees arrive at the exercise site they will be better prepared to start hands-on training on the system.

Smart Book.

The purpose of a Smart Book is to provide the EAG members with a ready reference on the overall purpose and objectives of the exercise and the concept and

procedures they will use in conducting analysis of the exercise. Some of the major topics that could be covered in the Smart Book are as follows:

- Objectives and Issues
- ABCA Exercise Purpose and Objectives
- Road to War
- ABCA Armies Troop and Task List
- Training Objectives
- Analysis Overview Chart
- Study Issues
- Focus Analysis Areas and Program and National Initiatives
- Coalition Operational Architecture
- Mission Threads
- Administrative Information
- Data Management
    - Concept
    - Types of Data
    - Exercise Schedule
    - Data Flow
    - Security
    - Communications
    - Observer Locations and Timeline
    - Observation Methodology
- Safety Issues
- Techniques and Procedures (e.g., collection procedures in the TOCs, work times, meeting times, analyst, SME responsibilities, etc.)
- Acronym List

EAG Training.

The amount of time needed for EAG instruction prior to STARTEX is driven by the scope and intent of the exercise or experiment and what tasks need to be trained. In some cases the EAG will be briefed or trained along with the exercise players as a part of general orientation on the hosting nation's post policies, safety awareness in garrison and at training sites, facilities and ranges, etc.

Specialized analytic training for the EAG should include briefings and familiarization on the exercise or experiment analysis objectives, study issues, wargame scenario, and operational environment, and their roles and responsibilities in the analytic effort.

The trainers will be the Chief and Deputy Chief of Analysis, Focus Analysis Lead, analyst team Chief of Operations, and the Quality Control Cell team. Other specialized training might be required for familiarization on the hosting and participating armies' tactics, techniques and procedures. For example, this training could include passage of information, work arounds, the ABCA nations' current SOPs and doctrine.

Specific workshops may need to be developed to address Battlefield Operating Systems being examined by the exercise or experiment. Potentially the workshops could address:

- Collection of data in areas not adequately supported by the actual exercise
- Clarification of Modeling and Simulation/Stimulation peculiarities or artificialities
- Work-arounds or alternative data sources.

Figures 4-11 and 4-12 illustrate a typical training plan, identifying tasks, audience, trainers, location, and other pertinent facts.

Training Schedule

Pre-Exercise Training Schedule (1-11 June XXXX)

Day/Time	Activity	Training Audience	Trainer	Location	Comments
Day Zero	GSU In-processing on arrival date	All Arrivals	HOST	TBD	
1-Jun					
0800-1200	GSU Mandatory Training	ALL	HOST	TBD	
1300-1700	Welcome/Admin Requirements	ALL	TBD	TBD	
	Training Breakdown and Overview	ALL	TBD	TBD	
	Study Plan Overview	ALL	TBD	TBD	
	Team Assignments	ALL	TBD	TBD	
1900-2200	Scenario and Focus Lead Briefs	ALL	Focus Leads	TBD	
2-Jun					
0800-1200	ODES Training	Group 1 & 2	TBD	TBD	
	Focus Lead Training	Group 3 & 4	Focus Leads	TBD	
1300-1700	ODES Training	Group 3 & 4	TBD	TBD	
	Focus Lead Training	Group 1 & 2	Focus Leads	TBD	
1900-2200	ODES PE/Remedial Training	ALL	TBD	TBD	
3-Jun					
0800-1200	Training at Command Posts (CPs)	Shift 1	TBD	CPs	
	BOS/Briefing TBD*	Shift 2	TBD	TBD	
1300-1700	Training at Command Posts (CPs)	Shift 2	TBD	CPs	
	FL Time/Enter Observations	Shift 1	TBD	TBD	
1900-2200	BOS Workshop #1	ALL(-)	TBD	TBD	
	Observe OpOrd Process	Selected Personnel	Hobson	CPs	
4-Jun					
0800-1200	Training at Command Posts (CPs)	Shift 1	TBD	CPs	
	FL Time/Enter Observations	Shift 2	TBD	TBD	
1300-1700	Training at Command Posts (CPs)	Shift 2	TBD	CPs	
	FL Time/Enter Observations	Shift 1	TBD	TBD	
1900-2200	BOS Workshop #1 - C2	Selected Personnel	TBD	TBD	COP, Run Est., SA, Collab
	Observe OpOrd Process	Selected Personnel	TBD	CPs	

Figure 4-11: Pre-exercise Training Schedule Example

Training Schedule (2)

5-Jun					
0800-1200	Training at Command Posts (CPs)	Shift 1	TBD	CPs	
	FL Time/Enter Observations	Shift 2	TBD	TBD	
1300-1700	Training at Command Posts (CPs)	Shift 2	TBD	CPs	
	FL Time/Enter Observations	Shift 1	TBD	TBD	
1900-2200	BOS Workshop #2 - ISTAR	Selected Personnel	TBD	TBD	
	Observe OpOrd Process	Selected Personnel	TBD	CPs	
6-Jun					
0800-1300	Free Time	ALL	NA	NA	
1300-1700	BOS/Briefing TBD*	Shift 1	TBD	TBD	
	Training at Command Posts (CPs)	Shift 2	TBD	CPs	
1900-2200	Free Time	ALL	NA	NA	
7-Jun					
0800-1200	Training at Command Posts (CPs)	Shift 1	TBD	CPs	
	FL Time/Enter Observations	Shift 2	TBD	TBD	
1300-1700	Training at Command Posts (CPs)	Shift 2	TBD	CPs	
	FL Time/Enter Observations	Shift 1	TBD	TBD	
1900-2200	BOS Workshop #3 - Maneuver	Selected Personnel	TBD	TBD	MOUT, BC/HB Issues
	Observe OpOrd Process	Selected Personnel	TBD	CPs	
8-Jun					
0800-1200	Training at Command Posts (CPs)	Shift 1	TBD	CPs	
	FL Time/Enter Observations	Shift 2	TBD	TBD	
1300-1700	Training at Command Posts (CPs)	Shift 2	TBD	CPs	
	FL Time/Enter Observations	Shift 1	TBD	TBD	
1900-2200	BOS Workshop #4 - Engr/HSS	Selected Personnel	TBD	TBD	Lethality/Survivability
	Observe OpOrd Process	Selected Personnel	TBD	CPs	
9-11 Jun					
0001-2400	Full Dress Rehearsal	ALL	TBD	CPs/TBD	
	Groupings - BC (31); FE (34); SI/Q&NI (34); HB/QRF/Others (33)		BOS Workshop	Lead	
	Categories	ODES, BOS Workshops, FL Trng, Training in CPs on OpOrd Dev/Embedding	#1 C2 - #2 ISTAR #3 Maneuver	BC (HB/FE) BC (HB/FE) FE (BC/FE)	#6 CIS will be "on-call" throughout the BOS workshop trng period; SI has the Lead
	Focus Lead (FL) Training	POI Book/Smart Book; FL POI for FL specific training	#4 Engr #5 HSS	FE (BC/HB) Sustainment	

Figure 4-12: Pre-exercise Training Schedule Example

Observation Database Training.

The EAG augmentees, the analysts, observers, and SMEs, will need specialized training on analytic procedures and methods for writing an observation and using an automated data entry system. Observation database training will need to be conducted before other analysis training to allow students to apply the learning immediately.

The pre-exercise training would include classroom familiarization on the observation data entry system combined with hands-on training and practice entering data.

Assumptions

- Trainees may have not have used an observation data entry system prior to training.

- Trainees are able to use windows-based office automation tools.
- Computer network will be established prior to commencement of training and will support an observation database entry system (ODES).
- The system has been installed and tested for all users on Exercise network.

Methods of delivery

- Train the trainer – one or two representatives from each analysis "group" to lead their group through a tutorial on the system in conjunction with data collection practice.
- Self-training system (from a CD ROM which is distributed to each country) with a refresher in country.
- The CD ROM could include a power point presentation on how to use the system, and also used in conjunction with on-the-job-training in country.
- Proficiency would be developed through on the job training during the build up phase of the exercise.

Training Topics

- Concept and Context.
- File management and structure.
- Data entry methods.
- Validation and clarification of data entry.
- Search facility.
- Reporting system.
- Analysis system.
- Monitoring Systems.

Course Terminal Objectives

- Explain the observation database entry system concept.
- Enter data into observation database entry system.
- Update data on observation database entry system.
- Search for data on observation database entry system.
- Record insights on observation database entry system.
- Store and recall files in observation database entry system.

Student Numbers

- A small group (16 students or less) is best suited to allow for practical experience. Larger groups can be addressed with a corresponding reduction in the practical component.

Course Duration

- The formal component of the courses will be dependent on the identified requirements. Local experts would provide follow-up training as required.

Equipment and Materials

- Computer system and facility.

- File storage mechanism.
- File management needs to be set up in the exercise format.
- A Presentation Venue to seat all SME and analysts.
- Trained instructors.

Analysis Support Planning Lessons Learned.

Embedding Observers. As a part of the ramp-up period prior to STARTEX, ensure that observers are embedded with their player units as early as possible. This allows time for them to become familiar with the unit's battle rhythm and develop the good rapport that is key in facilitating the data collection process. Planning factors that are impacted: the manning/augmentee requests, dates of arrival and departure, analyst/observer training, analyst C2 plan, billeting and transportation.

Analysts Dress Rehearsal. To help ensure success of executing the analysis plan, it is important to conduct a full dress rehearsal prior to STARTEX. This gives the analyst team the opportunity to validate collection processes, test collection systems, and collection enablers, and to also identify analyst/observer training deficiencies and correct them prior to execution. Planning factors that are impacted: the manning/augmentee requests, dates of arrival and departure, analyst/observer training, analyst C2 plan, billeting and transportation.

Presentation of Emerging Insights. Planning should also include developing the procedures for providing emerging analysis results to the Exercise Director, VIPs and other visitors. Planning factors impacted: exercise/experiment schedule, protocol/visitor office, information presentation format, analysts' battle rhythm, briefing and meeting facilities, scheduling, transportation, and audiovisual support.

Chapter 5. Analysis Reporting.

Background.

The first requirement of reporting is to provide information on the issues that were under investigation. The study products communicate the results to the ABCA Program and stakeholders, provide a lasting record and a body of knowledge that can be used for the improvement of the coalition forces. A well-written record is essential to the credibility and longevity of the study results.

During the course of the exercise, analysts compare observations and results and begin to integrate their unbiased views of what is being learned about coalition interoperability. As sufficient data is collected, analysts begin to form *preliminary insights.* These preliminary insights are not based on completed analysis, but they are of sufficient fidelity to spark more focused discussion or investigation of the trends. This process continues, building on the data gathered through the course of the exercise and after its completion. The syntheses of all these efforts result in the Emerging Insights Report, Initial Insights Report, Post Exercise Analysis, and the Final Operational Analysis Report, and are discussed in the following paragraphs.

Emerging Insights Report (EIR).

The emerging insights report is a concise, relatively short document formulated during the daily analysis process of the event.

Initial Insights Report (IIR).

Emerging insights form the basis for the development of the first official report from an exercise or experiment, the Initial Insights Report. This report, while based on the results of the completed exercise/experiment, is not usually the result of completed post-exercise/experiment analysis. It can take the form of either a short document or a scripted briefing. It can be either delivered in hard copy or briefed in person and then followed by a document.

Emerging Insight Development and the IAT.

The IIR documents the insights that surface during the exercise or experiment. The Integration Analyst Team (IAT) must develop and report these emerging insights throughout the event. The goal is to capture these insights, with their corresponding supporting observations and data, and communicate them to the study director while the details of the event are still fresh in their minds.

This is a very difficult task and one of the most critical pieces of an event to pull together. The sooner the analysis team begins work on the emerging insights report, the better. In order to develop a valid and operationally relevant insight, specific development criteria are required. These are depicted in Figure 5-1.

Analytic Insight Acceptance Criteria

- An insight must be logical, defendable, and understandable
- The insight statement:
    - must be precise and focused
    - should be no more than 3 sentences in length
    - should identify the following:
        - a capability or void
        - the enabler or inhibitor
        - operational impact

Example: ***"The level of situational awareness provided by Army Battle Command Systems enabled the ARFOR to conduct effective, independent actions on a dispersed battlefield."***

•The insight discussion should provide a more detailed description of the insight, synthesize the supporting observations, and counter contradictory observations. It should be no more than a page in length. A list of considered observations should accompany the insight.

•The insight recommendation should identify each applicable category (like doctrine, organization, training, material, etc.) and the specific issue that must be addressed. It should clearly drive a measurable, definitive course of action that would lead to a solution.

Figure 5-1: Insight Criteria

During an exercise/experiment, the IAT should present their emerging insights during daily insights authentication group (IAG) meetings, chaired by the Chief of Analysis or the deputy, with the focused analysis area leaders and PT EPA personnel present. IAG meetings would serve as the forum for verifying and validating emerging insights, highlighting those that are acceptable (having sufficient corroborating evidence), and identifying those that are conflicting. Conflicting insights would be investigated further. The Exercise Director would be briefed on periodic results so that the conduct of the exercise could be modified, if appropriate.

Lesson learned: Analysts should be cautious in how these emerging insights are portrayed—as they can potentially assume a level of validity exceeding the analysts' comfort.

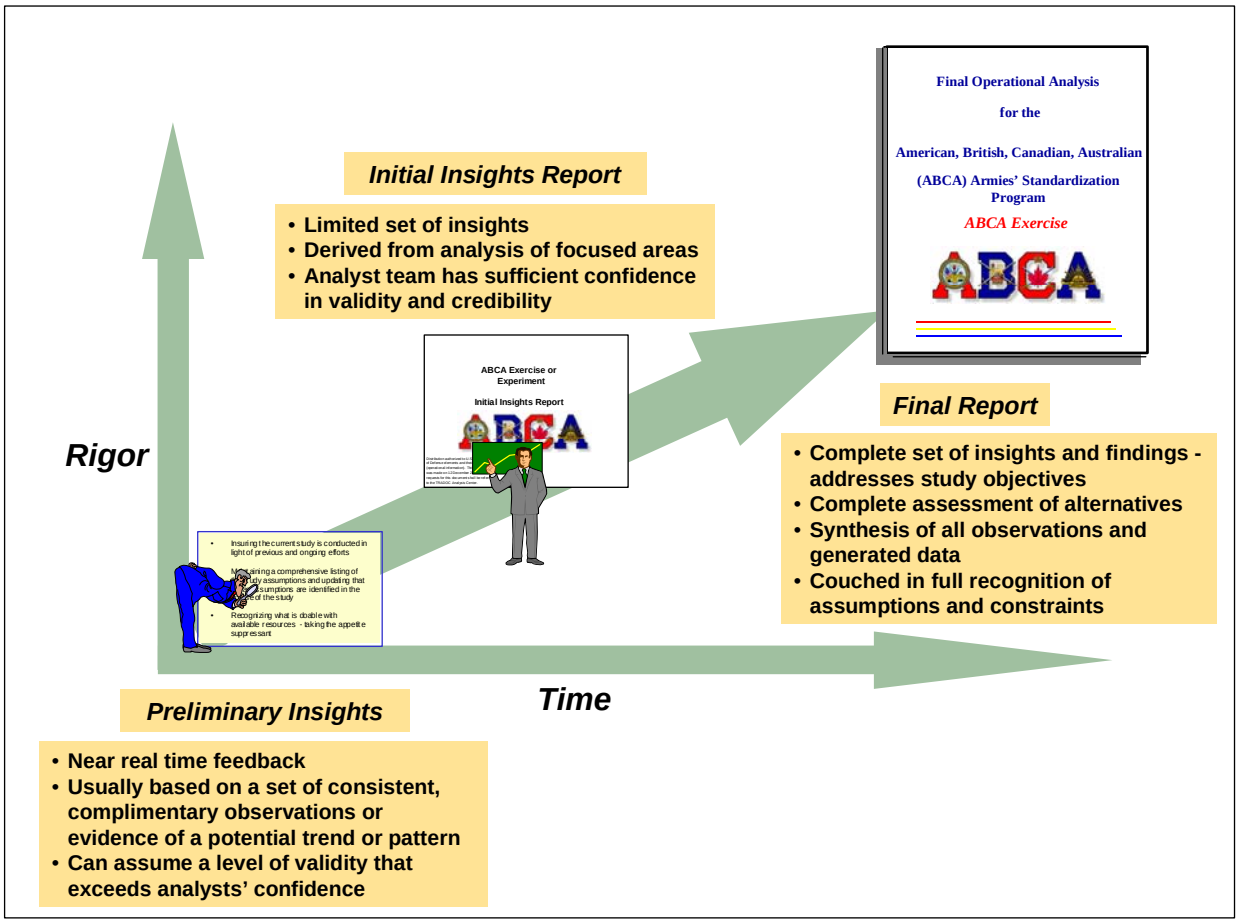


Figure 5-2: Development Principle Highlights for the Final OA Report.

Post Exercise Analysis.

Following the exercise/experiment and in keeping with the M-E-M concept discussed earlier, a planned course of post-experiment analysis is undertaken to refine the results. It is through this process that key evidence is verified, results are more thoroughly integrated, and causality is assessed to the degree feasible within the variable controls maintained during the exercise/experiment.

Preliminary and initial insights may be expanded or refuted during this process. The results of post-experiment analysis are documented as *final insights* in a Final OA Report. An individual exercise or experiment rarely produces *findings*. Findings are normally the result of analysis integrated across a number of exercises/experiments. Figure 5-2 illustrates the process leading to the final report.

Final Report Guiding Principles

The Final Operational Analysis Report is a single, synchronous body of knowledge that informs the customers (ABCA Program Office, ABCA Armies, Capability Groups) and enables planning for future work. It also provides benchmark documentation to inform future exercise development and planning.

- Produce one comprehensive report that includes operational analysis, Capability Group-collected information, Communication Information System test plan results, After Action Review (AAR) information, etc.
- Directly answer the ABCA exercise and experiment aim and objectives.
- Deliver report with an interoperability focus in an operational context.
- Develop an annex for each Capability Group to address their initiatives (with Program Office SO1 assistance).
- Develop Coalition Operations Handbook insights and recommendations.

Figure 5-3: Guiding Principles.

Final Operational Assessment (OA) Report.

The Final OA Report describes the collection, synthesis, and analysis of the observations, instrumented data, surveys and interviews obtained throughout the exercise or experiment in order to produce the interoperability insights. It also addresses any additional senior leadership requests for information and commanders critical information requests. It ties together all of the exercise study objectives, priorities and issues. Figure 5-3 summarizes the key requirements.

The structure of the Final Operational Assessment Report is depicted in Figure 5-4. This example report format uses a six-chapter organization to define the exercise concepts, the exercise framework, and the analysis framework employed in the exercise. The report will also expand on the initial insights and recommendations identified in the Initial Insights Report.

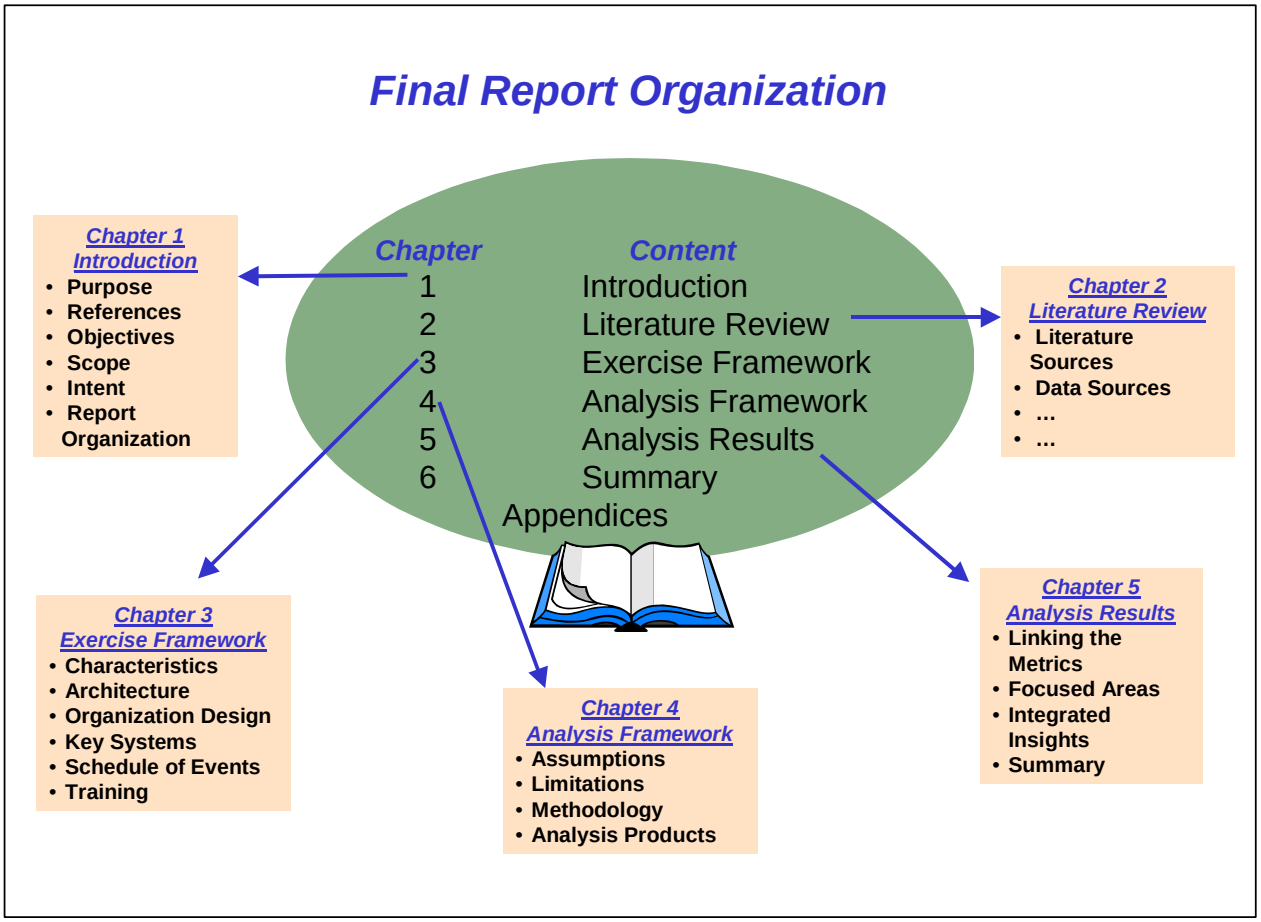


Figure 5-4: Organization of the Final Operational Analysis Report.

Document Handling and Classification.

During exercise or experiment planning phase, both the Initial Insights and the Final OA Reports may be drafted ahead of time. The material relating to the background, aim, scope, context, and other pertinent exercise information can be written and pre-organized into the final report formats. In this way, at the exercise conclusion, the analyst team developing the reports has only to focus on preparing the insights and conclusions, rather than the entire document.

The majority of the information in the Initial Insights and Final OA Report will be unclassified. However, it can be anticipated that portions addressing interoperability gaps or other sensitive information must be classified appropriately. The sections with sensitive information may be concentrated into separate annexes or appendices so that the entire report does not have to be handled as a classified document.

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SUMMARY

ABCA Armies' Program exercises and experiments serve as a *forcing function* for progress; that is, they bring together the coalition, cause actions to be taken, further the understanding of interoperability problems and gaps, and as a result lead to mitigation or elimination of those gaps.

ABCA exercises and experiments provide a two-fold opportunity. First, coalition forces have a venue to train together and gain operational experience. Second, and equally important, they provide the opportunity to gather data in a controlled environment in order to conduct interoperability assessments and identify the operational impact of capability gaps.

The resulting analytic products provide valuable information to the individual ABCA armies, and to the capability and support groups.

The exercise or experiment data and insights developed by the analysis team serve as enablers, helping to inform the Capability Groups in assessing the operational impact of interoperability gaps on systems, processes, structures, and behaviors. In turn, these activities support the ABCA Armies, providing an assessment of operational interoperability, and helping inform future real-world operations within a coalition framework.

To have the greatest impact, completion of the reports must be synchronized with the ABCA Armies' cycle of planning, programming, and budgeting to allow for timely development of policies, doctrine, procedures, and materiel solutions.

This Analysis Handbook is designed as a guide for analysis teams in planning, conducting analysis, and reporting their insights. In addition, it will provide useful information for exercise planners in understanding the role of the analysis team in furthering the ABCA Program Goals.

Comments for improving this publication should be made to the ABCA Program Office, Suite 8600, 117 North Kent Street, Rosslyn, Virginia, 22209-2192, USA. (703) 588-6560.

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ANNEX A, ACRONYM AND GLOSSARY LIST

The following is a list of the current acronyms, terms and abbreviations used within the Analysis Handbook for ABCA Exercises and Experiments.

AAR.....After Action Review

ABCA ..... American, British, Canadian, Australian Armies' Standardization Program

ABCS..... Army Battle Command System

ADPE.....Automated Data Processing Equipment

AIS..... Automation Information Systems

AO.....Area of Operations

ARFOR .....Army Force

ARL .....Army Research Laboratory

AS ..... Australia

AUTL ..... [US] Army Universal Task List

BC ..... Battle Command

BOS..... Battlefield Operating Systems

BSC.....Battle Simulation Center

C2.....Command and Control

C4..... Command, Control, Communications, and Computers

C4ISR……Command, Control, Communications, Computers, Intelligence, Surveillance, Reconnaissance

CA..... Canada

CA..... Civil Affairs

CCIR .....Commander's Critical Information Requirements

CD-ROM.....Compact Disk – Read Only Memory

CD-RW.....Compact Disk – Read - Write

CID .....Coalition Interoperability Demonstration

CMO.....Civil-Military Operations

CoA..... Chief of Analysis

COH .....Coalition Operations Handbook

COP .....Common Operational Picture

COS .....Chief of Staff

DAA..... Designated Approving Authority

DC&MP ..... Data Collection and Management Plan

DCC..... Data Coordination Cell

DCoA.....Deputy Chief of Analysis

DIS.....Distributed Interactive Simulation

DISCOM .....[US] Division Support Command

DITSCAP ... DoD Information Technology Security Certification and Accreditation Process

DIVARTY .....[US] Division Artillery

DSTO.....[AS] Defence Science and Technology Organisation

ESG..... Exercise and Experimentation Support Group

EAG..... Exercise Analysis Group

EC ..... ABCA Executive Council

ED .....Exercise Director

EEA .....Essential Elements of Analysis

EEFI ..... Essential Elements of Friendly Information

EPA.....(PT) Exercise Planning and Analysis

EXCON ..... **Exercise Control**

FE ..... **Force Effectiveness**

FFIR ..... **Friendly Force Information Requirements**

FLVN ..... **Fort Leavenworth**

GICOD ..... **Good Idea Cut-Off Date**

HA ..... **Humanitarian Assistance**

HB ..... **Human Behavior of Battle Command**

HLA ..... **High Level Architecture**

HPTL ..... **High Payoff Target List**

HQ ..... **Headquarters**

IAG ..... **Insights Authentication Group**

IASO ..... **Information Assurance Security Officer**

IAT ..... **Integrated Analysis Team**

IAW ..... **In Accordance With**

ID ..... **Infantry Division**

IRB ..... **Issues Review Board**

IIR ..... **Initial Insights Report**

IPB ..... **Intelligence Preparation of the Battlespace**

ISTAR ..... **Intelligence, Surveillance, Target Acquisition and Reconnaissance**

JCATS ..... **Joint Conflict and Tactical Simulation**

JTASC ..... **[US] Joint Training, Analysis, and Simulations Center**

JITT ..... **Joint Interoperability Tactical Task**

LAN ..... **Local Area Network**

LOC ..... Lines of Communication

LOCON ..... Lower Control

LOI ..... Letter of Instruction

LNO ..... Liaison Officer

M&S ..... Modeling and Simulation

MIB ..... Management Information Base

MOM ..... Measures of Merit

MSEL ..... Master Scenario Event List

NATO ..... North Atlantic Treaty Organization

NEO ..... Noncombatant Evacuation Operations

NZ ..... New Zealand

OA ..... Operational Architecture, Operational Analysis

OPLAN ..... Operation Plan

OPORD ..... Operation Order

ORBAT ..... Order of Battle

PC ..... Planning Conference

PIN ..... Personal Identification Number

PIR ..... Priority Intelligence Requirements

POC ..... Point of Contact

PT ..... Project Team

Q&NI ..... Quadripartite and National Initiatives

QWG ..... Quadripartite Working Group

QC ..... Quality Control

QRF ..... Quick Reaction Force

RFI.....Request For Information

SA ..... Situational Awareness

SASO ..... Stability and Support Operations

SI..... Systems Interoperability

SME.....Subject Matter Expert

SOF.....Special Operations Forces

SOFA..... Status of Forces Agreement

SOI.....Signal Operation Instructions

SOP.....Standing Operating Procedure

SSAA ..... System Security Authorization Agreement

STARTEX..... Start of Exercise

SWP ..... Special Working Party

TAC ..... Tactical Command Post

TBD ..... To Be Determined

TEAL.....Tripartite Equipment and Logistics

TOC.....Tactical Operations Center

TOR.....Terms of Reference

TRAC ..... TRADOC Analysis Center

TRADOC ..... Training and Doctrine Command

TTP..... Tactics, Techniques, and Procedures

UK..... United Kingdom

UO..... Urban Operations

US .....United States

USAF ..... United States Air Force

USMC.....United States Marine Corps

USJFCOM .....United States Joint Forces Command

WSMR.....White Sands Missile Range

VTC .....Video Teleconference

DEFINITION OF TERMS

AMSAA Taxonomy: A taxonomy originally designed to analyze vulnerability/lethality but later discovered to have usefulness in other areas as well. Based on a four-tier system that may be traversed in either top-down or bottom-up modes. Used to analyze how events/actions affect the overall mission plan.

ARFOR: An ARFOR consists of the senior Army headquarters and all Army forces assigned or attached to a combatant command, subordinate joint force command, or multinational command. The term ARFOR is commonly used to describe both the headquarters of the Army forces provided to a joint force and the Army forces themselves. An ARFOR is designated whenever Army forces are involved in an operation.

Battle Management Language (BML): The unambiguous language used to command and control forces and equipment conducting military operations and to provide for situational awareness and a shared, common operational picture.

Capability Groups: ABCA Capability Groups are responsible for interoperability-capability gap analysis for the ABCA Program. Five analytically focused Capability Groups, based on battlefield operating systems, replace the 13 Quadripartite Working Groups that were previously charged with this responsibility. Capability Groups provide recommendations to the ABCA Board on work that should be undertaken to mitigate identified capability gaps.

Collaboration: To work jointly with others or together especially in an intellectual endeavor: to cooperate with an agency or instrumentality with which one is not immediately connected.

Commonality: The state achieved when the same doctrine, procedures or equipment are used.

Compatibility: Capability of two or more items or components of equipment or material to exist or function in the same system or environment without mutual interference.

Conflict: An armed struggle or clash between organized groups within a nation or between nations in order to achieve limited political or military objectives.

Course of Action: A possible sequence of events, presented in human understandable form, which are related to the accomplishment of a task or mission by a unit. The recommended course of action will include the concept of operations, evaluation of supportability estimates of supporting organizations, and an integrated time-phased data base of combat, combat support, and combat service support forces and sustainment. When used on automated systems, COAs are facilitated by the use of software and represented in machine-readable form.

Defense Information Infrastructure (DII) Common Operating Environment (COE):
The DII COE concept is best described as an approach for building interoperable systems, a reference implementation containing a collection of reusable software components, a software infrastructure for supporting mission-area applications, and a set of guidelines, standards, and specifications. DISA changed name from DII COE to COE in 2001.

Exercise: A military maneuver or simulated wartime operation involving planning, preparation, and execution. It is carried out for the purpose of training and evaluation. It may be a multinational, joint, or single-Service exercise, depending on participating organizations.

Exercise Control (EXCON): An exercise or experiment team responsible for technical management of the modeling and simulation architecture. The team receives guidance from the White Cell to implement M&S actions needed to achieve tactical training or analytic requirements. An experiment will always have both a White Cell and an EXCON. In an exercise the functions may be combined or separated (see White Cell definition).

Experiment: To enact an *experiment*: an operation carried out under controlled conditions in order to discover an unknown effect or law, to test or establish a hypothesis, or to illustrate a known law.

High Level Architecture (HLA): The High Level Architecture (HLA) is a general-purpose architecture for simulation reuse and interoperability. The Modeling and Simulation (M&S) High-Level Architecture (HLA) comprises three main components: the HLA rules, the HLA federate interface specification, and the HLA object model template.

Interchangeability: A condition which exists when two or more items possess such functional and physical characteristics as to be equivalent in performance and durability, and are capable of being exchanged one for the other without alteration of the items themselves, or of adjoining items, except for adjustment, and without selection for fit or performance.

Interoperability: The ability of Alliance Forces, and when appropriate, forces of partner and other nations, to train, exercise and operate effectively together in the execution of assigned missions and tasks.

Master Scenario Event List (MSEL): A MSEL contains actions to be taken to stimulate exercise staff groups or functions that are not capable of being modeled in a simulation. A MSEL "inject" is the introduction of actions from the list by a control group into the scenario.

"Military" Scenario: A scenario filtered and scoped to military items of interest.

Mission: The task, together with the purpose, that clearly indicates the action to be taken and the reason therefore; In common usage, especially when applied to lower military units, a duty assigned to an individual or unit; a task.

Operations Plan: An operation plan for the conduct of joint operations that can be used as a basis for development of an operation.

Order of Battle: The identification, strength, command structure, and disposition of personnel, units, and equipment of any military force.

Objective: The clearly defined, decisive, and attainable goals towards which every military operation should be directed: The specific target of the action taken (for example, a definite terrain feature, the seizure or holding of which is essential to the commander's plan, or, an enemy force or capability without regard to terrain features).

Operational Interoperability: The ability of systems, units, or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together.

Quadripartite Working Groups (QWGs): Replaced by Capability Groups in 2004, the majority of the ABCA Program's standardization work was carried out by 13 QWGs, each covering a different specialization within the Program. QWGs were composed of subject matter experts from each of the Armies under the stewardship of a Standing Chairman (SC) appointed from one of the ABCA nations and represented the largest contribution of resources made by Armies to the Program.

Road to War: The political, socio-economic events, motives, rationales and passions leading to a military conflict.

Scenario: A scenario is a description of the area, the environment, means, objectives and events during a specified time frame related to significant event(s) of interest. Scenarios may contain one or more Courses of Action (COA). Scenarios may be used for the purpose of operations, research, training, testing or analysis. When used by automated systems, scenarios are created using software and processes that produce human and machine readable data in formats that enable execution among all Army C4I and M&S systems. Data formats will also facilitate interoperability with Joint and Allied C4I & M&S systems.

Scenario Generation: The process of creating a scenario.

Situation: The way in which something is placed in relation to its surroundings; position with respect to conditions and circumstances <the military *situation* remains obscure>; relative position or combination of circumstances at a certain moment; a critical, trying, or unusual state of affairs; a particular or striking complex of affairs at a stage in the action of a narrative or drama

Standardization: The development and implementation of concepts, doctrines, procedures and design to achieve and maintain the required levels of compatibility, interchangeability or commonality in the operational, procedural, materiel, technical and administrative field to attain interoperability. Note: The three levels of standardization in ascending order are: compatibility, interchangeability and commonality.

Start of Exercise (STARTEX) Data: Data and procedures used to initialize systems (C4I, Simulations, Test, etc.) as part of the preparation prior to the start of an exercise.

Taxonomy: The science of classification according to a pre-determined system.

Technical Interoperability: The condition achieved among communications-electronics equipment when information services can be exchanged directly and satisfactorily between them and/or their users.

Unit: Any military element whose structure is prescribed by competent authority, such as a table of organization and equipment; specifically, part of an organization; an organization title of a subdivision of a group in a task force.

Vignette: The tactical vignette is a training tool for tactical decision-making during mission execution.

White Cell: A group led by the Exercise or Experiment Director, and having oversight for the event, and responsible for ensuring training and analytic requirements are achieved. The White Cell establishes the exercise/experiment environment and sets tactical conditions to be trained or investigated (i.e. per the Army Universal Task List (AUTL) or Joint Tactical Task Lists (JTT)), and ensures the exercise/experiment events support the analysis Data Collection and Management Plan. Acts as the adjudicator for issues between blue and red forces, and oversees and controls introduction of scenario events (via MSEL injects) that cannot be provided by the simulation. In an exercise the functions of a White Cell and Exercise Control may be combined or separated. In an experiment they are distinctly separate groups (See Exercise Control definition).

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ANNEX C, STUDY DOCUMENT FORMAT

The following Appendices provide examples of the formats for the three major analyses plan documents.

Appendix 1. Study Plan Format 1-C-1

Appendix 2. Analysis Plan Format 1-C-2

Appendix 3. Data Collection and Management Plan (DC&MP) Format 1-C-3

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ANNEX C, APPENDIX 1, STUDY PLAN FORMAT

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DATA COLLECTION MATRIX

Focused Analysis Area Question: (Example) Provided a lead-nation C2 structure, did ABCA Armies demonstrate the ability to execute effective battle command, focusing on C2 processes and C2 structures, with 2004 equipped C2 systems?

Study Sub-Issues aligned with Focused Analysis Area: (Examples)

Sub-Issue One: (Example) How does the national doctrine of each Army impact coalition command and control?

Sub-Issue Two: (Example) How are national and coalition command and staff procedures executed?

Focus Area #	Issue	Sub-Issue	EEA	MOM	Data Element	Data Source	Location (TOC/PIR)	Event / Time	Task ID #	Priority	Coordinating Instructions	Admin Notes
Focus1	How do national and coalition command and control structures impact interoperability and mission success?							Pre-exercise planning.				
Focus1.1		How does the task organization of forces effect interoperability and mission success?		Use of Staff Planning Guidance (and contents of this guidance), by nation; task organization supports missions requirements; equipment and support requested by unit.		Staff planning guidance; orders; observer						
Focus1.1.1			How does task organization at the lowest levels affect interoperability and mission success?						MAN 1.1	1		
Focus1.1.1.1				Assessment of Cdr's understanding of subordinates' capabilities to perform tasks, including lowest level of task organization.	What is the lowest level of organization that each nation will detach?							
Focus1.1.1.2												
Focus1.1.1.3												
Focus1.1.1.4					What effects are disconnected when forces are attached/detached to another national command and how is this overcome?						ScenarioMSEL: To assess this need coalition ORBAT to ID unique national capabilities and then shape the scenario to lead the ARFOR to consider cross attachment. (i.e. AR; ENG; ADA)	
Focus1.1.1.5												
Focus1.1.1.6												
Focus1.1.1.7												
Focus1.1.2												

DENDRITIC DEFINITIONS

Dendritic Term	Definition (Source)	Interoperability Factors	Measures of Merit	Data Elements
i.e., Battle Command				
i.e., C2 Structures				

TERM DEFINITIONS

Terms	Definition	Reference / Source
i.e., Battle Command	The exercise of command in operations against a hostile, thinking enemy.	FM 3-0, 2001

INTEROPERABILITY FACTORS

Term	Definition	Source
i.e., Interoperability	The ability of Alliance Forces, and when appropriate, forces of Partner and other Nations, to train, exercise and operate effectively together in the execution of assigned missions and tasks	

Interoperability Gap Analysis and Initiatives Review.

Interoperability gap analysis is a key activity of the ABCA Program and is one of the main missions of the ABCA Capability Groups. The Capability Groups, assisted by the Support Groups, conduct interoperability gap analysis and identify the tasks required to close or mitigate the interoperability gaps. Capability Groups then list:

- The feasible tasks, in priority order.
- The resources required.
- The most effective means of achieving the task.
- Recommended lead nation.

Initiatives Review Board (IRB).

ABCA exercises or experiments present the opportunity to investigate and identify potential interoperability gaps, or to test procedures, doctrine, and equipment developed to solve or mitigate interoperability issues.

In this context, there could be a great number of initiatives (tasks or issues) to be examined and a methodology is needed to organize and prioritize the effort. One technique is to conduct an Initiatives Review Board (IRB) to examine the initiatives against a set of criteria to determine their applicability to the exercise or experiment. (For clarity in the analysis process the term ***initiatives*** was adopted to distinguish them from the first-order ***study issues***, which are broader, more overarching, and apply to the exercise as a whole.)

The IRB can be used to validate the initiatives by collating, organizing and prioritizing the list. The analysis team then can incorporate the data in the exercise or experiment analysis plans. An example set of criteria used to assess the applicability and necessity of the initiatives is illustrated in Figure D-1 below.

INITIATIVE DEVELOPMENT AND SELECTION CRITERIA

- **Relevance – Issue relevant to ABCA Exercise aim and objectives**
- **Venue – Appropriate venue for addressing issue; data obtainable**
- **Cost – No unfunded costs associated with issue**
- **Scenario – Issue addressable within the proposed scenario, or able to be accommodated without cost or penalty in a side activity**
- **Modeling – Simulation facilitates evaluation of the issue**
- **Criticality – How critical is the task/issue to warfighting/peacekeeping operations?**
- **Deficiency – How likely is the task or issue not to be performed to a standard that adequately replicates the real world?**

Figure D-1: IRB Tasks and Issues Development and Selection Criteria

IRB Methodology.

An ad hoc team may be formed to organized, collate, and prioritize the tasks or issues so that they may be used in an exercise or experiment analysis. Members of the IRB could include:

- Chief of Analysis (ABCA Chief of Staff)
- Deputy Chief of Analysis (PT EPA Chief and Study Director)
- ABCA Program Office Staff Officers
- Capability Group Members
- Exercise Planning and Analysis Team Members
- Subject Matter Experts

IRB Goals.

Analysts decompose the overarching exercise problem statement or issue into sub-issues, Essential Elements of Analysis (EEA), Measures of Merit (MOM), and finally into data elements. Not only is this information used by the analyst team in developing it's products (Study Plan, Analysis Plans, and Data Collection and Management Plans), it is used to focus the exercise scenario and objectives.

The IRB task selection process helps prioritize ABCA related activities such as:

- Developing an ABCA Joint Integrated Tactical Task (JITT) list.
- Developing scenario and MSEL.
- Identifying activities that cannot be undertaken within the exercise scenario.
- De-conflict ABCA objectives with those of the host when embedded within a larger exercise.
- Improve understanding of the analysis requirements.

Prioritization Process.

There are a number of ways that the tasks or issues can be sifted to establish a prioritization of effort for analysis. Two useful criteria are to rank the task/issue in terms of its ***criticality*** and its ***deficiency*** (which can be defined as its level of interoperability).

Criticality of a task can be assessed in terms of ABCA Program Focus Areas, Exercise Objectives, and Lessons Learned (from ABCA Armies' operational experiences and previous exercises/experiments). Deficiency (level of interoperability) can be assessed on the basis of Program Office/Capability Group input, Lessons Learned, and by subjective IRB assessment by consensus.

Once a sequence list is established the tasks can then be correlated to ABCA Focus Areas, sequenced to the exercise campaign plan, and (if the exercise is embedded within a larger host event—see Note 1.) cross-walked with the overarching host's tactical tasks. For the purposes of shaping the scenario events, the tasks can be sequenced with the exercise Campaign Plan phases, such as Pre-conflict; Deployment and Shaping Operations; Decisive Operations; and Post-Conflict Operations.

Essentially the Prioritization Process is as follows:

- Establish criteria for Prioritization
- Conduct process based on the criticality and deficiency of tasks
- Correlate the tasks to the ABCA Focus Area
- Allocate Issues to the Campaign Plan
- Cross Walk to Host's Joint Integrated Tactical Task List
- Produce an ABCA JITT
- Integrate the ABCA JITT in the exercise Study Plan, Analysis Plans, and Data Collection and Management Plans

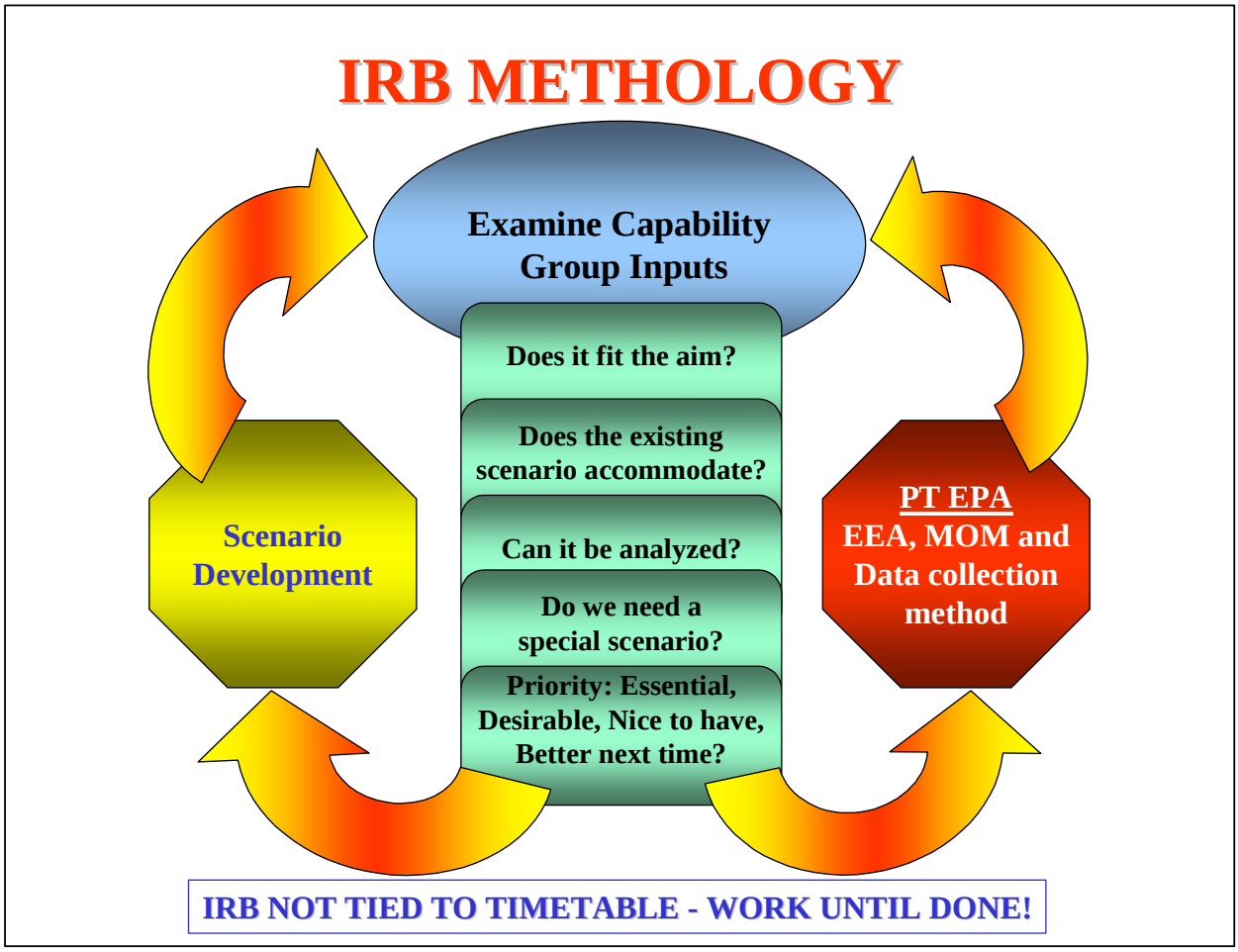

Figure D-2: IRB Methodology

Note 1. When an ABCA exercise is embedded within a larger event (e.g. a Joint, bi-lateral, or multi-national exercise), it is important to know the overarching tasks that are driving the scenario and training events in that exercise. With that knowledge ABCA tasks may be coordinated with the host events, using those existing conditions, scenarios and assets to achieve ABCA exercise goals. The knowledge can also be used to de-conflict or to create the ABCA unique scenario events necessary to achieve the ABCA Armies' exercise goals.

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ANNEX E, THREAD ANALYSIS

Background.

In Chapter 3 of this handbook, study issues were defined as the first-order questions to be answered through the application of investigation and analysis.

An exercise or experiment typically must examine broad and complex sets of study issues. The study plan and subsequent analysis plans have to be designed to balance coverage of all the key issues, along with a sufficiently in-depth and detailed examination of the essential elements.

One effective approach is using focus areas to logically divide certain aspects of the examination. For ABCA Ex 04, the study effort was organized around five broadly focused analysis areas, each having a designated lead analyst and team assigned to develop analysis and data collection plans (Figure E-1).

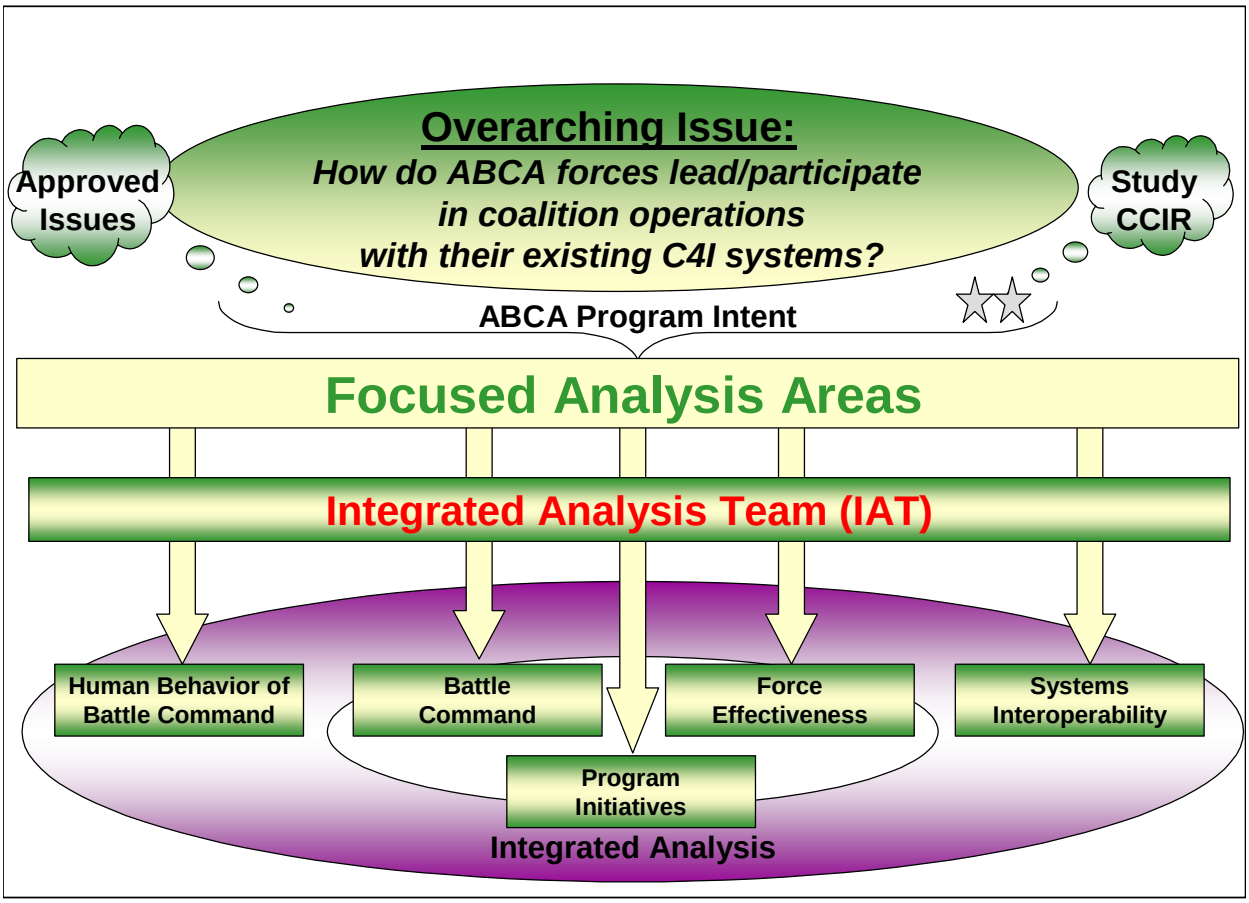

Figure E-1: Focused Analysis Area Break-Out

Explanation of Focused Analysis Areas.

Human Behavior of Battle Command (HB). Provided a lead nation command and control structure, what is the impact of the different armies' command and control systems on commander/staff performance?

Battle Command (BC). Provided a lead nation command and control structure, did all ABCA armies demonstrate the ability to execute effective battle command, focusing on C2 processes and structures, with 2004 equipped command and control systems?

Force Effectiveness (FE). Provided a lead nation command and control structure, how did the level of interoperability of the armies impact force effectiveness (lethality, survivability, and sustainment)?

Systems Interoperability (SI). How operationally effective and interoperable are the C4I systems of the different armies in a lead-nation command and control structure?

Program and National Initiatives (P&NI). Provided with various P&NI inputs and requirements, what ABCA Standardization Agreements and Advisory Publications require modification and how should they be modified?

Thread Analysis.

Although the ABCA Ex 04 main effort was organized to conduct analysis within these lanes, it was recognized that many questions or issues would cross or impact multiple focus areas. Therefore, employing a "Mission Thread Analysis" approach was used as a method to identify these issues, to deconflict between focus areas to prevent duplication of effort, and to see any cause-and-effect relationship across the areas. Another analytic collection technique was a "Decision Threads" methodology, which likewise may cross focus areas. Essentially a decision thread originates from a command "decision point" and follows the effect and actions taken as a result of that decision.

In order to adequately assess a mission thread, an architectural view is required. The mission thread information contained in this annex is a product of the Coalition Operational Architecture (COA) developed for ABCA Exercise 2004. The mission and purpose of the COA was determining the information exchange requirements (IERs) for the coalition force. This product describes who talks to whom (including information system requirements) and what they communicate about. The ABCA Ex 04 COA addressed specific organization arrangements for that exercise, structured around a US divisional headquarters, and subordinate maneuver brigades from each of the ABCA nations. The true customers of the COA are the Systems Architects (SA) and the Technical Architects. The Systems Architects determine the information exchange system solutions for the coalition, based on the IERs from the OA, while the Technical

ANNEX E, THREAD ANALYSIS

Architects attempt to provide the real-world systems according to the specifications of the Systems Architects.

The COA is a "snapshot in time" for future coalition efforts. An operational architecture is produced for a stated purpose, as the ABCA Armies are on an individual schedule for command and control upgrade and revision, and a continuous cycle of advancement, improvement, and organizational changes. The referenced COA is a starting point for future coalition efforts, and would have to be revisited to determine how a particular coalition differs from the arrangement for ABCA Ex 04.

Mission Threads are a structured, graphical modeling technique, capturing data in three ways: by identifying critical process and their component activities; identifying their participating or performing operational elements or nodes; and displaying the information workflow in an easy-to-use and understandable manner.

A Mission Thread shows the sequenced steps of activities and information flow between operational nodes, and it has an identified beginning and end. For example ABCA Ex 04 was planned as a Command, Control, Communications, Computers and Intelligence (C4I) interoperability exercise integrated within a larger U.S. joint (USAF, USN, USMC, US Army and US—UK Bilateral) exercise. The 25 mission threads for this exercise are listed in Table E-1 below.

Table E-1.

Coalition Forces Mission Threads
• Conduct Collaborative Planning
• Exchange Orders and Graphics
• Develop and Disseminate the Common Operational Picture (COP)
• Conduct Tactical Fire Mission Processing
• Disseminate Fire Support Coordinating Measures
• Tactical Units Submit Air Support Request
• Exchange Airspace Plans, Orders, and Graphics
• Execute Tactical Air Defense
• Exchange NBC Reports and Warnings
• Synchronize Supply (Class I (subsistence), III (POL), V (ammunition), & Water) Support
• Coordinate Transportation Support
• Units from CJTF to Brigade Update the COP with Enemy Situation (ENSIT)
• Employ UAV to Conduct Battle Damage Assessment
• Conduct Search and Rescue
• Early Entry Forces Call for Immediate Close Air Support (CAS)
• Effect Link-Up
• Upon Receipt of a Fragmentary Order (FRAGO) Conduct Enroute Mission Planning
• Locate and Destroy an Enemy Mobile (Time Sensitive Target) C2 Site
• Coordinate a Brigade Passage of Lines within Military Operations on Urbanized Terrain (MOUT) Operation
• Unit Reports Refugee Status
• Unit Reports an Obstacle

• Coordinate Air Assault Operation
• Unit Requests medical evacuation (MEDEVAC)
• Reports Enemy Prisoners of War (EPWs)

From an analysis perspective, a major advantage of this modeling technique is that it facilitates the logical capture and description of what an enterprise or organization actually does in the performance of their collective mission. From a user perspective, Mission Threads are easy to use due to the intuitive sequence or trace of logical steps within a process description.

Functional decomposition typically segregates disparate activities within separate model diagrams that frequently inhibit cross-functional analysis. A Mission Thread approach avoids this complication by placing the activities in the same view, thereby highlighting the activity and thus the cross-functional area interactions. This approach has been found most useful for the analysis of interoperability of heterogeneous organizations and systems. An example of how operational mission threads are mapped is illustrated in Figure E-2 on the following page.

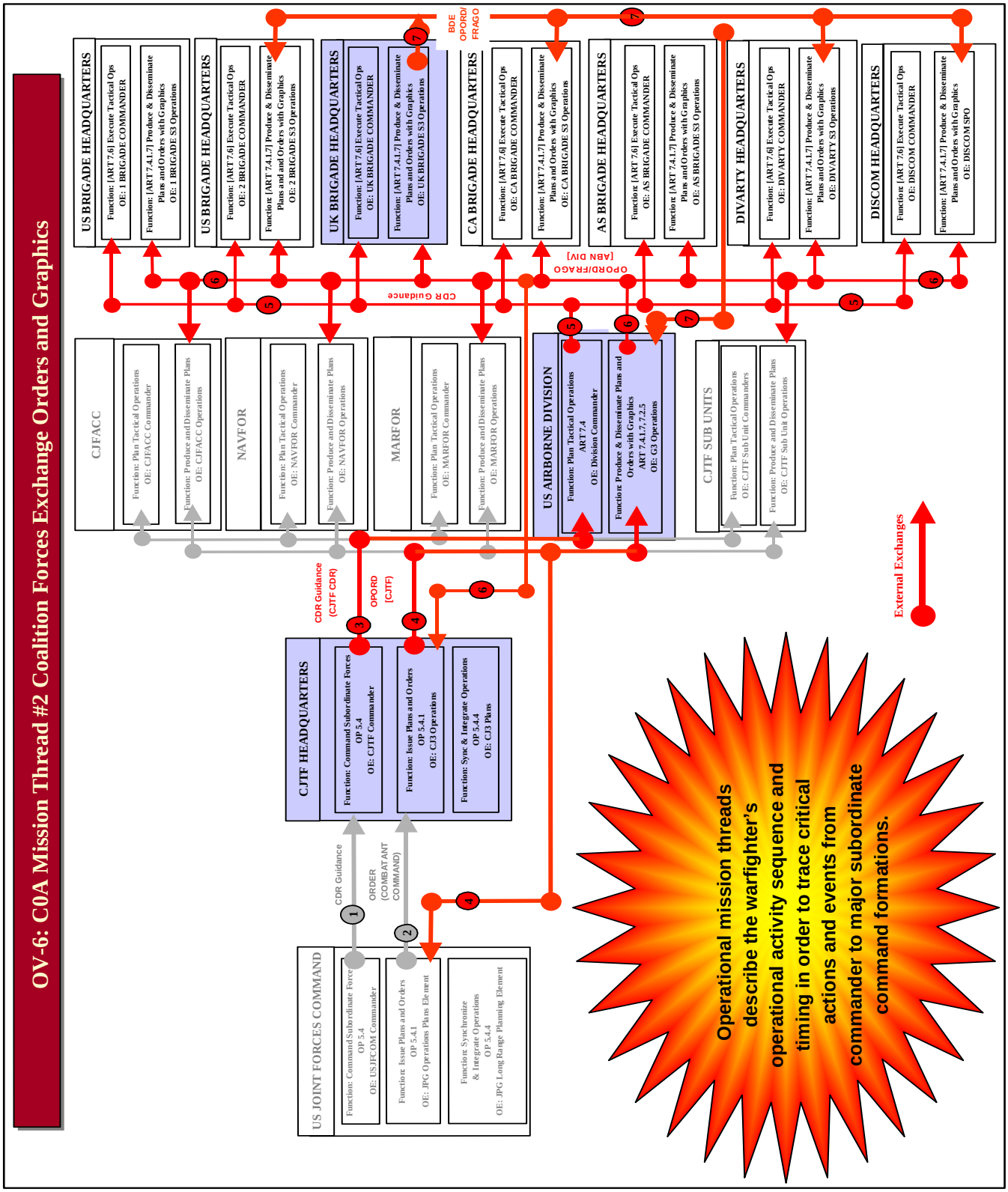

Figure E-2: Coalition Operational Architecture (COA) Mission Thread Example

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ANNEX F, EXERCISE SUPPORT REQUIREMENTS

There is a substantial administrative requirement underpinning the planning, executing, and reporting of the analysis for an ABCA biennial exercise or experiment. This is primarily a responsibility of the nation leading the analysis effort. Examples of some major administrative products are provided in the following appendices.

Appendix 1. Interoperability Factors for Gap Analysis 1-F-1

Appendix 2. STARTEX Data Requirements 1-F-2

Appendix 3. Augmentee Requirements Request 1-F-3

Appendix 4. Manning Spreadsheet 1-F-4

Appendix 5. Analysis Network Requirements 1-F-5

Appendix 6. Exercise Minimum Security Requirements 1-F-6

Appendix 7. LOI for Analysts, SMEs, and Staff 1-F-7

Appendix 8. Exercise Site Survey Checklist 1-F-8

Appendix 9. White Cell Event Log Requirements 1-F-9

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1. Background.

Force effectiveness is a broad term that may be applied to military activities, with different possible interpretations according to scenario and context. For example, measuring the force effectiveness of a small reconnaissance unit tasked to gather information is likely to involve a number of metrics that are different to those used to measure the force effectiveness of a tank battalion conducting a peacekeeping operation.

As we extend the scenario space, it can be seen that each scenario may have common factors associated with other scenarios whilst still holding certain unique characteristics. Instinctively one may relate force effectiveness to things like exchange ratios and casualty rates. However in recent years (operations in Timor and Somalia) we have seen military peacekeeping operations where such measurements would be of little use. It is therefore necessary that a general definition of force effectiveness be flexible enough to be applicable to a wide variety of scenarios. One such general definition may be "the ability of a force to achieve its mission."

Many scenarios may require a specific definition of force effectiveness in order to capture the essence of the problem. For instance, the reconnaissance example referred to above may define force effectiveness as "the ability of the force to provide an awareness of the battlefield" while a definition appropriate for a peacekeeping mission may be "the ability of the force to maintain civilian normality."

Other terms that are all related to force effectiveness and may, at times, be used interchangeably include combat effectiveness, battlespace effectiveness and mission effectiveness. The word "effectiveness" is present in all of these definitions and using a simple dictionary definition (Macquarie Dictionary, 3rd Edition 1997) the scope of the term is once again emphasized:

"Effectiveness: The ability to produce the desired result."

For the purpose of establishing a baseline understanding, force effectiveness is defined as the successful application of capability to attain a stated outcome.

The ABCA Program identified the following attributes and context, which contribute to the maintenance of a force's effectiveness.

- Lethality: How does interoperability affect the coalition's capability to detect, identify, engage and destroy an opposing system through manoeuvre fire support and non-lethal effects?
- Survivability: How does interoperability affect the capability of the coalition to protect its fighting potential, through the employment of protection, mobility maintenance, and combat identification to allow combat power to be applied at the appropriate time and place?
- Sustainability: How does interoperability affect the ability to maintain continuous logistics support during all campaigns and major operations?

As an example, combining the ABCA Program aim for the 04 Exercise with the attributes above produced the overarching question for the analysis of force effectiveness in the ABCA Exercise US 04.

> "Provided a lead nation command and control structure, what is the impact of interoperability on the coalition's capability to fight, sustain, and survive (force effectiveness) in a tactical coalition environment?"

Therefore, as in the example, to assess and analyze force effectiveness, measures should include a coalition force's ability to apply each of the three attributes – lethality, survivability, and sustainability.

2. Capability.

Armies bring together many people, equipment, and systems and apply them to achieve a desired effect. Many references use the term "capability" extensively, but do not specifically define it. Based on the usage of the term and the standard dictionary definition, this appendix defines "capability" as the ability to achieve a desired effect.

An army's capability is a system of a number of inputs. Whilst the interpretation varies from nation to nation, the following may be considered basic inputs to capability:

- Organisation
- Personnel (incorporating individual training)
- Collective Training
- Command and Management (incorporating doctrine)
- Major Systems
- Facilities
- Support
- Supplies

The range of actions that a land force must be able to undertake can be referred to as "combat functions." These actions are: know, sustain, shape, strike, shield, and adapt. The relationships between these and the ABCA attributes of force effectiveness are shown in Figure F-1.

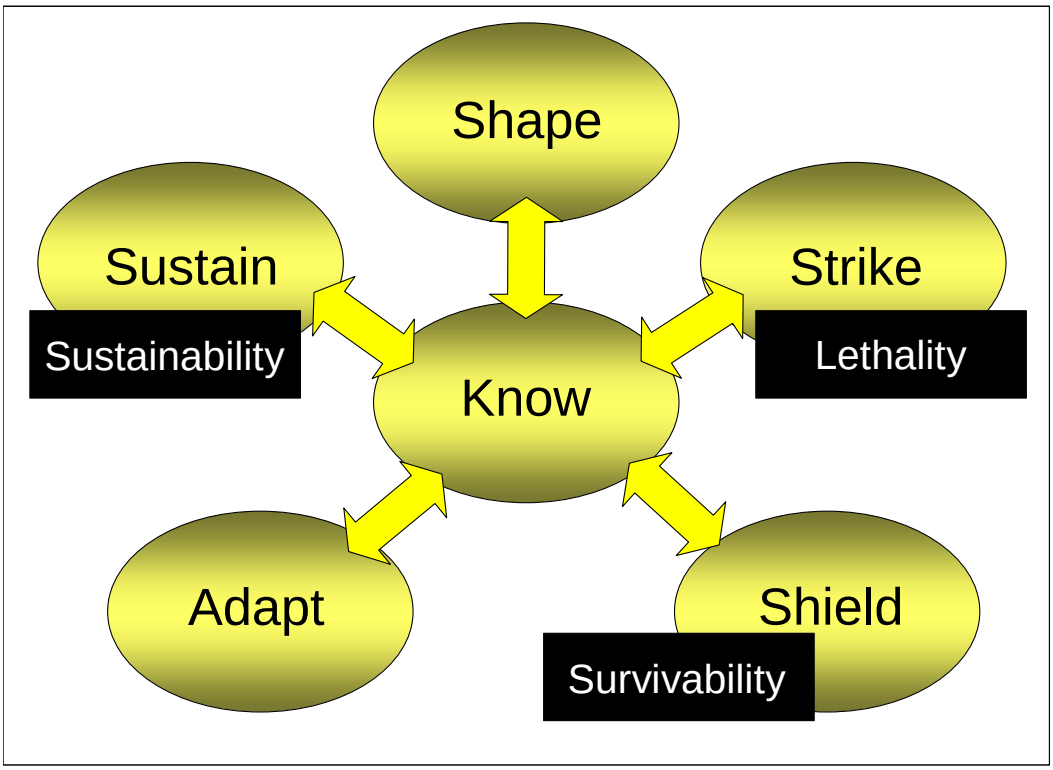

Figure F-1: Combat Functions.

Battlefield Operating Systems (BOS) is common terminology in the ABCA nations, although each nation has unique definitions. The BOS represents the major capability systems applied during land force operations throughout the battlespace. For the purposes of this paper, the following are considered representative of the different BOS:

- Manoeuvre
- Offensive Support
- Information Operations
- Intelligence, Surveillance and Reconnaissance
- Command, Control and Communications
- Mobility and Survivability
- Combat Service Support
- Ground Based Air Defence

The BOS provide the army with the means to fight. Land force capability can be viewed as a system of systems, made up of sub-systems or capability areas defined by the BOS. Each BOS represents the combination of the fundamental inputs as listed above in Section 2, Capability. The land forces fight by synchronizing the effects of BOS. BOS provide commanders with the means to achieve their objective. They are interdependent, no one is more important than any other, nor can they be applied separately. In simple terms the combat functions provide actions the army takes, the BOS represents the means

by which they go about performing those actions and the fundamental inputs to the capability are elements, which in combination are fielded as BOS.

3. Interoperability.

In order to assess interoperability gaps and their implications for force effectiveness it is necessary to gain an understanding of how interoperability may be defined. Kasunic (2001) noted that other authors also recognized interoperability as a broad and complex subject and use alternative definitions, including:

> "The ability of one system to receive and process intelligible information of mutual interest transmitted by another system." (Eldridge, 1978)
>
> "The effort required to couple one system with another." (McCall, 1980)
>
> "The ability of two or more systems or components to exchange information and to use the information that has been exchanged." (IEEE, 1990)

Tran and Douglas (2002) give perhaps the simplest definition as it embodies the consistent theme in all the definitions given so far:

> "Interoperability is systems working effectively together."

These definitions emphasize the importance of not only being able to exchange services or information but to be able to use it effectively. Illingworth (2002) notes that differences, such as cultural differences, can also be a key factor in the ability of systems to be used effectively in a coalition environment.

AAP-6, NATO Standardization Agreement, "NATO Glossary of Terms and Definitions (2004), provides the following definition.

> "The ability of alliance forces and when appropriate, forces of Partner and other nations to train, exercise and operate effectively together in the execution of assigned missions and tasks (4/10/2000)."

This definition is preferred for the purposes of this handbook as it is generic in nature and allows potential military interoperability issues to be included in the one definition.

4. Types of Interoperability.

The definitions above give a general description of interoperability but to further explain the concept, the following two types of interoperability are identified:

- Technical interoperability is the condition achieved among communications or electronic equipment when information services can be exchanged directly and satisfactorily between them and/or their uses.

- Operational interoperability relates to the general definition given in the previous section and includes people and procedures interacting on an end-to-end basis.

These two types of interoperability help us to recognize that the issue of interoperability is not just related to materiel items like guns, tanks, computers and other equipment and machinery, but also things like doctrine, training, and processes.

The US Defense Standardization Program (DSP, 2001) defines three types of interoperability:

> "Information systems interoperability is the DoD's highest priority and the focus of interoperability dialogue. Information interoperability includes all the technologies that enable systems and participants related to a mission to exchange data and communicate with each other. Key products influencing information interoperability include software, protocols, signal characteristics, and the equipment needed to create, transmit, receive, process, and display data.
>
> Materiel interoperability focuses on the form, fit, function, and interface (F3I) of materiel items. Materiel interoperability addresses the ability of materiel systems and items to work together efficiently and effectively and involves the compatibility, commonality, and interchangeability (levels of standardization) of materiel items.
>
> Doctrine interoperability focuses on the ability of individuals or organizations to effectively work together using a common set of rules defined by procedures, practices, or methods. Doctrine interoperability enables participants in a mission to understand how to execute operations based on shared guiding principles."

Materiel interoperability takes on the characteristics of the technical nature as discussed above while doctrine interoperability is operational in nature. Information systems interoperability may be both operational and technical in nature.

It is suggested that, for a force effectiveness focus area, interoperability types be categorized as none, operational, or both. In addition to identifying the current type of interoperability and type required, we need to identify the desired level of interoperability.

5. Levels of Interoperability.

Research shows that, as well as there being different types of interoperability, interoperability can be achieved at different levels of the joined systems.

One possible method would be to use the three levels mentioned in the definition of materiel interoperability. Compatibility would be at the lowest level, followed by interchangeability and commonality. Commonality as defined in Table 9 of this appendix would not only be unlikely but is unnecessary and infeasible. One possible

inadequacy of this hierarchy is that it does not describe any levels that may exist before compatibility is achieved or between levels of compatibility and interchangeability. As a result, this hierarchy may need to be expanded.

The ABCA Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Architecture Working Group (AWG) developed the Levels of Information Systems Interoperability (LISI), which consists of the five levels shown in Table 1.

This level of detail seems appropriate; however the LISI system may not be particularly adaptable to types of interoperability other than those to do with information systems. For instance, the LISI system may not be particularly suited for classifying doctrine interoperability. Another similar set of levels has been used by Land Operations Division of DSTO (Reid, 2002):

- Enterprise integration – overarching structure across scenarios
- Process integration processes – within specific scenarios
- Semantic interoperability – relating meaning in different world views
- Connectivity (technical) – moving data around, middleware, and parsers
- Physical – consumable (ammunition, fuel)

Table F-1-1: Levels of Systems Interoperability

Level	**Description**
Level 0 Isolated Interoperability in a Manual Environment	Level 0 encompasses the wide range of isolated or stand-alone systems. No direct electronic connection is allowed or available, so the only interface between these systems is by manual re-keying or extractable, common media. Fusion of information, if any, is done off-line by the individual decision-maker by other automated means.
Level 1 Connected Interoperability in a Peer-to-Peer Environment	Level 1 systems are capable of being linked electronically and providing some form of simple electronic exchanges. These systems have limited capacity, generally passing homogeneous data types such as voice, simple "text" email, or fixed graphic files such as GIF or TIFF images between workstations. They allow decision-makers to exchange one-dimensional information but have little capacity to fuse information to support decision-making.
Level 2 Functional Interoperability in a Distributed Environment	Level 2 systems reside on local networks that allow data sets to be passed from system to system. They provide for increasingly complex media exchanges. Formal data models (logical and physical) are present. Generally however, only the logical data model is accepted across programs and each program defines its own physical data model. Data is generally heterogeneous and may contain information from many simple formats fused together, such as an image with an annotated overlay. Decision-makers are able to share fused information between systems or functions.
Level 3 Domain-Based Interoperability in an Integrated Environment	Level 3 systems are capable of being connected via wide area networks (WAN) that allow multiple users to access data. Information at this level is shared between independent applications. A domain-based data model is present (logical and physical) that is understood, accepted, and implemented across a functional area or

	group of organizations that comprise a domain. Using agreed-upon domain data models, systems must now be capable of implementing business rules and processes to facilitate direct database-to-database interactions, such as those required to support database replication servers. Individual applications at this level may share central or distributed data repositories. Systems at this level support group collaboration on fused information products. Decision-making is supported by fused information from a localized domain.
Level 4 Enterprise-Based Interoperability in a Universal Environment	Level 4 systems are capable of operating using a distributed global information space across multiple domains. Multiple users can access and interact with complex data simultaneously. Data and applications are fully shared and can be distributed throughout this space to support information fusion. Advanced forms of collaboration (the virtual office concept) are possible. Data has a common interpretation regardless of form, and applies across the entire enterprise. The need for redundant, functionally equivalent applications is diminished since applications can be shared as readily as data at this level. Decision-making takes place in the context of, and is facilitated by, enterprise-wide information found in this global information space.

The NATO Interoperability Planning Document (NATO, 1993) defines six levels of system interconnection. Levels 1 to 3 relate to interconnections between systems that are not electronically connected (e.g. requiring human involvement). Levels 4 to 6 refer to electronically connected systems, i.e., system-to-system interconnectivity with:

- (Level 4) predetermined constraints and dynamically controlled data access,
- (Level 5) dynamically controlled data access, or
- (Level 6) full access to all information and programs on either system.

The levels are shown in Table 2.

Table F-1-2: NATO Levels of Systems Interconnection

Man in the loop	Level 1	Off-line communication
	Level 2	Collocated systems, separate operators
	Level 3	Collocated systems, single operator
Automated	Level 4	Pre-determined constraints
	Level 5	Dynamic constraints
	Level 6	Full access to all information and programs

Again, this system may be constrained to dealing with information interoperability and neglect materiel and doctrinal interoperability.

Bares (2000) introduced three alternative levels, which may be more suited to all types of interoperability. They are shown in Table 3.

Table F-1-3: Bares' Levels of Interoperability

Interconnectivity	This lowest level refers to all the necessary means to allow systems to communicate with each other.
Interoperability	Reflects a system's ability to assess meaning between cooperative systems.
Inter co-operability	Implies that the systems are able to share much, if not all, information relating to their common activity and can act to assist each other.

Clark and Moon (2001) also recognized that the LISI model was suitable for technical interoperability but wanted a model that was able to "take account of the organisational, doctrinal and cultural aspects of interoperability in military operations." They thus proposed the Organisational Interoperability Model based on the structure of the LISI model, that is, five levels of interoperability projected across four enabling attributes. The model is summarized in Table 4.

Table F-1-4: Organisational Interoperability Model

	Preparedness: What doctrine, experience and training enable the organizations to work together?	**Understanding:** What level of information sharing exists and how is information used?	**Command Style:** How are roles and responsibilities delegated or shared?	**Ethos:** What level of trust, culture and values and goals are shared?
Level 4 Unified	Complete – normal day-to- day working	Shared	Homogeneous	Uniform
Level 3 Combined	Detailed doctrine and experience in using it	Shared comms and shared knowledge	One chain of command and interaction with home organisation	Shared ethos but with influence from home organisation
Level 2 Collaborative	General doctrine in place and some experience	Shared comms and shared knowledge about specific topics	Separate reporting lines of responsibility overlaid with a single command chain	Shared purpose; goals, value system significantly influenced by home organisation
Level 1 Cooperative	General guidelines	Electronic comms and shared information	Separate reporting lines of responsibility	Shared purpose
Level 0 Independent	No preparedness	Voice comms via phone etc	No interaction	Limited shared purpose

Of particular interest to the ABCA community is that the above model was applied to the International Force in East Timor, an Australian lead coalition authorized by the United Nations to enforce peace in East Timor from September 1999 to February 2000. These assessments helped to identify potential interoperability issues for future coalition forces. Clark and Moon looked at the attributes of interoperability from the perspective of the interaction between members of the coalition. As a result,

comparisons of the level of interoperability between pairs of components in the system were made (in this case the components are each country in the coalition).

Hamilton et al. (2002) proposed a simplified model to measure C4ISR interoperability. Each system is labeled with a color code (referred to as a stoplight model) based on two factors:

1. Whether the system has any known interoperability problems.
2. Whether the system meets its interoperability requirements set.

Hamilton's model is however very specific to the US DoD and its Joint Interoperability Test Command (JITC) unit.

Kasunic (2001) also proposed a stoplight-like model that involved using a systems interoperability scorecard. The scorecard was set up as a matrix with all the possible systems listed in both the rows and columns and the entries contained a system-to-system interoperability rating of inadequate (red), marginal (yellow), or adequate (green).

6. An Alternative Interoperability Model.

An alternative stoplight model similar to that of Kasunic (2001) could be proposed for ABCA exercises or experiments that take the perspective of whether or not the interoperability of an issue is sufficient to be used on the battlefield. (Here 'issue' may not be the right term, for example, it may represent a piece of machinery or a procedure.) Table 5 summarizes a model that could be applied in the analysis reporting process.

Table F-1-5: Alternative Stoplight Model

Stoplight	Description
Red	There is no interoperability and the system / issue cannot be used in a coalition environment.
Amber	The interoperability is such that the system / issue is suitable for use although it is not entirely efficient (for example, this may mean that some double processing or manual intervention is necessary but the system can still be used).
Green	The interoperability is such that the system / issue can be used exactly as intended and any increase in commonality will result in no improved efficiency.

7. ABCA Exercise or Experiment Force Effectiveness Interoperability Levels

This appendix has focused on the need to determine a set of levels applicable to different types of interoperability. What is required for an ABCA exercise or experiment is a more detailed description of the levels of interoperability so that the coalition armies can assess their current and future interoperability requirements. The suggested levels in Table 6 are not exhaustive or flawless; they are intended to provide an example and

stimulate concept development. The table is focused on key issues from the definitions of interoperability, which are to provide, accept, and exchange services effectively.

Table F-1-6: Proposed Force Effectiveness Interoperability Levels

Level	Description
Isolated	Stand-alone systems that cannot be used with any other system. Any attempt to do so will result in a fundamental breakdown of the system(s).
One Way Connectivity	The system can provide or accept services via an intermediate process. There is no exchange or services between two systems.
Two Way Connectivity	The system can be used to provide, accept and exchange services via an intermediate process.
One Way Compatibility	The system can provide or accept services in a useable format. Exchange of services requires an intermediate process.
Two Way Compatibility	The system can be used to provide, accept, and exchange services in a useable format.
Interchangeability	The system can be interchanged with another system with no loss of functionality.
Commonality	The system is identical to another system.

8. Factors Affecting Interoperability.

This appendix has defined interoperability and identified the various types of interoperability that may exist. However, specific factors that may contribute to a system being interoperable are yet to be defined. The following list contains factors that could be considered potential characteristics of all types of interoperability. The list is by no means complete or exclusive and is intended to generate future discussion.

- Coordination: the ability of the system to bring diverse elements into order
- Flexibility: the ability of the system to be flexible to changing circumstances
- Reliability: how well the system can be trusted
- Effectiveness: how well the system is equipped and prepared
- Robustness: the ability of the system to be used in a range of environments
- Portability: how easily the system can be carried or moved (not just in the physical sense)
- Consistency: the degree of conformity with previous systems

The following attributes of interoperability know as PAID were developed by the C4ISR AWG (1998):

- **Procedures:** Policies and procedures that govern a systems development through established standards and the procedures and processes that influence system integration and functional operational requirements.
- **Applications:** The functions a system is intended to perform. These functions reside most often in the form of user-based application programs that perform or support a specific set of processes or procedures.
- **Infrastructure:** The infrastructure required to support the systems operations. This contains four sub-components that are also defined in terms of increasing levels of sophistication.

- **Data:** The data and information structures used to support both the functional applications and system infrastructure.

A considerable number of interoperability issues tend to be associated with information exchange. Table 7 shows a list of possible contributing factors to interoperability.

Table F-1-7: Factors that Affect Interoperability

Code	Factor	Description
1	Accessibility	Data is instantly available or easily and quickly retrievable
2	Accuracy	Data is correct and error-free
3	Quality & Requirements	The amount of data is good, and Commander's Critical Information Requirements were met
4	Believability	Data is regarded as true, real, and credible; it is highly regarded for source and / or content
5	Completeness and fidelity	Data is of sufficient breadth, depth, and scope for the task at hand
6	Conciseness	Representation of the data is compact and not overwhelming
7	Understanding	Data is clear, unambiguous and easily understood
8	Interpretability	Data is in the appropriate language / units, and definitions are clear
9	Relevancy	Data is applicable to and helpful for the task at hand
10	Representational Consistency	Data is presented in a consistent format each time and is compatible with previous data
11	Timeliness	The age of the data is appropriate to the task at hand
12	Coordination	The ability of the system to bring divers elements into order
13	Flexibility & Adaptability	The ability of the system to be flexible to changing circumstances
14	Reliability	How well the system can be trusted
15	Robustness	The ability of the system to be used in a range of environments
16	Portability	How easily can the system be carried or moved (not just in a physical sense)
17	Consistency	Three degree of conformity with previous systems

9. Standardization.

Standardization is another important term and is the cornerstone of the ABCA Program. The ABCA Program defines standardization as the "development and implementation of concepts, doctrine, procedures, and design to achieve and maintain the required levels of compatibility, interchangeability, or commonality in the operational, procedural, material, technical, and administrative field to attain interoperability." Key terms from this statement are further defined in Table 8.

Table F-1-8: Definitions of ABCA Standardization Terms

Level	**Definition**
Compatibility	The capability of two or more items or components of equipment or material to exist or function in the same system or environment without mutual interference.
Interchangeability	A condition which exists when two or more items possess such functionality and physical characteristics as to be equivalent in performance and durability, and are capable of being exchanged one for the other without alteration of the items themselves, or of adjoining items except for adjustment, and without selection for fit or performance.
Commonality	A state achieved when groups of individuals, organizations, or national use common doctrine, procedures or equipment.

Start of Exercise (STARTEX) Data Requirements

Definition: Data and procedures used to initialize systems (C4I, Simulations, Test, etc.) as part of the preparation prior to the start of an exercise.

- Blue Coalition Order of Battle (ORBAT) by nation; with a description of assets and capabilities
- Red ORBAT; with a description of assets and capabilities
- Joint Task Force (JTF) OPLAN and ARFOR OPORD; OPORD for each coalition brigade
- Commander's Critical Information Requirements (CCIR) for Commander, ARFOR and Commanders of coalition brigades.
    - Friendly Force Information Requirements (FFIR)
    - Priority Intelligence Requirements (PIR)
- Intelligence Preparation of the Battlespace (IPB)
- High Payoff Target List (HPTL)
- Attack Guidance Matrix (AGM)
- Map Products
    - Map sheets
    - Digital Maps
- (US) Army Battle Command Systems (ABCS) (especially the C2 piece) equipment description
- Known work-arounds list
- Established coalition Tactics, Techniques and Procedures (TTPs)
- LAN, TacLAN and radio bandwidth and frequency data
- Signal Operation Instructions (SOIs), FM/VHF security, radio fills, etc.
- Friendly/Enemy footprint
- Command Post/Tactical Operations Center (CP/TOC) organization and layout

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ANNEX F, APPENDIX 3, AUGMENTEE REQUIREMENTS REQUEST

SUBJECT: Request for Subject Matter Expert (SME) Augmentation for the American, British, Canadian, Australian (ABCA) Armies Standardization Program Exercise

1. Background – The ABCA Program exists to achieve levels of standardization necessary for two or more ABCA Armies to operate effectively together within a coalition. The ABCA Program holds biennial exercises in order to assess coalition interoperability capabilities.

a. The next ABCA Exercise will be hosted and executed in (location and date). The (name of the lead agency) is conducting the analysis efforts for the exercise.

b. (Provide a short general description of the type of exercise/experiment and involvement of the ABCA armies)

2. Location – ABCA Exercise _____ will be conducted (location).

3. Qualifications – The (number) Subject Matter Expert (SME) personnel required for the analysis supporting the ABCA Exercise _____ are listed in the enclosure.

4. Report /Release Dates. (First and last days of TDY periods are travel days)

Report Date: NLT ____ / Final Release Date: _____

5. Level of Clearance – All lines require at least (level) security clearance.

6. Request Justification – (short paragraph explanation).

7. Funding – _____ ABCA Exercise Planning Cell (EPC) will fund TDY. POCs for fund cite information are _____. _____ will contact each individual and provide a welcome letter along with specific administrative information for that person's position.

8. EPC POCs – Are _____-

9. Type of Orders – (list type).

10. Special Instructions –

a. It is desirable that all tasked personnel come from the host site (facility) in order to minimize costs for this exercise.
b. Personnel supporting ABCA Exercise _____ must bring (special or require clothing or equipment, _____).
c. Personnel support ABCA Exercise _____ will be expected to collect data for a designated 12-hour shift as the exercise is conducted 24/7.
d. Analyst and SME Training dates: ____.

e. Rehearsal: (dates)
f. Exercise dates: (dates).
g. After Action Review/Interviews/Surveys: (dates).
h. Billeting and messing will be provided (by facility).
i. Transportation??? Military drivers license?
j. Other (Laptop computers and automation support for data collection will be provided, etc.).

11. In-Processing / Reporting Location: Bldg # _____? Street

12. Other ?

Table F-3-1: Example Enclosure Subject Matter Expert Support for ABCA Exercise (Line by line detail of augmentee: rank, branch, specialty, background experience, special qualification or clearance, position/responsibility, etc.)

Line Number	Exercise Position	Position Location	Pay Grade	Branch	Background Reqts	Exercise Location
ECGA-137	Liaison Officer Combat (LNO CBT)	Exercise Control Group	MAJ	CBT Arms	BCTP, CBT Arms	TBD
ECGA-027	Subject Matter Expert Combat (SME CBT)	USJFCOM	LT COL	CBT Arms	CBT Arms, Corps Staff	TBD
ECGA-151	Senior Subject Matter Expert Combat (SR SME CBT)	ARFOR Main	COL	CBT Arms	Former CDR, CofS, S3	TBD
ECGA-170	Senior Subject Matter Expert Combat (SR SME CBT)	US ARFOR TAC	LT COL	CBT Arms	Former CDR, CofS, S3	TBD
ECGA-181	Senior Subject Matter Expert Combat (SR SME CBT)	US BDE	LT COL	CBT Arms	Former CDR, CofS, S3	TBD
ECGA-203	Subject Matter Expert Combat (SME CBT)	United Kingdom BDE	LT COL	CBT Arms	Bde S3 Exp	TBD
(To be determined)	Subject Matter Expert Combat (SME CBT)	Opposing Forces	MAJ	CBT Arms	JRTC, CBT Arms	TBD
(To be determined)	Subject Matter Expert Combat (SME CBT)	QRF Analysis Team	MAJ	CBT Arms	Bde S3 Exp	TBD
ECGA-138	Liaison Officer Combat Support (LNO CS)	Exercise Control Group	MAJ	ANY CS	BCTP, CS	TBD
ECGA-140	Liaison Officer Combat Support (LNO CS)	Simulation-Stimulation	MAJ	ANY CS	BDE Staff	TBD

ANNEX F, APPENDIX 4, MANNING SPREADSHEET

The following spreadsheet provides an example of a line-by-line identification of analysts and SMEs required to support an ABCA exercise employing an ARFOR Headquarters with subordinate ABCA Army Brigade Headquarters and supporting elements.

Personal Identification Numbers (PINs) are used both to track input by job (analysts/SMEs/Admin personnel/liaison officers) into an observation database, and for administrative purposes (equipment tracking, billeting information, transportation, etc.).

Total Count	Host Exercise Line Number	PIN	Status	Position	Name	Rank		Background Reqts	Source
1	ECGA-101	A001	Mil	Chief of Analysis		COL	1	ABCA Prog Office, CofS	UK
2	ECGA-102	A002	Mil	Deputy CoA		LTC	1	TRAC-FLVN	US
3	ECGA-103	A003	Govt	Battle Cmd Lead Analyst		GS13	1	TRAC-FLVN	US
4	ECGA-104	A004	Civ	Battle Cmd Analyst		CIV	1	CONTRACTOR	US
5	ECGA-105	A005	Civ	Battle Cmd Analyst		CIV	1	CONTRACTOR	US
6	ECGA-106	A006	Govt	Force Effectiveness Lead Analyst		SPC A/B	1	DSTO	AS
7	ECGA-107	A007	Mil	Force Effectiveness Analyst		Maj	1	DoD Australia	AS
8	ECGA-108	A008	Govt	Force Effectiveness Analyst		GS14	1	TRAC-LEE	US
9		A038	Cont	Force Effectiveness Analyst		CIV	1	TRAC-LEE	US
10	ECGA-109	A009	Mil	Force Effectiveness SME		LtCol	1	G75 LHQ	AS
11		A010	Mil	Force Effectiveness Analyst		MAJ	1	TRAC-WSMR	US
12	ECGA-110	A011	Govt	Human Behavior Lead Analyst		GS	1	ARL-APG	US
13	ECGA-111	A012	Cont	Human Behavior Analyst		CIV	1	CONTRACTOR	US
14	ECGA-112	A013	Govt	Human Behavior Analyst		CIV	1	ARL-APG	US
15		A039		ARL Data Base Analyst		CIV	1	ARL-APG	US
16		A040	Cont	ARL SA Technology Cont		CIV	1	ARL-APG	US
17	ECGA-113	A014	Govt	Systems Integration Lead Analyst		GS	1	LFDTS HQ	CA
18	ECGA-114	A015	Mil	Systems Integration Analyst		CPT	1	TRAC-FLVN	US
19	ECGA-115	A016	Mil	Systems Integration Analyst		LCOL	1	ABCA Prog Office, SO1 C4I	CA
20	ECGA-116	A017		Systems Integration Analyst		Govt Civ	1		CA
21		A018		Systems Integration Analyst		Govt Civ	1		CA

Total Count	Host Exercise Line Number	PIN	Status	Position	Name	Rank		Background Reqts	Source
22		A019	Cont	Q&NI Lead Analyst		CONT	1	CONTRACTOR	UK
23		A020		Q&NI Analyst (1)		CONT	1	CONTRACTOR	UK
24		A021		Q&NI Analyst (2)		CONT	1	CONTRACTOR	UK
25		A703		UK SME HOD		COL	1		UK
26		A704		UK SO1 (WFE)		LtCol	1		UK
27		A705		UK SO2 (WFE)		Maj	1		UK
28		A022	Mil	ABCA SO1 CS		LtCol	1	ABCA Prog Office	UK
29		A023	Mil	ABCA SO1 CSS		LtCol	1	ABCA Prog Office	AS
30		S024		QWG ENG (CBT) Rep		MAJ/SO2	1	QWG Engr	US
31		S026		QWG EW/ SIGENT Rep		MAJ/SO2	1	QWG EW/SIGINT	US
32		S027		Info Opns SME			1		US
33		S028		Info Opns SME			1		US
34		S029		QWG INT Rep		MAJ/SO2	1	QWG INT	US
35	ECGA-131	X001	Cont	Opns Officer		CIV	1	CONTRACTOR	US
36	ECGA-132	X002	Mil	Opns Officer		MAJ	1	US Army G3	US
37	ECGA-133	X003	Govt	Opns Officer		GS6	1	TRAC-FLVN	US
38	ECGA-134	X004	Mil	Opns NCO			1	TRAC-FLVN	US
39	ECGA-135	X005	Cont	Admin/Security Officer		CIV	1	CONTRACTOR	US
40	ECGA-136	X018	Govt	SO2 Agreements		Govt Civ	1	ABCA Prog Off	UK
41		X019	Mil	SO2 Coordination		MAJ	1	ABCA Prog Off	AS
42		X020	Mil	SO1 Operations		LtCol	1	ABCA Prog Off	NZ
43		X021	Govt/ Cont	Network Technician		CIV	1	TRAC-FLVN	US
44	ECGA-118	X008	Cont	Quality Control Officer		CIV	1	CONTRACTOR	US
45	ECGA-119	X009	Govt	Quality Control Officer		CIV	1	TRAC-WSMR	US
46		X010		Quality Control Data Entry Opr			1		CA
47		X011	CONT	Quality Control Analyst		CONT	1	CONTRACTOR	UK
48		X006	Govt	DB Mgt Officer		MAJ	1		AS
49	ECGA-125	X012	Govt	DB Mgt Officer		CWO	1		AS
50	ECGA-126	X013	Cont	DB Mgt Officer		CIV	1	CONTRACTOR	US
51	ECGA-127	X014	CONT	DB Clerk		CONT	1	CONTRACTOR	UK
52	ECGA-128	X015		DB Clerk		MIL	1		CA
53	ECGA-129	X016	Cont	NSC Rep		CONT	1	CONTRACTOR	US
54	ECGA-130	X017		VISION XXI Rep		CONT	1	CONTRACTOR	US
55	ECGA-120	A030	Mil	QRF Analysis Team Ldr		LTC	1	DUSA-OR	US
56	ECGA-121	A031		QRF Analysis Team Analyst			1		AS

ANNEX F, APPENDIX 4, MANNING SPREADSHEET

Total Count	Host Exercise Line Number	PIN	Status	Position	Name	Rank		Background Reqts	Source
57	ECGA-122	A032		QRF Analysis Team SME		CIV	1		CA
58	ECGA-123	A033	MIL	QRF Analysis Team SME		MAJ	1	CBT ARMS	UK
59	ECGA-124	S001		QRF Analysis Team SME SO1 Cbt		LTC	1	ABCA Prog Off	US
60		S002		QRF Analysis Team SME			1	MAJ, CBT Arms	AS
61		A034		Proj Tm IE QRF Tm Ldr		CIV	1	Project TM Interoperability & Engineering (IE)	US
62		A035		Proj Tm IE QRF Analyst		CIV	1	Project TM IE	AS
63		A035		Proj Tm IE QRF Analyst			1	Project TM IE	CA
64		A037		Proj Tm IE QRF Analyst			1	Project TM IE	UK
65		A041		Proj Tm IE QRF Analyst			1	Project TM IE	US
66		A900		ABCA Test Control Center (CIS) Analyst		Govt Civ			
67		A901		ABCA Test Control Center (CIS) Analyst		Govt Civ			
68		A902		ABCA Test Control Center (CIS) Analyst		Govt Civ			
69		A903		ABCA Test Control Center (CIS) Analyst		Govt Civ			
70		A904		ABCA Test Control Center (CIS) Analyst		Govt Civ			
71		A905		ABCA Test Control Center (CIS) Analyst		Govt Civ			
72		A906		ABCA Test Control Center (CIS) Analyst		Govt Civ			
73		A907		ABCA Test Control Center (CIS) Analyst		Cont			
74		A101		OPFOR Analyst		GS12	1	ADCSINT - Threats	US
75		S101		OPFOR SME CS		MAJ	1	JRTC	US
76	ECGA-117	X007	Cont	Scenario Exercise Control Officer		CIV	1	BAH	US
77	ECGA-137	L100		EXCON Grp LNO CBT		MAJ	1	BCTP, CBT Arms	US

Total Count	Host Exercise Line Number	PIN	Status	Position	Name	Rank		Background Reqts	Source
78	ECGA-138	L101		EXCON Grp LNO CS		MAJ / CIV Equiv	1	BCTP, CS	US
79	ECGA-139	L102		SIM/STIM LNO C4I		MAJ	1	BDE Staff	US
80	ECGA-140	L103		SIM/STIM LNO CS		MAJ	1	BDE Staff	US
81	ECGA-026	A100	Govt	USJFCOM Analyst		GS13	1	TRAC-FLVN	US
82	ECGA-027	L104		USJFCOM SME CBT		LTC	1	CBT Arms, Corps staff	US
83	ECGA-141	A800		DISCOM Analyst		GS12	1	TRAC-LEE	US
84	ECGA-142	S800		DISCOM SME CSS		MAJ	1	DISCOM Staff or FSB CDR	US
85	ECGA-143	S801		SIG BN SME		MAJ	1	SWP IE	CA
86	ECGA-144	S802		SIG BN SME		MAJ	1	SWP IE	CA
87	ECGA-145	S803		DIVARTY SME		MAJ	1	FA Officer	US
88	ECGA-146	S804		DIVARTY SME		MAJ	1	FA Officer	AS
89	ECGA-147	A200		US ARFOR Main Analyst		LTC	1	Bn/Bde/Div HQ Opns Exp	US TRAC
90	ECGA-148	A201		US ARFOR Main Analyst		MAJ	1	Bde S2/Div G2 Exp	US TRAC
91	ECGA-149	A202		US ARFOR Main Analyst		MAJ	1	BDE or DIV Staff	US TRAC
92	ECGA-150	A203		US ARFOR Main Analyst		MAJ	1	BDE or DIV Staff	US TRAC
93	ECGA-151	S200		ARFOR Main Senior SME CBT		COL	1	Former CDR, CofS, S3	US
94	ECGA-152	S201		ARFOR Main SME CS		MAJ	1	BDE Staff	US
95	ECGA-153	S202		ARFOR Main SME CSS		MAJ	1	DISCOM, CSS	US
96	ECGA-154	S203		ARFOR Main SME C4I		LTC	1	Bde S2/Div G2 exp	US
97		S025	MIL	ARFOR MAIN SCIF SME		LTC	1	TS/SCI Clearance	US
98		S030	MIL	ARFOR MAIN SCIF SME		MAJ	1	TS/SCI Clearance	US
99	ECGA-155	S204		ARFOR Main SME CBT		MAJ	1	BDE or higher staff, CBT	AS
100	ECGA-156	S205		ARFOR Main SME C4I		MAJ	1	BDE or higher staff, signals	AS
101	ECGA-157	S206		ARFOR Main SME C4I		LCOL	1	SC QWG CIS	CA
102	ECGA-158	S207	Mil	ARFOR Main SME CSS (QWG LOG)		LCOL	1		CA
103	ECGA-159	S208	MIL	ARFOR Main SME CBT		MAJ	1	BDE or higher staff, CBT	UK
104	ECGA-160	S209	MIL	ARFOR Main SME CS (ENG)		MAJ	1	BDE or higher staff, ENG	UK
105	ECGA-161	A204		ARFOR Main Human Behavior Analyst		LTC	1	MI, ACE Experience	US
106		A205	GOVT	ARFOR Main Human Behavior Analyst		CIV	1	ARL-APG	US

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Total Count	Host Exercise Line Number	PIN	Status	Position	Name	Rank		Background Reqts	Source
107	ECGA-162	A300		US ARFOR TAC Analyst		LTC	1	Bn/Bde/Div HQ Opns Exp	US TRAC
108	ECGA-163	A301		US ARFOR TAC Analyst		MAJ	1	Bde S2/Div G2 Exp	US TRAC
109	ECGA-164	S300		US ARFOR TAC SME CS (ENG)		MAJ	1	DIV Staff	AS
110	ECGA-165	S301		US ARFOR TAC SME CSS		MAJ	1	DIV Staff	AS
111	ECGA-166	S302		US ARFOR TAC SME FA		MAJ	1	DIV Staff	CA
112	ECGA-167	S303		US ARFOR TAC SME CSS		MAJ	1	DIV Staff	CA
113	ECGA-168	S304		US ARFOR TAC SME CBT		MAJ	1	DIV Staff	UK
114	ECGA-169	S305		US ARFOR TAC SME C4I-EW		MAJ	1	DIV Staff	UK
115	ECGA-170	S306		US ARFOR TAC Senior SME CBT		LTC	1	Former CDR, CofS, S3	US
116	ECGA-171	S307		US ARFOR TAC SME C4I		MAJ	1	Bde S2/Div G2 Exp	US
117	ECGA-172	S308		US ARFOR TAC Human Behavior SME		LTC	1	Former Cbt Arms Bn CDR	US
118		S309		US ARFOR TAC Human Behavior SME		MAJ	1	Former Cbt Arms Bn XO/S3 SME	US
119	ECGA-173	A400		US BDE Analyst		MAJ	1	Bde S2 Exp	US WSMR
120	ECGA-174	A401		US BDE Analyst		MAJ	1	Bde S2 Exp	US TRAC
121	ECGA-175	S400		US BDE SME FA		MAJ	1	BDE Staff	AS
122	ECGA-176	S401		US BDE SME CSS		MAJ	1	BDE Staff	AS
123	ECGA-177	S402		US BDE SME CS (ENG)		MAJ	1	BDE Staff	CA
124	ECGA-178	S403		US BDE SME CSS		MAJ	1	BDE Staff	CA
125	ECGA-179	S404		US BDE SME CBT		MAJ	1	BDE Staff	UK
126	ECGA-180	S405		US BDE SME C4I (CIS)		MAJ	1	BDE Staff	UK
127	ECGA-181	S406		US BDE Senior SME CBT		LTC	1	Former CDR, CofS, S3	US
128	ECGA-182	S407		US BDE SME C4I		MAJ	1	Bde S2/Div G2 Exp	US
129	ECGA-183	S408		US BDE Human Behavior SME		MAJ	1	Former Cbt Arms, Bn XO/S3	US
130		S409		US BDE Human Behavior SME		MAJ	1	Former Cbt Arms, Bn XO/S4	US
131	ECGA-184	A500		AS BDE Analyst		MAJ / CIV Equiv	1	BDE Staff	AS
132	ECGA-185	A501		AS BDE Analyst		MAJ / CIV Equiv	1	BDE Staff	AS

ANNEX F, APPENDIX 4, MANNING SPREADSHEET

Total Count	Host Exercise Line Number	PIN	Status	Position	Name	Rank		Background Reqts	Source
133	ECGA-186	S500		AS BDE Senior SME CBT		COL	1	Former CDR, CofS, S3	AS
134	ECGA-187	S501		AS BDE SME C4I		MAJ	1	BDE Staff	AS
135	ECGA-188	S502		AS BDE SME CBT		MAJ	1	BDE Staff	CA
136	ECGA-189	S503		AS BDE SME C4I		MAJ	1	BDE Staff	CA
137	ECGA-190	S504	MIL	AS BDE SME CS (ENG)		MAJ	1	BDE Staff	UK
138	ECGA-191	S505	MIL	AS BDE SME CSS		MAJ	1	BDE Staff	UK
139	ECGA-192	S506		AS BDE SME FA		MAJ	1	BDE Staff	US
140	ECGA-193	S507		AS BDE SME CSS		MAJ	1	BDE Staff	US
141	ECGA-194	A502		AS BDE Human Behavior Analyst / SME		MAJ	1	Former Cbt Arms, Bn XO/S3	AS
142		S508		AS BDE Human Behavior SME		MAJ	1	Former Cbt Arms, Bn XO/S3	US
143	ECGA-206	A600		CA BDE Analyst		Govt Civ	1		CA
144	ECGA-207	A601		CA BDE Analyst		Govt Civ	1		CA
145	ECGA-208	S600		CA BDE SME CBT		MAJ	1	BDE Staff	AS
146	ECGA-209	S601		CA BDE SME C4I		MAJ	1	BDE Staff	AS
147	ECGA-210	S602		CA BDE Senior SME CBT		LCOL	1	Former CDR, CofS, S3	CA
148	ECGA-211	S603		CA BDE SME C4I		MAJ	1	BDE Staff	CA
149	ECGA-212	S604	MIL	CA BDE SME FA		MAJ	1	BDE Staff	UK
150	ECGA-213	S605	MIL	CA BDE SME CSS		MAJ	1	BDE Staff	UK
151	ECGA-214	S606		CA BDE SME CS (ENG)		MAJ	1	BDE Staff	US
152	ECGA-215	S607		CA BDE SME CSS (SO1)		MAJ	1	BDE Staff	US
153	ECGA-216	A602		CA BDE Human Behavior Analyst		Govt Civ	1	Behavior /Human Factors Experience	CA
154		S509		CA BDE Human Behavior SME		MAJ	1	Cbt Arms, Former Bn XO/S3	US
155	ECGA-195	A700	CONT	UK BDE Analyst		CONT	1	CONTRACTOR	UK
156	ECGA-196	A701	CONT	UK BDE Analyst		CONT	1	CONTRACTOR	UK
157	ECGA-197	S700		UK BDE SME CS (ENG)		MAJ	1	BDE Staff	AS
158	ECGA-198	S701		UK BDE SME CSS		MAJ	1	BDE Staff	AS
159	ECGA-199	S702		UK BDE SME FA		MAJ	1	BDE Staff	CA
160	ECGA-200	S703		UK BDE SME CSS (SO2)		MAJ	1	BDE Staff	CA
161	ECGA-201	S704		UK BDE Senior SME CBT		COL	1	Former CDR, CofS, S3	UK
162	ECGA-202	S705		UK BDE SME C4I-CIS		MAJ	1	BDE Staff	UK
163	ECGA-203	S706		UK BDE SME CBT		LTC	1	Bde S3 Exp	US
164	ECGA-204	S707		UK BDE SME C4I		MAJ	1	Bde S2/Div G2 Exp	US

ANNEX F, APPENDIX 4, MANNING SPREADSHEET

Total Count	Host Exercise Line Number	PIN	Status	Position	Name	Rank		Background Reqts	Source
165		S708		UK BDE Human Behavior SME		MAJ	1	Cbt Arms, Former Bn XO/S3	US
166	ECGA-205	A702	CONT	UK BDE Human Behavior Analyst		CONT	1	CONTRACTOR	UK

Key:
A = Analyst
L = Liaison Officer
S = Subject Matter Expert
X = Admin/Operations

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ABCA Exercise Analysis Automation Requirements

The ABCA exercise analysts and subject matter experts will require adequate automatic data processing equipment (ADPE) and a Local Area Network (LAN) to support data input, processing, and insight development.

The basic requirement for the analyst network is to ensure there is sufficient quantity of ADPE for the analysts, security and accreditation requirements are met, and there is an adequate staff to operate, maintain and support the system.

Enough individual laptops or desktop PCs should be provided so that there are no delays in entering observations and analytic data. The network should provide the necessary capacity, speed, and flexibility to support analytic effort.

Figure 3-20: ABCA Exercise Analysis ADPE Requirements Example in Chapter 3, Section 3, "Analysis and Support Planning" illustrates the physical requirements for setting up a standalone secure analyst LAN. Specific areas should be allocated for the analysts and SMEs to work and upload observation data. The LAN may be supported with a dedicated server, networked printers and scanners.

Provisions for access to the Internet and personal email should be included in exercise planning.

An example list of the ADPE and peripheral equipment needed to support analysis of an ABCA division-level exercise (i.e., ARFOR headquarters and subordinate brigade headquarters elements from each ABCA nation) is below.

Item	Quantity
Laptop PC, 1.33Ghz, 128MB, 20GB, 10/100MBS,CD/RW	80
Network Server, 1GB, 2x80GB, 10/100/1000, CD/RW	1
Cisco 2950 Switch, 24 Port, 10/100	4
Brother IntelliFax 1270 Plain Paper Fax Machine	1
Umax 2000 USB Scanner	1
IOMega USB ZIP 250 Drives	4
MS IntelliMouse (Wheel)	80
Cat-5 Cable, 200 Ft., RED	20
Cat-5 Cable, 150 Ft., RED	20

Cat-5 Cable, 100 Ft., RED	20
Cat-5 Cable, 50 Ft., RED	20
Cat-5 Cable, 25 Ft., RED	20
Portable Flash Drive (memory stick)	20
Power Strips - 6 ft cord	40
Laser Jet 8000N Printer (Secret)	2
HP 4600 Color Printer (Secret)	1
Xerox copier (approx cost, est. 2 cents per copy extra) (Secret)	1
Classified Shredder	1
CD-ROM RW Disks	TBD
CD ROM Burner	1
3.5 Computer Disks	TBD
Secret Marking Labels - Classified Document Cover Sheets	TBD
3-4 Drawer Safe - Classified Secret	1

Minimum Requirements.

All Automation Information Systems (AIS) processing classified or unclassified-sensitive information will achieve the minimum security requirements through automated or manual means. Commanders and accreditation authorities may impose more stringent requirements based on the risk analysis.

Accountability. Safeguards will be in place to ensure that each person having access to an AIS may be held accountable for his or her actions on the AIS. For all AIS except small computers, an audit trail will provide a documented history of AIS use. The audit trail will be of sufficient detail to reconstruct events in determining the cause or magnitude of compromise should a security violation or malfunction occur. Audit trails should be reviewed for security implications daily, but as a minimum will be reviewed once per week. The manual or automated audit trail will document the following:

- The identity of each person and device having access to the AIS.
- The time of the access.
- User activity is monitored sufficiently to ensure user actions are controlled and open to scrutiny.
- Activities that might modify, bypass, or negate safeguards controlled by the AIS.
- Security-relevant actions associated with periods of processing, the changing of security levels, or categories of information.

Access. Each AIS will have an associated access control policy. It will include features or procedures to enforce the access control measures required for the information within the AIS. The identity of each user-authorized access to the AIS will be established positively before authorizing access.

Security training and awareness. All persons accessing an AIS will be part of a security training and awareness program. The program will ensure that all persons responsible for managing AIS resources or who access AIS are aware of proper operational and security-related procedures and risks.

Physical controls. AIS hardware, software, documentation, and all classified and unclassified-sensitive data handled by the AIS will be protected to prevent unauthorized (intentional or unintentional) disclosure, destruction, or modification. The level of control and protection will be commensurate with the maximum sensitivity of the information present in the system, and will provide the most restrictive control measures required by the data to be handled. This includes personnel, physical, administrative, and configuration controls. Unclassified hardware, software, or documentation of an AIS will be protected if access to such AIS resources reveals classified information, or information that may be used to eliminate, circumvent, or otherwise render ineffective the security safeguards for classified information. Software development and related activities (for example, systems analysis) will incorporate appropriate security measures if that software will be used for handling classified or unclassified-sensitive data.

Marking. Marking on classified and unclassified-sensitive output will reflect the sensitivity of the information as required by existing directives. For example, U.S. Army Regulation (AR) 380-5 contains requirements for security classification and applicable markings for classified information, and AR 340-17 governs "for official use only" information. The markings will be applied through either an automated means (that is, the AIS has a feature that produces the markings) or manual procedure. Automated markings on classified output must not be relied on for accuracy, unless the security features and assurances of the AIS meet the requirements for a minimum-security class B1, as specified in U.S. Department of Defense (DOD) 5200.28-STD. If B1 is not met, but automated controls are used, all classified output will be protected at the highest classification level of the information handled by the AIS until an authorized person manually reviews it to ensure that it was marked accurately with the classification and caveats. All media will be marked and protected commensurate with the requirements for the highest security classification level and most restrictive category of information ever stored on the media until the media is declassified or destroyed under this regulation, or until the information is declassified or downgraded under AR 380-5.

Least privilege. The AIS will function so that each user has access to all the information he or she is entitled to (by virtue of clearance and formal access approval), but no more. In the case of need-to-know for classified information, access must be essential to accomplish lawful and authorized Government purposes.

Data continuity. An owner or proponent will be identified for each file or data grouping on the AIS throughout its life cycle. The file or data grouping accessibility, maintenance, movement, and disposition will be governed by security clearance, formal access approval, and need-to-know as appropriate.

Data integrity. There will be appropriate safeguards in place to detect and minimize inadvertent or malicious modification or destruction of data.
Contingency planning. A contingency plan will be developed so that if data is modified or destroyed unexpected, recovery procedures are available.
Accreditation. Before operation, each AIS will be accredited under a set of approved security safeguards.

Risk management. A risk management program will be put in place to determine how much protection is required, how much exists, and the most economical way of providing the needed protection.

Security planning. An AIS security plan will be developed and maintained for the life of the AIS. The security plan evolves into the accreditation document.

Security Plan/Accreditation Document Format

See the applicable ABCA national publications for the format for preparing accreditation documentation.

A checklist of Exercise Minimum-Security Tasks is provided below.

Task	POC	Organization	References	Notes	Date Completed
1. Accountability of equipment					
1.1 Document procedures for accounting for hardware, software, and equipment (network and non-network in the area of operations).					
1.2 Appoint or identify had receipt holders.					
1.3 Establish audit procedures for access to AIS.					
2. Access					
2.1 Develop access control policy and procedures.					
2.2 Verify access permission before allowing access to AIS (personnel clearance verification).					
2.3 Maintain the Visitor Access List.					
3. Security Training and Awareness					
3.1 Provide operational and security training to all users of the AIS.					
3.2 Document operational and security training plan for the exercise.					
3.3 Document operational and security training.					
4. Controls (data on AIS: hardware, software, documentation).					
4.1 Define the AIS security level for the system.					

Task	POC	Organization	References	Notes	Date Completed
4.2 Identify the minimum security requirements for the appropriate AIS security level of the system					
4.3 Implement all relevant security requirements for the AIS as determined in 4.2					
4.4 Establish and document procedures for disclosure of the information.					
4.5 Establish and document procedures for the destruction of information.					
4.6 Establish and document procedures for modification of data.					
5. Marking					
5.1 Coordinate and distribute security classification guide.					
5.2 Mark and protect information IAW regulations associated with the security level of information.					
5.3 Verify "Open storage secret" or other security requirements to operate in classified settings.				Includes container requirements, physical security requirements.	
6. Least Privilege					
6.1 Appoint a systems administrator (SA) for the AIS.					
6.2 The SA implements system privileges for the user according to their need to know.					
7. Data Continuity					
7.1 Appoint a data administrator for the AIS.					

Task	POC	Organization	References	Notes	Date Completed
7.2 Database administrator limits access to data privileges, functions, and movement to only authorized users.					
7.3 Database administrator ensures all protective markings are in place before data is released from the system.					
8. Data Integrity					
8.1 SA ensures safeguards are in place to protect data.					
9. Certification and Accreditation for each network.					
9.1 Appoint a Designated Approving Authority (DAA).					
9.2 Appoint Certification Authority (CA).					
9.3 Appoint a user representative.					
9.4 Appoint an information assurance security officer (IASO)					
9.5 Develop and document the System Security Authorization Agreement (SSAA)					
9.6 Coordinate relevant Memorandums of Agreement and Memorandums of Understanding for connected, interfacing, co-located and other agreements with outside agencies.					
9.7 Obtain an Interim Authority to Operate (IATO) or Authority to Operate (ATO).					

Task	POC	Organization	References	Notes	Date Completed
10. Risk Management					
10.1 Conduct risk management tasks in accordance with government mandated certification and accreditation processes.					
11. Security Planning					
11.1 Review operations directive for input to the security plan.					
11.2 Implement security tasks identified in the security annex of the overall exercise directive.					
11.3 Develop and document security plan in accordance with the overall SSAA.					
12. Copyright Laws					
12.1 Inform all users of copyright restrictions and penalties for misuse.					
12.2 Develop procedures for software and middleware installation on the network.					

The Letter of Instruction (LOI). The LOI is provided as a read-ahead for Analysts, Subject Matter Experts, and Supporting Staff. The purpose is to provide participating personnel information concerning training, conduct of the exercise or experiment, and internal logistics concepts.

The introduction section provides: a general information section, travel and lodging information, work assignments, training, STARTEX data information, shift change, AAR information, points of contact, and a list of key exercise dates.

Enclosures. Enclosures to the LOI provide additional detail and instruction as required. An example table of contents is listed below:

Introduction 0

Enclosure 1. Analyst and Subject Matter Expert (SME) Joint Reception & In-Processing 0

Enclosure 2. Analyst and SME Assignments..... 0

Enclosure 3. Analyst and SME Training Schedule..... 0

Enclosure 4. Simulation Center and ABCA Tactical Operations Center Layouts 0

Enclosure 5. Notebook Computer Assignments/Computer Security 0

Enclosure 6. Analysis and SME Communications..... 0

Enclosure 7. Analyst and SME Billeting..... 0

Enclosure 8. Analysis and SME Transportation..... 0

Enclosure 9. Analysis and SME Messing 0

Enclosure 10. Analysis and SME Health Support 0

Enclosure 11. Protocol and VIPs 0

Enclosure 12. Morale, Welfare & Recreation, and Special Services..... 0

Enclosure 13. Funding 0

Enclosure 14. General Supplies & Impact Credit Card Purchase 0

Enclosure 15. Deployment & Re-Deployment of Classified Materials 0

Enclosure 16. After Action Review 0

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EXERCISE SITE SURVEY

Approximately one year in advance of the ABCA exercise or experiment, the analysis team should conduct a site survey to begin coordination actions. Follow-On Site Surveys will also be required.

Analysis team representatives should meet with the exercise host unit (Corps/Division) G3 Plans, the supporting Battle Simulation Center (BSC), and hosting camp/post personnel to coordinate planning and support efforts.

The site visit should include a walk-through examination of the Battle Simulation Center facilities, work and briefing areas to be used by the analysis team, billeting, messing, etc. Obtain maps of the post/facility and training areas; obtain blueprints/diagrams of the building, or take measurements of the facilities for use in planning. Take photographs or video of the work areas facilities.

The analyst team should gain an understanding of the BSC concept of support for the exercise or experiment.

Obtain Points-of-Contact (POC) information for the site survey attendees and other key personnel.

Key offices and functions include:

Corps/Division G3 Plans (lead for planning, augmentee support, etc.)

Corps/Division G6 Communications (coordination for exercise support – tactical communications)

Frequency Manager (approval for exercise and commercial radio frequencies)

Battle Simulation Center (operations, security, access)

Resource Management Office (local purchase and funding requirements)

Hospital/Health Clinic (routine and emergency care)

Provost Marshal – Military Police (post – facility access, local law enforcement liaison)

Safety Office (post, facilities, briefing requirements)

Food Service Office (messing support)

Lodging Office (housing and billeting support)

Public Works Department (buildings and facilities support)

Media Support Center (audio visual equipment and support)

Directorate of Information Management (exercise commercial telephone support)

Directorate of Plans, Training and Mobilization (security issues, etc.)

Central Issue Facility (special clothing, field gear, etc.)

Transportation Motor Pool (bus service, vehicles)

Morale, Welfare, and Recreation (availability of post/camp and vicinity facilities)

An example site survey Check List is provided below.

POCs	**Visit / Walk-Thru**	**Locations**	**Request For Information (RFIs)**	**Quantity**	**Notes**
Battle Simulation Center (BSC) Representative	**X**	**BSC**	Access requirements - procedures - rosters		In-Processing Location
			Location of all Classified work areas		
			Vehicle Parking		
			Simulation - Stimulation Reqts		
			White Cell location		
			Photos of work site		
			Scale Diagrams of work site		Training Area Maps - Fort/Post Maps
Military Police		**Provost Marshal Office**	Vehicle Passes		Exercise Site Map -- Maps from Airport to site & to lodging
			Force Protection ?		Access to Military Reservation/Post/Camp
			Post In process Requirements?		
Directorate of Plans, Training, and Mobilization (DPMT)		**DPMT**	Clearance Requirements: What are requirements for ABCA nations		
BSC Facility Mgr	**X**	**Briefing Rooms / Classrooms**	Location		Space for briefings, meeting, and analyst & SME training
			Location of all Classified briefing areas		
Media Support Center Representative			Overhead Projector		

POCs	**Visit / Walk-Thru**	**Locations**	**Request For Information (RFIs)**	**Quantity**	**Notes**
			White Board		
			PC Projector		
			Easel- Pads- Marking Pens- Dry Erase Pens		
Safety Office Representative			Range or other required safety brief		
	X	**VTC Facility**	Required ?		
			Can it handle Classified VTCs?		
Site Mgr (facility; furniture)	**X**	**Analyst Work Area**	**FURNITURE**		(Analyst & SME support)
			Location of / access to all Classified work areas		
			Desks/Tables		
			Chairs		
			File Cabinets		
			Fans		
			Bulk storage areas		
			Electrical capacity (computers, etc.)		
			Refrigerator		
Directorate of Information Management (DOIM) Representative			**TELEPHONE SUPPORT**		
			Network Access (Inter / Intra) SIPRNET?		LAN Drops =
			Telephone Lines - Class A, Class C access; Secure Telephones required?		Hosting Facility & Exercise Phone Books
			Telephone Access - PINs		
			Local Telephone procedures & books		
Analyst Home Organization			Cell Phones		
			Speaker Phone Instrument(s) Standard Telephone Instruments		
Frequency Manager			Hand-Held (Brick) Radios? Or Handy-Talkies Frequencies?		
Corps - Div Commo Rep			Player - Unit Telephone Books		
Corps - Div Commo Rep			Commo: Tactical Radios - Digital Nonsecure Voice Terminals - Cryptographic Key Material		

ANNEX F, APPENDIX 8, EXERCISE SITE SURVEY CHECKLIST

POCs	Visit / Walk-Thru	Locations	Request For Information (RFIs)	Quantity	Notes
			Can they provide the training?		Is Tactical Communications Equipment required?
			ADMINISTRATIVE SUPPORT		Commercial Shipping Account; Shipping for paper products & classified documents.
			Power Outlets		Amps Required =
			Power Strips		
Supply Representative			Office Supplies (pens, markers, staplers; etc.)		
			Paper		Boxes/reams =
			Coffee & Tea Makers		
			Coffee; Tea; Sugar; Creamer; sugar substitutes		
			Paper or Styrofoam cups		
			Microwave		
			Maps - Host Site (and ranges if necessary); Local community		
			Classified Document Cover Sheets		
			CD ROM disks		
			Government Credit Card: responsibilities, procedures		
			Floppy Disks		
Housing/Billeting Site Mgr (Repairs; plumber)			Janitorial Services and/or equipment		
DOIM Rep Security			**SECURITY**		
			3 or 4 Drawer Safe - Classified Secret		
			Paper Shredder - Secret Destruction		What are local regulations?
			Classified Storage Areas		
DOIM Rep ADP			**AUTOMATION EQUIPMENT**		
			Which systems will be able to handle Classified info?		
Analyst Home Station			Desktop or Laptop Computer(s)		
			Network Server		
			Network Hub, switch, and/or Router		
			Cat 5 Network Cable, NIC cards		

POCs	Visit / Walk-Thru	Locations	Request For Information (RFIs)	Quantity	Notes
Media Support Ctr Rep			Copy Machine (lease?)		
Resource Management Office (RMO) Contracting Representative			Network Printer (lease?)		
			laser printer		
			color printer		
			high resolution color? fax		
			high resolution scanner		
			zip-drives		
			Multiple-CD ROM Burner		
			White Board / Electronic White Board		
			MISC		
Central Issue Facility (CIF)			Helmets / Load Bearing Equipment, Battle Dress Uniforms for civilians?		
Transportation Motor Pool (TMP)			Transportation - Military Vehicles		Shuttle service/routes
			Exercise Support Vehicle Drivers		
			Shuttle - Bus Service?		
Hospital or Health Services Representative			Health Services (Medical & Dental)		Coordination for foreign nationals to obtain care
			Morale Activities (sports; cook out; cater?)		Host Nation Lead?
Morale, Welfare and Recreation (MWR) Representative			Chapel service schedules		
			Fitness center locations		
Facilities Site Manager	**X**	**Lodging**	Location		Pay phones in lodging area?
			Cost		
			Bedding Issue/Turn-In		
			Facility Issue/Turn-In		
			Janitorial Services and/or equipment		
			Laundry facilities		
			Finance - Personal Banking		
			Block of hotel rooms		Check for quantity rates & long term stay

POCs	Visit / Walk-Thru	Locations	Request For Information (RFIs)	Quantity	Notes
Food Services POC	**X**	**Mess Hall**	Location; Operation Hours; Cost		
			combat rations or box lunches/Brown bags for shift work?		
Host Nation Representative		**Post Facilities**	Military Post Exchange; Commissary; Barbershop; Alcohoic Beverages Store?		
Identify POCs			ABCA Embassy Locations & POCs		
Protocol Office			Distinguished Visitors, Distinguished Visitor Quarters; Welcome Packets		
Post Office & ?			Mail: personal; mailing classified & unclassified (to and from)		
		Command Posts - other Facilities	When can we coordinate with units for access rosters to CPs, space in CPs, explanation of what's being collected, etc?		
			Can there only be a certain total number of analysts/SMEs present in CPs? If so what number? Are they limited in their interactions with the player units?		
			At what point can the analysts establish initial contact with the player units to let them know on what they are doing/collecting?		
			Who is putting together the access rosters for each facility/CP location?		
			What are the procedures for getting orders/unit graphics/other unit documents?		

WHITE CELL EVENT LOG REQUIREMENTS / INSTRUCTIONS

EVENT / ACTION	WHAT IS ENTERED	PERSONNEL LIKELY TO BE INVOLVED	OTHER ACTIONS / INSTRUCTIONS
Exercise Leadership Decisions	Time Situation What was the decision Rationale (if known) Implications to event		Inform Chief / Deputy Chief of Analytic Support
General Exercise Events	Time Information or action (what happened & who did it)	All white cell members	Log all actions for transferal to Analysis Database
MSEL Event	Time MSEL Number How it was communicated / implemented		Announce over analyst radio net to all observers so they can be looking for resulting actions in their areas. Notify any off sites. Attach a description of the MSEL event.
Federation Status	Time System / equipment affected Impact on the event (if known)		Depending on severity of the impact, inform Chief / Deputy Chief of Analytic Support
Screen Captures	Time Computer ID number Area / location to be captured	Any Observer	
Exercise Times / Events	Start / Pause / Stop Times	Any white cell member	If in doubt – record it!

The exercise log will be kept on a lap top computer. At the conclusion of the exercise day the event log will be saved to a floppy disk and given to the Deputy Chief of Analytic / Admin Support. They will transfer (cut & paste) the word document into the analysis data base.

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Battlefield Operating System (BOS) Workshops

1. Potential Purposes of BOS Workshops:

- Collect data of areas not adequately supported by actual exercise
- Afford preparation time for exercise participants that results in more focused execution during the exercise
- Clarify M&S sim/stim peculiarities/artificialities
- Work-arounds / alternative data source

2. Considerations:

Does not interfere with observing OPLAN development; however, supplements OPLAN development.

- Enables a High Return-On-Investment (ROI): (enhances interoperability = players; ability to collect data = analysts)
- Structured to accommodate flexibility; built-in process to allow focus, beneficial training, and data collection

3. General Characteristics:

- Plan for 3-4 hours maximum per workshop
- Workshops should be lead by the Host Nation
- DISCOM to chair the CSS BOS
- Host Nation decides if they want to run workshops by BOS, G-Staff function, key event, etc.
- Focus should be on how the Host Nation wants to do business; e.g., passage of information, work arounds, but not on passing ABCA Standards information. The exercise should use ABCA nations current SOPs and doctrine. ABCA Standards information should be imbedded. This information is for the analysts and SMEs to discover and report, but not to try and fix as the exercise is in progress.
- Sequence of Training. Workshops should be over 2-4 days, timed as to not interfere with staff planning underway by the ARFOR and Brigade HQs.

- Participants. Appropriate G-Staff (2 per), S-Staff from the Bde HQs (1 or 2 per Bde). An ABCA Program SO1, analyst and SME should observe to note any interoperability gaps/disconnects that arise. An analyst/SME should be assigned to lead data capture. Approximately 15-20 personnel per workshop. Simulation Suite Players (Pucksters) and LOCON players are not required to attend the workshops.

4. Coordinating Instructions:

- If the workshops are BOS based: C2, Int, FS, Mvr, AD, CSS, Mob/CntrMob/Surv (7 workshops), may need to consider adding HSS, if it is being played. It may be that the Maneuver workshop will need to meet twice, with the second workshop being focused on a particular type of operation (e.g., airfield takedown). Command and Control workshop would consider C2 relationships (e.g., if OPCON, any tasking limitations; explore ORBAT/capability imbalances with in the coalition; passage of critical information etc., [not to be driven/attended by Div/Bde Commanders themselves]).

5. Way Ahead: To be coordinated and further developed during Project Tm EPA meetings and activities. Discuss purpose and content of BOS workshops at the appropriate Planning Conference and get buy-in from ABCA nations.

6. Instructional Aids. Such as SOPs, charts, etc., by Division HQ (to be kept to a minimum).

7. Information Needed from Focus Leads:

- What are the potential workshops?
- Who should facilitate the BOS workshop(s)
- Who attends which workshops (appropriate training)?
- How many participants per workshop?
- Where can the workshops be conducted (facility)?
- What should be presented (POI)?
- How long will it take to conduct?
- Instructional materials – what is needed; who produces; presentation media?

Enclosure:

1. Proposed Focus Lead BOS Workshops

Enclosure 1:

1. Proposed Battle Command (C2) Workshops:

- COP -- BC workshop to address COP commonality, compatibility, and information depicted & associated SA expected
- STAFF ESTIMATE/Assessment Process --BC workshop to determine Staff Estimate as vehicle for Level 2/3 SA
- ISTAR -- BC workshop to address Intelligence Sharing, Collection Planning process, Interoperability concerns, UAV C2 and targeting process issues
- Urban Operations – LOC/Routes ID/prioritization; collateral damage & second or third order effects

2. Proposed Force Effectiveness Workshops:

- An Engineer workshop to get at mobility, counter-mobility, and use of obstacles (mines) issues
- Command and Staff workshop to get at NEO, HA, CA, SOF, and other national issues
- Fire Support workshop to address targeting and resource allocation issues

Common Operational Picture Workshop

Issues

- For each coalition headquarters, what is the COP and how is it displayed?
- Is the common operational picture provided across the coalition? If so, how and to what depth?
- What are the differences in COP (e.g., content, granularity of detail or medium depicting those details)?
- How did combat systems affect the construction/maintenance of the COP?
- What COP-related information is disseminated to/from division-level and among the coalition BDEs.

Staff Estimate/Assessment Process

Issues

- What information does the commander use to monitor and evaluate the situation/operation?

- How do the staff's "running" estimates support the commander's assessment?
- What is the commander's guidance to the staff in the development of the running estimates?
- Describe how the commander uses these estimates for assessment (monitoring/evaluating) leading to decision & adjustments (i.e., level 2, 3 SA).
- What data elements comprise each of the running estimates used by the commander?

Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR)

Issues

- What were the key planning considerations and processes for coalition ISTAR management? Discuss the impact of interconnectivity issues between available collection assets on this planning.
- How does the ARFOR integrate ISTAR management and coalition intelligence capabilities to improve Situational Awareness (SA)?
- What are the processes for dissemination of time sensitive information/intelligence (Near Real Time (NRT) to Real Time (RT) to coalition elements to support maneuver, combat operations, target development, and targeting (with emphasis on Time Sensitive Targets/Time Critical Targets and force protection)?
- How does the coalition plan, coordinate, and execute its collection plan?
- How do the coalition HQ and its subordinates request information from operational and strategic ISTAR assets?
- How will ISTAR for maritime, land, and air units contribute to the COP?
- What are the systems and procedures for conducting predictive analysis at the ARFOR Headquarters and the coalition brigades?

Urban Operations

Issues

- How does coalition prioritize and designate movement routes?
- What are the commander’s criteria for prioritizing the monitoring and control of routes/airspace?
- What route monitoring capabilities (ground and air) exist within national forces?
- How does coalition plan to minimize collateral damage (second and third order effects) and integrate into the maneuver scheme?
- What urban densities exist within the battlespace and which of these impact on the mission?
- For UO, what effects are planned to accomplish the mission and how are they constrained by ROE/Red Cards?

- What means of gauging second and third order effects in urban operations exist within the coalition?
- How do the coalition's combat ID capabilities and tactics, techniques, and procedures influence the planning for application of weapon effects in order to minimize collateral damage and prevent fratricide?
- How does the level of authorization for use of fire support assets impact the application of weapon effects?
- How does the level of precision and availability of precision ordnance impact the tasking of coalition lethal and non-lethal assets?
- Is higher centralized coordination by the ARFOR required to facilitate control of key infrastructure nodes and minimize the negative impacts of operations on existing lines of communication and infrastructure, from both a military and civil perspective? Explain.
- In Urban Operations, what collateral damage is acceptable (e.g., casualties, infrastructure, LOCs) with regard to mission success?
- How does consideration of the negative impacts of operations on existing lines of communication and infrastructure, from both a military and civil perspective, influence operations planning?

Engineer Workshop

Lethality Issues

- What assets and TTPs were used to minimize delays caused by terrain or barriers, obstacles, and mines?

  Narrative answer addressing: Time of delay, time to clear the obstacle, etc… Narrative answer on the technique or collaboration used to clear the obstacle, etc…, refer to AUTL 5.1 MOMs for more specific data elements.

- What control measures and communications actions were used to designate, mark, and identify mobility events?

  Narrative answer addressing marking, designating, and reporting procedures of friendly and enemy obstacles.

- How was the Coalition's mobility effected by bridges, to include the conduct of bridging operations, and the classification and reporting of established bridges throughout the area of operation?

  Narrative answer addressing what format and products (QSTAG 180) the coalition used to conduct bridging classifications and determine requirements for bridging operations.

- Did the Coalition emplace countermobility obstacles in accordance with restrictions established by higher headquarters, to include obstacle control measure graphics and rules of engagement?

  (yes/no) If yes, narrative answer addressing the types of obstacles emplaced (flame, blast, mine, deadfall, crater, etc…), authorization required for emplacement, compliance with ROE and National Policies, and reporting/marking/graphics of the obstacle.

- How long did it take the Coalition to install an obstacle or mine field?

  Narrative answer with an element of time, that covers time to plan, coordinate, task organize, move assets, deconflict national ROE, and construct the obstacle or mine field?

- How does the Coalition deconflict differences in international agreements (e.g. the Ottawa Treaty) to facilitate maneuver (movement)?

  Narrative answer addressing the process and outcome of how the coalition overcame national/political differences. e.g. How the unit dealt with issues of use of landmines, or handling non-combatants to facilitate maneuver.

Survivability Issues

- Where the contributing NBC defensive capabilities effective?

  Narrative answer identifying perceptions of potential problem areas.

- What C2 arrangements were used to avoid exposure to NBC threat (including control measures, task organization, reporting, doctrine, timeliness)?

  Narrative answer to identify the changes that had to be made to national C2 arrangements to ensure that planning and implementation were effective. This could then be used to focus on remaining NBC MOM.

- What C2 arrangements were used to ensure protection against exposure to NBC threat (including control measures, task organization, reporting, doctrine, timeliness, compatibility)?

- What C2 arrangements were used to ensure timely decontamination of affected personnel, equipment and areas?

- What impact did interoperability have on the false alarm rate?

- How are coalition monitoring systems integrated?

- Potential Program Activities: Determine standard procedures for the early warning, reporting, dissemination and response to NBC and WMD threats to coalition forces and collocated organizations or populations. Produce agreements on the required capability,

- What C2 arrangements were used to ensure commonality and integration of obstacle reporting, recording and breaching arrangements (including control measures, task organization, reporting, doctrine, timeliness)?

  Narrative answer identifying issues in implementation of obstacle reporting and clearance from a C2 perspective.

- What C2 arrangements were used to ensure commonality and integration of route maintenance arrangements (including control measures, task organization, reporting, doctrine, timeliness)?

  Narrative answer identifying issues in implementation of route maintenance plans from a C2 perspective.

Command and Staff Workshop (Planners)

Lethality Issues

- Did the coalition conduct any Civil-Military operations?

  (yes/no) If yes, narrative answer describing the operation and the location/level of the CMOC, any conflicts CIMIC or CA doctrine, etc…

- What was the common understanding within the coalition HQ on the different national doctrines, information requirements and the integration of various specialized planning cells?

  Narrative answer addressing the (mis)understanding of each countries tactical doctrine, terminology, OPORD format, and display of the "Common Operational Picture" in the CP. E.g. US uses a 5-paragraph OPORD format do the other countries? What is the "agreed upon decision cycle? Does the term seize mean the same thing to all countries? Did the coalition planners use QSTAG 894, 509, 506, or the COH?

- Did the coalition conduct any NEO?

  (yes/no) If yes, narrative answer addressing the circumstances and the timeliness of the intelligence/information?

- What doctrinal implications were encountered during the establishment of command relationships, the decision making process, and the adjudication of national requirements to control operations in all dimensions of the battlespace?

  Narrative answer addressing the use of national "red cards or caveats" and how they were resolved, differences in command relationship terminology (TACON and OPCON), and the decision making processes that the coalition used to control their forces and influence the enemy.

- How did the coalition integrate and synchronize Special Operations Forces into the maneuver plan?

  Narrative answer addressing the intent, concept of operations, and coordination between coalition and SOF missions.

- What is the coalition's interpretation of acceptable first, second, and third order effects created through movement, based on the ROE?

  Narrative answer (summary of questions to key leaders, CA, or PSYOPS personnel on what effects are acceptable, and how they would gauge second and third order effects)

Survivability Issues

- What interoperability issues influenced the timely provision of Ground-Based Air Defence?

  Narrative answer to identify the changes that had to be made to national C2 arrangements to ensure that planning and implementation were effective. This could then be used to focus on remaining GBAD MOM.

- How was Ground Based Air Defence integrated across coalition force?

- What interoperability issues constrained the use of GBAD?

- What interoperability issues influenced the provision of continuous Ground-Based Air Defence?

- How did interoperability influence the GBAD tempo?

- What capabilities and control measures did the coalition synchronize to achieve ground-based air defense?

- How did the C2 arrangements and environment influence the quality and flow of information necessary to complete the GBAD engagement?

- What C2 arrangements were used to conduct defensive counter information operations? Conduct defensive information operations - Plan, coordinate, and integrate policies and procedure, operations, personnel, and technology to protect and defend information and information systems. Primary elements of defensive IO include information assurance, physical security, operations security, counter-deception, counterpropaganda, counterintelligence, electronic warfare, and special IO.

  Narrative answer to identify the changes that had to be made to national C2 arrangements to ensure that planning and implementation for operational security were effective. Will need to identify the changes that were made, those that worked and issues that arose. This could then be used to focus discussion on remaining Operational Security MOM.

- What are the interoperability issues associated with the determination of the appropriate response to possible threats?

- What C2 interoperability factors influenced the operation of the threat identification and response management (including synchronization of contributing capabilities)?

- Electromagnetic means - What capabilities are essential and utilized by coalition forces to conduct electromagnetic deception?

- Physical means - What capabilities are essential and utilized by coalition forces to conduct physical deception: such as, demonstrations, feints, ruses, displays, and deception smoke screens?

- Disperse tactical forces - What capabilities are essential and utilized to relocate forces and spread or separate troops, material, or activities following concentration and maneuver to enhance their survivability?

- What C2 arrangements were used to ensure commonality and integration of dispersion arrangements (including control measures, task organization, reporting, doctrine, timeliness)?

- Conduct Security operations - What capabilities are essential and utilized by coalition forces to provide early and accurate warning of enemy operations, time and maneuver space within which to react to the enemy, and allow the commander to develop the situation? The forms of security are screen, guard, cover, area security, and local security.

- Did the operations of the security force provide the protected force with sufficient reaction time and maneuver space to conduct defensive operations?

- What C2 arrangements were used to ensure commonality and integration of combat identification arrangements (including control measures, task organization, reporting, doctrine, timeliness)?

  Narrative answer to identify the changes that had to be made to national C2 arrangements to ensure that planning and implementation were effective. This could then be used to focus on remaining combatant identification MOM.

- How does the battlespace environment affect the interoperability issues associated with the coalition?

- How have the C2 targeting arrangements for the coalition force been modified to cater for Cbt ID?

- Do the units in the coalition force have sufficient information on the distribution of friendly and enemy forces and on the Cbt ID procedures to ensure effectiveness?

Fire Support Workshop

Lethality Issues

- What planning, control measures, or doctrines were used by the coalition to decide, detect targets for precision, non-precision, direct or indirect munitions delivery while minimizing ROE violations, collateral damage, and fratricide?

  Narrative answer addressing control measures, doctrines, TTPs, ROE violations/compliance, deconfliction measures (for example, using UAVs to provide detection, classification, and identification of a target, within a Restricted Fire Area (RFA), followed by the use of a laser designator to provide precision information for munitions delivery (hellfire, maverick, or precision artillery round) of fires into an urban area)

Survivability Issues

- How Does The Coalition Achieve Effective Tactical Missile Defence?

  Narrative answer to identify the changes that had to be made to national C2 arrangements to ensure that planning and implementation were effective. Also identify the impact of differing national capabilities and policies.

- What C2 arrangements were used to ensure commonality and integration of missile defense arrangements (including control measures, task organization, reporting, doctrine, timeliness)?

- What C2 arrangements were used to ensure commonality and integration of EOD arrangements (including control measures, task organization, reporting, doctrine, timeliness)?

  Narrative answer in all cases to identify the C2 changes, issues and arrangements for the implementation of missile defense.

Logistics Planners Workshop

LOG Issues

- At the Combined/Joint level, it is recommended that the Combined/Joint Force Headquarters (C/JFHQ) is organized as per the QSTAG 2020 and executes its designated responsibilities.

  Note: The workshop will provide logistics planners with the guidelines for coalition organizational structure and command and control relationships that we want to observe during the experiment to gain insights on interoperability gaps in the area of logistics as delineated in the following essential elements of analysis (EEA).

- Effectiveness of coalition LOG staff and staff structure. Explore the extent to which the ABCA coalition force established logistic planning groups to plan its logistic effort to support the force with a view to developing doctrine and TTPs for future ABCA coalition force log planning.

- Coordination of HNS, CMO (to include NGO, PVO, IO, other) operations. Explore the extent to which the ABCA coalition force established and controlled HNS, CMO (to include NGO, PVO, IO, other) operations with a view to developing doctrine and TTPs for future ABCA coalition force operations.

- To what extent did the ABCA coalition force establish C2 relationships with all national log organizations with a view to developing doctrine and TTPs to improve coalition interoperability in this area?

- Explore the extent to which a coalition Movement Control Center was established to control movement in the ABCA AOR with a view to developing doctrine and TTPs for future ABCA coalition force operations.

- Effectiveness of Coalition CSS unit integration and organizational structure.

Health Service Support (HSS) Workshop

HSS Issues

- Development of Multi-national Medical Unit (QSTAG planned). Can a Multi-national Medical unit function effectively (possible or probable)?

- Medical Employment of Air Transport in the Forward Area (QSTAG 529).

- Medical Regulating (QSTAG 910) to ensure effective control of casualty evacuation to prevent unnecessary and over evacuation.