



High Performance Team (HPT) Facilitation Guidebook

*A Methodology for Planning and Facilitating
AoA Study Guidance and AoA Study Plan HPTs*

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Office of Aerospace Studies

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1 Introduction

The Office of Aerospace Studies (OAS) has nearly 20 years of experience in supporting organizations across the Department of Defense and Federal government with analysis training, planning, and execution. OAS provides a full spectrum of analytical assistance in planning and conducting Capabilities-Based Assessments (CBAs), pre-Materiel Development Decision (MDD) analyses, and the Analysis of Alternatives (AoAs). As described in AFI 10-601, *Operational Capability Requirements Development*, OAS has the following roles and responsibilities:

- Assists AF/A5R, Lead Commands and field agencies with the development of Concept Characterization and Technical Descriptions (CCTDs), AF study guidance, study plans, study organizing, and study execution for CBAs, Pre-MDD analyses, and AoAs.
- Trains analysis leads, teams, and stakeholders. Training is based upon regulations, policy, best practices, and lessons learned. It is tailored to the specific analytic effort and addresses the planning, scoping, execution, and out-brief of the analysis.
- Advises the Air Staff, AFROC, AFRRG, Lead Commands, teams, and stakeholders during the planning, execution, and review of the analysis.
- ***Facilitates High Performance Teams (HPTs) for developing AoA study guidance and AoA study plan.***
- Assesses the study guidance, study plan, and study final report/briefing. The assessment is advisory and given to the team, Lead Command, AFRRG, and AFROC.

As described in the fourth bullet above, OAS facilitates HPTs for developing the AoA study guidance and study plan. Although OAS has been involved in previous HPTs over the years, officially filling the role of HPT facilitator is new for OAS. Given this new role, OAS developed this handbook to assist the HPT facilitator in guiding and advising AoA study guidance and AoA study plan HPTs. The handbook contains general information about facilitation concepts, techniques, and tips as well as approaches for developing the AoA study guidance and plan during an HPT event. In addition, the general facilitation information may apply to other situations requiring facilitation. For information on planning and conducting an AoA, see the OAS AoA Handbook or contact OAS.

1.1 Purpose of the HPT

The HPT concept is used to develop Air Force-sponsored JCIDS documents and AoA study guidance and plans. The purpose of the HPT is to provide the appropriate level of consistent cross-functional involvement in requirements generation from ICD to CPD to produce executable, risk-based, fiscally informed requirements that deliver affordable capabilities at optimal cycle time to the warfighter. The intent is to accelerate the documentation process, improve the quality of the requirements document, and provide an enduring forum for developing, fielding, and sustaining operational systems. As much as possible, core members of the various HPTs that are formed to develop JCIDS and AoA documents are maintained throughout the process (from ICD to CPD). This concept is

referred to as the enduring HPT. The objective of the enduring HPT is to achieve a more efficient and effective connection between the AF requirements and acquisition processes.

1.2 HPT Roles and Responsibilities

Understanding the roles and responsibilities of the HPT facilitator, HPT lead, and HPT members will help enable the facilitator to guide and advise the HPT and meet the objectives of the HPT event. The following sections describe the key roles and responsibilities of the HPT facilitator, HPT lead, and HPT members.

1.2.1 The Facilitator

The facilitator guides and advises the HPT to ensure it is productive and worthwhile for all team members and helps enable the HPT to achieve its objectives. It is important to note that the facilitator is not the HPT lead nor a passive observer of the HPT event. Furthermore, the facilitator must be engaged throughout the HPT event and be prepared to serve in an OAS advisory capacity *and* as a traditional facilitator to keep the HPT focused on the topic at hand. Ideally there will be two OAS representatives on the HPT, one focusing on each of these two related but different roles. The facilitator must have an appreciation for the experience that the members bring to the HPT event and be able to shift readily between the roles of traditional facilitator and OAS advisor. The main responsibilities include the following:

- Preparing the HPT lead for the HPT event and assisting the HPT lead in identifying and preparing the other HPT members
- Guiding and advising the HPT during the HPT event
- Providing subject matter expertise on the AoA study process and expectations (e.g., effectiveness, cost, and risk analysis methodologies, alternative development and screening, scenario and threat identification, measures development) and associated JCIDS processes (the facilitator will typically not be an expert on the specific operational problem)
- Ensuring the HPT understands the content requirements of the study guidance or plan and associated staffing requirements
- Enabling the HPT to achieve its objectives

The intent of HPT facilitation is to introduce the AoA study guidance or study plan HPT process and to help HPT members effectively implement the process through the development of products that meet established capability document requirements. This intent is different than that of the traditional facilitation in which a subject-agnostic individual maintains administrative control of the process and event timeline. The HPT facilitator guides participants through the event to ensure that they are aware of the standards of performance required, can provide useful input to the HPT product, and can deliver a quality product in the time available.

As noted, the HPT facilitator must be a subject matter expert on the HPT process (e.g., AoA study guidance or AoA study plan development) and well-versed in HPT facilitation techniques. Facilitators with these skills will be most effective as every HPT will require some measure of both

skills to be successful. As illustrated in Figure 1-1, the amount of each skill used depends primarily on two factors: the experience of the HPT lead and members and the teamwork displayed by the HPT members. For example, facilitating an AoA study guidance HPT characterized by High Teamwork and Low Experience will likely require a greater amount of time dedicated to advising the team members on study guidance development and less time on traditional facilitation. Any remaining time is used by the facilitator to monitor the team’s activity. Note that the percentages in the figure are illustrative and relative and not intended to be absolutes.

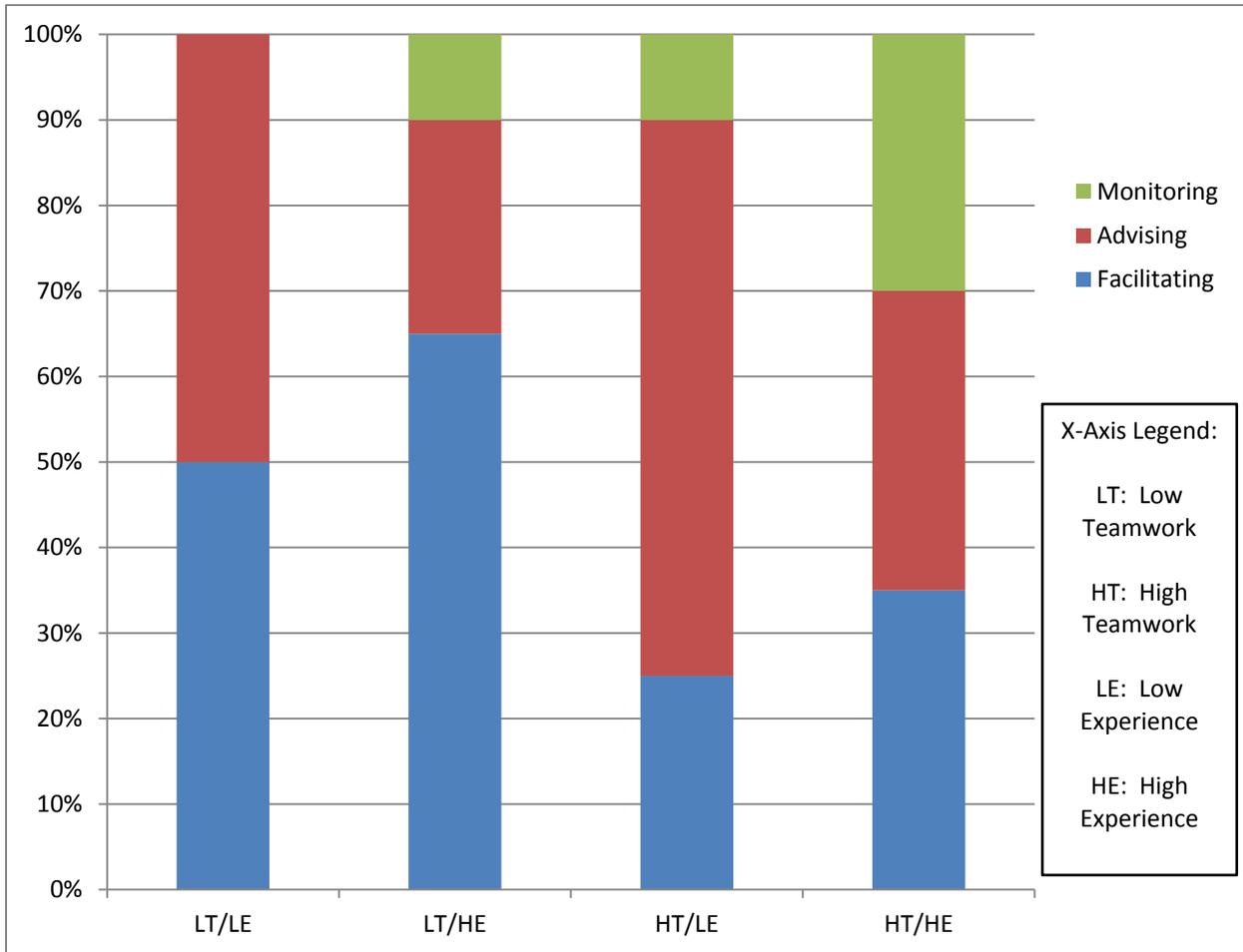


Figure 1-1: Percentage of Facilitator’s Monitoring, Advising, and Facilitating given HPT Teamwork and Experience

To enable the HPT to meet its objectives, the facilitator must have general knowledge of the mission area, capability gaps, and other key studies pertinent to the mission area of interest. The facilitator prepares for the HPT event by reviewing and understanding the CBA(s), RSR, ICD(s), lessons learned, and other relevant studies and documents. In some situations, the facilitator may need to conduct a literature search for other studies that may have been completed in the mission area of interest. In all cases, the facilitator must engage the study sponsor, Air Staff, and other key players to understand their perspectives, issues, and concerns.

Ideally, the facilitator should establish a rapport with the HPT lead well in advance of the HPT event. Through this rapport, the facilitator will be better able to assess the needs of the HPT (e.g., how much have they done, what needs to be done, what is the level of experience, how best to guide them forward) which will help the facilitator and HPT lead plan the HPT event as well as determine the resources that are required. The needs assessment will also enable the facilitator to develop the facilitation approach that will be used (e.g., number of days for the HPT event, tasks that will be completed on each day, working groups that will be formed). Working with the HPT lead prior to the event will also allow the facilitator to gain insights into the politics, issues, subject matter, and personalities involved.

Facilitation Tip

If questions remain and additional information is required as the facilitator prepares for an upcoming HPT, ask an experienced OAS advisor to help. He/she can recommend policy and document resources that can be used to learn more about the process (JCIDS manual, AoA handbook, CBA handbook).

1.2.2 The HPT Lead

The MAJCOM or organization that is sponsoring the AoA study designates an AoA study lead. The AoA study lead is a military member or government civilian (not a contractor). In most cases, the AoA study lead is also the HPT lead for developing the AoA study guidance and study plan. The HPT lead has overall responsibility for planning and conducting the HPT and has the final decision on the content of the HPT products.

The HPT lead is responsible for communicating details of the HPT event (e.g., dates, meeting location), identifying HPT participants, ensuring participants have the permission and funding required to attend the event, distributing read ahead material, writing and sending HPT invitations to identified participants, obtaining funding to conduct the HPT, leading the execution of the HPT, and providing support to document HPT outcomes and actions.

1.2.3 The HPT Members

Each member of the HPT plays a vital role in the success of the HPT. Each member is selected for a specific reason and is expected to contribute to meeting the objectives of the HPT. For example, the HPT member(s) who is selected for his or her background in intelligence is expected to address intelligence-related aspects of the study guidance or study plan such as potential scenarios and threats for consideration, scenario and threat selection methodology development, intelligence mission data requirements, and other intelligence support requirements or issues. As another example, members of OSD(CAPE) and OUSD(AT&L), when they participate, are expected to express the interests and concerns of their respective organizations as they help guide the HPT.

The HPT lead and facilitator must define the expected contributions of each member and establish an HPT environment that is conducive to open and non-confrontational discussions to enable each member to be as productive as possible. The HPT lead and facilitator should strive to make the HPT event a productive and worthwhile experience for all members.

1.2.4 The HPT Support

Experience has shown that scheduling the HPT event, consolidating and distributing read-ahead materials, recording information during the HPT event, and producing and publishing minutes requires assistance from one or more individuals responsible for managing and accomplishing administrative tasks. It is not advisable for the HPT lead to attempt to lead and provide administrative support to the HPT. Having one or more individuals charged with handling the administrative details will help alleviate the administrative burden on the HPT lead and enable him or her to focus on the more important task of leading the HPT.

2 Facilitation Fundamentals

This chapter provides an introduction to five fundamental concepts of facilitation (stages of team development, leading a team, active listening, gaining consensus, and human interaction). Although an understanding of these concepts will be helpful to anyone who must facilitate an HPT or other group, these should not be viewed as rules, absolutes, or magic formulas for successful facilitation. Facilitation, and the work of the HPTs themselves, is a highly human endeavor, more of an art than a science. These five concepts are broadly applicable facilitation tools and knowing when and how to apply the tools—or in some cases *not* to apply them—is the critical part of the art.

2.1 Stages of Team Development

Similar to other groups, the HPT will progress through stages of development that are necessary and inevitable for the team to mature, accept challenges, plan work, address problems, develop solutions, and deliver results. Tuckman (1965) developed a four-stage group development model that is relevant to understanding and facilitating the HPT. The model is comprised of four development stages: forming, storming, norming, and performing. The four stages of development are:

- **Stage 1 – Forming.** This stage is important since it allows team members to get to know one another and understand the details of the task at hand. The behavior of the individual team member is driven by a desire to be accepted by others and avoid conflict and controversy. Team members are typically uninformed and focus on gathering information such as the team objectives, organization, tasks, and schedule. Team members may be motivated, but typically behave independently, focus on themselves, and exhibit their best behavior. During this stage, team members are individually pondering questions such as “Why am I here?”, “Who can I work with?”, and “What are we doing?” Clear and strong leadership is needed to get team members introduced to each other and involved in the effort. The facilitator must be prepared to answer many questions about the purpose and individual roles and responsibilities of the HPT. The theory at this stage applies to a group that has just been brought together at or near the start of the HPT. That may be the case, but more typically an HPT is likely to have several core people who have been closely working the issue for an extended period, and a few new members who truly do not know each other. Often the MAJCOM and Product Center representatives may have been part of the CBA and other work that led up to the RSR and have been working the related development planning issues for a year or more. This makes the facilitator’s job more “interesting” because parts of the group might be in this stage and parts may be beyond.
- **Stage 2 – Storming.** The team has entered the storming stage when team members begin voicing their opinions, aligning with others who share similar views, and confronting others with different views. This stage can be contentious and unpleasant for team members who do not handle conflict well. Sometimes, the tension level may rise to a level that causes arguments to occur among team members. If not properly controlled, this stage can be

destructive and adversely impact the motivation of the team. In some cases, teams will not develop past this stage. The facilitator must emphasize being patient and allowing others to express their views. Without tolerance and patience, the team will likely fail to accomplish its tasks. Facilitators must help all team members voice their views, and when needed, work to achieve consensus. Compromises may be required to reach consensus and enable the team to progress. The facilitator should be directive in his or her guidance for decision-making and professional behavior. The facilitator should be accessible to help resolve differences and enable the team to evolve to the next stage. In many ways this is the most trying stage of the process. The facilitator will often feel serious pressures to hurry up and “get through” this stage, but if the group artificially “decrees” that they are finished storming the different views and perspectives will often just go into hiding, not really having been resolved. Several things to avoid at this stage, none of which are necessarily easy:

- Do not assume every issue will reach consensus. Sometimes there truly are multiple correct opinions and they all need to be addressed. That is why there are different perspectives on the team. The logistician and the operator may both be correct even though significantly at odds.
- Do not easily rely upon voting to shut down serious discussions. It may have its place, but usually only as a last resort, and it hardly ever comes without a significant delayed pain. It is often better to accept that diverse opinions that are strongly held **and** supported on both sides by logic and facts. The issue may need to be resolved after the HPT event.
- Neither the loudest voice nor the voice with the highest rank should be given a pass on having to defend one’s views and statements.
- Stage 3 – Norming. At this stage, agreement and consensus form among the team members. They begin to share a common commitment to achieve the goals of the team. This may have required some members to give up their own ideas and agree with others to enable the team to function. Individual roles and responsibilities are clear and accepted. The facilitator focuses on enabling the team to achieve its goals. In this stage, the facilitator needs to be sensitive to whether one or more members are giving up their ideas because they have been convinced by logic and facts, or whether they are feeling significantly outnumbered and pressured to “stop delaying the group”.
- Stage 4 – Performing. At this stage, the team has achieved a high-level of autonomy and requires little direct involvement from the facilitator beyond keeping the team on track to reach its daily goals. The team is knowledgeable, motivated, and competent. Tasks are delegated by the facilitator and all decision-making is handled by the team. Although disagreements may still arise, they are more likely to be resolved positively by the team.

2.2 Leading a Team

Before the HPT event, the facilitator should determine his or her role in supporting the HPT lead. This requires discussion between the facilitator and HPT lead to ensure they both understand each other’s role and the HPT lead’s expectations – early and frequent communication and trust is

critical. It is important to note that the facilitator is not the HPT lead's backup. The facilitator and HPT lead have tasks to accomplish with no single right way to divide the tasks.

In some cases, the HPT lead may have little to no experience in leading an HPT or conducting an AoA study. Consequently, the HPT lead will likely rely heavily on the facilitator to help lead the HPT. In other cases, the HPT lead may have HPT and AoA experience and rely less on the facilitator in leading the HPT. While leading a team can be a daunting task, an understanding of leadership styles and needs of the team will enable the facilitator to lead an effective discussion.

The type of leadership style used by the facilitator will depend on the situation. There is no single best style of leadership a facilitator can use all the time, but rather the facilitator must be flexible and adapt his or her leadership style based on the situation. Effective leadership is task-relevant, which means the facilitator and the leader must use a leadership style that is appropriate for the HPT task that must be accomplished and needs of the team.

Hersey and Blanchard (1977) describe a situational leadership model that addresses leadership styles and team maturity levels that are relevant to leading and facilitating an HPT. The model is comprised of four situational leadership styles and four maturity levels of a team. The four leadership styles are:

- S1 (Telling/Directing). Characterized by primarily one-way communication in which the leader defines the roles of the team members and provides the what, how, why, when, and where for the tasks that must be accomplished. In other words, the leader takes a directive role and tells the team what to do and how to do it. The focus is on accomplishing the task and less on the relationship with the team. If the leader focuses more on the relationship, the team may become confused about what must be done.
- S2 (Selling/Coaching). While the leader is still providing direction, he or she is now primarily using two-way communication and providing support that will allow the team members to get on board. The leader provides information and direction, but there is more communication with the team. The leader spends time listening, advising, and coaching. Telling the team what to do may demotivate it or lead to resistance, so the leader must sell the way of working a task by explaining or clarifying an approach.
- S3 (Participating/Supporting). The leader focuses more on the relationship with the team and less on direction. The leader supports and works with the team and shares decision-making responsibilities. The leader spends time listening, praising, and making the team feel good when it demonstrates the necessary commitment.
- S4 (Delegating). The leader passes most of the responsibility onto the team. The leader still monitors progress, but is less involved in decisions.

Note

Leadership style S1 (Telling/Directing) and S2 (Selling/Coaching) are more focused on getting the task accomplished. Styles S3 (Participating/Supporting) and S4 (Delegating) are more focused on developing the team members' abilities to work independently.

The appropriate leadership style will depend on the maturity of the team being led. Maturity levels are task-specific, which means team members may be generally skilled, confident, and motivated in their jobs, but the maturity of the team may still be low since the team is performing a task requiring skills they may not possess. The four levels of maturity are:

- M1 (Unable and insecure). The team members lack the knowledge, skills, or confidence required to accomplish the task. They are also unwilling to take responsibility for the task and often need to be pushed to take the task on.
- M2 (Unable, but willing). The team members are willing to work on the task, but they still do not have the skills to complete it successfully.
- M3 (Capable, but lack confidence). The team members are ready, experienced, and able to do the task, but lack the confidence or willingness to take on responsibility. They have more skills than the M2 group, but they are still not confident in their abilities.
- M4 (Very capable and confident). The team members are experienced in the task and comfortable with their abilities to do it well. They are able and willing to not only accomplish the task, but to take responsibility for the task. They have high confidence and strong skills, and they are committed to the task.

Using the situational leadership model, Hersey and Blanchard (1977) map each leadership style to each maturity level as shown in Table 2-1. The facilitator should assess the maturity of the HPT at the beginning of the HPT event to determine the most appropriate leadership style to use. The HPT members will likely have different levels of experience in developing JCIDS and AoA documents. For example, DoD-level members (e.g., OSD(CAPE) and OUSD(AT&L)) may have extensive backgrounds in developing AoA and other JCIDS documents, while the MAJCOM study lead may not have any experience. This means the HPT maturity level at the beginning of the HPT event can range from M1 (unable and insecure) to M4 (very capable and confident).

There is also a difference between the members' maturity level in writing a study plan compared to their maturity level in their area of expertise. Hopefully, HPT members were selected because they are very capable and confident within their topical area of expertise. The A6 representative, for example, should have an M4 maturity when talking about the communications aspects of the task, but may be at an M2 maturity level with respect to planning and conducting an AoA study. This dichotomy can result in some seemingly strange behavior that the facilitator needs to understand and address accordingly.

Facilitation Tip

The facilitator should think about what style(s) he or she is most comfortable with personally. For those styles that are less comfortable, the facilitator may first have to learn some new behaviors before using the styles.

Table 2-1: Maturity Level and Most Appropriate Leadership Style

| Maturity Level | Most Appropriate Leadership Style |
|-----------------------------------|-----------------------------------|
| M1 (Unable and insecure) | S1 (Telling/Directing) |
| M2 (Unable, but willing) | S2 (Selling/Coaching) |
| M3 (Capable, but lack confidence) | S3 (Participating/Supporting) |
| M4 (Very capable and confident) | S4 (Delegating) |

The situational leadership styles and maturity levels of a group are related to Tuckman’s four stages of group development described in the previous section (Figure 2- 1). Through effective leadership, the facilitator can help enable the team to progress through the stages of development and accomplish its tasks. During an HPT event, the HPT matures by acquiring knowledge and developing ability. As the HPT matures, the facilitator adapts his or her leadership style to move to higher levels of leadership and ultimately finish with S4 (delegating). The facilitator should understand this relationship and use the most appropriate leadership style for the maturity level and development stage of the team.

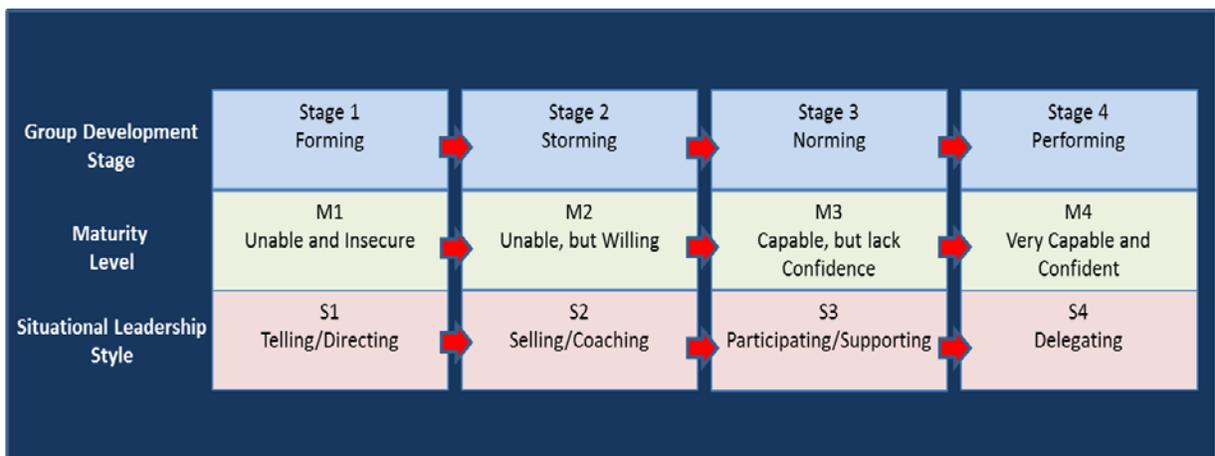


Figure 2-1: Situational Leadership Style, Maturity Level, and Group Development Stage Relationship

As with any interpersonal group effort, the real answer is always “it depends”. The discussions above have broad applicability and the work behind these theories applies to many HPTs, but it is not a recipe to be followed by rote, and as mentioned already, the critical skill of the facilitator is to observe, sense, and apply the right tool and approach at the right time. Preexisting relationships among some team

members will significantly affect this matrix. How thoroughly the pre-HPT preparation work was done, the quality of the read-aheads, and the nature of the problem will all modify the thoughts above.

Regardless of what leadership style is used, the facilitator and HPT lead are responsible for leading the team and ensuring effective discussion. The facilitator should use the following principles when leading a discussion:

- Foster open discussion. The facilitator should be attentive to the process, content, and interpersonal dynamics of the discussion. The facilitator should ensure no one person or small group dominates the discussion and that the discussion is civil and organized. The facilitator should ensure everyone follows the ground rules and that all ideas are critically analyzed. The facilitator should establish an environment where minority ideas can be elicited freely and the discussion is respectful.
- Involve all team members. In most teams, there are one or more members who are less assertive, shy, or cannot break in the discussion quickly enough. For these team members, the facilitator should directly ask for their opinions and encourage them with body language or praise. It is important to achieve an exchange of ideas by providing an opportunity for all the team members to participate.
- Ask questions or offer ideas to advance the discussion. The facilitator should be aware of the progress of the discussion and, when necessary, ask questions or provide information to stimulate thinking and move the discussion along. In some situations, the discussion may become sidetracked, lose strength, or stalled on a problem or “pet rock.” It is the facilitator’s responsibility to identify the points of agreement or disagreement and ask questions or offer ideas to move the discussion along. Open-ended questions that cannot be answered with a simple yes or no response are ideal in these situations since they require some thought which can generate discussion. Also use questions to elicit **why** someone believes as he or she does, especially if it seems to go counter to the HPT’s “prevailing wisdom”. Often the first input is not the real input.
- Summarize important points, arguments, or ideas. Summarizing important points, conclusions, or ideas as they are raised will ensure that all team members understand what the individual or group meant. This may be achieved by simply restating the information and observing the team for verbal or non-verbal clues of understanding (e.g., head shaking).
- Make sure that everyone is using the same definition of key words. If someone says, “Everyone knows what *requirements* means,” it is likely that there are really multiple definitions of the word being used by different members, and no, not everyone knows what it means.
- Demonstrate behavior and attitudes. The facilitator should demonstrate the behavior and attitudes desired of the team by:
 - Respecting all team members equally
 - Being aware of feelings and reactions of team members and responding appropriately
 - Admitting mistakes or not knowing facts or answers,

- Being objective and controlling bias
- Asking questions based on others' statements
- Focusing on positions rather than personalities
- Listening carefully and using encouraging body language and tone of voice
- Acceding when others have a better idea
- Accepting criticism
- Providing positive feedback
- Giving up the floor when appropriate
- Supporting points with fact

2.3 Active Listening

Listening is one of the most important attributes of a facilitator. Notwithstanding its importance, research indicates that people generally remember only a fraction of what is heard. When communicating, people often wait to speak or become distracted rather than listening attentively. The good news is that listening is a skill that can be improved. By becoming a better listener, the facilitator will be able to gain more information and a better understanding of the communication exchange which will improve his or her ability to facilitate a team.

The way to become a better listener is to practice active listening. Active listening is a communication technique which requires the listener to hear not only the words that another person is saying, but more importantly, try to understand the complete message being sent. The fundamental underpinning of active listening requires the listener to feedback what he or she heard to the speaker by re-stating or paraphrasing the information in his or her own words. In some situations, the listener paraphrases the speaker's words as a question which reduces the chances of assumption or interpretation. This not only confirms what the listener heard, but also confirms the understanding between the listener and speaker.

For most people, poor listening habits are often difficult to break. Overcoming poor listening habits typically requires changes in how one comprehends, retains, and responds to the messages received. Hallett (n.d., accessed March 2014), describes five key principles of active listening that, when followed, should help one become a better listener. The facilitator should use these principles to ensure successful communication with HPT members. The five principles are described as follows:

- Pay Attention. The listener should give the speaker his or her undivided attention. Key elements of paying attention include the following:
 - Look at the speaker directly
 - Put aside distracting thoughts
 - Do not mentally prepare a rebuttal
 - Avoid being distracted by environmental factors such as side conversations
 - Read the speaker's body language

- Show Listening. The listener should use his or her own body language and gestures to convey that he or she is listening. Using body language and other signs to indicate listening also reminds the listener to pay attention. The listener should use simple head nods or short affirmative comments which do not necessarily mean agreement, but rather indicate the listener is listening. The listener can show that he or she is listening by the following actions:
 - Maintain eye contact
 - Nod occasionally
 - Smile and use other appropriate facial expressions
 - Maintain an open and inviting posture (uncrossed arms, facing position)
 - Encourage the speaker to continue with short affirmative comments (e.g., yes, uh huh)

- Provide Feedback. The listener's personal filters, assumptions, judgments, and beliefs can distort what is heard. The role of the listener is to understand what is being said, which requires reflecting on what is said. The following tips can help the listener provide feedback to the speaker:
 - Paraphrase what is being said into a question, for example:
 - "What I'm hearing is..."
 - "Sounds like you are saying..."
 - Ask questions to clarify certain points, for example:
 - "What do you mean when you say..."
 - "Is this what you mean..."
 - Summarize the speaker's comments periodically

Oftentimes during the course of an HPT event, HPT members are not listening to the speaker, but are instead rehearsing their next statement. One of the most important functions of a facilitator is to provide feedback to both the speaker and member(s) who should be listening using the approaches described above. By doing this, the facilitator redirects attention back to the issue at hand, enabling the HPT to fully address the issue before moving on.

- Defer Judgment. Interruptions can frustrate the speaker, be counterproductive, and hinder listeners from gaining a full understanding of the message. Listeners should defer judgment by:
 - Allowing the speaker to finish each point before asking questions
 - Avoiding interruptions with counter arguments

In some situations, the HPT lead will have the urgency to "stay on schedule" and may attempt to short circuit the HPT process. An indication that this may be occurring is when

the HPT lead allows one or two people to speak, but then cuts off the conversation prematurely in order to move on. When this happens, the member who was patiently waiting to reply or counter the speaker will now feel shut-out. As a result, the member loses patience and starts interrupting conversations as a way to get his or her perspective heard. Such behavior can be very detrimental to the HPT process. It is important to allow all members the opportunity to respond. Nothing is gained by being disrespectful, cutting off, or verbally attacking the speaker. Listeners should respond appropriately by:

- Being candid, open, and honest
- Asserting opinions respectfully
- Being polite to the speaker

2.4 Gaining Consensus

During HPT events, there may be times when the facilitator must gain consensus on a decision to keep the team moving forward. Consensus means overwhelming agreement, and does not necessarily mean unanimity (A Short Guide to Building Consensus (n.d., accessed March 2014)). Although the facilitator should aim to achieve unanimity in all decisions, there will likely be situations when one or more team members may be holdouts (i.e., team members who think their interests may be better served by not agreeing with a decision). Interests are the underlying needs or reasons why team members take positions or make demands. In these situations, the facilitator should settle for consensus that goes as far as possible toward meeting the interests of all team members. The following describes a four-step approach for gaining consensus:

- Step 1. Present the Position. The facilitator asks the team member(s) who is holding out to explain why he or she is taking a certain position. To help the team understand, the facilitator can ask the team member to explain his or her position with an example or citation.
- Step 2. Ask Questions. After the team member has expressed his or her position, asking questions helps the team gather more information to understand the underlying reasons why the team member is taking a certain position. The facilitator and other team members should be actively listening rather than thinking about a response. The facilitator should allow time for the team to consider the new information.
- Step 3. Discuss Modifications. The facilitator should ask the team member(s) who is holding out to suggest modifications to the decision that would make it acceptable to him or her without making it less acceptable to the other team members.
- Step 4. Make Decision. If the modifications are not acceptable to the other team members and unanimity is not achieved, it is appropriate to settle for consensus (overwhelming agreement) on the decision. Great care must be taken not to let the majority, even an “overwhelming majority” override the lone voice ***if the lone voice is the expert in that area.*** When deciding how to do brain surgery, fifty patients in “overwhelming agreement” should not carry the decision over the one brain surgeon who believes otherwise. It is also important to note that the dissenter’s opinion will not die in the HPT. The study will have to

go through formal coordination and the dissenter's office may make a critical comment on the issue at that time, which may need to be resolved at a higher level.

2.5 Human Interaction

It is helpful for those facilitating any group to develop certain skills in dealing with people and to be aware of and understand some fundamentals of basic human nature. Honing these skills can be useful in conducting efficient and productive meetings. As these skills are concerned with interpreting human behaviors, they are largely subjective in nature. And while none of these skills provide foolproof, objective, repeatable, or accurate results, they do provide a foundation for the facilitator to understand what motivates people, deal with certain behaviors exhibited by individuals, and guide a group to effective and positive outcomes.

The following sections examine some techniques for reading people, including verbal and nonverbal communications, and for identifying types and ways to work with difficult people.

2.5.1 Reading People

Being able to "read people" involves paying careful attention to both verbal and nonverbal communication taking place during any encounter with other human beings. It is important to understand that being able to "read people" is not an exact science and research shows that most people, who believe they read people well, typically do not. This could be in part due to their own weakness in understanding themselves and their actual capabilities and limitations, but typically the complexity of human behavior does not lend itself to accurate characterization. That said, there are some verbal and nonverbal behaviors that generally indicate certain moods, attitudes, and personality traits. Understanding and recognizing these will help the facilitation process for any group (or individual) interaction.

2.5.1.1 Verbal Communication

Effective communication is important to the success of any group interaction. The ability to exchange ideas, understand other perspectives, solve problems, and achieve goals depends significantly on how effectively we communicate with others.

Windle and Warren (n.d., accessed March 2014) discuss three components of effective communication: verbal, paraverbal, and nonverbal messages. This section focuses on the verbal and paraverbal aspects of communication and how each part, along with nonverbal signals, impacts our ability to effectively communicate. Nonverbal communication will be discussed in depth in the following section. The three components of communication are defined as follows:

- Verbal. Aspects of verbal messages are word choice, word arrangement, and message content.
- Paraverbal. Paraverbal messages deal with how words are stated. Aspects of paraverbal messages are tone, pitch, and speed.
- Nonverbal. Nonverbal messages are communicated through body language.

Effective verbal messages are clear, concise, and cogent. Listening to a rambling, unorganized speaker is tedious. Lengthy and convoluted dissertations not only lose the messages' relevance, they confuse listeners. Consider that Abraham Lincoln's Gettysburg address, which followed other presentations that day, is now regarded as one of the greatest speeches in American history. In just over two minutes, Lincoln reminded the audience of the principles decreed by the Declaration of Independence and campaigned for the continued preservation of the Union. Compare that to Edward Everett's two-hour, 13,607-word oration, presented prior to Lincoln's address, now seldom read and only remembered for its length. The point is to choose words carefully, avoid slang and jargon, minimize acronym use, and eliminate superfluous information from the message. Additionally, refrain from using words that are critical, judgmental, sarcastic, or accusatory as it tends only to instill defensiveness in the person they are directed to. Defensiveness is not conducive to problem solving and achieving the goals of the group interaction.

According to Windle and Warren (n.d., accessed March 2014), paraverbal messages account for about 38% of what is perceived and understood by others. Consider the saying, "It's not what you say, it's how you say it." When the emphasis is placed on different words in the same sentence, the meaning of the sentence changes. For example:

- "I didn't say he was responsible." (It wasn't me)
- "I didn't say he was responsible." (I conveyed it some other way)
- "I didn't say he was responsible." (I said something else)

As noted above, there are three major components of paraverbal messages (pitch, tone, and speed of words). Pitch is simply defined as the key of one's voice. A high pitch is often interpreted as anxious or upset. A low pitch sounds more serious and authoritative. This was so important to UK Prime Minister Margaret Thatcher that she worked with a vocal coach to lower her naturally high-pitched voice. Because people pick up and respond to it, practice varying voice pitch to add emphasis to various aspects of the message and keep the audience interested. No one enjoys listening to a monotone speaker.

Tone is the second component of paraverbal messages. Tone is produced through a combination of pitches which create a mood. Create a positive, authoritative tone by lowering pitch, smiling, sitting (or standing) straight and actively listening, and by controlling inner thoughts. Negative thoughts are reflected in the tone of voice.

The third component, speed, also effects communication. Someone speaking quickly is harder to understand than someone speaking at a moderate pace. On the other hand, speaking very slowly may result in a loss of interest on the part of the audience. Combine this with a monotone pitch, and the message (and perhaps the speaker's credibility) may be completely lost. Speed also has an effect on the tone and quality of the message. A fast pace makes the communication rushed. Slow paced messages may be perceived by the listeners as unimportant. A moderate pace is the easiest for the listeners to focus on.

Given that communication is comprised of verbal, paraverbal, and nonverbal messages, it is important that these three messages be consistent. In cases of conflicting messages, it is the paraverbal and nonverbal messages that are most often believed.

“Speak as if we are absolutely correct, and listen as if we are absolutely wrong.”
Dr. Robert Sutton

2.5.1.2 Nonverbal Communication

Research shows nonverbal behaviors make up a large percentage of daily interpersonal communication. Windle and Warren (n.d., accessed March 2014) claim that as much as 55% of what is perceived by others is through nonverbal communication. Given that so much information is communicated nonverbally, it is useful for the facilitator to recognize nonverbal signals and understand what they potentially mean. Remember, interpreting nonverbal communications, like any other method of “reading people,” is not an exact science and can be subject to misinterpretation.

Nonverbal communication takes its form in mainly two areas of a person: the face and the body. Emotions and moods are expressed through both facial expressions and body language. Cherry describes eight major nonverbal behaviors and the emotions expressed by these behaviors:

1. **Facial expressions:** Facial expressions are responsible for a significant portion of nonverbal communication and convey several emotions. Universal facial expressions are those that are similar throughout the world and communicate the same emotion. These include happiness, sadness, fear, and anger. Other facial expressions/emotions include surprise, disgust, confusion, excitement, desire, and contempt.
2. **Gestures:** Gestures are deliberate movements and signals used to communicate information. Some of the most common gestures include waving, pointing, and using one’s fingers to indicate numeric amounts. Other gestures are arbitrary and often relate to specific cultures.
3. **Paralinguistics:** Paralinguistics refers to vocal features that accompany speech and contribute to communication, but are not generally considered to be part of the language system. Examples of vocal features include vocal quality, loudness, inflection, pitch, tempo, and tone of voice. It may also include facial expressions and gestures.
4. **Body language and posture:** While posture and movement convey information and indicate feelings and attitudes, research suggests body language is more subtle and less definitive than popular belief. Unfortunately, the media has focused on over interpretation of defensive postures such as arm-crossing and leg-crossing.
5. **Proxemics:** Proxemics deal with personal space requirements and the role it plays in communication and social interaction. How far apart individuals stand during a conversation

generally depends on the degree of intimacy between them. Other factors that influence the amount of space one needs or perceives to possess include social norms, the specific situation, and personality characteristics. Most people are familiar with the “close talker.”

6. **Eye gaze, blinking, pupil size:** While a person looking directly into another’s eyes during a conversation indicates interest and attentiveness, prolonged eye contact can feel threatening. On the other hand, breaking eye contact may indicate distraction, uncomfortableness, or the concealment of true feelings. Generally, the rate of blinking increases and pupils dilate when people encounter things they like. As poker players do, a person may strive to conceal his or her feelings by trying to control eye movement.
7. **Haptics:** In medicine, haptics refer to the science that deals with the sense of touch. In terms of non-verbal signals, haptics refer to communication through touch. Common emotions communicated through touch include affection, familiarity, and sympathy.
8. **Appearance:** Finally, Cherry considers the choice of color, clothing, hairstyles, and other factors regarding appearance as nonverbal communication behaviors. Appearance can impact physiological reactions, judgments, interpretations, and first impressions. Additionally, different colors evoke different moods. Therefore, it is important for the facilitator to keep his or her own appearance in mind when interacting with teams in addition to understanding how his or her own perceptions may be influenced by the appearance of others.

Cherry also provides her list of the top ten nonverbal communication tips in her paper titled “*Master the Art of Nonverbal Communication with these Tip.*” Paraphrased below, Cherry describes each of these nonverbal communication behaviors and provides insight into their potential meaning:

1. Pay attention to nonverbal signals such as eye contact, gestures, posture, body movements, and tone of voice. All of these can transmit important information not put into words.
2. Look for incongruent behaviors. Listen for words that fail to match a person’s nonverbal signals. For instance, an individual may be frowning at the same time he or she is claiming to be happy. Incongruent behaviors tend to mean the meeting message is being ignored. The individual’s focus is likely on unspoken moods, thoughts, or emotions.
3. Concentrate on tone of voice. Pay attention to how tone affects others. Use tone of voice to emphasize ideas or thoughts one wants to communicate.
4. Use good eye contact. A person who does not make eye contact may be evading or hiding something. However, too much eye contact may appear confrontational and intimidating. Do not stare intently into someone’s eyes. Intervals of eye contact lasting only four or five seconds is recommended by some communications experts. The facilitator should apply sound judgment regarding the appropriate amount of eye contact for each situation.

5. Ask questions about nonverbal signals. Repeat back your interpretation of what was said; ask for clarification. Clarification should be asked for in a genuinely inquisitive and forthright manner. Avoid cynical or aggressive tones that might imply the individual is somehow “wrong.” Examples of asking questions for clarification include:
 - “So what you’re saying is that”
 - “Let me make sure I understand what you said....”
6. Use signals to make communication more effective and meaningful. Both verbal and non-verbal communication work best to convey the message. Use body language that reinforces the message. This is particularly useful when making presentations or speaking to large groups.
7. Look at signals as a group. A single gesture may mean many things or nothing at all so do not place too much emphasis on just one signal. Look for groups of signals that reinforce a common point.
8. Consider context. Always consider the situation and context in which any communication occurs. Are the nonverbal communications appropriate for the context? More formal behaviors required in some situations might be interpreted differently than the same behavior performed in other settings. Concentrate on making signals match the level of formality.
9. Be aware that signals can be misread. The firm versus weak handshake – neither may mean what you think. Always look for groups of behavior. A person’s overall demeanor communicates more information than a single gesture.
10. Practice, practice, practice. Practice these tips to build communication skills and the ability to correctly interpret signals from others. Always pay careful attention to nonverbal behavior.

2.5.2 Recognizing and Working with Difficult People

Working with difficult people is always a challenge. Difficult people come in a variety of forms including those that are perpetually negative and pessimistic, those that are toxic or hostile, those that are neurotic and anxious, and those with overinflated egos. Certain qualities such as meanness and a sense of worthlessness make some people consistently hard to handle. Additionally, some people have hair-trigger defensiveness that degrades their ability to listen and communicate effectively. These qualities lead people to bulk up self-esteem by putting down others. Most likely, everyone has had to deal with difficult individuals, including leaders at some point in their lives. Most people are familiar with the bullies, the abusive, the self-serving, the arrogant, the screamers. Marano (2012) describes four specific types of difficult people and provides some suggestions for dealing with them:

2.5.2.1 The “Hostile”

Some common traits of the “hostile” person include being disagreeable, cynical, and mistrustful. Additionally, the hostile person has a highly explosive reactivity when confronted and always hates to be wrong. Hostile types include the “bully boss” and the passive aggressive individual whose typical modus operandi is to “throw people under the bus.” When it is necessary to confront a bully directly, remain calm and professional. Never confront a bully in public as bullies will never back down in front of an audience. Tell the bully that his or her behavior is unacceptable and be specific about exactly what behaviors are at issue. Clearly explain to the bully how to treat others. There is no guarantee that these tips will get any positive results, but engaging in the same type of hostile behavior as that of the bully is guaranteed to get negative ones.

2.5.2.2 The “Rejection-Sensitive”

The “rejection-sensitive” person deems all slights intentional and constantly scans for them, both real and imagined. They are unnerved in the face of any slight no matter how small. In very extreme cases, their behavior may include stalking (typically male). Rejection sensitive people have very little self-esteem and a lot of self-doubt. Rejection or the expectation of it makes these individuals hostile, although this aggression is generally passive rather than overt. Although challenging, remaining calm and keeping one’s own reactivity low is the best way to deal with a rejection-sensitive person. Listen well to understand the individual and respond clearly to avoid the conversation from spiraling out of control.

2.5.2.3 The “Neurotic”

The “neurotic” person is usually a pessimist and often suffers from anxiety. Obstructionism is a common trait among neurotic individuals. They are cynical and tend to delay progress while dismissing the ideas of others. Dealing with the neurotic person requires maintaining a calm presence. Resist the temptation to write the difficult person off and try to understand his or her perspective without advocating it: “My experience has been different...”

2.5.2.4 The “Egoist”

Common traits of the “egoist” include the inability to compromise, insisting on being seen as “right,” taking everything personally, and promoting his or her own interests first. For egoists, “It’s my way or the highway.” Egoists are inclined to respond strongly, even angrily when their desires are not met. The egoist may be the most difficult type of hostile, toxic person to deal with because of his or her narcissism and inability to compromise. Like the rejection-sensitive, the egoist is handled by remaining calm and keeping one’s own reactivity low.

2.5.3 Additional Tips for Working with Difficult People

2.5.3.1 Defusing a Difficult Encounter

In addition to the tips for dealing with specific types of difficult people identified above, Marano (2012) provides several tips recommended by physician and *Psychology Today* blogger, Susan Biali, to defuse a difficult encounter. First, minimize time with problem people by keeping interactions as short as

possible. When interacting with a toxic person, keep the discussion or disagreement logical. Provide fact-based communication with minimal details only. Maintain focus on the hostile person during the conversation to help avoid being the target of demeaning comments, twisted words, or manipulation. If possible, avoid topics that may invite trouble. Accept the person as is; he or she will never be the person one would like him or her to be. As much as possible, refrain from trying to explain oneself as the hostile person will not empathize with others or see their point of view. Conducting an interaction with a hostile person around some recreational activity or entertainment may also help to soften or neutralize a problematic encounter.

2.5.3.2 Negative People

Kruse describes eight techniques to deal with individuals he likens to the *Saturday Night Live* character, Debbie Downer. Kruse postulates that some people, like Debbie, are only happy when they are unhappy and bringing down everyone else around them. These people are surrounded by negative energy that tends to infiltrate the moods of others. To prevent this, Kruse provides the following advice:

- 1 Do not get dragged down: Do not let the “Debbie Downers” pull oneself into their world of negativity. The negative “vibes” emanating from the “Debbie Downers” of the world are not healthy and can hinder productivity. Misery may love company, but avoid becoming the companion. Stay positive and focused on the objectives.
- 2 Listen: While tempting, do not tune negative people out. Although their very nature is generally negative, there may be some solid thoughts or ideas in their blustering that can be useful to the group. Use good, normal listening techniques to extract those nuggets and change the attitude from a negative tone to a positive one.
- 3 Use a time limit for venting: The occasional need to vent does not equal a perpetual pessimist. If individual(s) in the group need to vent, allow only 5 minutes or so and then move forward with the agenda by saying something to the effect of: “I understand your concerns and/or issue but we need to move on now. Perhaps we can address this again at some later date.”
- 4 Do not agree: Do not appease the “Debbie Downer” just to make him or her shut up and go away. Agreement only encourages the complaining.
- 5 Do not stay silent: Staying silent even though actively listening will lead the difficult person to interpret one’s silence as agreement. Others, if present, might assume this as well.
- 6 Switch extremes into facts: Negative people often speak in extremes by frequently using terms such as “never” and “always.” Most often perceived issues, problems, or slights should not be in terms of “never” and “always.” Switch the negative person to fact-based statements only.
- 7 Move to problem solving: Complainers frequently feel powerless and that most situations are hopeless. The best way to deal with this is to try to move them from continual complaining into problem solving.
- 8 Cut them off: If all else fails, and after a sufficient amount of venting has been allowed to take place, one may just have to politely shut the difficult person down and move on to something else.

2.5.3.3 An Approach for Dealing with a Difficult Person in the HPT

The information above will help the facilitator recognize and deal with one or more difficult people in the HPT. If a difficult individual is part of the HPT and his or her behavior is negatively impacting the progress of the meeting, try the following steps (these should be discussed and agreed upon by the HPT lead and facilitator prior to the HPT event):

- Step 1. Discuss the situation with the HPT lead. If the HPT lead agrees that there is an issue and action should be taken, the HPT facilitator should take the person aside during a break and speak frankly with him or her to resolve the issue. This may require one or more consultations between the facilitator and the disruptive individual. Always attempt to solve at the lowest level first. In most cases, the person needs to feel "heard" and the facilitator can do that without it disrupting the rest of the group. It is more effective for the facilitator to take this role because the group will view the facilitator as a neutral and more objective HPT member. The HPT lead is a stakeholder with his/her own interests and could potentially be perceived as less objective.
- Step 2. If Step 1 does not work, the facilitator should recommend to the HPT lead that he/she dismiss the individual and replace him/her with a representative from the same organization.

Keep in mind that there are some things that are simply out of the facilitator's control. Not all people are easy or pleasant to deal with. Recognize when the fight is not worth it and back off. Understand the things that can be changed and do not waste time and effort trying to change those that cannot be changed. At times it can be very difficult, but strive to maintain professionalism and civility in these challenging settings. Know what a critical issue is and what is not. Finally, remember the maxim of OAS philosopher Boninius: *Perfection is the enemy of good enough; but never accept a "compromise" in a critical area just to end a contentious discussion.*

3 Preparing for the HPT

Since preparation is essential to the success of the HPT, this chapter describes five key elements to consider when preparing for an HPT event: initial communication with the HPT lead, developing the HPT objectives, determining HPT membership, developing the agenda and schedule, and identifying administrative and logistical considerations.

3.1 Initial Communication with the HPT Lead

The initial communication with the HPT lead is a very important since it forms his or her initial impression of you as a facilitator, helps establish rapport, and enables the facilitator to determine the level of readiness to conduct the HPT event. This is a critical step in the process since the facilitator will be working closely with the HPT lead throughout the HPT event.

In most cases, the initial communication between the facilitator and HPT lead will likely be by telephone. Ideally, the facilitator should meet with the HPT lead in-person, but this is not always possible. In preparing for this initial conversation, the facilitator will need to coordinate a date and time (most likely, several times) with the HPT lead to discuss the upcoming HPT event. This initial conversation may be an hour or more in length, so the facilitator and HPT lead should plan accordingly. The facilitator should prepare a list of questions beforehand to gain insights into various aspects of the HPT such as the HPT members, experience levels, participating stakeholders, tasks accomplished, and projected timeline. Do not assume all this has been done—be prepared with some thoughts about how to fill in any blank areas. Having a successful first encounter requires both people to have done their homework.

Although not an all-inclusive list of questions, Table 3-1 lists questions the facilitator should consider for his or her initial conversation. Based on the responses received from the HPT lead, the facilitator can assess HPT readiness, determine what additional actions must be taken to prepare for the HPT, and begin formulating an approach to facilitate the HPT.

Table 3-1: Examples of Initial Conversation Questions

| Topics | Questions |
|------------------------|--|
| Experience, Background | What is your experience with conducting or participating in Analyses of Alternatives? With other requirements studies? What is your background (AFSC, past assignments, accomplishments)? What is your current job title and what responsibilities do you have? |
| Mission Area Knowledge | What is known about the mission area under study? What background documentation can you send to me so I can become familiar with the study? What documents exist today? Was there a CBA that directly led to this? Other analyses? Can I get copies of them? What JCIDS documents do you have? JROC approved ICD? CBA? |
| OAS Familiarity | How familiar are you with OAS and its mission? What are your expectations of OAS throughout the HPT and study? Explain how you envision OAS involvement |

| | |
|----------------------------------|--|
| | and assistance. |
| OAS AoA Handbook Knowledge | Do you have a copy of the OAS AoA Handbook? Are you familiar with it? Do you need other documents from OAS? |
| HPT Familiarity | How familiar are you with a High Performance Team? Have you ever served as a leader or member of an HPT? If so, what HPT(s)? |
| Guidance/Process Knowledge | How familiar are you with the JCIDS manual, AFI 10-601, and other guidance relevant to your area of study? Do you have any questions regarding the JCIDS process or conducting an AoA? |
| RSR Products | When was the RSR conducted? What are the important aspects of the strategy described in the RSR? How does the planned HPT effort align with the RSR? |
| Air Staff Engagement | Have you spoken with the functional representative at HAF/A5R? If so, who? Have you talked to anyone else in Air Staff? If so, who? What do they want from the study? Have they articulated any issues, key questions, scope, or other study requirements? |
| Concept Development | What concepts will you consider for development? Why these? Where did they come from? How mature are the concepts? Are you familiar with the CCTD process? What is the stage of development of the initial CCTDs? |
| OSD(CAPE and/or AT&L) Engagement | Have you talked to anyone at OSD(CAPE)? What do they want from the study? Have they articulated any issues, key questions, scope, or other study requirements? |
| MAJCOM Engagement | What other directorates/divisions/offices in your MAJCOM have you collaborated with regarding this AoA study? What do they want from the study? Have they articulated any issues, key questions, scope, or other study requirements? |
| HPT Goals | What are the goals of the HPT (i.e., develop draft document, develop final document)? How many days do you think is needed for the HPT event? What administrative support do you have? What assistance do you need in planning and arranging the HPT event? |
| HPT Members | What organizations should have HPT membership? How many members do you think you need for the HPT? Who have you already invited for HPT membership? Who are you considering for HPT membership? What experience do the selected members and those you are considering have in conducting an AoA? What expertise do they have? What expertise is needed? What assistance do you need from OAS in forming the HPT? |
| AoA Study Schedule and MDA/MDD | What is the projected schedule or timeline for this study? What is the coordination timeline/process for this study? Who is the MDA? Has MDD been scheduled? If no, when do you anticipate the MDD taking place? What has been accomplished in preparing for the MDD? AFRB? SAF/AQR review/approval? How much of the MDD entry criteria have you met? See Appendix I for MDD entry criteria. |
| AoA Study Team | Have you thought about key organizations (or people) you will need on the AoA team? What specific skills will we need? Are there organizations that need to participate for political reasons? Who are the key people who have been involved in the effort do date? Based upon this, who do we need to have on the HPT? |
| AoA Funding | Do you have funding for the AoA? To the next milestone? The HPT? |

3.2 Requirements Strategy Review (RSR)

As described in AFI 10-601, an Initial RSR is required for all Air Force-sponsored programs entering the JCIDS requirements process regardless of where the program enters the process. The Initial RSR is conducted by the Air Force Requirements Review Group (AFRRG) before the sponsor convenes the High Performance Team (HPT) event. The AFRRG provides a cross functional, corporate evaluation of identified requirement gap(s) and determines how to best address the identified gap(s) through solutions which are Materiel, non-materiel, S&T investment, accepting the risk, or a combination of these. Before talking with the HPT lead, the facilitator should review the RSR sections in the CBA Handbook and the Pre-MDD Handbook. In addition, the facilitator should advise the HPT lead and members to review the RSR sections in AFI 10-601 and the OAS handbooks before the HPT event.

For a previously approved and ongoing Air Force program, a Follow-on RSR is normally conducted by the Air Force Gatekeeper (AFGK) (this is generally AF/A5RP) before convening the HPT event for follow-on requirements documentation. The Follow-on RSR may be elevated to the AFRRG or AFROC, as directed, to review program changes that have occurred since the initial RSR was approved (e.g., significant changes in requirements, funding, or schedule). Since the AoA study guidance and study plan are considered follow-on requirements documentation, a RSR would be required before convening HPT events for developing the AoA study guidance and study plan.

In preparing for the HPT, the facilitator should ensure the HPT lead understands the information in the RSR. Given that the RSR is the Air Force assessment of the capability gaps, potential solutions, and how the AF wants to move forward, the facilitator should advise the HPT lead to maintain alignment with the RSR in developing the AoA study guidance and study plan. If the HPT develops AoA documents that significantly deviate from the RSR, then the facilitator should recommend that the sponsor provide an RSR update to the AFRRG before proceeding any further with AoA planning. The focus of the update would be on explaining the rationale behind the changes in the RSR and garnering AFGK, AFRRG, or AFROC approval. Because the purpose of the RSR is to get a corporate Air Force discussion of the gaps, it is one of the primary sources of information to write the ICD, the guidance, and the AoA study plan.

3.3 Key Planning Factors to Consider

A major challenge for the facilitator and HPT lead is determining the length of the HPT event and the tasks that will be accomplished on each day of the event. As shown in Figure 3-1, there are several key planning factors the facilitator, in collaboration with the HPT lead, must consider when preparing for the HPT event. As a minimum, the facilitator must assess the level of experience of the team, the complexity of the problem, and the amount of work that has been accomplished when determining the length of the HPT event and tasks to be accomplished on each day. For instance, a more experienced team that has developed a good quality initial draft of the study guidance or study plan document on a less complex problem will require less time to complete tasks, so the length of the HPT event will likely be short. In contrast, a less experienced team working that has developed a very rough and largely incomplete draft of the study guidance or study plan on a complex problem will require more time to complete the HPT tasks, so the length of the HPT event will likely be longer.

In Chapter 4 (Conducting the AoA Study Guidance HPT) and Chapter 5 (Conducting the AoA Study Plan HPT), two example methods (short and long) are provided in each chapter for the facilitator to consider. Depending on the planning factors, the facilitator may select the short or long version to use for the HPT event. In some cases, the facilitator may need to tailor the example methods described in this handbook to develop a method for a particular situation.

Note
In most cases, tasks tend to take longer than planned, so the facilitator should keep this in mind when allocating time to accomplish tasks in the HPT event.

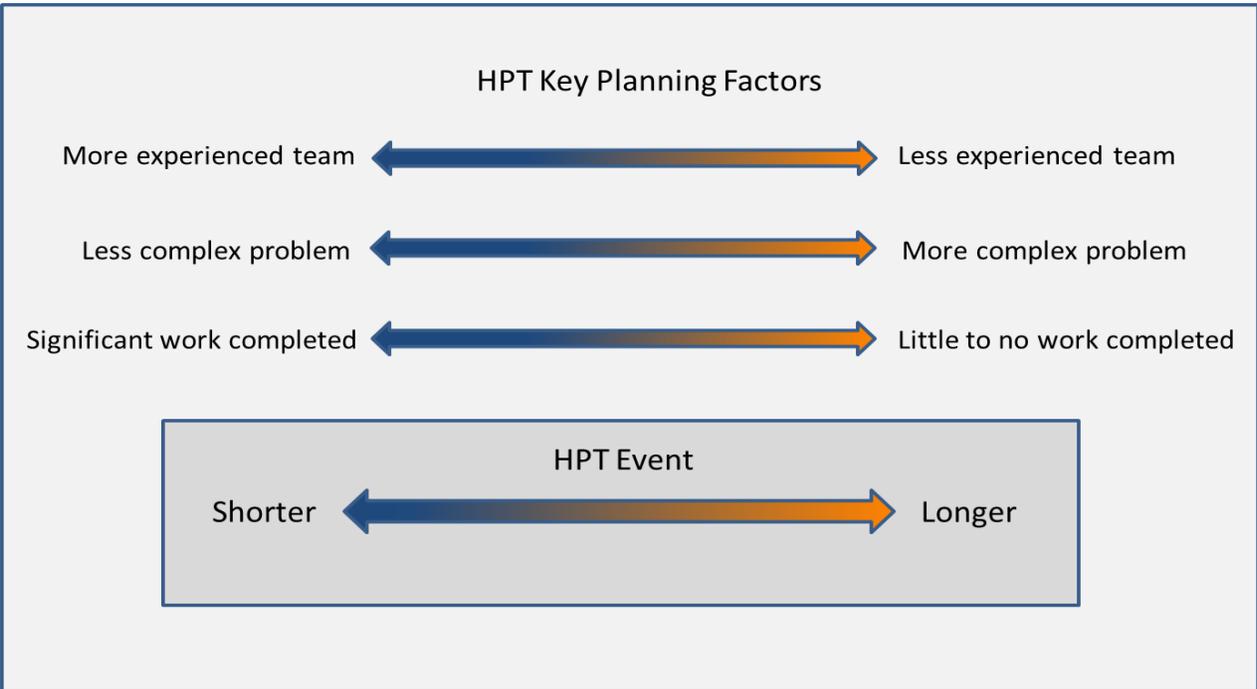


Figure 3-1: Key Planning Factors and Length of HPT Event

3.4 Develop HPT Objectives

A well thought-out set of objectives is essential to the success of the HPT. The facilitator should work with the HPT lead to ensure that the HPT objectives are established, documented, realistic, and clearly articulated to HPT members prior to arrival at the meeting location.

The following should be considered as early in the process as possible:

- Determine length of the HPT. As noted in the previous section, the facilitator, in collaboration with the HPT lead, considers several key planning factors to determine the appropriate length of the HPT event and tasks to be accomplished on each day.

- Help the HPT lead determine the list of attendees (organization and/or individuals) and their function on the team. Review AFI 10-601 and the RSR briefing and minutes to help determine the attendees. Funding may be a factor when determining how many people can attend in person or virtually, but virtual attendance should be the last resort—and it should be made clear to the HPT lead that in most cases, virtual is a poor substitute for in person. Here are some numbers that might be useful:
 - The HPT will set the foundation for an AoA that will cost several million dollars.
 - The AoA will inform billions of dollars in investment decisions.
 - Twelve people TDY for a week to the HPT location will probably be less than \$20K. This is probably less than 1% the cost of the AoA, and probably less than .001% the cost of the investment decision.
- The facilitator will collaborate with the HPT lead to develop an approach for conducting the HPT (e.g., length of HPT, breakout sessions, working group configuration, homework required prior to HPT). The approach will depend upon many factors, including the nature of the problem, the amount of work accomplished already, and the anticipated members.
- Decide on the level of completion expected. Will the HPT deliver a draft or a near-final document? There should be shared understanding of the level of completeness expected at the end of the HPT. If the HPT homework has been properly accomplished and the right people are on the HPT (and empowered to speak for their organization in most things), then the goal should typically be a near-final document ready for coordination.
- Consider the administrative details early and make decisions about location, facilities, refreshments, accommodations, transportation, lunch options (working lunch, on your own). See Appendix F for a detailed discussion of administration tasks to consider.
- Four common mistakes that can be very costly:
 - **No icebreaker:** An icebreaker activity is very helpful in allowing HPT members to meet and understand what each person brings to the table, their backgrounds and expertise, and who they need to get to know better during breaks. Much of the HPT work is done during breaks out in the hallway or over lunch.
 - **No “Success Oriented Schedule”:** Go back and read section 2.1 of this handbook. HPTs will almost, without exception, have to go through the four stages of team evolution. The change from Stage 1 to Stage 2 typically requires time for people to think about it and to internalize it, which usually requires an overnight. The same is true from Stage 2 to Stage 3. Add in the fact that HPTs should be comprised of “experts” in their various areas, and such people do not quickly acknowledge that their ingoing opinions need to change—this too takes time for thought, reflection, and discussion. Groups of this type cannot produce quality products in artificially compressed timelines. They almost always take longer than the HPT lead would like to schedule for.
 - **Underestimating the Importance of Real Lunch Breaks:** HPTs typically deal with problems that are complex and difficult to solve. Consequently, there will likely be some very contentious moments during the course of the HPT event. This is to be

expected, and is a good thing. Taking real lunch breaks will allow members to relax, recharge, and take care of other business (e.g., calling back to home station, and working sidebar issues). The time spent in taking real lunch breaks will invariably be worth the “time lost” by not having working lunches. The best facilitators often try to schedule the contentious pieces in the mid to late morning and therefore use the lunch break as a planned “cooling off” period.

- **Underestimating the Importance of Working Dinners:** This seems to contradict the point directly above, but it does not. It is not uncommon for an HPT to encounter a roadblock. For example, two members from two different organizations who are essentially stating and restating each organization’s position over and over with neither side being able to back down in public and lose face. Without some shifting of these positions, progress will be stalled. Often a carefully planned dinner meeting is a way to break the impasse. The two members, along with two or three others they both trust and value, go to dinner. It is a less formal situation, but more importantly it provides a venue where some give and take is possible without either side publicly backing down. Often, the next morning, the HPT lead or facilitator can simply announce that a compromise has been reached and move on.

3.5 HPT Membership

Determining HPT membership requires significant thought and deliberation on the part of the sponsor, OAS, and Air Staff (HAF/A5R). As described in AFI 10-601, the AoA study guidance and study plan HPTs should be an extension of the enduring HPT that was initiated for developing the ICD. When selecting members for the study guidance and study plan HPTs, the HPT lead should consider the following:

- **OUSD(AT&L).** For potential and designated Major Defense Acquisition Program (MDAP) Acquisition Category (ACAT) ID or Major Automated Information System (MAIS) ACAT IAM programs, OUSD(AT&L) should be invited to participate in the HPT since USD(AT&L) will be the MDA for the program, unless delegated to a DoD Component or other official (see DoDI 5000.02 for more information). “Participate in” is not the same as “be a member of”. AT&L will typically not want to sit through the entire HPT, and the Air Force members will probably not want to air all their issues in front of OSD. But getting the perspective of the organization that will chair the MDD and which can veto the AoA before it starts is valuable.
- **OSD(CAPE):** The Director of CAPE (DCAPE) develops and approves AoA study guidance for potential and designated ACAT I and IA (includes IAM) programs and for each joint military or business requirement for which the Chairman of the Joint Requirements Oversight Council (JROC) or the Investment Review Board is the validation authority (see DoDI 5000.02 for more information). In addition, OSD(CAPE) also participates in AoAs that have JROC or Defense Acquisition Executive (DAE) interest. For these programs, OSD(CAPE) should be invited to participate in the HPT. It is important to note that for the AoA study, OSD(CAPE) will often either chair a Study Advisory Group (SAG) or co-chair the SAG with OUSD(AT&L),

so including OSD(CAPE) as an HPT member will help ensure their interests and concerns are addressed as early as possible.

- JROC/JCB/Service/Other US Government Agency/Allied Partner Interest. Most programs have some level of joint interest and will involve other Services. Occasionally, a program will involve other US government agencies or have interest from allied partners. It is important to consider including representatives from these interested entities as members of the HPT. The most recent version of CJCSI 3170 reemphasized the increased JCS interest in AoAs. Typically they have not participated on most AoA teams, but it is worth considering case by case. Before going directly to the Joint Staff, discuss JCS participation with the Air Staff functional and the appropriate Air Staff FCB representative. Other government membership depends upon the problem being worked. If it will impact non-AF parts of the government as major customers, enablers, partners, or suppliers then they should probably be offered HPT membership. Just as the Navy does not speak for the Air Force on most issues, neither does the Air Force speak for the other Services—nor DoD for the other Departments.
- Air Force-level organizations. The following Air Force-level organizations should be considered for HPT membership:
 - HAF/A5R: Headquarters Air Force, Operational Capability Requirements Directorate
 - SAF/AQ: Office of the Assistant Secretary of the Air Force (Acquisition)
 - AFOTEC: Air Force Operational Test and Evaluation Center
 - AFCAA: Air Force Cost Analysis Agency
 - HAF/A2/A4/A6 for most HPTs since ISR, logistics, and communication are critical to almost every effort
 - Other HAF and SAF organizations on a problem by problem basis (e.g.: A10 for nuclear related problems)
- CBA Study Team Members. The study team members of the CBA(s) that identified the capability gaps that will be assessed in the AoA should be considered for HPT membership. These members will benefit the HPT since they will likely have more insights into the baseline capabilities, potential solutions, risks, and costs associated with the capability gaps. Typically if CBA team members are part of the HPT they will also fill one or more other roles mentioned above.
- AoA Study Team Members. AoA study team members that have been selected or are being considered for selection should be included as HPT members. Key members include the AoA study lead deputy, working group leads, working group deputy leads, and any other members who have experience or expertise that may benefit the HPT. As with the CBA team members, any key AoA team members will typically fill other roles as well, and in reality their membership on the HPT will often drive their AoA role since the HPT comes first (and how the guidance and plan are written should drive the AoA).
- Program Enablers/Interdependencies. All programs require enablers (e.g., intelligence, human systems integration, logistics, and communications) and have interdependencies with other systems and programs. These enablers and interdependencies may be managed, controlled, or influenced by organizations in other Services, DoD agencies, Air Staff,

MAJCOMs, or US government agencies. To ensure these enablers and interdependencies are appropriately addressed, representatives from these organizations should be considered for HPT membership.

- Other DoD-level organizations. Depending on the projected ACAT level and focus of the AoA study, there are some organizations that may be included as members of the AoA Study Advisory Group (SAG) and should be considered for HPT membership. These organizations include the following:
 - ASD(A)/S&ST: Assistant Secretary of Defense for Acquisition / Strategic and Tactical Systems
 - ASD(R&E)/SE: Assistant Secretary of Defense for Research and Engineering / Systems Engineering
 - OUSD(C): Office of the Under Secretary of Defense (Comptroller)
 - OUSD(I): Office of the Under Secretary of Defense for Intelligence

3.6 Developing the Agenda

The HPT lead, in collaboration with the facilitator, plans the agenda and communicates the information to the HPT members. An agenda is the framework that helps HPTs run effectively and efficiently. It is a step-by-step outline of the topics to be covered at the HPT. Effective agendas enhance group accomplishments:

- The agenda informs HPT members of accomplishments and priorities
- It ensures adequate consideration of all issues, events and projects
- It identifies the order in which topics will be addressed
- It keeps the discussion focused and on track
- It focuses and encourages better pre-HPT preparation
- It makes effective use of participants' time

A detailed agenda will help the facilitator communicate what needs to be accomplished. The facilitator should be very well prepared and well versed on the HPT process and mission area of interest prior to the meeting.

It is important to balance the time allotted with the agenda goals and objectives. For example, some tasks may be more difficult than originally thought. In these cases, the agenda may need to be revised if the team falls behind. Agendas can be flexible, but every effort should be made to accomplish the objectives set for the HPT (see Appendices D and E for samples of the AoA study guidance agenda and AoA study plan agenda). If there are some objectives that must be accomplished during the HPT event, the agenda should be structured to ensure the “must do” objectives will be accomplished.

3.7 Administration

There are many important details involved in planning and executing an HPT that must be accomplished. Being organized and having a list of administrative considerations is critical when

preparing to execute an HPT. The host, often the HPT lead, will likely delegate many of the administrative tasks to one or more individuals responsible for handling these tasks.

The success of the HPT will rely on a number of behind-the-scenes activities. This section is dedicated to introducing some of the activities that contribute to extracting the most from the highly talented group that may only have a short time period allocated to contribute. Appendix F provides a list of critical tasks that must be accomplished to plan and conduct an HPT event.

There are numerous documents that provide regulation, policy, instruction, background and technical information on the mission area and processes (Table 3-2). HPT members should review these documents in preparation for the HPT event. OAS recommends developing a collection of documents in a widely accessible central location such as a SharePoint site for the team to use. Physical distribution of the material through email is more cumbersome, but can accomplish the goal of the team having an understanding of the governance, previous study work, and state of the art. Providing this information ahead of time will help prepare members for the event and enable them to be productive at the start. Regardless of the storage or distribution mechanisms, it is crucial that someone be personally responsible for configuration control of all the key documents the team will use and create. Whatever mechanism is chosen, be aware that classification issues and team members outside the Air Force may require special handling to make information available to all who need it.

Table 3-2: Important Study Documents

| What* | Why |
|--|--|
| AFI 10-601 | Air Force instruction on requirements development includes roles and responsibilities, method, and study deliverables |
| JCIDS Manual | Overarching guidance document on acquisition related analysis activities |
| Appropriate CBAs, RSRs, ICDs, and pertinent studies | Necessary to learn about mission area under study – prevent “reinventing the wheel” |
| Mission area background information | Some knowledge about the mission is necessary in order to effectively facilitate and conduct an HPT |
| OAS Handbooks (CBA, Pre-MDD, AoA) | Provides information on how to conduct the CBA or AoA |
| OSD(CAPE) or Air Force AoA Guidance Template | Describes the content and format requirements of the study guidance document |
| AoA Study Plan Template | Describes the content and format requirements of the study plan document |
| DoD 5000.02 | Overarching guidance document on DoD acquisition activities |
| Various drafts of guidance & study plan | Serves as starting point for developing the near-final or final draft document |
| Minutes & action items from HPT and appropriate pre- & post- meetings | Describes the key decisions and happenings of the HPT event and records the post-HPT way ahead and actions to be completed |
| *Documents should be made available to team members as soon as the library is established (see Appendix F) | |

4 Conducting the AoA Study Guidance HPT

This chapter describes example methods for conducting an HPT to develop the AoA study guidance. It explains the tasks that must be accomplished and provides guidance for facilitating an HPT.

4.1 Introduction

The study sponsor, whether a MAJCOM or other organization, typically makes the decision to proceed with AoA planning in conjunction with the Air Force requirements community. The Milestone Decision Authority (MDA) makes the decision to proceed with AoA execution. As such, conducting an HPT to develop AoA study guidance or an AoA study plan supports decision-maker and stakeholder organizations which have an interest in the outcome of the subsequent analytic effort. The decision-makers, stakeholders, and HPT members should have a common understanding of the mission area under study. Communication with the decision-makers is critical in order to understand what the study guidance and plan should address. For the HPT process to be effective, the decision-maker and stakeholders must:

- Articulate and gain consensus on the scope of the study
- Provide adequate resourcing to support the AoA study guidance or study plan HPT
- Respond promptly to resolve issues affecting HPT product development

Tables 4-1 and 4-2 graphically show short and long versions for conducting the AoA study guidance HPT. Although the same tasks are accomplished during the HPT event, the assignment of tasks and time allocated to accomplish the tasks on each day is different for each version. Depending on the planning factors discussed in Chapter 3, the facilitator may select the short or long version to use for the HPT event. In some cases, the facilitator may need to tailor the example methods described in this handbook to develop a method for a particular situation.

The facilitation methods are comprised of ten tasks as shown in Tables 4-1 and 4-2. Table 4-1 shows a short version of the method that requires 16 working hours (2 days) to develop the study guidance, while Table 4-2 shows a long version of the method that requires 32 working hours (4 days) to develop the study guidance. In both versions, the facilitator can establish breakout sessions, if necessary, designed for various purposes such as resolving problems or issues, finishing work in specific sections, or planning future activities. Select members of the HPT would participate in these breakout sessions which may occur concurrently with the tasks. At the end of each day, the HPT facilitator, HPT lead, and other HPT members as needed, meet to discuss how the day went (e.g., progress made, issues or concerns that must be addressed, answers to questions that must be provided) and plan for the next day and beyond (e.g., adjustments to the schedule, changes in working group membership, additional resources that are required, breakout session timing and purpose).

It is important to note that the facilitation methods described in this chapter are designed to produce content for the OSD(CAPE) AoA guidance template. The OSD(CAPE) AoA study guidance template provides information for the HPT to address as it develops the initial draft of the study guidance. In cases when OSD(CAPE) will not issue study guidance, the OSD(CAPE) study guidance template may be adapted for developing guidance issued by Air Force or other organizations. Unlike other AoA documents, the study guidance is developed by the HPT, but is published by OSD(CAPE), the Air Force, or other organization. If for whatever reason the OSD(CAPE) study guidance template does not seem appropriate to the specific problem, it is vital to talk with OSD(CAPE) as early as possible. There may be very valid reasons to add, omit, or change parts of the template, but the key is to talk with OSD(CAPE) and reach a common understanding. It is also possible that the Air Force will have concerns and questions that CAPE does not view as a priority. These may need to be addressed by the HPT and documented, but not necessarily included in the eventual OSD(CAPE) guidance.

Table 4-1: AoA Study Guidance Development (Short Version Example)

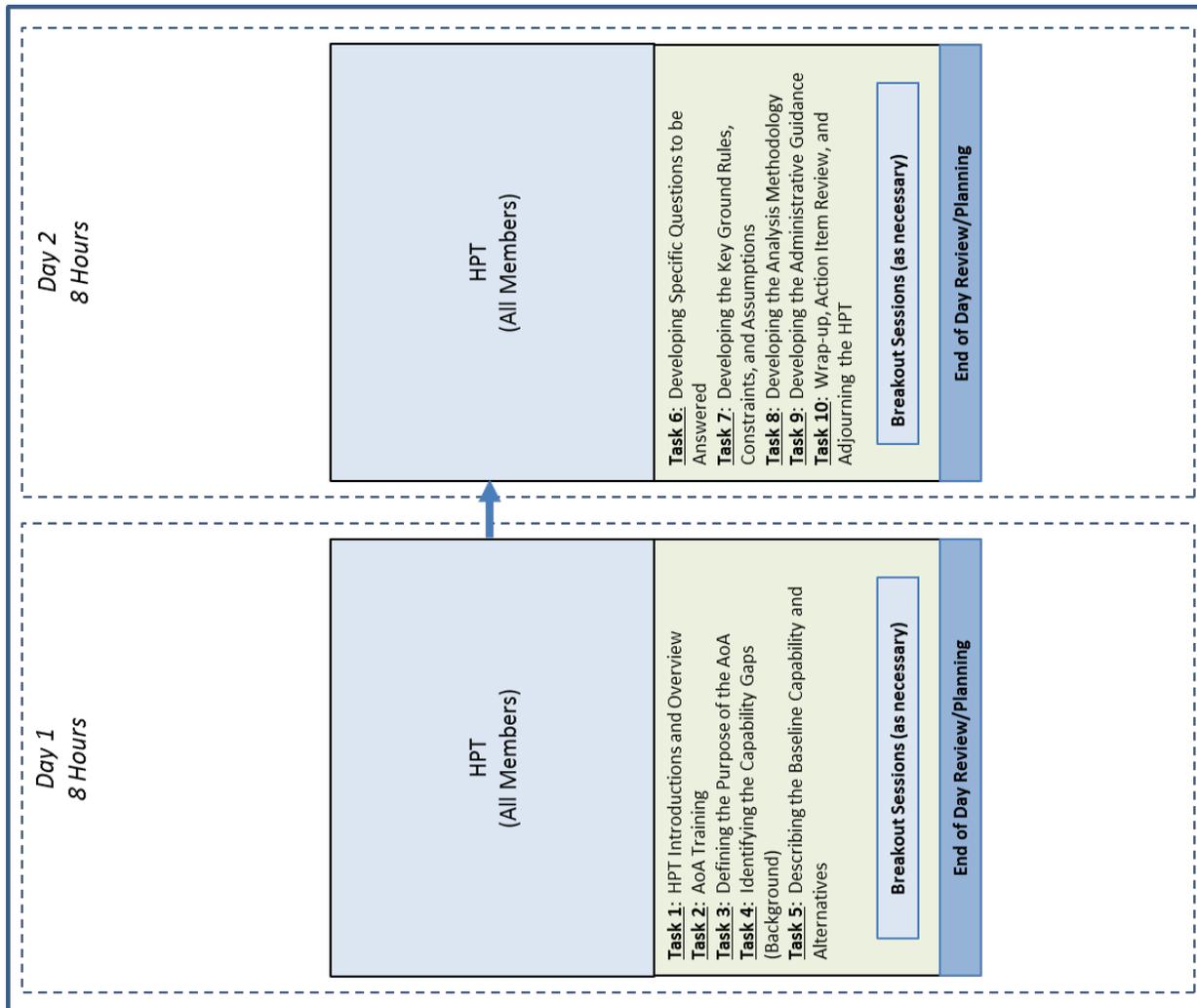
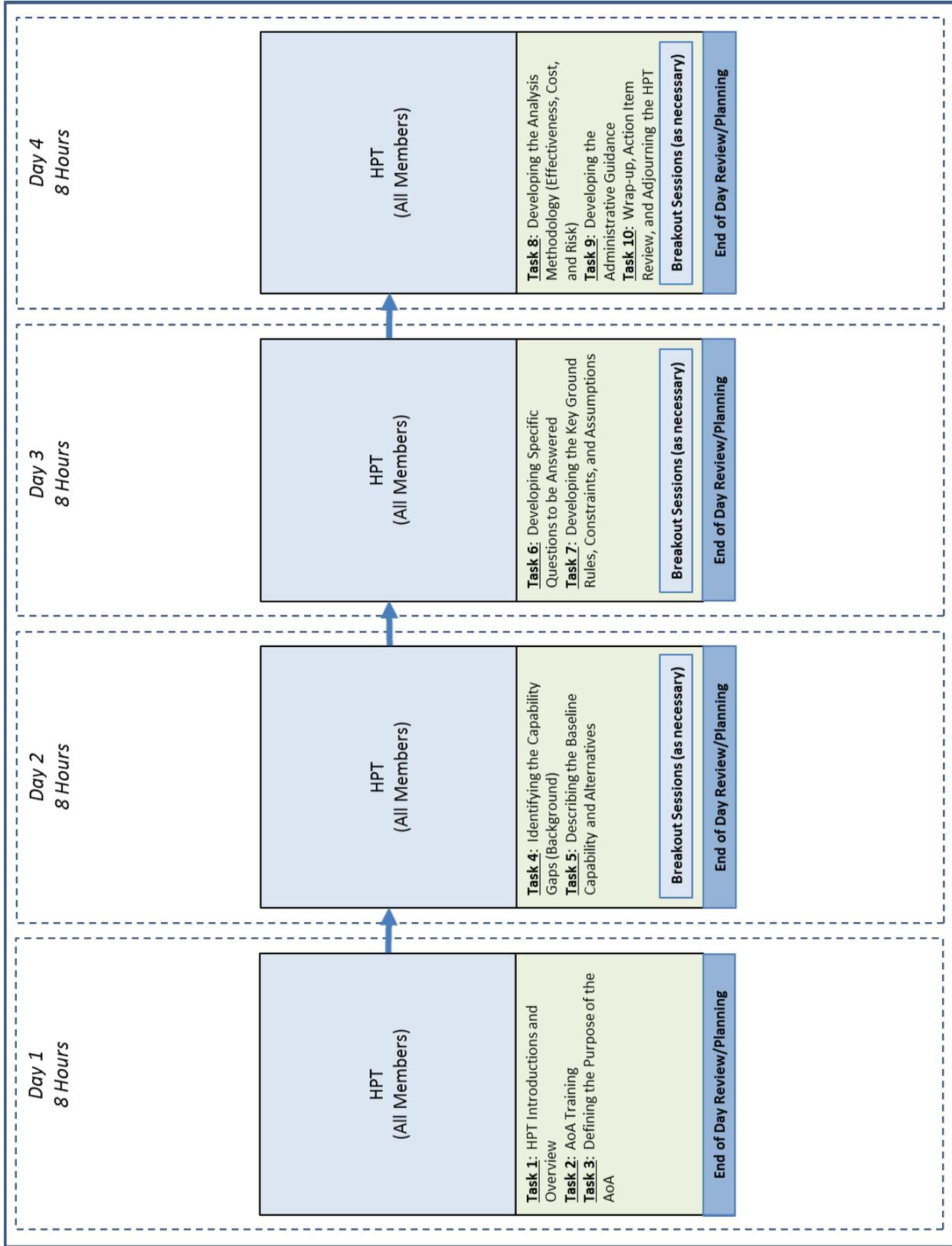


Table 4-2: AoA Study Guidance Development (Long Version Example)



4.2 Facilitation Tasks

Although there is a specific order to the facilitation tasks, the facilitator may make adjustments depending on the situation. In some cases, the HPT may finish the assigned tasks for the day early. The facilitator and HPT lead will need to determine whether there is sufficient time remaining in the day to begin the next or another day's tasks or use the time for another purpose. In other cases, the HPT may take longer to finish the assigned tasks. The facilitator and HPT lead will need to make adjustments to the schedule and perhaps defer some work until after the HPT event.

Another option entails working some of the tasks concurrently by forming smaller groups within the HPT that are focused on developing specific sections of the guidance. In these cases, the facilitator should ensure the smaller groups are aligned in their efforts by fostering cross-communication and requiring frequent progress updates from each group. Decomposing the work this way will often speed up writing the different sections of the guidance, but it inherently adds importance and time to the integration/consistency check of the pieces. Keeping the group together helps insure good integration/consistency, but will typically slow down the development of some individual parts. Finding the right mix is as much an art as a science.

Task 1: HPT Introductions and Overview. The facilitator begins the HPT event by welcoming the team members and briefly introducing himself or herself to the team. As part of the introduction, the facilitator should describe his or her role as well as the roles of the team members. Given that the team is in the forming stage, the facilitator should allow the team members to briefly introduce themselves and identify their area of expertise on the team.

Once the introductions are complete, the facilitator presents the rules of the HPT and explains why they are important and must be followed (Table 4-3). The rules are necessary to help enable the team to be fully productive and ensure the HPT experience is worthwhile for all team members. There may be times during the course of the HPT event that the facilitator must remind the team of these rules and the need to abide by them.

Table 4-3: Rules of the HPT

| Rule | Description |
|----------------------|---|
| Active Participation | The HPT benefits when all team members are contributing to the effort. Individual team members must actively participate and not rely on one or a few team members to accomplish the preponderance of work. There are numerous ways team members can actively participate such as sharing in the work to be accomplished, voicing positions or opinions (rather than remaining silent), and offering solutions to problems as they arise. Participation will not be uniform throughout the HPT. The logistician will obviously be most engaged in the logistics related parts of the meeting, but should stay engaged throughout. |
| Withhold Criticism | Withholding criticism, especially during brainstorming sessions, is necessary for encouraging creative thinking. Withholding criticism does not indicate support or agreement, but instead enables team members to generate ideas without fear of disapproval. For this to be effective everyone needs to understand “silence is NOT consent”, and adequate time needs to be allotted to eventually critically discuss any brainstorming list. A common problem is an unrealistic schedule that does not allow this critical discussion and that can result in brainstorming ideas being accepted into the final product not because they were good, but strictly because time ran out. |
| Avoid Attribution | The documents produced by the HPT are accomplished through a team effort. Attributing specific text or sections of text to a single team member or smaller group within the HPT can provoke criticism or jealousy and does not help the HPT achieve consensus. Sometimes the collective HPT wants to attribute something to a certain member because it increases the credibility based on that members credentials, but this should be the exception. |
| Remember Boninius | Perfection is the enemy of good enough, but so is being driven by schedule constraints and prematurely declaring “good enough”. |

To help the team understand what to expect, the facilitator provides an overview of the purpose of the HPT and the approach that will be used to develop the AoA study guidance. If OSD(CAPE) AoA study guidance is being developed, the facilitator should strongly consider providing a review of the OSD(CAPE) AoA guidance template to the HPT. This decision will depend on the quality and state of completion of the draft study guidance as well as the experience level of the team. For Air Force guidance, the facilitator, in conjunction with the HPT lead, should coordinate with the A5R functional representative during pre-HPT planning for specific study guidance content requirements. Again, the decision to review the study guidance content requirements during the HPT will depend on the quality and state of completion of the draft study guidance template as well as the experience level of the team. Finally, before beginning Task 2, the facilitator should provide an opportunity for the HPT members to ask questions about their roles, the facilitator’s role, the HPT purpose, the study guidance development approach, or any other issues.

Task 2: AoA Training. The extent of AoA training required will depend on several factors such as the experience level of the HPT members in planning and conducting an AoA and developing AoA study guidance. As a minimum, the facilitator should present an overview of the requirements development process in the context of the program that includes discussion of the key decisions made by the sponsor, AFRRG, and AFROC as well as the documents that have been produced (e.g.,

CBA, RSR, ICD) at this point in the process. The facilitator should also describe the decision points, milestones, and documents that will come later in the process (e.g., MDD, AoA, Milestone A, CDD) and how they are linked to previous decisions and documents. The facilitator should highlight how the HPT is not starting from scratch, but rather leverages information from various sources such as the CBA, ICD, RSR, AFROCMs, OSD(CAPE) discussions, and existing pre-MDD analyses to develop the AoA study guidance.

Task 3: Defining the Purpose of the AoA. The first section in the AoA study guidance describes the purpose of the AoA. The basic purpose of an AoA is to assess the effectiveness, cost, and risks of alternatives that have potential to close or mitigate the capability gaps addressed in the study. The facilitator should ensure the purpose statement addresses the three fundamental aspects of the assessment (i.e., effectiveness, cost, and risk) as well as identifies the specific gaps that will be addressed. Since the specific capability gaps are described in more detail in the Background section (see Task 3 below), detailed descriptions of the capability gaps are not needed in this section.

The facilitator should ensure the purpose highlights how the results of the AoA will be used to inform the Milestone Decision Authority (MDA) at the next milestone. For Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) programs, the Defense Acquisition Executive (Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L))) is the MDA unless delegated to another appropriate OSD official (see DoDI 5000.02 *Operation of the Defense Acquisition System* for more information). The MDA determines the milestone that a future program will enter by considering many factors (e.g., level of technology development, urgency of the program). In most AoAs, Milestone A is the next milestone.

Task 4: Identifying the Capability Gaps (Background).

The capability gaps that will be addressed in the AoA are described at the end of the Background section of the study guidance. The facilitator should point out that the description of the capability gaps is more than just background information since it establishes the fundamental scope of the AoA.

Before the advent of the RSR, the process of selecting capability gaps was often contentious for the HPT. Given the different perspectives and interests of the HPT members, disagreements could arise regarding what capability gaps would be addressed in the AoA. With the RSR, the specific capability gaps that will be addressed in the AoA are identified before the HPT convenes. The AFGK/AFRRG-reviewed RSR is the corporate Air Force position on the capability gaps. Unless there is other guidance from the AFGK, AFRRB, or AFROC, the facilitator should ensure the capability gaps that will be addressed in the AoA align with the capability gaps described in the RSR. Lastly, the facilitator should watch for efforts by the team to eliminate (or add) one or more capability gaps for arbitrary reasons. Such actions are not appropriate. Any changes to the capability gaps identified in the RSR will require AFGK/AFRRG review and approval.

The remainder of the Background section provides a brief history of the effort and explains why the AoA is being conducted now. The facilitator should ensure the HPT discusses related programs and

lessons learned from previous program cancellations. This information is discussed in the beginning of the Background section and leads into the capability gap(s) discussion. Ideally, the facilitator should work with the HPT lead to develop a draft of this part of the study guidance before the HPT event. If the HPT is time-constrained, the facilitator may defer development of this information until later in the HPT event, or even after the HPT event, in order to focus on more important sections of the study guidance.

Task 5: Describing the Baseline Capability and Alternatives. The baseline capability and alternatives are described in the Alternatives section of the study guidance. As noted in the guidance template, the baseline capability includes legacy systems and their approved modifications through the current Program Objective Memorandum (POM). The alternatives should be realistic and grounded in industry, national laboratory, or other agency responses to one of more Requests For Information (RFIs). The team should avoid contriving idealized alternatives that have no basis in industry or government. The team should consider one or more alternatives from the following alternative categories:

- Modified legacy systems
- As-is or modified commercial, government, or allied off-the-shelf systems
- Repurposing and/or recombining existing systems with new pieces in a system-of systems approach
- New development systems

The facilitator should endeavor to assist the team in defining the baseline and alternatives with enough detail to inform the decision-makers (e.g., AFRRG, OSD(CAPE)) and avoid misconceptions regarding what will be addressed in the AoA. To do this, the facilitator should advise the team to use the initial CCTDs as a source of information to describe the baseline and alternatives (NOTE: one of the AoA study guidance approval criteria in AFI 10-601 is the review of CCTDs by SAF/AQR and posting to IRSS). If initial CCTDs do not exist, then the team must rely on other sources of information (e.g., Joint Concept Technology Development studies, Advanced Technology Development studies, Science and Technology initiatives, subject matter expert opinion) to define the alternatives.

In most cases, there should be other analysis that helps defend why certain alternatives will be included or excluded from the AoA scope. If the team knows a specific alternative has political support from one or more stakeholders, but the HPT believes it is not a viable option, it is best to state why the particular alternative will not be included. This will preclude supporters of the alternative from claiming that the alternative was excluded due to an oversight by the HPT.

OSD(CAPE) emphasizes the exploration of the full range of viable modifications to legacy systems in the AoA. During the HPT event, the facilitator should ensure the team deliberately considers modified legacy system alternatives. These alternatives are generally referred to as baseline+ or modified baseline. The team should consider having multiple alternatives with appropriate

modifications, rather than one with all potential modifications. Much of this should have been done prior to the ICD and prior to the HPT, but the reality is this does not always happen.

Similar to the capability gaps described in the previous section, the number of alternatives will drive the scope of the AoA. The number of alternatives will depend on the AoA, but is typically ten or less, although it is not uncommon to have more. The facilitator should advise the team to consider the number of alternatives that will be analyzed and determine whether it is possible to complete the analysis within the time and resource constraints. In some situations, it may be possible to bin similar concepts and conduct an analysis on a single representative from each bin. In all cases, alternatives should be general at this stage – avoid brand names and specific instantiations (except in the baseline) as this is not source selection.

The facilitator should highlight that it is not appropriate for the team to eliminate one or more alternatives due to time and resource constraints since such actions could result in an incomplete analysis and adversely impact the credibility of the results. If the alternatives should be addressed in the study, but time and resource limitations are an issue, the facilitator should recommend the HPT lead seek assistance from the sponsor. Sometimes, if schedule and resources are a concern, the guidance can define one set of alternatives that must be analyzed, and another group (or further stratification of the initial group) that should be analyzed as resources allow.

Facilitation Tip

If necessary, the facilitator can establish breakout sessions designed for purposes such as resolving issues, finishing work in specific sections, or planning future activities. Select members of the HPT would participate in these breakout sessions which may occur concurrently with the tasks.

Task 6: Developing Specific Questions to be Answered. This is one of the more difficult sections to development since it requires some critical thinking and discussion. The facilitator should ensure the questions do not address requirements that are discussed elsewhere in the guidance, but rather probe issues associated with the future program. For example, questions that are inherent in the analysis are not appropriate study questions. The following are some examples of inappropriate questions:

- How effective are the alternatives?
- What are the life-cycle costs of the alternatives?
- How affordable are the alternatives?
- What are the most viable alternatives and why should they be pursued?
- What are the risks associated with each alternative?
- What are the DOTmLPF-P implications associated with each alternative?
- What is the military utility or worth of each alternative and why is this important?
- What are the operational benefits and risks associated with each alternative?
- What operational environment factors could affect performance?

This section of the guidance should pose questions that are substantive to the specific future program and, when answered, will highlight important aspects of the tradespace (e.g., how a future program would achieve high reliability; how a future program might trade lethality versus survivability if cost (or weight) is a limiting factor). Study questions are used to guide the study team in analyzing aspects important to the stakeholders. Some examples of substantive questions include the following:

- What are the potential reductions in cost, risk, and time that can be obtained by using systems and components that are off-the-shelf or already in advanced development?
- Given the expected lower cost, risk, and time associated with off-the-shelf systems, how much performance degradation would be acceptable to the Air Force if off-the-shelf systems are chosen?
- What is the export potential of each alternative and how might export sales affect DoD costs?
- What are the potential cost savings that could result from leveraging maintenance and spares support from existing programs, or using alternative maintenance sustainment concepts that differ from the baseline capability?

Many of these key questions should trace back to the RSR direction the team should have received. Others will reflect issues CAPE or other stakeholders have that the sponsoring CFL may not have considered.

Task 7: Developing the Key Ground Rules, Constraints, and Assumptions. Defining the key ground rules, constraints, and assumptions (GRC&As) is important in properly scoping the study and limiting bias. Despite their importance, GRC&As are typically misunderstood, resulting in the tendency to misuse the terms. This misunderstanding can cause teams to default to labeling most elements as assumptions, when in fact it is not the appropriate term to use. To help enhance the team's understanding, the facilitator should provide a thorough overview of GRC&As by defining them and highlighting their differences, explaining how and why they are used in the AoA, and showing examples of appropriate and inappropriate GRC&As.

The facilitator should guide the team in identifying GRC&As that are key and have the potential to drive the results. Key GRC&As address important elements such as force ratios, threat characterizations, and CONOPS that will be used in the study. GRC&As that have no potential to impact the results are less important and should not be identified in the study guidance, although they may be identified in the study plan and report.

This section of the study guidance should describe how the key GRC&As will be validated. The Study Advisory Group (SAG) typically validates the key GRC&As prior to beginning the analysis. However, in some situations, key GRC&As may be identified during study execution, requiring SAG validation as they are developed.

The facilitator should watch for efforts by the team to not include something or assume it away for various reasons such as the data does not exist, it is too difficult to address, or the team does not

have the time or resources to address it. GRC&As developed for reasons such as these will likely bias the results and adversely impact the credibility of the team and sponsor. The facilitator should emphasize that GRC&As are not developed for convenience sake, but rather have a purpose in helping to effectively scope the study. One of the most egregious errors is to assume away problems in order to bias the results in a certain direction. This can be done by assuming away a certain type of threat, assuming the availability of a critical enabler that might not actually be available, or by excluding a significant cost element because it will make the alternatives unaffordable.

Task 8: Developing the Analysis Methodology (Effectiveness, Cost, and Risk). The analysis should be based on sound methodologies and data that enable the AoA study team to explain the rationale for the results, which goes well beyond simply presenting the results. The AoA study team should understand that the value of the analysis is in understanding why options do well or poorly.

At this stage of AoA planning, the HPT may not have a clear understanding of how the analysis will be conducted. In these cases, the HPT should at least capture what is being considered in AoA analysis planning and development. Regardless of the level of understanding at this point, the facilitator should ensure the following fundamental aspects of the effectiveness, cost, and risk analyses are addressed in the study guidance:

- Development of mission tasks, measures of effectiveness (MOEs), measures of suitability (MOSSs), and measures of performance (MOPs). NOTE: The HPT may not know what these are yet, but acknowledges they must be developed to conduct the analysis. Refer to the OAS AoA Handbook for more information
- Specific tools or techniques that the study team plans to use or is considering (e.g., Modeling and Simulation (M&S) applications (BRAWLER, SUPPRESSOR, etc.), parametric analysis, expert elicitation)
- Cost-capability tradeoff analysis and other sensitivity analysis that will be conducted. (NOTE: this is intended to be a minimum set – other tradeoffs and sensitivity analyses will only be identified once the AoA is underway and initial results are produced).
- Scenarios, CONOPS, threats, and targets that will be used or are being considered
- Cost analysis approach that describes the development of life-cycle cost estimates (LCCEs) and what they include (i.e., research, development, test and evaluation (RDT&E), procurement, operations and support, and disposal costs), then-year and base-year estimates, and applicable OSD and Air Force guidance that will be followed
- Risk analysis methodology the study team will use or is considering (e.g., Risk Assessment Framework, Risk Management Guide for DoD Acquisition)
- Plan to present analysis methodology (e.g., scenarios, threats, tools, techniques, measures, data) for review and approval of the SAG and other stakeholders

The facilitator should ensure HPT members understand and address, where necessary, the following specific OSD(CAPE) guidance:

- **Scenarios.** The study team should identify the scenarios and CONOPS that will be used and explain the rationale for the inclusion of non-standard scenarios. If non-standard scenarios will be employed, the study team should plan to fully explain outcomes unique to those scenarios. The guidance should direct that a range of less stressing and more stressing scenarios be used, rather than using only highly demanding scenarios. Every scenario identified should be logically linked to the questions and gaps (i.e., the team should be able to explain why the scenario is needed in the AoA). The study team should also explain how variations to CONOPS or attributes of alternatives might mitigate cost drivers or low ratings on assessment metrics. The guidance should instruct the study team to characterize the circumstances in which a given option appears superior and the conditions under which its outcomes degrade (a useful example of this was in the AoA for the replacement of the M113 armored personnel carrier, which showed how casualties varied according to the explosive weight of improvised explosive devices).
- **Cost Analysis.** The study team should conduct an analysis of life-cycle costs that includes estimates of development, production, operations and support, military construction (MILCON), and disposal costs. These estimates should be of sufficient quality to support acquisition and investment decisions, but are not to be of budget quality. The guidance should also call out any problem-unique cost considerations that should be addressed in the AoA.
 - Operations and Support cost estimates will cover a common life-cycle period for the system under consideration (for most, a 20-30 year period) for all alternatives, consistent with the Operating and Support Cost-Estimating Guide (Cost Analysis Improvement Group, Office of the Secretary of Defense, October 2007). The estimates shall include point estimates for the Average Procurement Unit Cost (APUC), as well as total life-cycle cost.
 - Life cycle estimates should be calculated as point estimates and also shown at 50% and 80% confidence levels.
 - The cost analysis will identify APUC estimates for varying procurement quantities, if applicable. Present-value discounting should be used in comparing the alternatives, in accordance with OSD and Office of Management and Budget guidelines.
 - Costs should be expressed in base-year dollars and, if appropriate in the context of FYDP funding, in then-year dollars. Costs should be presented at the major appropriation level with defined risk ranges to communicate the uncertainty associated with the estimates.
 - The cost portion of the analysis should include an assessment of how varying the annual procurement rate affects cost and manufacturing risk when appropriate (e.g., procuring items faster to complete the total buy sooner vice buying them
- **Cost-Capability Tradeoff Analysis.** The study team should conduct a cost-capability tradeoff analysis of the alternatives that considers variations or excursions for attributes that are significant cost drivers. The intent is to consider of cost effective solutions rather than

single point solutions that turn out to be unaffordable. The guidance should instruct the study team to identify measures used, any weighting factors applied to these measures, and the rationale for applying each weighting factor. The analysis should include comparisons between the (weighted) measures and cost to facilitate cost, performance and schedule tradeoff discussions. The facilitator should advise the HPT that weighting may not be required or appropriate for some analyses.

- Sensitivity Analysis. Through the sensitivity analysis, the study team should identify cost, schedule, and performance drivers to illuminate the trade space for decision-makers (e.g., identify performance attributes that make the largest changes to mission effectiveness or are likely to most influence development or production cost). The study team will identify GRC&As, variables, and measure thresholds that when altered, may significantly change the relative schedule, performance, and cost-effectiveness of the alternatives. The guidance should make clear that the values of the capability gaps in the Initial Capabilities Document (ICD) and draft Capability Development Document (CDD) should be treated as reference points to frame the decision space rather than minimum standards to disqualify alternatives.

For features that appear to provide substantive operational benefit to one or more alternatives, the team should assess whether they apply to all viable alternatives. For example, if a type of sensor is found to provide improved effectiveness for one alternative, the team should explore incorporating the feature in all alternatives.

- Operational, Schedule, Cost, and Technology/Manufacturing Risk Assessment. The guidance should instruct the study team to give full treatment to both operational and non-operational risks (i.e., technical, schedule, and cost). Within the technical risk area, empirical data should guide the assessment, with particular focus on integration risk. Note that the cost risk assessment is addressed in cost analysis section of the guidance. As part of the risk assessment methodology, the study team should develop a realistic acquisition strategy for the recommended alternative(s), if one or more is identified. The study team should describe how the estimated schedules for each alternative and Technology Risk Levels (TRLs)/Manufacturing Risk Levels (MRLs) for critical technologies will be used to assess the likelihood of completing development, integration, and operational testing activities on schedule and within budget. Where significant risks are identified, the assessment should outline practical mitigation strategies to minimize impact to delivering the operational capability to the warfighter, and if applicable, possible workarounds in the event the risks are realized.
- Other Specified Analysis (as required).
 - All mandatory Key Performance Parameters (KPPs) as noted in the Joint Capabilities Integration and Development System (JCIDS) manual should be analyzed, as applicable. Additionally, if a value has been specified within the requirements documents for these KPPs, describe the risk incurred for failing to achieve these values.

- DOTmLPP-P Assessment. The study team will evaluate the implications for doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTmLPP-P) for each alternative.
- Operational Energy Assessment. If applicable, the study team will include an examination of demand for fuel or alternative energies under each of the alternatives, using fully burdened costs. The study lead will:
 - Ensure the Fully Burdened Cost of Energy (FBCE) method is used in computing costs for the Life Cycle Cost Estimate (LCCE) and documented in the final report.
 - Brief the SAG as to whether FBCE significantly differentiate between the alternatives being considered.
 - In cases where it does not significantly differentiate between alternatives, the Service shall complete the FBCE work external to the AoA.

Facilitation Tip

Details of the methodology enable stakeholders and decision-makers to assess the level of analysis rigor that is planned for a study. However, the facilitator should advise the HPT to only provide specific methodology details that are certain. For example, stating that a particular M&S application will be used in the analysis essentially obligates the study team to use the application in the AoA. It is important to note that any major deviations from the study guidance will require an explanation and approval from the study advisory group. In most cases, the methodology is under development at this stage, so it is acceptable for the HPT to state what is being considered. The information will be sufficient to enable stakeholders and decision-makers to assess the level of analysis rigor while giving the study team some flexibility in how the analysis will be conducted.

Task 9: Developing the Administrative Guidance. The administrative guidance describes the oversight and staffing requirements associated with the AoA. This guidance is straightforward and is not likely to vary much from what is described in the template. Ideally, the facilitator should work with the HPT lead to develop a draft of this section of the study guidance before the HPT event. If the HPT is time-constrained, the facilitator may defer development of this information until after the HPT event. Most of this information is in the purview of OSD CAPE to decide, and should have been discussed with the CAPE representative prior to the HPT. Administrative guidance that is specific to the OSD(CAPE) AoA study guidance includes the following (note that for other study guidance such as Air Force issued guidance, the facilitator, in collaboration with the HPT lead, should determine what aspects of the following may apply):

- Study Advisory Group (SAG). Will one be used? What organizations will be members? The SAG is responsible for overseeing the AoA and ensuring it complies with the guidance. The SAG has the authority to change the study guidance. The SAG is typically co-chaired by OSD(CAPE) and OUSD(AT&L) and includes representatives from OUSD(AT&L), OUSD(P), OUSD(C), OUSD(P&R), ASD(R&E), ASD(OEPP), DOT&E, the Joint Staff, and the Services. The facilitator should ensure the HPT considers other key stakeholders (e.g., Air Force

headquarters, sponsoring command or organization, other Air Force commands and agencies, combatant commands, civilian government agencies) for membership in the SAG.

- **AoA Study Plan.** The AoA sponsor will present an AoA study plan (not to exceed 10 pages) for OSD(CAPE) approval 30 days after the issuance of the AoA study guidance or no less than 30 days prior to the Materiel Development Decision (MDD). The facilitator should highlight that although the body of the study plan may not exceed 10 pages, appendices can be added that provide additional information. This additional information will be required for the AFRRG study plan review and AFROC study plan validation. The AoA sponsor will work with OSD(CAPE) to develop a schedule for briefing the SAG on the AoA study team's progress. The briefings should be held every other month unless needed more frequently. In between briefings to the SAG, the study lead will maintain dialogue with OSD(CAPE).
- **Analysis Timeline.** The guidance should set strict time limits on the analysis timeline – shorter is better. If the AoA analysis is expected to take longer than 6-9 months, the scope of work should be reconsidered to ensure the analysis planned is truly necessary to inform the milestone decision.
- **AoA Final Deliverables.** For AoAs that have OSD(CAPE) oversight, the final deliverables will include a briefing to the SAG and a written report. The written AoA report is due to Director, (OSD)CAPE, DCAPE at least 60 days prior to the Milestone Decision (to allow for sufficiency review) and to the other SAG members to properly inform the stakeholders prior to the release of the Request For Proposal (RFP) for the next acquisition stage. The final report will provide a detailed written record of the AoA's results and findings and shall be on the order of no more than 50 pages in length, plus the Executive Summary which should be no more than 10 pages in length. As is the case for the study plan, the facilitator should highlight that although the body of the final report may not exceed 50 pages, appendices can be added that provide additional information. This additional information will be required for the AFRRG final report review and AFROC final report validation. For AoAs that do not have OSD(CAPE) oversight, the facilitator should collaborate with the HPT lead to determine the final approach, schedule, and deliverables.

Note

Although OSD(CAPE) may specify an abbreviated AoA study plan and final report (10 and 50 pages respectively), the level of detail in these abbreviated documents is insufficient to meet the content requirements of the Air Force. It is necessary for the HPT/study team to add appendices to capture the level of detail that is expected by the Air Force. This will enable the AFRRG to conduct its review during the staffing process and prepare the documents for AFROC validation.

Task 10: Wrap-up, Action Item Review, and Adjourning the HPT. The wrap-up entails finishing up the remaining work before adjourning the HPT. This does not mean rushing work and settling for a mediocre or worse product. If it is not possible to produce a quality product in the remaining time, it is better to defer the work until after the HPT event.

The HPT lead, in collaboration with the facilitator, should assign actions items with time deadlines to the appropriate team members. Action items may address various aspects such as issues that must be resolved, questions that must be answered, and study guidance sections or parts of sections that must be completed.

Before adjourning the HPT, the facilitator should elicit feedback from the team members regarding his or her performance as a facilitator, the value of the HPT approach, and improvements or enhancements that should be considered. In addition, the facilitator should document any lessons learned as well as the successes and shortcomings of the HPT. Finally, the facilitator should advise the HPT members to coordinate the study guidance with their respective organizations to avoid possible delays during formal staffing. For representative(s) of organization(s) that were invited but did not attend, the HPT lead should provide a draft of the study guidance to these representatives for review and comment prior to the formal staffing.

5 Conducting the AoA Study Plan HPT

This chapter describes example methods for conducting an HPT to develop the AoA study plan. It explains the tasks that must be accomplished and provides guidance for facilitating the HPT.

5.1 Introduction

Tables 5-1 and 5-2 graphically show short and long versions for conducting the AoA study plan HPT. Although the same tasks are accomplished during the HPT event, the assignment of tasks and time allocated to accomplish the tasks on each day is different for each version. Depending on the planning factors discussed in Chapter 3, the facilitator may select the short or long version to use for the HPT event. In some cases, the facilitator may need to tailor the example methods described in this handbook to develop a method for a particular situation.

The facilitation methods are comprised of 16 tasks as shown in Tables 5-1 and 5-2. Table 5-1 shows a short version of the method that requires 32 working hours (4 days) to develop the body of the study plan, while Table 5-2 shows a long version of the method that requires 64 working hours (8 days) to develop the body of the study plan. It is important to note that the body of the study plan does not include the appendices. Development of the appendices will require additional time after the HPT.

In both versions, the facilitator can establish breakout sessions, if necessary, designed for various purposes such as resolving problems or issues, finishing work in specific sections, or planning future activities. Select members of the HPT would participate in these breakout sessions which may occur concurrently with the tasks. At the end of each day, the HPT facilitator, HPT lead, and other HPT members as needed, meet to discuss how the day went (e.g., progress made, issues or concerns that must be addressed, answers to questions that must be provided) and plan for the next day and beyond (e.g., adjustments to the schedule, changes in working group membership, additional resources that are required, breakout session timing and purpose).

Table 5-1: AoA Study Plan Development (Short Version Example)

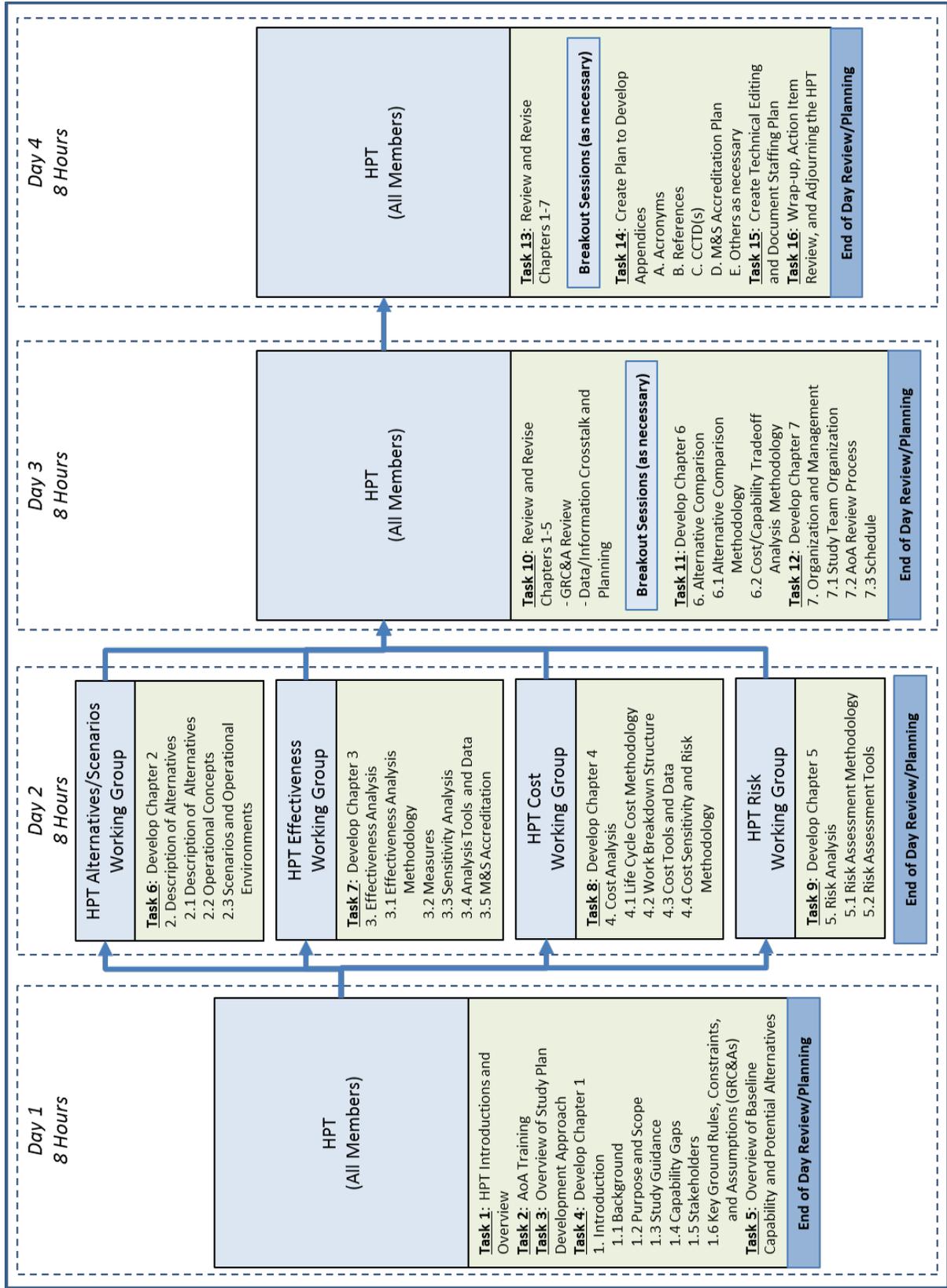


Table 5-2: AoA Study Plan Development (Long Version Example)

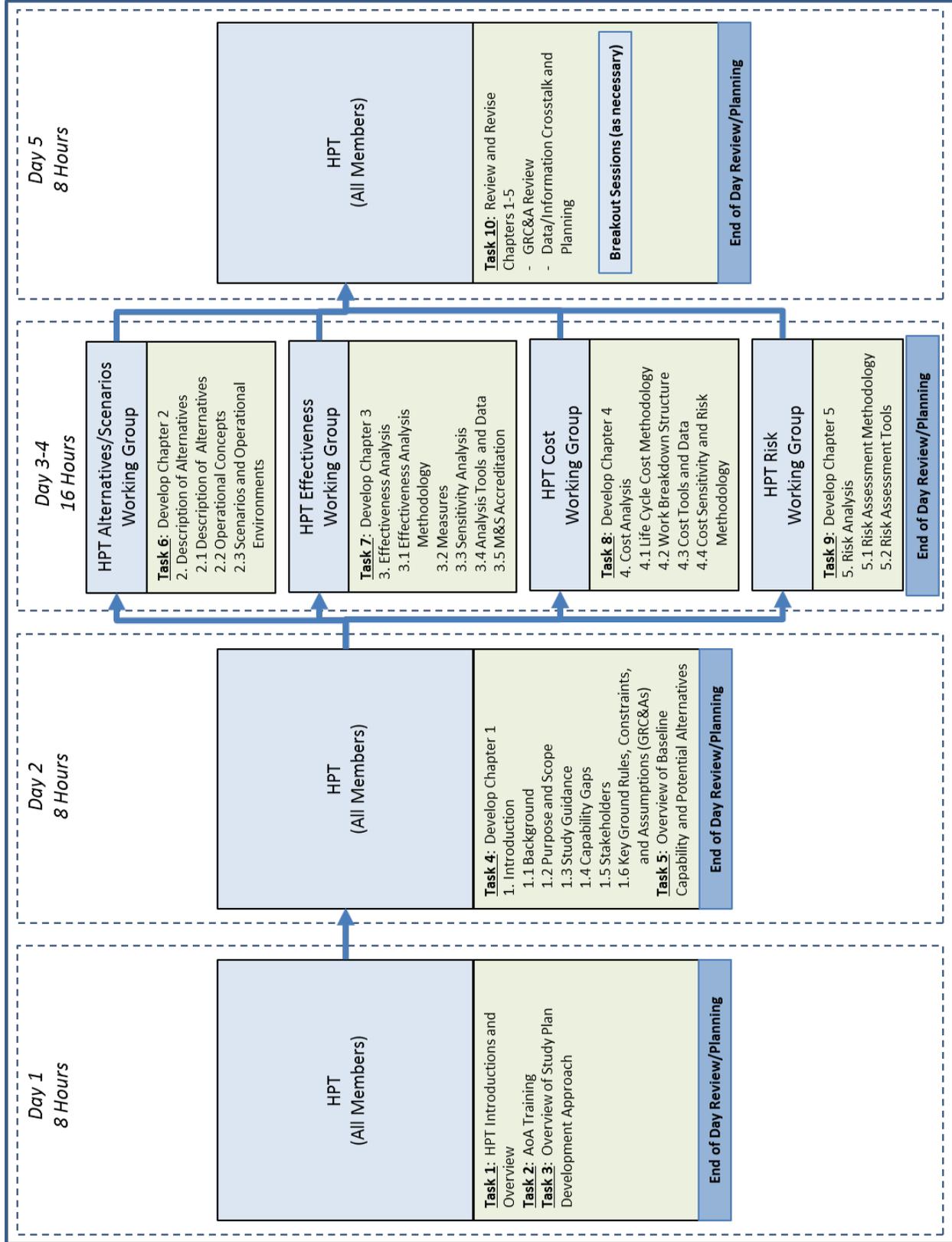
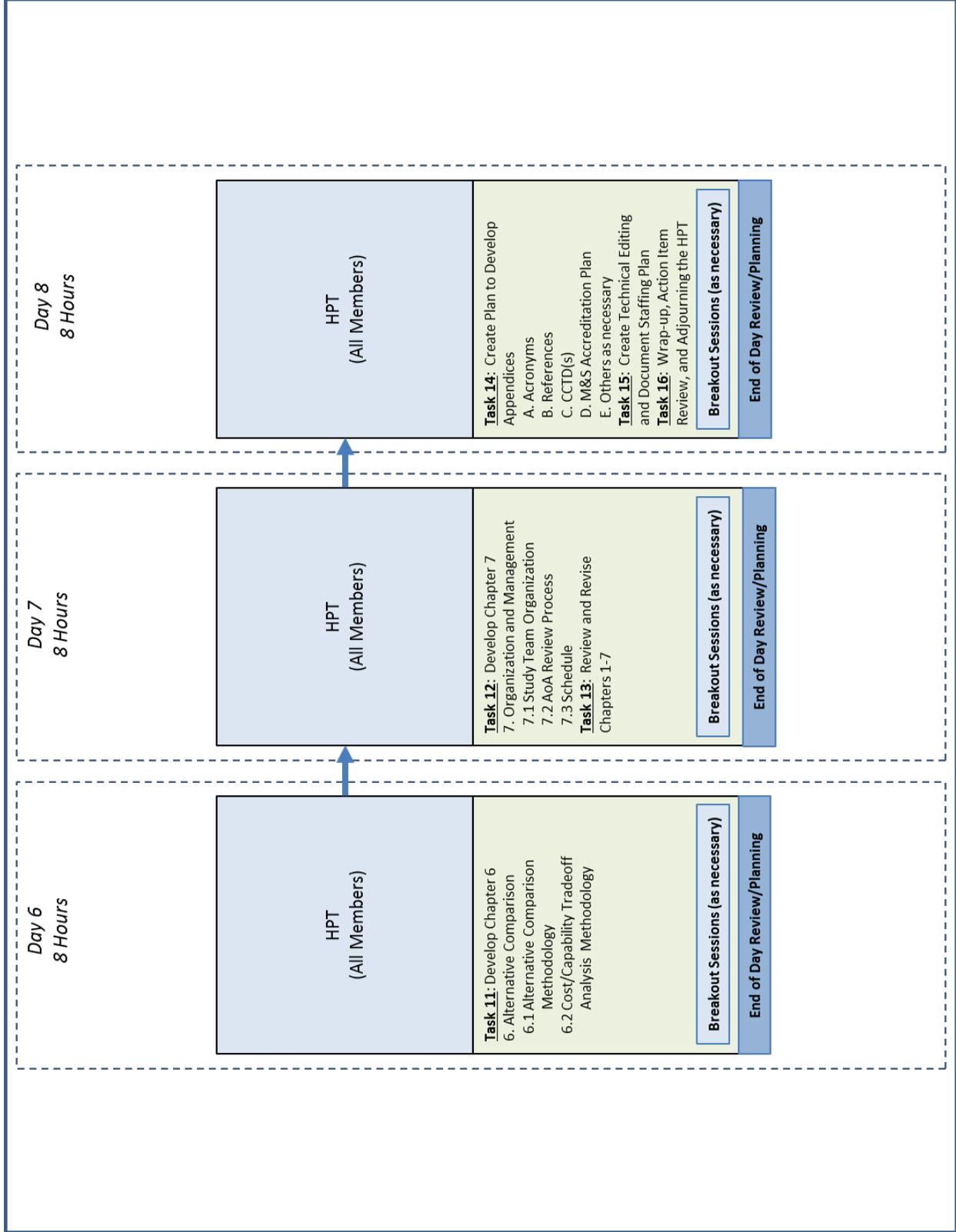


Table 5 -2 (continued): AoA Study Plan Development (Long Version Example)



5.2 Facilitation Tasks

Although there is a specific order to the facilitation tasks, the facilitator may make adjustments depending on the situation. In some cases, the HPT may finish the assigned tasks for the day early. The facilitator and HPT lead would need to determine whether there is sufficient time remaining in the day to begin the next or another day's tasks or use the time for another purpose. In other cases, the HPT may take longer to finish the assigned tasks. The facilitator and HPT lead would need to make adjustments to the schedule and perhaps defer some work until after the HPT event.

Another option entails working some of the tasks concurrently by forming smaller groups within the HPT that are focused on developing specific sections of the study plan. In these cases, the facilitator should ensure the smaller groups are aligned in their efforts by fostering cross-communication and requiring frequent progress updates from each group. Decomposing the work this way will often speed up writing the different sections of the guidance, but it inherently adds importance and time to the integration/consistency check of the pieces. Keeping the group together helps insure good integration/consistency, but will typically slow down the development of some individual parts. Finding the right mix is as much an art as a science.

Task 1: HPT Introductions and Overview. The facilitator begins the HPT event by welcoming the team members and briefly introducing himself or herself to the team. As part of the introduction, the facilitator should describe his or her role as well as the roles of the team members. Given that the team is in the forming stage, the facilitator should allow the team members to briefly introduce themselves and identify their area of expertise on the team.

Once the introductions are complete, the facilitator presents the rules of the HPT and explains why they are important and must be followed (Table 5-3). The rules are necessary to help enable the team to be fully productive and ensure the HPT experience is worthwhile for all team members. There may be times during the course of the HPT event that the facilitator must remind the team of these rules and the need to abide by them.

To help the team understand what to expect, the facilitator provides an overview of the purpose of the HPT. This should include a review of the AoA study plan template and, if applicable, the study guidance (draft or final document). Finally, before beginning Task 2, the facilitator should provide an opportunity for the HPT members to ask questions about their roles, the facilitator's role, the HPT purpose, the study plan template, or any other issues.

Table 5-3: Rules of the HPT

| Rule | Description |
|----------------------|---|
| Active Participation | The HPT benefits when all team members are contributing to the effort. Individual team members must actively participate and not rely on one or a few team members to accomplish the preponderance of work. There are numerous ways team members can actively participate such as sharing in the work to be accomplished, voicing positions or opinions (rather than remaining silent), and offering solutions to problems as they arise. Participation will not be uniform throughout the HPT. The logistician will obviously be most engaged in the logistics related parts of the meeting, but should stay engaged throughout. |
| Withhold Criticism | Withholding criticism, especially during brainstorming sessions, is necessary for encouraging creative thinking. Withholding criticism does not indicate support or agreement, but instead enables team members to generate ideas without fear of disapproval. For this to be effective everyone needs to understand “silence is NOT consent”, and adequate time needs to be allotted to eventually critically discuss any brainstorming list. A common problem is an unrealistic schedule that does not allow this critical discussion and that can result in brainstorming ideas being accepted into the final product not because they were good, but strictly because time ran out. |
| Avoid Attribution | The documents produced by the HPT are accomplished through a team effort. Attributing specific text or sections of text to a single team member or smaller group within the HPT can provoke criticism or jealousy and does not help the HPT achieve consensus. Sometimes the collective HPT wants to attribute something to a certain member because it increases the credibility based on that members credentials, but this should be the exception. |
| Remember Boninius | Perfection is the enemy of good enough, but so is being driven by schedule constraints and prematurely declaring “good enough”. |

Task 2: AoA Training. The extent of AoA training required will depend on several factors such as the experience level of the HPT members in planning and conducting an AoA and developing an AoA study plan. As a minimum, the facilitator should present an overview of the requirements development process in the context of the program that includes discussion of the key decisions made by the sponsor, AFRRG, and AFROC as well as the documents that have been produced (e.g., CBA, RSR, ICD) at this point in the process. The facilitator should also describe the decision points, milestones, and documents that will come later in the process (e.g., MDD, AoA, Milestone A, CDD) and how they are linked to previous decisions and documents. The facilitator should highlight how the HPT is not starting from scratch, but rather leverages information from various sources such as the CBA, ICD, RSR, AFROCMs, OSD(CAPE) discussions, and existing pre-MDD analyses to develop the AoA study plan.

Task 3: Overview of the Study Plan Development Approach. In this task, the facilitator provides an overview of the study plan development method to ensure the HPT members understand how the study plan will be developed. As noted earlier, the facilitator may use one of the versions described in Tables 5-1 and 5-2, or develop his or her own method.

Task 4: Develop Chapter 1 (Introduction). In this task, the facilitator guides the HPT in the development of Chapter 1 (Introduction) of the study plan. The following provides specific guidance for each section of the chapter:

Facilitation Tip

If study guidance had been previously developed, whether draft or a signed document, the facilitator should utilize it since most of the information can be used to develop sections of this chapter. Another benefit of using the study guidance is that it will help maintain alignment between the study guidance and study plan.

Section 1.1 Background. The Background section provides a brief history of the effort and explains why the AoA is being conducted now. Ideally, the facilitator should work with the HPT lead to develop a draft of this section before the HPT event. If the HPT is time-constrained, the facilitator may defer development of this section until later in the HPT event, or even after the HPT event in order to focus on more important sections of the study plan.

Pre-HPT Tip

During pre-HPT planning with the study lead, the facilitator should identify sections of the study plan such as the background section that can be developed before the HPT event. All sections of the study plan are fair game, and any work that is accomplished before the HPT event will not only save time but also enhance the quality of the study plan.

The facilitator should advise the HPT to include a discussion of the related programs and lessons learned from previous program cancellations. Previous analyses such as relevant Joint Concept Technology Demonstrations (JCTDs) and Advanced Technology Demonstrations (ATDs) should be discussed. The AoA Handbook provides a list of potential sources of information that the HPT can use to identify relevant programs and studies.

Section 1.2 Purpose and Scope. The basic purpose of an AoA is to assess the effectiveness, cost, and risks of alternatives that have potential to close or mitigate the capability gaps addressed in the study. The facilitator should ensure the purpose statement specifically states the three fundamental aspects of the assessment (i.e., effectiveness, cost, and risk) as well as identify the specific gaps that will be addressed. Since the specific capability gaps are described in more detail in section 1.4 (Capability Gaps), detailed descriptions of the capability gaps are not needed in this section.

The facilitator should guide the HPT in describing how the results of the AoA will be used to inform the Milestone Decision Authority (MDA) at the next milestone. For Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) programs, the Defense Acquisition Executive (Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L))) is the MDA unless delegated to another appropriate OSD official (see DoDI 5000.02 *Operation of the Defense Acquisition System* for more information). The MDA determines the milestone that a future program will enter by

considering many factors (e.g., level of technology development, urgency of the program). In most AoAs, Milestone A is the next milestone.

The study scope defines the focus of the study. In other words, the study scope defines what is and is not in the study. Scope is primarily driven by three things:

- Information decision makers need (may be expressed in study guidance or other directives)
- Previous analyses
- Ground rules, constraints (e.g., resources, time), and assumptions

The facilitator should ensure that the HPT identifies and explains any limitations to the depth and breadth of analysis and impacts on the study (e.g., what study questions will not be answered, what will not be evaluated, what analyses will not be conducted). A clearly and carefully written scope increases the likelihood that the study team will meet the objectives of the study and complete it on time and within budget.

In describing the study scope, the facilitator should guide the HPT in identifying and building upon previous studies and other analytical products applicable to the area of interest. The intent is to avoid unnecessary repetition of prior efforts and provide continuity between analyses for reviewers and decision makers. This does not preclude the sponsor from applying different context or different assumptions, as appropriate, for the scope of the study.

The study scope should also define the timeframe of interest in the study. This includes the estimated time when solutions will be delivered to close or mitigate the capability gaps. By defining a timeframe of interest, the study team can better determine the operational context (described later in Chapter 2 of the study plan) that will be used to conduct the assessment.

Section 1.3 Study Guidance. The key aspects of the AoA study guidance from OSD(CAPE), the Air Force, or other organization are summarized in this section. Along with the key aspects, the facilitator should ensure that the key questions in the study guidance are documented in this section. As stated in Chapter 4, any of the key questions should trace back to the RSR direction the team should have received. Others will reflect issues CAPE or other stakeholders have that the sponsoring CFL may not have considered.

It is highly likely that the study guidance will not be signed before the HPT event. In these situations, the facilitator should recommend deferring development of this section until the guidance is signed or is in the final stages of staffing. Once the study guidance is signed, it should be attached as an appendix to the study plan.

Section 1.4 Capability Gaps. In this section, the HPT describes the capability gap(s) that will be addressed in the AoA. The facilitator should ensure the actual wording of the capability gap(s) is used and the name(s) of the source document(s), typically one or more ICDs, is provided.

The specific capability gaps that will be addressed in the AoA are identified in the RSR and AoA study guidance. If the HPT event to develop the study guidance has not occurred, the facilitator should complete Task 4 of the AoA Study Guidance HPT facilitation method to guide the HPT in identifying and selecting capability gaps.

Section 1.5 Stakeholders. Before beginning this section, the facilitator should define the term “stakeholder” to ensure all HPT members have a common understanding. A stakeholder is defined as any agency, Service, or organization with a vested interest (a stake) in the outcome of the pre-acquisition analyses. A stakeholder may contribute directly or indirectly to the pre-acquisition activities and is usually affected by decisions made as a result of these activities.

In this section of the study plan, the HPT identifies the AoA stakeholders and their roles and responsibilities. The HPT determines which stakeholders should have membership in the Study Advisory Group (SAG) and any other special group that may be formed for the AoA. In addition, the HPT describes how the SAG will review and approve key aspects of the study such as the analysis methodologies, alternatives, scenarios, and assessment criteria.

Pre-HPT Tip

The facilitator should advise the HPT/study lead to identify and involve the stakeholder community as early as possible, preferably before development of the study guidance and plan. There are many benefits of having stakeholders involved in the AoA. Stakeholder involvement can help facilitate buy-in and understanding of the AoA purpose, scope, capability gaps, risks, and potential alternatives. In addition, the stakeholder community can assist the study team in identifying potential alternatives available from other Services or agencies (within or outside DoD).

As the HPT begins identifying stakeholders, the facilitator should advise the HPT to consider the sponsoring command/organization, other Air Force commands and agencies, combatant commands, other Services, Joint Staff, and civilian government agencies (e.g., Department of Homeland Security, Department of Energy, Department of State, National Aeronautics and Space Administration). To help initiate effective discussion, the facilitator can pose insightful questions such as the following:

- Who are the end-users (e.g., COCOMs, warfighters, etc.) of the capability?
- What enablers (e.g., intelligence, human systems integration, logistics, and communications) have interdependencies with the alternatives being analyzed in the AoA?
- How do the other Services, DoD agencies, and other government agencies fit into the mission area being explored in the AoA?

Section 1.6 Key Ground Rules, Constraints, and Assumptions. The HPT describes the key AoA ground rules, constraints, and assumptions (GRC&As) in this section of the study plan. An initial set of key GRC&As is identified during the AoA study guidance HPT. If the HPT event to develop the study guidance has not occurred, the facilitator should complete Task 7 (Developing the Key Ground Rules,

Constraints, and Assumptions) of the AoA Study Guidance HPT facilitation method to guide the HPT in developing GRC&As.

During the HPT event, additional GRC&As may be developed. The facilitator should ensure the HPT reviews these additional GRC&As to determine whether they are appropriate and do not conflict with other previously identified GRC&As. Some of these GRC&As may be specific to an analysis methodology (e.g., effectiveness analysis, cost analysis) and should be listed in the appropriate analysis chapter. Others may be overarching and should be designated as key GRC&As and included in this section of the study plan. It is important that the facilitator review the information provided in Task 7 (Developing the Key Ground Rules, Constraints, and Assumptions) of the AoA Study Guidance HPT facilitation to learn about inappropriate GRC&As. This will help the facilitator to ensure the GRC&As are necessary and appropriate for the study.

Note

The purpose of the AoA study plan template is to provide a starting point for the HPT to develop a study plan. Since every AoA is different, it follows that every study plan is different. The facilitator should inform the HPT that additional sections, chapters, and appendices may be added beyond those identified in the AoA study plan template. Also, the study plan template may be tailored by combining or separating sections if it helps facilitate understanding.

Task 5: Overview of Baseline Capability and Potential Alternatives. Before beginning development of Chapters 2 - 5 of the study plan, the facilitator should ensure the HPT fully understands the baseline and alternatives that are being considered in the AoA. By having a good understanding of the baseline and alternatives, the working groups that are formed will be better able to develop their assigned chapters (see next paragraph for more discussion regarding the working groups). The ideal method for achieving this is through a briefing or background paper(s). During pre-HPT planning, the facilitator coordinates with the HPT lead to assign responsibility for developing the briefing or background paper(s) to a member of the study team, most likely the individual who has been selected or is being considered for the AoA study TAWG lead position. For this task, this member presents the key aspects of the baseline and alternatives to the HPT and answers any questions that may arise.

Note

The purpose of the baseline/alternatives briefing or background papers is to provide more detailed descriptions of the baseline/alternatives that are being considered in the study. This will help the HPT in developing the study plan during the HPT event. The briefing or background papers should be developed from the initial CCTDs.

Prior to starting Tasks 6 - 9, the facilitator and HPT lead divide the HPT into four working groups (Day 2 of the short version method and Days 3-4 of the long version method) and assign a chapter to each working group to develop (see Tables 5-1 and 5-2). The tasks are completed concurrently by the working groups (note that this means Chapters 2 - 5 in the study plan are developed concurrently).

Despite working concurrently, the groups must collaborate to maintain alignment and unity of effort. The facilitator and HPT lead should meet with the working group leads as necessary during these sessions (2-3 times per day is recommended) to review progress, share information, and foster collaboration.

Task 6: Develop Chapter 2 (Alternatives). In this task, the facilitator guides the HPT Alternatives/Scenarios Working Group in the development of Chapter 2 (Alternatives) of the study plan. The following provides specific guidance for each section of the chapter:

Section 2.1 Description of Alternatives. The baseline capability and alternatives are described in this section of the study plan. If study guidance had been previously developed, the facilitator should utilize it since the information can be used to develop this section of the chapter. If the HPT event to develop the study guidance has not occurred, the facilitator should complete Task 5 of the AoA Study Guidance HPT facilitation method to guide the HPT Alternatives/Scenarios Working Group in identifying the baseline and alternatives.

Section 2.2 Operational Concepts. In this section of the study plan, the HPT Alternatives/Scenarios Working Group describes the operational concepts that are relevant to the baseline and alternative capabilities. The facilitator can assist in developing this section by describing an overarching operating concept that is generic enough to span the entire tradespace and then assisting the working group in defining alternative-specific employment concepts. The following are some aspects of the operational concepts the facilitator should ensure the working group considers:

- Missions, tasks, processes, decision points, and business rules
- Activities, relationships among activities, activity sequence and timing, activity responses to events, activity inputs and outputs, and delivery timing
- Organizational and human roles and responsibilities
- Manpower requirements and skill-sets
- Intelligence support, logistics support, and other support services
- Command, control, coordination, and other relationships among organizations
- System of systems (SoS), and family of systems (FoS)
- Geographic configuration and connectivity
- Communications systems, links, interfaces, and networks
- Data requirements, information flows, and types of information exchanges and relevant attributes such as media, quality, quantity, frequency, and the level of interoperability
- Key tactics, techniques, procedures, and doctrine
- Peacetime, contingency, and deployment requirements

Section 2.3 Scenarios and Operational Environments. If study guidance had been previously developed, the facilitator should utilize it since the information can be used to develop this section of the chapter. If the HPT event to develop the study guidance has not occurred, the facilitator should refer to Task 8 of the AoA Study Guidance HPT facilitation method to guide the HPT Alternatives/Scenarios Working Group in identifying the scenarios and operational environments that

will be used in the study. The remainder of this section provides additional information for the facilitator to guide the working group in identifying preliminary scenarios and the associated operational environments.

Scenarios and the associated operational environments describe the realistic operational settings (e.g., locations, conditions, threats, environments) that apply to the baseline and alternative capabilities that will be assessed in the AoA. Scenarios provide a common frame of reference that covers the full spectrum of relevant operational situations that will help enable the study team to analyze the baseline and alternatives. Every scenario identified should be logically linked to the questions and gaps (i.e., the team should be able to explain why that scenario is included in the AoA).

Note

Sometimes the timeframe addressed in the AoA extends beyond the time frame of available DPSs, ISCs, OPLANs, CONPLANS, and other plans. This presents an additional challenge to the study team to find appropriate source documents to describe the projected operational environments (i.e., threats, scenarios, missions, capabilities). It is critical to vet these environments through the appropriate expert communities to maintain credibility of the analysis. The locations, conditions, and environments used in the AoA, and in subsequent JCIDS products, should be anchored in a credible operational context.

As the working group begins identifying scenarios, the facilitator should advise the working group to consider the capability gaps and requirements, constraints and assumptions, and physical environments expected. In addition, a range of scenarios may be needed to fully analyze the baseline and alternatives. Scenarios used in previous analyses should be considered as well. If a CONOPS is used to define the operational environment, it must be previously endorsed by the JROC, combatant command, or at a minimum, the sponsoring DoD component.

In most situations, the working group may not have enough information to select scenarios or fully describe the operational environments in the AoA study plan. The facilitator should advise the working group to at least describe how the scenarios will be selected, the sources of information that will be used, and possible scenarios that are being considered. The following are some sources of information for the working group to consider:

- Defense Planning Scenarios (DPSs), Integrated Security Constructs (ISCs), and Support for Strategic Analysis (SSA) products
- OPLANs, Contingency Plans, and Concepts of Operations (CONOPS)

Finally, the working group should describe how the scenarios and associated threats will be reviewed and approved by the study advisory group (SAG).

Task 7: Develop Chapter 3 (Effectiveness Analysis). In this chapter, the HPT Effectiveness Working Group describes the AoA effectiveness analysis methodology. If study guidance had been previously developed, the facilitator should utilize it since the information can be useful for developing this section

of the chapter. It is important to note that the effectiveness analysis methodology in the study guidance is much abbreviated and is insufficient for the study plan.

Note

The term “effectiveness analysis” entails more than just analyzing the effectiveness of baseline capabilities and alternatives. If not mentioned explicitly, sustainability (also referred to as suitability) should be included in the effectiveness analysis. The facilitator should ensure the working group addresses sustainability by describing how it will be measured (i.e., measures of suitability) and analyzed.

At this stage of AoA planning, the working group may not have a clear understanding of how the effectiveness analysis will be conducted. In these cases, it is important to at least capture what the working group is considering in its effectiveness analysis planning and development. The following provides specific guidance for each section of the chapter:

Section 3.1 Effectiveness Analysis Methodology. In this section, the working group describes the scope (i.e., what is or is not included in the analysis), level of analysis (i.e., campaign, mission, engineering), and resources required to conduct the analysis. The methodology includes a discussion of the specific methods and techniques that are planned or being considered such as Modeling and Simulation (M&S), parametric analysis, and expert elicitation. To help foster ideas, the facilitator should advise the working group to develop an illustration of the linkages between the mission tasks, measures, and methods. The illustration should be included in the study plan to help explain the analysis approach.

The working group describes how the mission tasks and the associated measures are traceable to the capability gaps that will be addressed in the AoA. The facilitator should stress the importance of explaining this linkage since it will be critical to determining how well potential alternatives can close or mitigate the capability gaps. The working group derives one or more objectives from the capability gap(s). For example, if a capability gap describes a shortfall in global integrated intelligence, surveillance, and reconnaissance, an objective could be “provide moving target indicator support to maneuver and surface forces.” Once the objective(s) is determined, the working group derives one or more mission tasks from the objective(s). Continuing with this example, mission tasks associated with the objective of providing moving target indicator support to maneuver and surface forces could be the following:

- Find target (detect, identify, classify)
- Fix target
- Track target
- Communicate information

One important aspect of the effectiveness analysis that is commonly overlooked is discussion about the analysis of the dependencies (e.g., intelligence, logistics, human systems integration, and communications support) associated with the baseline and alternative capabilities. The facilitator

should highlight the importance of identifying and addressing these dependencies since they can play a major role in enabling capabilities.

The working group identifies ground rules, constraints, and assumptions (GRC&As) that are specific to the effectiveness analysis. The facilitator should advise the working group lead to coordinate the identified GRC&As with the other working groups to avoid potential conflicts. It is possible that one or more conflicts cannot be resolved at the working group level and must be elevated to the HPT lead or higher for resolution. If the working group identifies one or more GRC&As that should be considered as key GRC&As, the facilitator should ensure the working group lead presents them during Task 10 (Review and Revise Chapters 1 – 5). Finally, the working group describes how the effectiveness analysis methodology and associated mission tasks and measures will be reviewed and approved by the SAG or other oversight group.

Section 3.2 Measures. If the measures can be defined, the working group should attempt to define all the essential elements. Essential elements of a measure include the mission task, attribute, measure statement, metric, criteria or standards (i.e., threshold and, if needed, objective values). Refer to the OAS AoA Handbook for more information.

This section may not be required if the working group sufficiently describes the mission tasks and associated measures of effectiveness (MOEs), measures of suitability (MOSs), and measures of performance (MOPs) in Section 3.1 above.

Section 3.3 Sensitivity Analysis. The sensitivity analysis is used to identify cost, schedule, and performance drivers to illuminate the trade space for decision makers (e.g., identify performance attributes that make the largest changes to mission effectiveness or are likely to most influence development or production cost). The working group describes how the study team will identify GRC&As, variables, and measure thresholds that, when altered, may significantly change the relative schedule, performance, and cost-effectiveness of the alternatives. The facilitator should ensure the working group understands that the requirements in the applicable Initial Capabilities Document(s) (ICD) and other JCIDS documents should be treated as reference points to frame the decision space rather than minimum standards to disqualify alternatives.

The working group describes how the study team will assess whether features that appear to provide substantive operational benefit to one or more alternatives apply to all viable alternatives. For example, if a type of sensor is found to provide improved effectiveness for one alternative, the study team should explore incorporating the feature in all alternatives.

Section 3.4 Analysis Tools and Data. If there are any known issues or risks with the data collection or analysis methods, the working group should describe them and the planned actions to address them.

This section may not be required if the working group sufficiently describes the analysis tools (methods) and data in Section 3.1.

Section 3.5 M&S Accreditation. The M&S Accreditation Plan is attached as an appendix to the AoA study plan only when M&S applications will be used in the study. There is insufficient time during the HPT to develop an M&S Accreditation Plan. For this section of the chapter, the facilitator should advise the working group to discuss the general approach for accrediting the M&S applications that will be used in the study. The HPT lead, in collaboration with the facilitator, will assign development of the M&S Accreditation Plan to an appropriate study team member, most likely the EAWG lead during the action item review in Task 16.

Task 8: Develop Chapter 4 (Cost Analysis). In this chapter, the HPT Cost Working Group describes the AoA cost analysis methodology. If study guidance had been previously developed, the facilitator should utilize it since the information can be useful for developing this section of the chapter. It is important to note that the cost analysis methodology in the study guidance is much abbreviated and is insufficient for the study plan.

At this stage of AoA planning, the working group may not have a clear understanding of how the cost analysis will be conducted. In these cases, it is important to at least capture what the working group is considering in its cost analysis planning and development. The following provides specific guidance for each section of the chapter:

Section 4.1 Life Cycle Cost Methodology. The working group describes the methodology for conducting the cost analysis in this section of the study plan. The cost analysis methodology describes the development of life cycle cost estimates (LCCEs) and what they include (i.e., Research, Development, Test and Evaluation (RDT&E), Procurement, Operations and Support (O&S), MILCON, and Disposal costs), then-year and base-year estimates, and applicable OSD and Air Force guidance that will be followed. The LCCEs should be of sufficient quality to support acquisition and investment decisions, but are not to be of budget quality. For study plans that will be approved by OSD(CAPE), the working group should address the following in the methodology (note that for other study plans, the facilitator, in collaboration with the HPT lead, should determine what aspects of the following may apply):

- O&S cost estimates will cover a common life-cycle period for the system under consideration (for most, a 20-30 year period) for all alternatives, consistent with the Operating and Support Cost-Estimating Guide (Cost Analysis Improvement Group, Office of the Secretary of Defense, October 2007). The estimates shall include point estimates for the Average Procurement Unit Cost (APUC), as well as total life-cycle cost.
- Life cycle estimates should be calculated as point estimates with confidence levels.
- Development of APUC estimates for varying procurement quantities, if applicable. Present-value discounting should be used in comparing the alternatives, in accordance with OSD and Office of Management and Budget guidelines.
- Costs should be expressed in base-year dollars and, if appropriate in the context of FYDP funding, in then-year dollars. Costs should be presented at the major appropriation level with defined risk ranges to communicate the uncertainty associated with the estimates.

- An assessment of how varying the annual procurement rate affects cost and manufacturing risk when appropriate (e.g., procuring items faster to complete the total buy sooner vice buying them more slowly over a longer period of time).
- Discussion of the specific estimating methods and M&S applications that are planned or being considered.
- Discussion of the Cost as an Independent Variable (CAIV) analysis that will be conducted.
- Discussion of how the LCCEs will be assessed against the affordability constraints identified at MDD or in the study guidance.
- If applicable, an examination of the demand for fuel or alternative energies for each of the alternatives using fully burdened costs.

The working group identifies ground rules, constraints, and assumptions (GRC&As) that are specific to the cost analysis. The facilitator should advise the working group lead to coordinate the identified GRC&As with the other working groups to avoid potential conflicts. It is possible that one or more conflicts cannot be resolved at the working group level and must be elevated to the HPT lead or higher for resolution. If the working group identifies one or more GRC&As that should be considered as key GRC&As, the facilitator should ensure the working group lead presents them during the review of the GRC&A section in Chapter 1 on Day 3. Finally, the working group describes how the cost analysis methodology will be reviewed and approved by the SAG or other oversight group.

Section 4.2 Work Breakdown Structure (WBS) and other cost estimating approaches. MIL-STD-881C requires programs of record to use product oriented WBSs and thus it is the most common approach used for cost estimating in AoAs. In addition to the WBS, the Defense Acquisition University (DAU) identifies two other approaches for estimating costs. They are a cost breakdown structure approach (functional allocation of costs), and an activity based costing approach (a distribution of overhead activities). The facilitator should be aware of and inform the working group that other approaches may be used. For example, cost breakdown structure (functional allocation of costs) may be appropriate for developing cost estimates for non-materiel solutions. For a detailed description of these approaches see the OAS AoA Handbook.

OAS recommends that the study plan include WBSs to at least level 3, although there may not be enough information in the initial CCTDs to fully develop the WBSs for the baseline and alternatives to level 3. In this case, the facilitator should ensure the working group at least describes the approach.

This section may not be required if the working group sufficiently describes in Section 4.1 how the work breakdown structures (WBSs) for the baseline and alternatives will be developed.

Section 4.3 Cost Tools and Data. In this section, the HPT cost working group should address the cost tools and data that will be used to develop the cost estimates. The working group should also identify the organizations that will be providing data. If there are any known issues or risks with the data collection or analysis methods, the working group should describe them and the planned actions to address them.

This section may not be required if the working group sufficiently describes the cost tools (M&S) and data that will be used in Section 4.1.

Section 4.4 Cost Sensitivity and Risk Methodology. The sensitivity analysis reveals how the cost estimate is affected by changes in GRC&As and cost drivers. The facilitator should ensure the working group includes a discussion of how the sensitivity analysis will be conducted in the study plan.

Task 9: Develop Chapter 5 (Risk Analysis). In this chapter, the HPT Risk Working Group describes the AoA risk analysis methodology. The following provides specific guidance for each section of the chapter:

Section 5.1 Risk Assessment Methodology. The study team should give full treatment to both operational and non-operational risks (i.e., technical, schedule, and cost). Within the technical risk area, empirical data should guide the assessment, with particular focus on integration risk. Note that the cost risk assessment methodology is addressed in Chapter 4 (Cost Analysis).

As part of the risk assessment methodology, the study team should develop a realistic acquisition strategy for the recommended alternative(s), if one or more is identified. The working group should describe how the estimated schedules for each alternative and Technology Risk Levels (TRLs)/Manufacturing Risk Levels (MRLs) for critical technologies will be used to assess the likelihood of completing development, integration, and operational testing activities on schedule and within budget. Where significant risks are identified, the assessment should outline practical mitigation strategies to minimize impact to delivering the operational capability to the warfighter, and if applicable, possible workarounds in the event the risks are realized.

Section 5.2 Risk Assessment Tools. The facilitator should inform the working group that there are two risk assessment approaches that can be used, The Risk Assessment Framework (RAF) and The Risk Management Guide for DoD Acquisition. See the OAS AoA Handbook for information on these approaches and under what circumstances to use them.

For Air Force-led AoAs, there is an expectation that the risk assessment results will be expressed in the Risk Assessment Framework (RAF) risk statements (see AoA Handbook for more details). Although risk statements are expected in AoAs, this does not mean that the study team must use the RAF to identify and assess risks. Instead, there is an option to use the Risk Management Guide for DoD Acquisition to conduct the risk assessment, but the results of the assessment must be expressed in the form of the RAF risk statements. The approach to develop the risk statements from results produced through the Risk Management Guide for DoD Acquisition is discussed in the AoA Handbook.

To help foster the standardization of assessing, displaying, and discussing risks across the Air Force enterprise, OAS highly recommends using the RAF. The use of the RAF is becoming more widespread and is used by the HAF/A5R functional representatives to assess risks associated with Core Function capabilities. Another benefit of using the RAF is that the development of the risk statements is already an inherent part of the RAF methodology.

Task 10: Review and Revise Chapters 1 - 5. The HPT reconvenes as a group to review and revise, as necessary, the chapters that have been produced. It is important to note that the review includes Chapter 1 which was developed earlier in the HPT event. Since new GRC&As could have been identified by the working groups, the review provides an opportunity for the HPT to determine whether any new GRC&As should be included in the set of key GRC&As and whether any GRC&As conflict with each other. Additionally, the working groups could have developed analysis methodologies that will affect the scope of study, requiring adjustments to either the study scope or analysis methodologies.

In addition to the GRC&A review, the working group leads discuss their data and information requirements and their expectations regarding who or what organization is expected to provide the data and information. This crosstalk is a critical element of the planning effort that is needed to meet all data and information requirements of the study. Effective planning in this area will help minimize data and information disconnects between the AoA study team working groups during AoA execution. For example, the cost analysis working group may require specific details of the alternatives in order to develop accurate cost estimates. By knowing about this information requirement, the technology and alternatives working group can plan to gather this information for the cost analysis working group.

Facilitation Tip

If necessary, the facilitator can establish breakout sessions designed for various purposes such as resolving problems or issues, finishing work in specific sections or chapters, or planning future activities. Select members of the HPT would participate in these breakout sessions which may occur concurrently with other tasks.

Task 11: Develop Chapter 6 (Alternative Comparison). In this task, the facilitator guides the HPT in the development of Chapter 6 (Alternative Comparison) of the study plan. As described in the AoA Handbook, the study plan template shows two sections in this chapter (Section 6.1 Alternative Comparison Methodology and Presentations and Section 6.2 Cost/Capability Tradeoff Analysis Methodology). Since the cost/capability tradeoff analysis is useful for conducting the alternative comparison, it may not be practical to describe the alternative comparison methodology and presentations and the cost/capability tradeoff analysis methodology in separate sections. In this situation, the facilitator should advise the HPT to develop a methodology that addresses the alternative comparison, presentations, and cost/capability tradeoff analysis. This means the chapter sections would not be needed, although the content that would normally be in these sections would still be addressed. The following provides specific guidance for each section of the chapter:

Section 6.1 Alternative Comparison Methodology and Presentations. The HPT describes the methodology for conducting the alternative comparison in this section of the study plan. The facilitator should ensure the HPT develops a methodology that entails a simultaneous comparison of the alternatives with respect to effectiveness (and sustainability), cost, and risk. The methodology should describe how the results of the sensitivity analysis (discussed in Chapter 3 of the study plan, Section 3.3 (Sensitivity Analysis)) will be incorporated into the alternative comparison.

The facilitator should present examples of alternative comparison presentations to help the HPT determine a potential approach for presenting the results. If possible, the HPT should develop an example of the alternative comparison presentation (e.g., color-coded table, graphic) in the study plan.

Section 6.2 Cost/Capability Tradeoff Analysis Methodology. The HPT describes the cost-capability tradeoff analysis methodology that addresses variations or excursions for attributes that are significant cost drivers. The intent is to find the “knee-in-the-curve” for the cost driver to ensure consideration of cost effective solutions rather than single point solutions that turn out to be unaffordable. The HPT should describe the manner in which the results of the analysis will be presented. The facilitator should inform the HPT of various techniques that can be used to present the results of the cost capability tradeoff analysis such as stoplight charts, cost vs. measures, cost vs. capability, cost table depicting cost results. The specific technique chosen will depend on the study.

The facilitator should guide the HPT in describing how tradeoff parameters will be selected, any weighting factors applied to the parameters, and the rationale for applying each weighting factor. The analysis should include comparisons between the (weighted) parameters and costs to facilitate cost, performance and schedule tradeoff discussions. The facilitator should advise the HPT that weighting may not be required or appropriate for some analyses.

Task 12: Develop Chapter 7 (Organization and Management). This chapter describes the organization of the study team and oversight group(s), study plan review process, and study schedule. Ideally, this chapter should be developed prior to the HPT event. If there is insufficient time during the HPT, the facilitator, in collaboration with the HPT lead, may defer development of this information until after the HPT event. The following provides specific guidance for each section of the chapter:

Section 7.1 Study Team Organization. This section describes the organization of the study team and oversight group(s). The facilitator should guide the HPT in developing an illustration of the study team organization since it will be useful for explaining the structure of the AoA study working groups (i.e., EAWG, TAWG, OCWG, TSWG, CAWG, and RAWG) and Working Integrated Product Team (WIPT) as well as the roles and responsibilities of the team members.

When the Director of CAPE (DCAPE) develops and approves AoA study guidance, the Study Advisory Group (SAG) is responsible for overseeing the AoA and ensuring it complies with the study guidance. The SAG is typically co-chaired by OSD(CAPE) and OUSD(AT&L) and includes representatives from OUSD(AT&L), OUSD(P), OUSD(C), OUSD(P&R), ASD(R&E), ASD(OEPP), DOT&E, the Joint Staff, and other Services and government agencies. The facilitator should ensure the HPT considers other key stakeholders (e.g., Air Force headquarters, sponsoring command or organization, other Air Force commands and agencies, combatant commands, civilian government agencies) for membership in the SAG. For programs that do not have DCAPE oversight, the facilitator should work with the HPT lead in determining SAG membership.

The facilitator should advise the HPT to consider other special groups for the study. For example, an O-6/GS-15-level group of stakeholders can be established to review and provide feedback on documents

prior to the review by the SAG. This is beneficial since it enables the study team to gain insights into possible enhancements to improve the quality of the documents before they are reviewed by the SAG.

Section 7.2 AoA Review Process. The AoA review process will largely depend on whether the AoA has OSD(CAPE) and OUSD(AT&L) oversight. As described in the OSD(CAPE) AoA Study Guidance template, the AoA sponsor presents the AoA study plan (not to exceed 10 pages) for OSD(CAPE) approval 30 days after the issuance of the AoA study guidance or no less than 30 days prior to the Materiel Development Decision (MDD). The facilitator should highlight that, although the body of the study plan may not exceed 10 pages, appendices can be added that provide additional information. This additional information will be required for the AFRRG study plan review and AFROC study plan validation. The AoA sponsor works with OSD(CAPE) to develop a schedule for briefing the SAG on the AoA study team's progress. It is expected that the briefings should be held every other month unless needed more frequently. Again, as noted earlier, for AoAs that do not have OSD(CAPE) and OUSD(AT&L) oversight, the facilitator should collaborate with the HPT lead to determine an AoA review approach.

As the HPT describes the review process that will be followed, the facilitator should ensure the HPT understands the AFRRG and AFROC staffing process and requirements described in AFI 10-601 *Operational Capability Requirements Development*. The facilitator should provide a general overview of the staffing timeline and requirements to help the HPT understand what is expected. The facilitator should refer the HPT to the AF/AF5R-P website for more information.

Section 7.3 Schedule. This section should include a high-level schedule (i.e., includes only the key events and phases) of the timeline from the start of AoA planning to Milestone A. The facilitator should advise the HPT to include the following (note that if the AoA has JROC or JCB interest, the JROC/JCB reviews should be included as well):

- Study planning phase
- AFRB approval to proceed to MDD
- Study guidance issuance
- AFRRG study plan review
- AFROC review and validation
- Study plan approval
- MDD
- Study execution phase
- SAG reviews during study execution phase
- Final report staffing phase
- AFRRG final report review
- AFROC final report review and validation
- Final report approval
- Materiel Solution Analysis Phase
- Milestone A

With four tasks remaining, the facilitator must assess whether additional breakout sessions are needed to address issues or complete specific sections or chapters.

Task 13: Review and Revise Chapters (1-7). As a group, the HPT reviews and revises, as necessary, the chapters that have been produced. This gives the HPT one last opportunity as a group to review the document and express any remaining concerns or issues. This also helps the facilitator determine whether consensus has been achieved on how the study will be conducted. The facilitator should be ready to deal with holdouts (see the Gaining Consensus section of this handbook for information on dealing with holdouts).

Task 14: Create Plan to Develop Appendices. The HPT lead, in collaboration with the facilitator, should develop a plan to develop the appendices. This will entail assigning actions items with time deadlines to the appropriate study team members (for instance, Appendix C (CCTDs) should be assigned to the TAWG lead, while Appendix D (M&S Accreditation Plan) should be assigned to the EAWG lead).

Task 15: Create Technical Editing and Document Staffing Plan. The HPT lead, in collaboration with the facilitator, should develop a technical editing and staffing plan. The facilitator should advise the HPT members to coordinate the study plan with their respective organizations to avoid possible delays during formal staffing. For representative(s) of organization(s) that were invited but did not attend, the HPT lead should provide a draft of the study guidance to these representatives prior to formal staffing.

Task 16: Wrap-up, Action Item Review, and Adjourning the HPT. The wrap-up entails finishing up the remaining work before adjourning the HPT. This does not mean rushing work and settling for a mediocre, or worse, product. If it is not possible to produce a quality product in the remaining time, it is better to defer the work until after the HPT event.

The HPT lead, in collaboration with the facilitator, should assign actions items with time deadlines to the appropriate team members. Action items may address various aspects such as issues that must be resolved, questions that must be answered, and study guidance sections or parts of sections that must be completed.

Before adjourning the HPT, the facilitator should elicit feedback from the team members regarding his or her performance as a facilitator, the value of the HPT approach, and improvements or enhancements that should be considered. In addition, the facilitator should document any lessons learned as well as the successes and shortcomings of the HPT. Finally, the facilitator should advise the HPT members to coordinate the study guidance with their respective organizations to avoid possible delays during formal staffing. For representative(s) of organization(s) that were invited but did not attend, the HPT lead should provide a draft of the study guidance to these representatives for review and comment prior to the formal staffing.

Appendix A: List of Acronyms

| | |
|--------|---|
| ACAT | Acquisition Category |
| ADM | Acquisition Decision Memorandum |
| AF | Air Force |
| AF/A5R | Air Force Director of Requirements |
| AF/A9 | Director, Studies & Analyses, Assessments and Lessons Learned |
| AFI | Air Force Instruction |
| AFMC | Air Force Materiel Command |
| AoA | Analysis of Alternatives |
| CAPE | Cost Assessment and Program Evaluation (OSD) |
| CBA | Capabilities-Based Assessment |
| CBP | Capabilities-Based Planning |
| CCTD | Concept Characterization and Technical Description |
| CDD | Capability Development Document |
| CPD | Capability Production Document |
| DAE | Defense Acquisition Executive |
| DoD | Department of Defense |
| FoS | Family of Systems |
| HPT | High Performance Team |
| ICD | Initial Capabilities Document |
| IPT | Integrated Product Team |
| JCIDS | Joint Capabilities Integration and Development System |
| JROC | Joint Requirements Oversight Council |
| M&S | Modeling and Simulation |
| MDA | Milestone Decision Authority |

| | |
|--------|--|
| OAS | Office of Aerospace Studies |
| OSD | Office of the Secretary of Defense |
| POM | Program Objective Memorandum |
| SAF | Secretary of the Air Force |
| SAF/AQ | Assistant Secretary of the Air Force for Acquisition |
| SAG | Study Advisory Group |
| SME | Subject Matter Expert |
| SoS | System of Systems |
| USAF | United States Air Force |
| WG | Working Group |

Appendix B: References and Information Sources

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OAS Capabilities-Based Assessment (CBA) User's Guide, February 2014 (Contact OAS for this document)

Appendix C: HPT Invitation Template

MEMORANDUM FOR: SEE DISTRIBUTION

FROM: MAJCOM/Study Lead Organization

ADDRESS:

SUBJECT: Request for Participation in ##### High Performance Team (HPT)

(SUSPENSE: DATE)

ORG NAME will be forming an HPT to develop a PRODUCT NAME – AoA STUDY GUIDANCE/PLAN. The objective of the HPT is to LIST GOALS AND OBJECTIVES. We request your organization's participation in this process.

The HPT is a forum for stakeholders and key team members to develop and generate important requirements and analysis study documents. The HPT enables development of the Analysis of Alternatives (AoA) study guidance the AoA study plan.

The HPT aids in creating a common understanding of the goals and objectives of the mission area under study. It is important for the team to be in agreement on the procedural way of documenting the AoA study guidance and study plan. If done thoughtfully and methodically, these documents will greatly increase the odds of study success.

Under the HPT concept, a core team meets to scope the effort, gather references and analyses, and begin to frame the document in accordance with Air Force guidance. See AFI 10-601. The core of the HPT will consist of approximately 30 to 40 members from across the user and developer community. These members should have the authority to speak on behalf of their organization and effectively communicate questions, concerns, and desires for the AoA.

Request addressees forward the name and contact information of core/support team candidates to the HPT lead, name, MAJCOM/Office, email, phone number by date. Negative replies are requested. We appreciate your support of our effort.

Regards,

XXXXX

O-6/GS-15/ GO/SES-Level Sponsoring MAJCOM/Agency Division Chief

Appendix D: Sample HPT Agenda: AoA Study Guidance Development

DAY 1 (8 hours)

Goal: Complete Tasks 1-4

- Task 1: HPT Introductions and Overview
- Task 2: Define the Purpose of the AoA
- Task 3: Identify the Capability Gaps (Background)
 - Breakout Sessions as required
- Task 4: Describe the Baseline Capability and Alternatives
 - Breakout Sessions as required
- Bring group together, discuss Day 1 progress, answer questions, obtain feedback on progress of event, assign homework if necessary
- Adjourn

DAY 2 (8 hours)

Goal: Complete Tasks 5-9

- Recap of Day 1
- Task 5: Generate Specific Question to be Answered in the Study
 - Breakout Sessions as required
- Task 6: Develop Key Ground Rules, Constraints, and Assumptions
 - Breakout Sessions as required
- Task 7: Develop the Analysis Methodology
 - Breakout Sessions as required
- Task 8: Develop the Administrative Guidance
- Recap HPT event, assign action items, follow on meetings, discuss plan for completing the document
- Adjourn

Appendix E: Sample HPT Agenda: AoA Study Plan Development

DAY 1 (6-8 Hours)

Goal: Complete Tasks 1-1 to 1-4

- Task 1-1: Introductions and Overview
- Task 1-2: Overview of Study Plan Development Approach
- Task 1-3: Develop Chapter 1 (Introduction, Background, Purpose and Scope, Study Guidance, Capability Gaps, Stakeholders, Key Ground Rules, Constraints, and Assumptions)
- Task 1-4: Overview of Baseline Capability and Potential Alternatives
- Bring group together, discuss Day 1 progress, answer questions, obtain feedback on progress of event, assign homework if necessary
- Adjourn

DAY 2 (6-8 Hours)

Goal: Complete Tasks 2-1 to 2-4

- Breakout Session: HPT Alternatives/Scenarios Working Group
 - Task 2-1: Develop Chapter 2 (Description of Alternatives, Operational Concepts, Scenarios and Operational Environments)
- Breakout Session: HPT Effectiveness Working Group
 - Task 2-2: Develop Chapter 3 (Effectiveness Analysis Methodology, Measures, Sensitivity Analysis, Analysis Tools and Data, Modeling and Simulation Accreditation)
- Breakout Session: HPT Cost Working Group
 - Task 2-3: Develop Chapter 4 (Cost Analysis, Life Cycles Cost Methodology, Work Breakdown Structure, Cost Tools and Data, Cost Sensitivity and Risk Methodology)
- Breakout Session: HPT Risk Working Group
 - Task 2-4: Develop Chapter 5 (Risk Analysis Methodology, Risk Assessment Tools)
- Bring group together, discuss Day 2 progress, answer questions, obtain feedback on progress of event, assign homework if necessary
- Adjourn

DAY 3 (6-8 Hours)

Goal: Complete Tasks 3-1 to 3-3 (Breakout Sessions as Required)

- Task 3-1: Review and Revise Chapters 1-5
- Task 3-2: Develop Chapter 6 (Alternative Comparison Methodology, Cost/Capability Tradeoff Analysis Methodology)
- Task 3-3: Develop Chapter 7 (Organization and Management, Study Team Organization, AoA Review Process, Schedule)
- Bring group together, discuss Day 3 progress, answer questions, obtain feedback on progress of event, assign homework if necessary
- Adjourn

DAY 4 (4-6 Hours)

Goal: Complete Tasks 4-1 to 4-4 (Breakout Sessions as Required)

- Task 4-1: Review and Revise Chapters 1-7
- Task 4-2: Create Plan to Develop Appendices (Acronyms, References, CCTD(s), Modeling and Simulation Accreditation Plan, etc.)
- Task 4-3: Create Technical Editing and Document Staffing Plan
- Task 4-4: Elicit HPT Feedback
- Recap HPT event, assign action items, follow on meetings, discuss plan for completing the document
- Adjourn

Appendix F: HPT Administration Considerations

| Task | Subtasks Involved | Caveats | OPR | Begin |
|----------------------------------|--|---|----------|-----------------|
| Obtain funding for HPT | Includes travel, refreshments, facility fees if applicable | Funding may be limited due to fiscal environment | HPT lead | 6 months prior |
| Enlist HPT Participants | Contact stakeholder organizations, send invitation letter, obtain supervisor approval, ensure participants have relevant knowledge, skills, experience | Personnel limited. Start early | HPT lead | 3 months prior |
| Publish team contact information | Collect, populate SharePoint site | Will be a living document | HPT lead | Ongoing effort |
| Determine Location | Obtain attendee list first to ensure most convenient and cost effective location is chosen | Funding, meeting length, travel approval timelines, competing events in the area, local amenities | HPT lead | 6 weeks prior |
| Obtain Required Technology | Ensure computers are compatible at correct security levels, projectors, copy machine, etc. | Potential delays in obtaining required resources | HPT lead | 4-6 weeks prior |
| Security | Obtain SMO codes and passing instructions | Establish location first, if held at too high a level, some may be unable to participate | HPT lead | 4 weeks prior |

| | | | | |
|--|---|---|------------------------|------------------|
| Designate Roles | Meet with core team to determine roles | Ensure roles are clearly defined | HPT lead | 4 weeks prior |
| Prep Meeting with CAPE | Schedule meeting, discuss HPT goals & objectives, obtain buy-in | Ensure the CAPE POC is aware of progress on effort | HPT lead | 2-4 months prior |
| Create document library | Establish a shared location, populate, communicate location | Consider document classification, system availability | HPT lead / facilitator | 2 months prior |
| Generate Agenda | See Appendices D & E | Inadequate agenda results in decreased value of HPT | HPT lead/ facilitator | 3 weeks prior |
| Arrange appropriate security precautions | Determine meeting classification level, arrange as appropriate | Side meetings are possible at higher levels with limited attendance | HPT lead | 3 weeks prior |
| Meeting nourishment | Procure snacks, beverages, lunches | Decide if working lunch is necessary | HPT lead | 1 week prior |
| Meeting equipment | Secure audio visual tools | Type of meeting | HPT lead | 1 week prior |

Appendix G: AoA Study Plan Template

This appendix contains the AoA Study Plan template required for the AoA.

-----Cover Page-----

<Name of Project Here>

Analysis of Alternatives (AoA)

Study Plan

<Lead MAJCOM>

<Date>

Distribution Statement

Refer to these sources for more information:

1. Department of Defense Directive (DODD) 5230.24, "Distribution Statements on Technical Documents"
2. Air Force Pamphlet (AFP) 80-30, "Marking Documents with Export-Control and Distribution-Limitation Statements" (to be reissued as Air Force Instruction (AFI) 61-204)

Ask the Scientific & Technical Information (STINFO) Officer for help in choosing which of the available statements best fits the AoA

REMEMBER -- AoA information may be PROPRIETARY, SOURCE SELECTION

SENSITIVE, OR CLASSIFIED

-----Table of Contents-----

- 1. Introduction**
 - 1.1. Background
 - 1.2. Purpose and Scope
 - 1.3. Study Guidance
 - 1.4. Capability Gaps
 - 1.5. Stakeholders
 - 1.6. Ground Rules, Constraints, and Assumptions

- 2. Alternatives**
 - 2.1. Description of Alternatives
 - 2.2. Operational Concepts
 - 2.3. Scenarios and Operational Environment

- 3. Effectiveness Analysis**
 - 3.1. Effectiveness Methodology
 - 3.2. Measures
 - 3.3. Sensitivity Analysis Methodology
 - 3.4. Analysis Tools and Data
 - 3.5. Modeling and Simulation Accreditation

- 4. Cost Analysis**
 - 4.1. Life Cycle Cost Methodology
 - 4.2. Work Breakdown Structure
 - 4.3. Cost Tools and Data
 - 4.4. Cost Sensitivity and Risk Methodology

- 5. Risk Assessment**
 - 5.1. Risk Assessment Methodology
 - 5.2. Risk Assessment Tools

- 6. Alternative Comparison**
 - 6.1. Alternative Comparison Methodology and Presentations
 - 6.2. Cost/Capability Tradeoff Analysis Methodology

- 7. Organization and Management**
 - 7.1. Study Team Organization
 - 7.2. AoA Review Process
 - 7.3. Schedule

Appendices

- A. Acronyms**
- B. References**

- C. CCTD(s)
- D. Modeling and Simulation Accreditation Plan
- F. Other appendices as necessary

-----Plan Section Contents-----

1. Introduction

1.1. Background

- Briefly describe the history of the effort and related programs. Summarize relevant analyses that preceded this study such as applicable Joint Concept Technology Demonstrations (JCTDs) or Advanced Concept Technology Demonstrations (ACTDs). This should include any lessons learned from previous efforts, especially those that were cancelled.
- Explain why the study is being conducted now and the key decisions that have been made to this point.

1.2. Purpose and Scope

- Describe the scope and purpose of the AoA. Describe any tailoring or streamlining used to focus the study.
- Identify potential areas of risk and/or roadblocks pertinent to the study (particularly schedule, lack of required data, lack of stakeholder participation, etc.)
- Identify the key acquisition or other issues that will be addressed in the analysis. Also explain why any key issues will not be considered or addressed in the analysis.
- Identify the milestone decision the analysis will inform.

1.3. Study Guidance

- Summarize the AoA study guidance from the Air Force and/or CAPE, as appropriate.
- Identify the key questions in the guidance.

1.4. Capability Gaps

- Identify and describe the specific AFROC or JROC approved capability gaps that will be addressed in the AoA. Identify the validated sources of these gaps.
- Identify the threshold/objective requirement values in the ICD and how they will be treated as reference points to explore the tradespace.
- Identify the timeframe for the operational need.

1.5. Stakeholders

- Identify the stakeholders for this AoA and explain their roles/responsibilities in the AoA.
- Describe how methodologies, alternatives, evaluation criteria, and results will be reviewed by the stakeholders and oversight groups (e.g., Senior Review Group, Study Advisory Group, etc.).

1.6. Ground Rules, Constraints, and Assumptions

- Identify the AoA ground rules, constraints, and assumptions. Describe the implications of the ground rules, constraints, and assumptions. Reference appropriate assumptions identified in the ICD or AoA guidance and describe their implications to the study.
- Identify the projected Initial Operating Capability (IOC) and Full Operating Capability (FOC) milestones.

2. Alternatives

2.1. Description of Alternatives

- Describe the baseline (existing and planned systems) capability.
- Describe the alternatives specified in the AoA study guidance and how the alternatives will be employed in the operational environment. Explain the rationale for including them in the study. Explain the rationale for excluding any specific types of alternatives in the study.
- Discuss dependencies associated with each alternative and how the dependencies will be addressed in the analysis.
- Identify the appendix that contains the CCTD(s) for baseline and each alternative.

2.2. Operational Concepts

- Identify organizational functions and operations performed during the mission. This includes describing logistics and maintenance concepts.
- Describe what enablers exist and how they interface with the alternatives. This includes identifying the dependencies of each alternative.
- Discuss significant tactics, techniques, procedures, and doctrine used.
- Discuss significant interfaces with other systems.
- Identify any peacetime and contingency operation implications. Describe any deployment issues.

2.3. Scenarios and Operational Environment

- Describe the scenarios that will be used in the AoA and rationale for their selection. This includes an explanation of how the scenarios represent the operational environment.
- Describe the expected operational environment, including terrain, weather, location, and altitude. Describe how the environment will impact the alternatives.
- Describe the enemy tactics (include potential countermeasures).

3. Effectiveness Analysis

3.1. Effectiveness Methodology

- Describe the effectiveness methodology, including the types of analysis (e.g., parametric, expert elicitation, modeling and simulation, etc.). This includes

describing how performance drivers will be identified and fully explored in the sensitivity analysis.

- Describe how the methodology and associated measures will be reviewed by the appropriate stakeholder and oversight groups (e.g., Senior Review Group, Study Advisory Group, etc.).
- Describe how the dependencies identified for each alternative will be addressed in the analysis.
- Describe the decomposition of the capability gaps and how they will be addressed in the analysis.
- Describe the methodology to explore the tradespace and give a brief description of what sensitivity analysis will be accomplished to determine Key Performance Parameters/Key System Attributes and threshold/objective (T/O) values for the Requirements Correlation Table (RCT). This includes describing how the tradespace around the capability threshold values will be explored to determine if adjustments need to be recommended based on the results.
- Describe the methodology to assess sustainability concepts such as reliability, availability, and maintainability.

3.2. Measures

- Identify the Measures of Effectiveness, Suitability, and Performance.
- Describe the traceability of the AoA measures to the requirements and associated minimum values identified in the ICD (from the CBA).
- Describe the traceability of the AoA measures to the capability gaps and mission tasks.
- Discuss how the measures are measurable and will support the development of the post-AoA documents (e.g., CDD, CPD, TES, TEMP).

3.3. Sensitivity Analysis Methodology

- Describe the sensitivity analysis that will be conducted to determine key performance parameters/key system attributes and threshold/objective values for the RCT.

3.4. Analysis Tools and Data

- Describe the analysis methods and tools that will be used to conduct the analysis and the rationale for selection. Describe the input data to be used and corresponding sources.
- Discuss how the data for the scenarios, threats, and each of the alternatives will be current, accurate, and unbiased (technically sound and doctrinally correct).
- Describe how the analysis methods and tools will provide data to address the measures. Illustrate how the analysis methods and tools are linked (suggest using the confederation of tools diagram described in Chapter 4 of this handbook).

3.5. Modeling and Simulation Accreditation

- Describe the modeling and simulation accreditation plan.
- Discuss any potential model biases, such as “man-in-the-loop” biases.

4. Cost Analysis

4.1. Life Cycle Cost Methodology

- Describe the cost analysis methodology. Describe how the cost drivers will be identified and fully explored in sensitivity analysis.
- Describe how the cost analysis methodology will be reviewed by the stakeholders and oversight groups (e.g., Senior Review Group, Study Advisory Group, etc.).
- Describe how the dependencies identified for each alternative will be addressed in the analysis.
- Identify the economic operating life of the alternatives (e.g., 10 year, 20 year, 25 year Operations and Support cost).
- Describe the methodology for costing Research and Development (R&S), Investment, Operations and Support (O&S), Disposal, and total LCC for each alternative.
- Identify the sunk costs for information purposes only.

4.2. Work Breakdown Structure

- Describe the cost work breakdown structure.

4.3. Cost Tools and Data

- Describe the cost analysis methods (e.g., analogy, expert opinion, etc.) and models (e.g., ACEIT, CRYSTALL BALL, etc.) that will be used and the reason for their selection. Describe the input data to be used and corresponding sources.
- Discuss any potential model shortfalls.

4.4. Cost Sensitivity and Risk Methodology

- Describe the methodology to identify the cost drivers.
- Describe the methodology for determining the level of uncertainty for each element of LCC and each cost driver.
- Describe how the cost of each alternative will be assessed with respect to the affordability constraints identified at MDD and in the AoA study guidance.

5. Risk Assessment

5.1. Risk Assessment Methodology

- Describe the methodology for identifying risk (operational, technical risk, cost, and schedule). Discuss how empirical data will be used to assess technical risk, especially in the area of integration risk.
- Describe the methodology to identify schedule drivers.

5.2. Risk Assessment Tools

- Describe the risk assessment tools or models that will be used in the analysis.

6. Alternative Comparison

6.1. Alternative Comparison Methodology and Presentations

- Describe the alternative comparison methodology. If using a color scheme (e.g., red, yellow, green), describe how the color rating will be determined from the values.
- Describe how the alternative comparison methodology will be reviewed by the stakeholders and oversight groups (e.g., SAG).
- Describe the methodology for performing the sensitivity tradeoff analysis. This includes describing how knee-in-the-curves for cost drivers will be determined to identify cost effective solutions rather than single point solutions.
- Describe the methodology for identifying the assumptions and variables, when changed, will significantly change the schedule, performance, and/or cost-effectiveness of the alternatives.
- Describe the methodology for identifying performance parameters, when changed, will significantly change operational effectiveness. Also identify performance parameters, if fixed as performance specifications, are most likely to influence development and production cost.

6.2. Cost/Capability Tradeoff Analysis Methodology

- Describe the cost/capability tradeoff analysis methodology to determine the best value alternative(s) that provide acceptable capability to the warfighter.

7. Organization and Management

7.1. Study Team Organization

- Identify how the team is organized and a general description of the responsibilities of each working group.
- Describe the stakeholders and oversight groups (e.g., Senior Review Group, Study Advisory Group, etc.) and their roles.

7.2. AoA Review Process

- Describe the review process and the oversight groups involved (e.g., Senior Review Group, Study Advisory Group, Milestone Decision Authority, etc.).

7.3. Schedule

- Describe the AoA schedule (a chart of the timeline with key decision points and events is suggested). Discuss the ability of the study team to execute the study plan according to the schedule. Identify potential schedule risk pertinent to the study.

Appendix H: OSD CAPE AoA Study Guidance Template

DRAFT (XXXXX PROGRAM NAME)

ANALYSIS OF ALTERNATIVES GUIDANCE



Program Name (Abbreviation) Analysis of Alternatives Guidance

Purpose

The goal of Analysis of Alternatives (AoA) guidance is to facilitate high caliber analysis, fair treatment of options, and decision-quality outcomes to inform the Milestone Decision Authority (MDA) at the next Milestone and shape/scope the Request For Proposal (RFP) for the next acquisition phase. *CAPE guidance should direct the AoA to explore tradespace in performance, schedule, risk and cost across a full range of options to address validated capability requirements.* Additionally, the guidance should support an AoA feedback mechanism to the requirements process of recommended changes to validated capability requirements that, upon further study, appear unachievable and/or undesirable from a cost, schedule, risk and/or performance point of view.

Background

The guidance should provide a brief background on why the AoA is being conducted and how we got here. It should discuss the history of the effort and characterize related programs, to include lessons learned from previous cancellations. This section should also include a discussion of the Joint Requirements Oversight Council (JROC)-approved capability gaps and their role in the AoA study. *The guidance should make clear that the values of the capability gaps in the Initial Capabilities Document (ICD) and draft Capability Development Document (CDD) should be treated as reference points to frame decision space rather than minimum standards to disqualify options.* The AoA should illuminate the operational, schedule, risk and cost implications of tradespace around the validated capability gaps.

Assumptions and Constraints

Defining and understanding key assumptions and constraints are important in properly scoping the issue, defining excursions, and limiting institutional bias. Assumptions that are standard or trivial and therefore provide limited insight on what is actually driving the answer are not of interest. Since assumptions can determine outcomes, *the guidance should direct the study team to identify the key assumptions driving the AoA results.* Significant assumptions can include U.S.: enemy force ratios, threat characterization, CONOPs, etc. All major/key assumptions and constraints should be validated by the Study Advisory Group (SAG) as they are developed, but prior to beginning analysis.

Alternatives

This section should delineate the base case set of alternatives. These alternatives typically include a baseline (legacy systems and their approved modifications through the current POM), modified legacy systems, modified commercial/government/allied off the shelf systems, and new development alternatives. The alternatives should be distinctly defined, with enough detail to support the analytic approaches used. The alternatives should be grounded in industry, national lab or other agency responses; the AoA should avoid contriving unrealistic, “idealized” options.

The guidance should direct the AoA to explore a full range of viable modifications to legacy systems. For all alternatives, the AoA should assess features that appear to provide substantive operational benefit and apply to all viable alternatives (e.g., if a type of sensor is found to provide notably improved effectiveness for one alternative, the AoA should explore incorporating that feature in all alternatives).

Alternatives should also consider variations or excursions for attributes that are significant cost drivers. The intent is to find the “knee-in-the-curve” for the cost driver to ensure consideration of cost effective solutions rather than single point solutions that turn out to be unaffordable.

Analysis

The analysis should be based on sound methodologies and data that are briefly outlined in the Study Plan. The guidance should establish an early milestone/date for the AoA team to present their detailed methodology and data approaches, tools, scenarios, metrics, and data in- depth to the SAG and other stakeholders.

The AoA should spell out the scenarios and CONOPS used and explain the rationale for the inclusion of non-standard scenarios. If non-standard scenarios are employed the study team should explain in depth outcomes unique to those scenarios. The guidance should direct that a range of less stressing and more stressing scenarios be used, rather than using only highly demanding scenarios.

The guidance should instruct the AoA to spell out the metrics used, any weighting factors applied to these metrics, and the rationale for applying each weighting factor. Metrics should include comparisons between the (weighted) metrics and cost to facilitate cost, performance and schedule tradeoff discussions.

A problem with many legacy AoAs is that they have focused on operational benefits and downplayed technical, schedule, and cost risk. To avoid this, the guidance should instruct the AoA team to give full treatment to non-operational risks, since these factors have been a major cause of failed programs in the past. Within the technical risk area, empirical data should guide the AoA's assessment, with particular focus on integration risk.

The guidance should direct the AoA team to explain the rationale for the results, which goes well beyond simply presenting outcomes. The AoA team should understand that the value of the analysis is in understanding *why* options do well or poorly. The study guidance should require the AoA team to acknowledge the limitations and confidence in the results due to lack of mature or reliable data at the time of the AoA. The team should also explain how/if variations to CONOPS or attributes of alternatives might mitigate cost drivers or low ratings on assessment metrics. Also, many AoAs have presented preferred options only for those cases advantageous to the option. The guidance should instruct the AoA to characterize the circumstances in which a given option appears superior and the conditions under which its outcomes degrade (a useful example of this was in the AoA for the replacement of the M113 armored personnel carrier, which showed how casualties varied according to the explosive weight of improvised explosive devices).

Cost Analysis

Provide an analysis of life-cycle costs that includes estimates of development, production, operating and support (O&S), and disposal costs. These estimates should be of sufficient quality to support acquisition and investment decisions, but are not to be of budget quality.

- O&S cost estimates will cover a common life-cycle period for the system under consideration (for most, a 20-year period) for all alternatives, consistent with the Operating and Support Cost-

Estimating Guide (Cost Analysis Improvement Group, Office of the Secretary of Defense, October 2007). The estimates shall include point estimates for the Average Procurement Unit Cost (APUC), as well as total life-cycle cost.

- Life cycle estimates should be calculated as point estimates and also shown as 50% and 80% confidence levels.
- The cost analysis will identify APUC estimates for varying procurement quantities, if applicable. Present-value discounting should be used in comparing the alternatives, in accordance with OSD and Office of Management and Budget guidelines.
- Costs should be expressed in current-year dollars and, if appropriate in the context of FYDP funding, in then-year dollars. Costs should be presented at the major appropriation level with defined risk ranges to communicate the uncertainty associated with the estimates.
- The cost portion of the analysis should include an assessment of how varying the annual procurement rate affects cost and manufacturing risk when appropriate (e.g., procuring items faster to complete the total buy sooner vice buying them more slowly over a longer period of time).

Schedule and Technology/Manufacturing Risk Assessment

The AoA should include estimated schedules for each alternative, as well as an assessment of existing Technology Risk Levels (TRLs)/Manufacturing Risk Levels (MRLs) for critical technologies which may impact the likelihood of completing development, integration, and operational testing activities on schedule and within budget. Since legacy AoAs have often proposed development and procurement schedules that were more aggressive than we actually achieved, future AoAs should include an assessment of the likelihood of achieving the proposed schedule based on our experience. Where significant risks are identified, the assessment should outline practical mitigation strategies to minimize impact to delivering the operational capability to the warfighter, and if applicable, notional workarounds in the event the risks are realized.

Sensitivity Analysis. The AoA will identify assumptions, constraints, variables and metric thresholds that when altered, may significantly change the relative schedule, performance, and/or cost-effectiveness of the alternatives. The sensitivity analysis should identify cost, schedule, and performance drivers to illuminate the trade space for decision makers. (e.g., identify performance attributes that make the largest changes to the force's mission effectiveness or are likely to most influence development and/or production cost.)

Other specified analysis as required

- All mandatory Key Performance Parameters (KPPs) as noted in the Joint Capabilities Integration and Development System (JCIDS) manual should be analyzed, as applicable. Additionally, if a value has been specified within the requirements documents for these KPPs, describe the risk incurred for failing to achieve these values.
- DOTmLPF-P Assessment. The AoA will evaluate the implications for doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTmLPF-P) for each alternative.
- Operational Energy Assessment. If applicable, the AoA will include an examination of demand for fuel or alternative energies under each of the alternatives, using fully burdened costs. The study

lead will:

- Ensure the Fully Burdened Cost of Energy (FBCE) method is used in computing costs for the Life Cycle Cost Estimate (LCCE) and documented in the final report.
- Brief the SAG as to whether FBCE significantly differentiate between the alternatives being considered.
- In cases where it does not significantly differentiate between alternatives, the Service shall complete the FBCE work external to the AoA.

Specific questions to be answered by the AoA

Additional program-specific questions should be included that do not repeat the requirements described elsewhere in the guidance. Rather, these questions should probe issues that are specific to the program – e.g., how a program would achieve high reliability; how a program might mitigate risk if the technology required fails to materialize; how a program might trade lethality versus survivability if cost (or weight) is a limiting factor. This section of the guidance should be a description of ideas that are substantive to the specific program and pose questions that, when answered, *will highlight the truly important aspects of the tradespace for the program.*

Administrative Guidance

A SAG will oversee the conduct of the AoA and ensure that the study complies with CAPE guidance. The group will be co-chaired by OSD CAPE and a Service representative and will include representatives from OUSD(AT&L), OUSD(P), OUSD(C), OUSD(P&R), ASD(R&E), ASD(OEPP), DOT&E, the Joint Staff, and the Services. The SAG is responsible for ensuring that the study complies with this guidance. The SAG has the authority to change the study guidance.

The organization performing the AoA will present an AoA study plan (not to exceed 10 pages) for CAPE approval 30 days after the issuance of the AoA Study Guidance or no less than 30 days prior to the Material Development Decision. The organization performing the AoA will work with OSD CAPE to develop a schedule for briefing the SAG on the AoA study team's progress. The briefings should be held bimonthly unless needed more frequently. In between briefings to the SAG, the study lead will maintain dialogue with OSD CAPE.

The guidance should set strict time limits on the analysis timeline – shorter is better. If the AoA analysis is expected to take longer than 6-9 months, the scope of work should be reconsidered to ensure the analysis planned is truly necessary to inform the milestone decision.

The final deliverables will include a briefing to the SAG and a written report. The written AoA report is due to D,CAPE at least 60 days prior to the Milestone Decision (to allow for sufficiency review) and to the other SAG members to properly inform the stakeholders prior to the release of the RFP for the next acquisition stage. The final report will provide a detailed written record of the AoA's results and findings and shall be on the order of no more than 50 pages in length, plus the Executive Summary which should be no more than 10 pages in length.

Appendix I: Materiel Development Decision (MDD) Potential Topics

- Entrance Criteria:
 - Approved ICD – Joint Staff
 - Identification of promising technologies and design concepts – DDR&E
 - Approved AoA Study Guidance – CAPE
 - Full funding to Materiel Solution Phase – CAPE
 - Affordability constraints – CAPE, OIPT lead, and Comptroller
- Preliminary CONOPS and Operational Risk – Joint Staff
- Sufficiency of AoA Guidance – CAPE and OIPT Lead
- Industrial Base Considerations – Industrial Policy
- Intel Support Considerations – USD(I)

For more information, see:

Principal Deputy Under Secretary of Defense Memorandum for DAB Members and Advisors, 23 April 2010,
Subject: Preparation for Defense Acquisition Board (DAB) Meetings, DAB Readiness Meetings (DRM), and DAB
Planning Meetings (DPM)