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A Method for Improving Strategic Decisions and Senior-level Teamwork in U.S. National Security Organizations Part 2

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Introduction: This is the second of two articles on a risk-based method for supporting strategic decisions and building teamwork. The Integrated Risk Assessment and Management Model (IRAMM) developed by the Institute for Defense Analyses (IDA) systemically captures informed personal views that help decision makers better understand their own views on national security issues and where they fit relative to their peers and staff. It also helps build teamwork among the senior staff that can result in imaginative solutions to challenging problems and promotes the consistent application of organizational policies. Another benefit of the IRAMM structure is the national-level perspective it provides that can support the development, coordination, and implementation of national defense and security strategies, including the articulation of the resulting strategy to others.

Part 1, published in the March, 2017 Phalanx, contained an executive overview of the method. Part 2 (this article) contains a detailed description of IRAMM, along with a discussion of the advantages and limitations of the approach. The three basic steps are (1) establish the baseline and conduct the individual interviews; (2) hold a group discussion informed by the interviews; and (3) provide results to senior leadership.

Step 1: Preparing for and conducting the interview

This part contains a description of the basic tools used in IRAMM, the activities associated with preparing for the interview, and the process used to conduct the interview

Description of the basic tools

IRAMM is a structured process that elicits consistent responses from those being interviewed by using a common definition of risk, a common and detailed consequence scale, and a numerical calibration scale. We will discuss each of these in turn.

Definition of risk: The IRAMM methodology defines the risk associated with a single future event as the *likelihood* of the event occurring times the predicted political, economic, and military losses facing the United States if the event does occur *given* a U.S. capability, such as the programmed force (or a postulated alternative). Thus, risk involves predicting events (scenarios) and how consequential they will be if they do happen, assuming a program and set of policies. Strategic risk is the aggregation of risks associated with a challenge area, such as major combat operations, homeland defense, irregular warfare, etc.

Consequence scale: A detailed consequence scale was developed to promote consistency across respondents in three areas: economic, military, and political. It is based in part on the findings from a 2000 study co-chaired by General Andrew Goodpaster[1] that defined a hierarchy of U.S. strategic interests with "vital" (threatening the survival of the United States as a sovereign nation) as the highest category. The criteria in the study are in bullet form in the IRAMM consequence scale aid, displayed in Figure 1.

[1] The Commission on America's National Interests, *America's National Interests* (Cambridge, MA: Belfer Center for Science and International Affairs, Harvard University, July 2000).

Economic	Military	Political	
• 4% or greater cumulative loss in GDP • Extreme, semi-permanent structural and economic costs. • Capital flows massively degraded and/or dollar collapses jeopardizing U.S. economic foundation. • Alliances and economic agreements terminated.	• Loss of more than 10% of overall military force capability; recovery longer than 4 years. • Covering worldwide mission areas adequately is impossible. • Deterrence severely compromised in key areas. • Potential international condemnation due to high non-combatant casualties. • Loss of confidence in military, internally and externally.	• The U.S. seen as unreliable by multiple allies or coalition partners and new regional security orders emerge. • Loss of credibility as guarantor of global security. • Allies and friends create their own nuclear arsenals to guarantee their security • Competitors become increasingly aggressive and adversarial.	Most Severe
• 3% cumulative loss in GDP • Severe economic costs resulting from trade disruptions, operational factors, or property damage. • Capital flows seriously degraded and/or substantial devaluation of dollar. • Global economy stalled. • Recovery eventually.	• Loss of 5-10% of overall military force capability; recovery within 4 yrs • Reduced worldwide mission areas commitment. • Deterrence weak in key areas. • Critical U.S. vulnerability revealed to all from military surprise. • International criticism due to high non-combatant casualties.	• U.S. strategic influence severely degraded. • U.S. loses credibility in one or more key regions of the world. • One or more competitors takes advantage of perceived U.S. weakness. • Some coalitions fail; some allies turn away from the U.S.	
• 2% cumulative loss in GDP • Serious economic costs due to trade disruptions, operational factors, or property damage. • Capital flows degraded and /or value of dollar weakens. • Economic disruptions possible, but no recession follows. • Reconstruction of key economic capabilities could take months.	• Loss of 1-5% of military force capability; recovery within 18 months. • Worldwide mission areas still covered. • Overall mission success not questioned. • Deterrence weaker, but still strong. • High non-combatant casualties.	• U.S. weakened as major global political broker. • International cooperation with U.S. put at risk. • U.S. credibility weakened with one or more competitors. • U.S. partners doubt U.S. commitment and begin to forge separate security arrangements or seek unilateral measures to guarantee their security.	
• 1% cumulative loss in GDP • Some economic costs due to trade disruptions, operational factors, or property damage. • Confidence quickly restored domestically and internationally.	• Loss of less than 1% of military force capability.. • Worldwide mission areas covered adequately. • Low or predicted non-combatant casualties.	• Some political opposition to and suspicion of U.S. intentions in previously friendly countries. • Reduced willingness of allies and friends to cooperate with U.S. on other international security goals.	
• Negligible effect on GDP	• No major loss of military force capability overall. • Worldwide mission areas covered adequately. • Low or predicted non-combatant casualties.	• Some minor political opposition to and suspicion of U.S. intentions in previously friendly countries.	Least Severe

Figure 1. Consequence Scale Aid

The scale is constructed so that the criteria in the three cells in a row have roughly equal consequences relative to other events in their category. The events with the smallest consequences are at the bottom and the most severe consequences are at the top. Some past respondents have assigned consequence scores in five equal bins (0–20, 20–40, 40–60, 60–80, and 80–100). However, respondents are not bound by the values in the scale and are free to assign consequence scores in accordance with their value systems. As a result, the scale is referred to as an "aid."

Consequence Calibration: Calibration scenarios are used to further support consistency. Short scenario descriptions are used as calibration points for the top and bottom of a 100-point scale (see Figure 2 for an illustration). Respondents are asked to compare their consequence estimates to those in the calibration scenarios and adjust their scores as needed. The IRAMM calibration scenarios are (1) a nuclear attack on the U.S. homeland with a consequence value of 100 and (2) one with no significant military events over the decade with a consequence score of "zero." Pairwise comparisons[2] of the respondent's score (a weighted average of the political, military, and economic consequences) with the calibration points help ensure internal consistency and consistency with other respondents. Most respondents consider the scenarios they identified to be less

[2] Using pairwise comparisons to induce consistency among responses is discussed in Edwards, Ward, "How to use Multi-attribute Utility Measurement for Social Decision Making," *IEEE Transactions on Systems, Man, and Cybernetics*, Vol. SMC-7 No. 5, May, 1977, 326 – 340.

consequential than the high-end calibration scenario; however, nothing prohibits respondents from estimating consequences greater than 100.

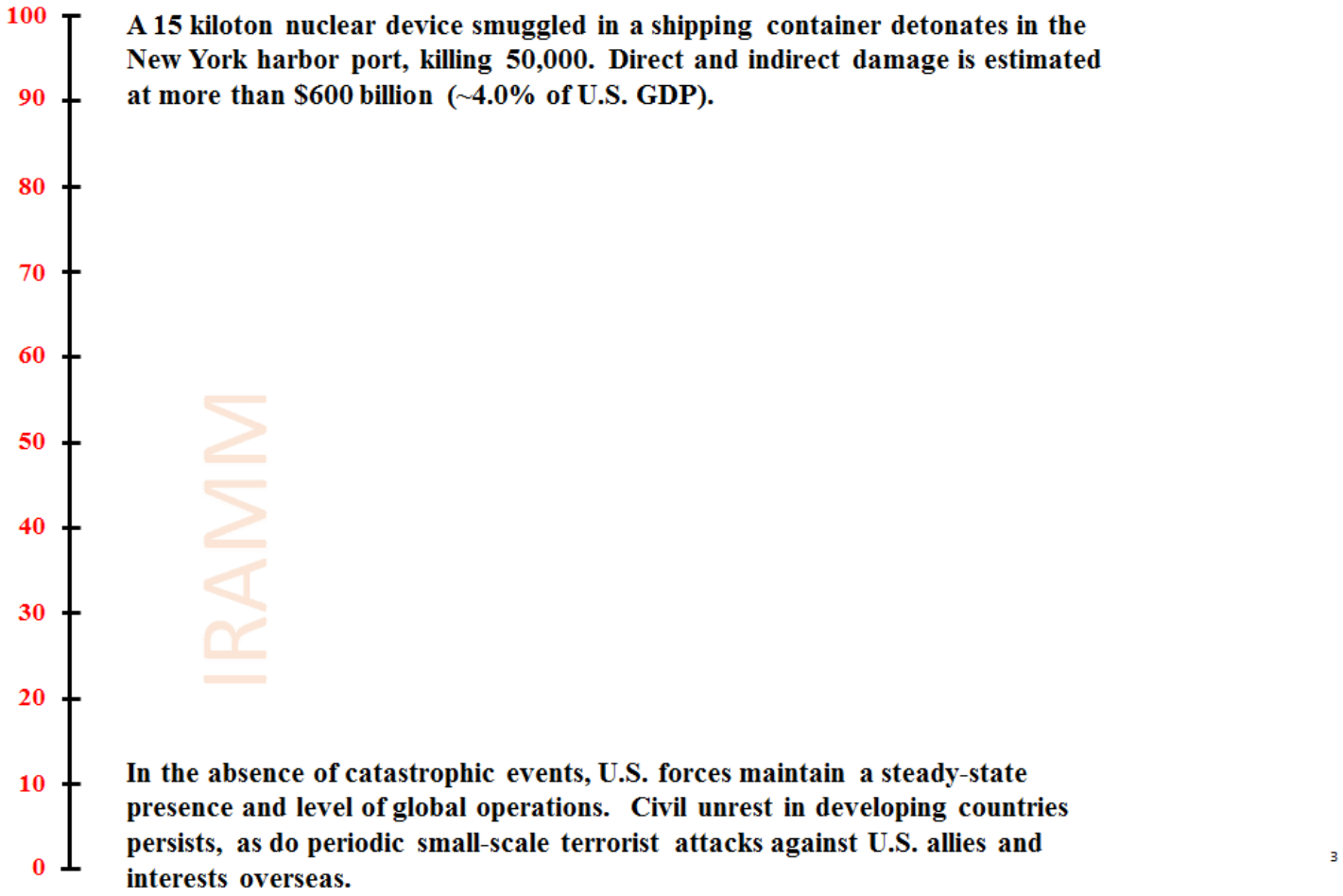

Figure 2. Calibration Scenarios

Preparation for the Interview

The process begins with a meeting with the senior leader (sponsor) where objectives are established; participants are identified; major "challenge areas" that the nation or security organization may face in the future, such as major combat operations (MCOs), are defined; and special topics to be addressed in the interviews are specified. Correspondence is prepared and sent to each respondent, introducing them to the IRAMM process and the team conducting the interview. Finally, the senior interviewer reviews recent analyses and policies to ensure that they are prepared to engage in dialogue with the respondents.

Meeting with the senior leader to:

a. Establish objectives: The senior leader may use the IRAMM protocols for many reasons, such as to help inform a difficult decision, to help build a program, to foster greater teamwork among the staff, to better understand the views of the staff, etc. Another objective may be insights on a special topic (problem), as was done in the 2015 IRAMM support to the National Commission on the Future of the

U.S. Army, where the commissioners needed to develop pros and cons associated with the transfer of AH–64 Apache aircraft from the Army National Guard to the regular Army.

b. Identify challenge areas: The challenge areas define major concerns to the organization. Executing the IRAMM protocol will produce respondent risk scores, with rationale, for each challenge area. The number and content of the challenge areas may vary depending on the objectives of the senior leader. Figure 3 is an example. Other applications split cyber and weapons of mass destruction (WMDs) from homeland defense, or combine global peacetime operations with irregular warfare (IW). Finally, the scenarios associated with each challenge area may be identified by the respondent or specified by the senior leader.

Challenge Areas	Definitions
Major Combat	Operations conducted against a state or non-state actor that possesses significant military capability. This area should account for risk related to the use of WMD during the course of major combat. *e.g., China, North Korea, Iran, Libya*
Irregular Warfare	Stability operations, counterinsurgency, peacekeeping, or counterterrorism operations involving significant participation of U.S. forces in combat or prospective combat. *e.g., Iraq, Afghanistan, Bosnia, Somalia*
Homeland Defense	Protection of U.S. sovereignty, territory, population, and critical infrastructure against external threats. This area should delineate among risks from WMD, cyber attack, and all other forms of external attack (except those directly related to Major Combat). *e.g., 9/11, missile attack, WMD attack, cyber attack, other terrorist attack*
Global Peacetime Operations	Operations conducted to influence partners and adversaries. This area should account for risks related to changes in allied or adversary military capabilities, weapons proliferation, or political instability that are contrary to U.S. peacetime military objectives but do not result in U.S. combat operations. *e.g., presence, deterrence, building partnership capacity, counter-proliferation, freedom of navigation, humanitarian and disaster response.*

Figure 3. Example Challenge Areas

c. Select respondents: Respondents are often the senior leader's direct reports and/or peers. General Pace, Chairman, Joints Chief of Staff, sought the views of all of his Commanders, but excused the Central Command Commander from participating due to the two wars in his theater. Sometimes the perspectives of recent retirees are included.

Correspondence with respondents prior to the interview: The content of the letter or email that the respondent receives prior to the interview may include a schedule of interviews, senior leader objectives, an overview of the IRAMM process, definitions of the challenge areas, suggested background material the respondent may want to review prior to the interview, etc.

Interviewer preparation: The senior interviewer may "gently" challenge the respondent during the interview to more fully defend a response. This often involves providing some background that the respondent may not know, such as results from recent studies, intelligence assessments, etc. The senior interviewer prepares for these discussions by reviewing recent documents associated with each challenge area.

The Interview (1.5-2 hours)

Introduction by interviewer: The interviewer begins with a statement of the objectives, an overview of the IRAMM process, definitions of the challenge areas, a summary of the U.S. and allied forces that may be available to respond to an adversary, an introduction to the consequence tools, and additional background on the first challenge area. This usually takes about 10-15 minutes.

Respondent specifies scenario: Next, the interviewer asks the respondent to identify the scenarios of highest concern to them in the first challenge area. For each scenario, the respondent is asked to indicate who the players are, how it starts, key events that may occur (including conflicts), how it may end, etc. A recorder documents the answers, which will become part of a report provided to the respondent later.

Respondent estimates probabilities and begins building an event tree: The interviewer accomplishes this by asking the respondent to (assuming the first challenge area is MCOs):

a. Specify the probability that one or more MCOs (as identified in the preceding step) will occur within the risk time period (usually a decade) and confirm the response by asking: "Does this mean there is a 1.0 – p probability that there will be no MCO in the period?" This is displayed in Level I in Figure 4, with an estimate of 70% that no MCOs will occur during the risk time period.
b. Specify the probability that exactly one MCO occurs given at least one scenario occurs. Level II in Figure 4 shows a 94% chance that exactly one MCO will occur in the time period given at least one MCO occurs. The complement is the probability that two or more MCOs occur.
c. Specify the probabilities each of the scenarios occurs if exactly one MCO occurs during the time period. These probabilities must sum to 1. Level III displays an example for two MCOs, with each occurring 50% of the time.

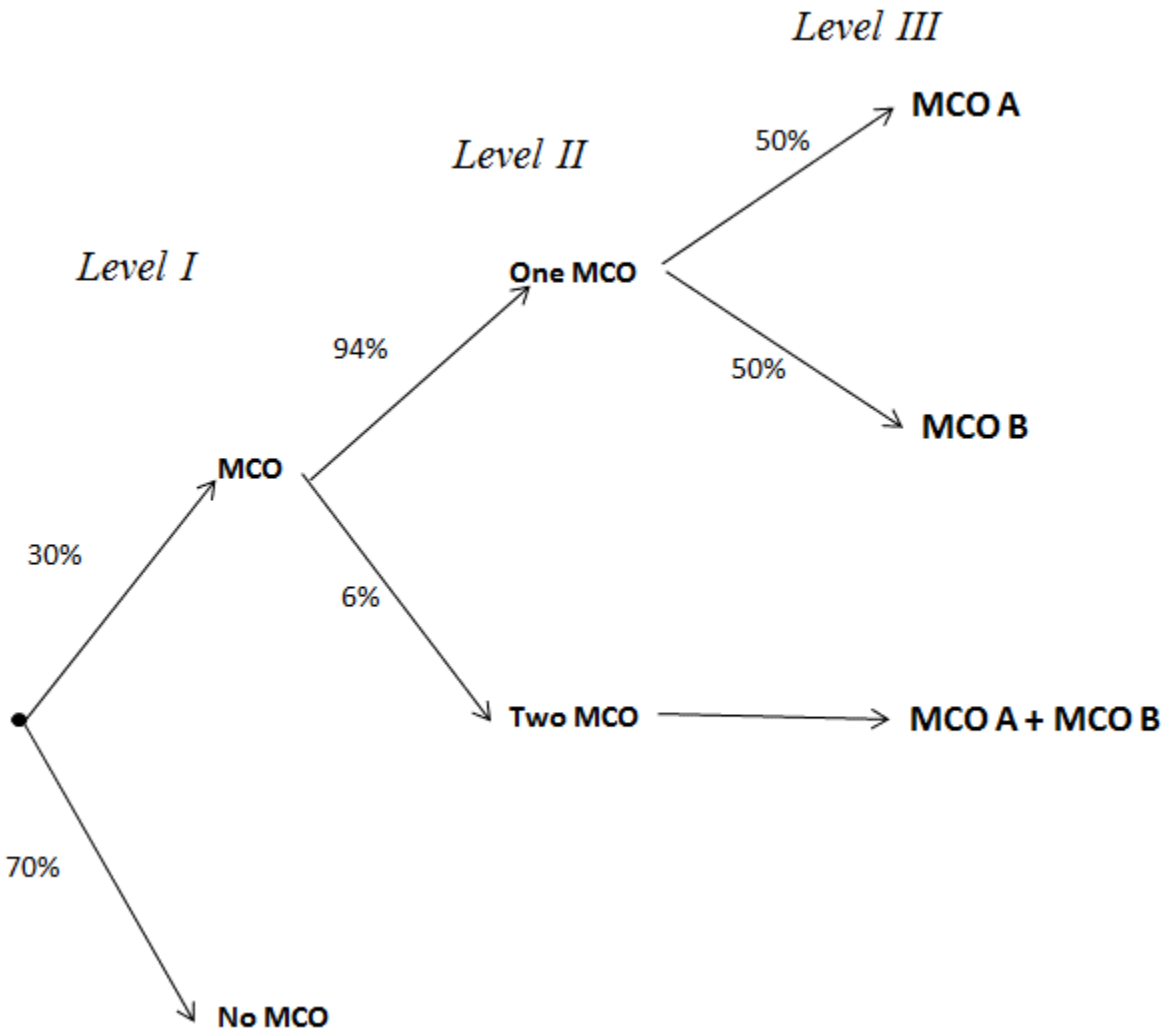

Figure 4. Partial Event Tree for MCOs

Respondent estimates consequences for each of the terminal branches in the event tree: The respondent needs to estimate consequences for MCO A, MCO B, and MCO A + MCO B in the example. The respondent usually uses the consequence scale aid to estimate economic, military, and political consequences. Next, the respondent is asked to use a weighted average to combine the three scores into an overall score for each of the terminal branches. Finally, the respondent is asked to compare their score to the calibration scenarios with questions like, "You provided a consequence score of 50 for MCO A which means you feel it is "½" as consequential as the calibration scenario. Is this true?" The respondent may adjust their scores based on these pairwise comparisons.

Interviewer calculates the risk for the challenge area. This is accomplished by calculating the probabilities for each branch, multiplying the probabilities by the consequence score, and then summing the results to obtain the risk score for the challenge area. A software program is often used to do the calculations, as the respondent frequently specifies several scenarios and combinations of scenarios, complicating the risk calculation. Again, the respondent is free to adjust their risk score when it does not reflect their beliefs. Figure 5 provides results for the example.

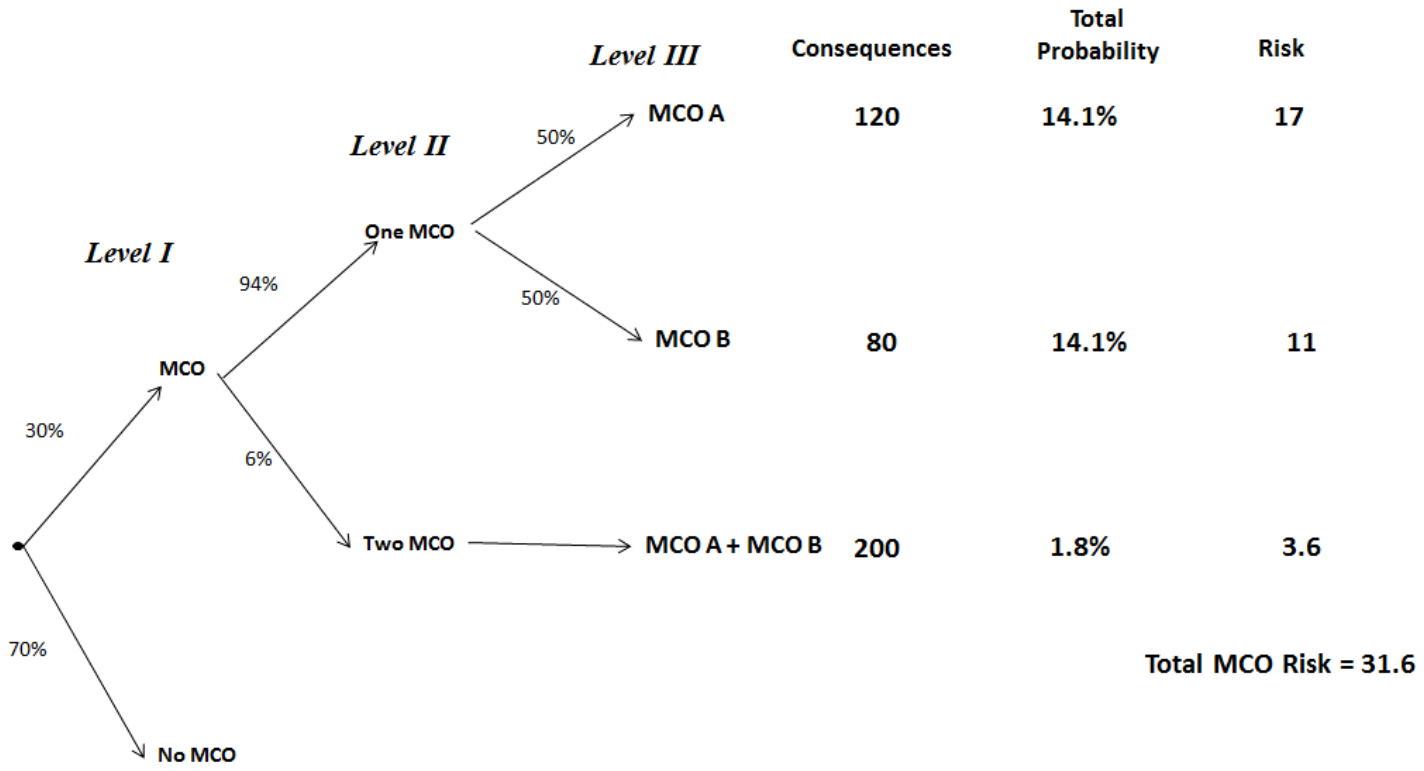

Figure 5. Example Event Tree

Next, the respondent repeats the process for the other challenge areas: Subsequent challenge areas typically take less time, as the respondent now understands the process and specifies fewer scenarios. At the end of each challenge area, pairwise comparisons are used to ensure consistency *across* challenge areas. The respondent is asked to compare the total risk estimate for a just-completed challenge area to previously completed ones. For example, after specifying a risk score of 30 for the IW Challenge Area and 10 for the MCO Challenge Area, the respondent could be asked to confirm that the threat associated with the IW Challenge Area is "three times more risky" to U.S. vital national interests than that posed by the MCO Challenge Area. As before, the respondent is given the opportunity to change estimates. In addition, risk-averse participants sometimes increase their risk scores for very high consequence and very low probability events.

Final respondent comments and risk mitigating suggestions: The respondent is offered the opportunity to add to the rationale they have provided during the interview and are asked to suggest risk-mitigating solutions. They are also asked to comment on how risk may change over time and on special topics designated by the sponsor.

Documentation prepared by the IRAMM team: The IRAMM interview team usually includes a recorder who prepares a summary of results that includes scenario descriptions, tree diagrams, risk scores, and rationales for each challenge area. The summary may also contain comments on risk trends, force adequacy, and risk-mitigating suggestions.

Step 2: The group meeting

The group meeting begins with the respondents being given a copy of their interview results, including a display of their risk scores in relation to those of the other respondents (Figure 6) and their rationales. A senior facilitator then presents not-for-attribution results that include graphical displays (Figure 6 with the blue line changed to gray), tables containing comparisons of rationale, and a summary of creative approaches to challenging problems. The ensuing discussion often leads to lively, productive debate of basic concepts and the generation of additional promising program and policy options for mitigating strategic risks. The meeting can also encourage respondents to modify their views and adjust initial scores and rationales before they are provided to the senior leader.

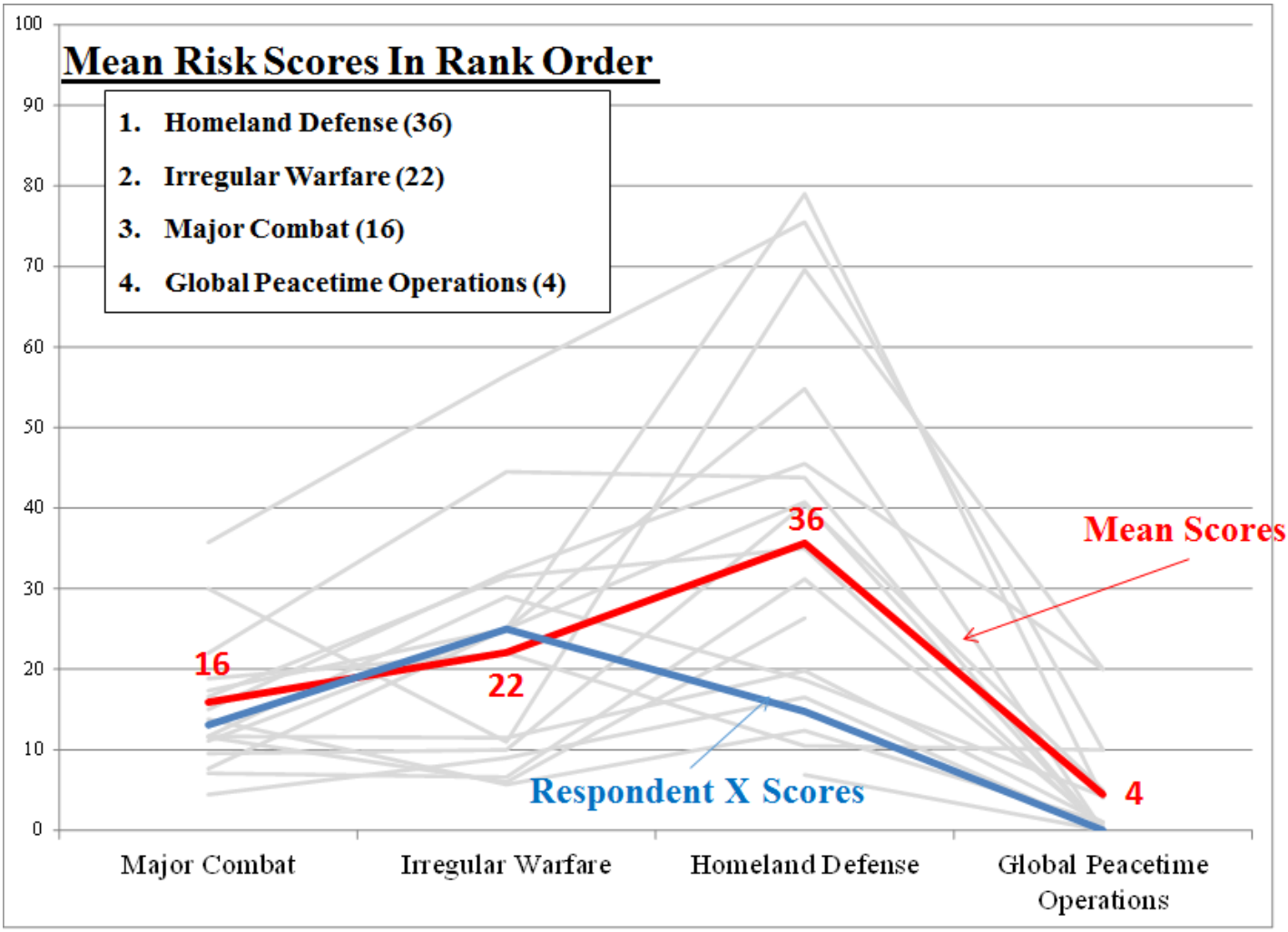

Figure 6. Example IRAMM Strategic Risk Scores

Another way of displaying results is to identify the percentage of respondents that rank each of the challenge areas first, second, or third. For example, 85% may rank HLD first, 10% may rank MCOs first and 5% may rank IW as the challenge area of greatest risk. In addition, sometimes measures of dispersion are shown (e.g., standard deviations, minimum and maximum individual scores).

There are several ways in IRAMM to display shared and divergent rationales among the respondents. Shared views may be expressed with a statement like, "almost all respondents felt that the irregular warfare area is low risk," followed by statements made in the interviews that supported this view. Differing views may be expressed in a table like the one in Figure 7.

Alternative Viewpoints: Homeland WMD Attack

	Greater Risk Viewpoint	Lesser Risk Viewpoint
1	An individual or organization with intent to attack the U.S. with a nuclear, biological, or radiological weapon could succeed and there could be significant psychological effects. The resultant domestic *political consequences* could threaten the federal structure of our government.	There is a "negligible chance" that a Radiological or Chemical attack would occur and, in the event one did, the consequences would be "negligible".
2	The consequences of a significant terrorist-initiated biological event had the potential to be "surprisingly" close to those of a nuclear detonation as the result of the disruption of our way of life and the suppression of the *economy* following the breakout of a vector-borne illness. The probability of a radiological attack is much higher than that of a nuclear attack but the consequences would be almost as severe.	A biological attack would most likely be conducted by a disgruntled domestic who is not particularly sophisticated. The consequences would be small and contained consisting of possibly "giving up some liberties."
3	There is an 80% chance that a nuclear weapon is detonated in the U.S. in the coming decade. With regard to a nuclear attack, there is a serious threat e.g., emanating from Pakistan, of proliferation to small groups, and insufficient capacity to detect devices coming into the U.S.	Nuclear attack would require a lot of things to have to come together. It is too difficult for someone to detonate a nuclear device on the homeland. Our enemies are not sophisticated enough to obtain, create, or deliver such weapons.

Figure 7. Example: Displaying Alternative Viewpoints

Displays comparing risk-mitigating solutions differ in format depending on the topic. Figure 8 compares the risk associated with two force structures, the baseline and a Force Capability Option (FCO) described in the box to the left. A second interview is used to generate the risk associated with the FCO, with ideas for the content for the FCO coming from risk mitigations identified in the first interview. The "puts" specify what is added to the baseline force and the "takes" stipulate what is removed from the baseline force to create the equal cost alternative. Finally, note that the risk scores are median values (vice mean values).

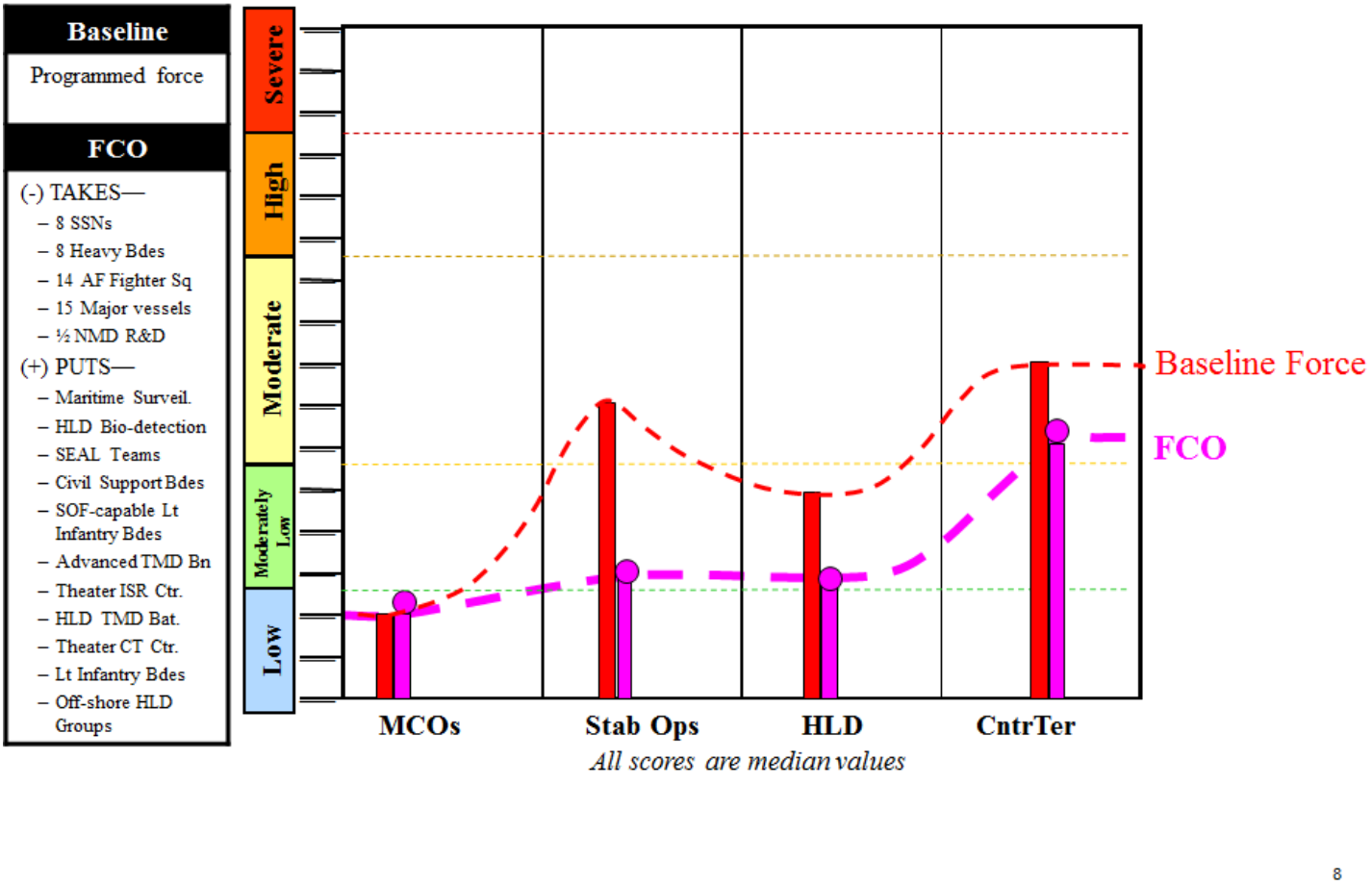

Figure 8. Example of a comparison of Risk for Two Force Capability Options

Step 3: Providing results to the senior leader

The senior leader may be briefed by the IRAMM team and/or receive a written report. All products are provided on a not-for-attribution basis with results by name closely guarded. This is an important feature of the process, as some respondents may not express their true views otherwise. The senior leader's deeper understanding of the issues and how their views compare to the views of their peers and staff often lead to requests for additional research, new programs, and changes in policies. In addition, the rationales that respondents use to support their IRAMM inputs are frequently appropriate for use in official organization publications.

Past and potential future uses of IRAMM

The reasons for using IRAMM have varied widely. Mr. Ken Krieg, then the Director of Program Analysis and Evaluation (now Cost Assessment and Program Evaluation) in the Office of the Secretary of Defense sponsored an IRAMM application to make senior-level programmatic discussions more productive and efficient. He also valued the team-building aspect of the application. The National Commission on the Future of the Army used a tailored version of IRAMM to systematically address the risk portion of their congressionally directed charter. They stated in their report that "IRAMM allows knowledgeable experts to express their views on strategic risk during one-on-one, not-for-attribution interviews." A study used IRAMM to prioritize national investments in

strategic materials (including rare earths) for the White House and Congress. In this case, IRAMM was used to generate inputs for an optimization model. See reference 8 for more details.

Potential future applications could help develop policies and prepare and market an organization's strategy. It could also help identify unintended consequences associated with a planned activity. Still others may use it to encourage thinking out of the box and to challenge underlying assumptions associated with a course of action. A combatant commander could use IRAMM to identify concerns his senior staff have regarding the adequacy of today's force to address his scenarios and execute his operational plans.

IRAMM participants suggested:

- that IRAMM results be briefed on a regular basis to the Secretary of Defense and senior decision groups. (General Peter Pace, Chairman of the Joint Chiefs of Staff)
- that a forum be convened of senior leaders to discuss, resolve, and/or elevate strong differences of opinion identified by the assessment and that a roadmap be developed for using the results in programmatic decisions (Mr. Brad Berkson, Director, OSD Program Analysis and Evaluation)
- that IRAMM be used to provide a framework to improve Department of Defense-Congressional interactions on strategy and resource trade-off decisions, to extend to interagency venues, and to be used in new general officer and senior executive training as a risk-assessment framework. (Mr. Ken Krieg, Undersecretary of Defense, Acquisition, Technology and Logistices)

Finally, there are other ways of expanding the use of IRAMM, including adding it to the curricula of the war colleges, employing it in war-games, and building it into formal analyses to inform decisions.

Concluding Observations

IRAMM provides a structure that senior leaders can use to think "strategically" and gain a clearer nationwide perspective of key challenges. Its risk-based approach produces both quantitative assessments and supporting rationales. Its strong scales enable comparisons across decision makers, which can result in group discussions that can strengthen understanding, reduce disagreements, and help establish priorities.

That said, there have been criticisms, such as the process is too lengthy and too broad to be of much use, it is too subjective – no real analysis, and there is no proof as to its utility –how good it is. These criticisms raise important questions that need to be addressed:

- What is the best balance between length and breadth? The level of detail can be increased at the expense of longer interviews. The answer probably depends on the organization involved and their goals.
- How can IRAMM increase its rigor? The process relies on judgments that can and should be informed by rigorous analysis. Some IRAMM applications have sent read-ahead material to the participants or briefed analysis results during the interview.
- Measuring the utility for a process like IRAMM is difficult. To date the evidence is largely anecdotal, but most of the 75 senior leaders who went through the protocol said that they found it useful. Perhaps the best measure is an assessment by the senior leader that commissioned the protocol. In future applications, the sponsor will be given a series of surveys (the first at the completion of the study, the second six months later, and the final one at the end of one year) to better understand the utility of the process.

In summary, IRAMM can help national security organizations develop policies and strategies, make programmatic decisions, and efficiently build senior-level teamwork. It may be used at senior and lower levels of an organization. As a decision-support aid, it can help bring an enterprise-wide perspective by efficiently summarizing the views of senior players and ensuring that the players take advantage of the best available "objective" evidence from analyses and intelligence reports when articulating their views. IRAMM can help a senior leader to better understand the risk calculus used by their senior staff, and the strong teamwork among the senior staff may provide creative solutions to problems, enhance understanding of priorities, and result in more integrated applications of policy.

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14. ABSTRACT

Good analysis helps, but it is not, and should not be, the sole basis for a decision. Good decisions consider non-quantifiable factors such as the value structure and experiences of the decision maker and those who serve as advisers. Incorporating these factors can be difficult as decision makers often have conflicting priorities and are confused by the contradictory inputs from staff. A method developed by the Institute for Defense Analyses (IDA) that systemically captures these informed personal views to help decision makers better understand their own views on national security issues and where they fit relative to their peers, may prove immensely valuable. The Integrated Risk Assessment and Management Model (IRAMM) could be the answer to improving the decision-making process

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