PROJECT ON NATIONAL SECURITY REFORM

CONCEPT PAPER:
The National Security Planning & Execution Management System (NSPEMS)

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PART I: System Overview

Overview:

Most reforms in national security planning have focused on what could be called pockets of solutions – usually involving a redefinition of processes within a lead agency or office in the National Security Council (NSC). A few proposals offer ideas about wider whole-of-government reforms but only for a particular issue area such as combating terrorism, disaster relief, or foreign reconstruction and stabilization (R&S). Some of these have tried to distinguish between steady state and crisis planning. But in almost all cases these proposals have spent their greatest efforts emphasizing the planning process over the other equally important phase – implementation, or as some call it – execution/operations. For those who have tried to address both, the descriptions have almost always emphasized a linear, sequential, top-down approach from the planning to the execution rather than a symbiotic, dynamic, "living" relationship between the two.

If there is any doubt about this emphasis of the one over the other, just consider the titles of most of these proposed processes – they rarely include the words "implementation" or "execution." Rather, they are most likely described as a *National Planning Framework* as in the case of the Department of State's Coordinator for Reconstruction and Stabilization (S/CRS), or a *National Response Framework* (formally the *National Response Plan)* from the Department of Homeland Security. Even the *Beyond Goldwater-Nichols* project, which has been on the forefront of this evolution in planning, listed its work on this particular subject as *Strategic Planning for National Security*. The DoD processes of *Defense Planning, Programming, Budgeting, and Execution process* (PPBE) may be the only true example of a system formally acknowledging the symbiotic nature of both planning and execution, but it of course only applies to a single department. No one has ever seriously presented a common, fully inclusive approach to planning AND execution involving all the various actors from across the breadth of the public and private sectors working seamlessly together in a continuing narrative of both top-down and bottom-up efforts capable of handling any issue area from the strategic to the tactical.

The PNSR submits that management of national security at its very essence should be about the entire end-to-end process of both *"thinking"* (assessments, policy, strategy, planning,

feedback, etc…) and *"doing"* (operations/implementation) equally with often interchangeable and collaborative parts and processes in order for the hand-off back and forth between them to be seamless. Leaders of today and tomorrow at all levels should manage these two basic halves of a whole together. This is why the system proposed here is entitled the *National Security Planning & Execution Management System (NSPEMS).*

The NSPEMS may be thought of as a subsystem of the national security system; however, the Visions and Guiding Principles Working Group of the PNSR would prefer to think of the NSPEMS as an extension or a tool rather than a subset of the national security system. For example the NSPEMS elements themselves certainly do not encompass the entirety of the national security system processes and structures, but they are involved in the management of those processes and structures. Perhaps a better way to describe it is to say that whatever the national security system is, the NSPEMS is the management of that system in the "interagency space," as defined by the PNSR Report recommendations as that which is between the President and the departments. The original PNSR Report calls for such a management process but this is the first time it has been described by name and in this particular manner.

The PNSR Report leaves the actual form and functions of the new national security system up to the next administration to decide upon while expressing many of its own analyses as options for consideration. The report does offer "recommendations" on the form and function of the new national security system and then includes additional and separate options for consideration. It describes a series of core reforms that transcend or underpin all the options and that which should be adopted in some form in order for any additional variation to succeed. In these core reforms, much of the substance and inspiration can be found to proceed with an evolved dialogue on how the President may manage his/her new national security system in a way that best ensures the end-to-end integration of the national Ends, Ways, and Means.

In order to better understand this NSPEMS as proposed, a conversation about the system and its relationship to the national security system as a whole must be described at a very basic level before descending into a discussion about the details of the NSPEMS components and processes. Every system or system of systems should be understood first in terms of its shared purpose based on the shared values it seeks to support before one can speak of its functions or forms. In the case of the NSPEMS and its relationships to the national security system it proposes to serve, the following system characteristics are derived from these shared values and purpose and should be considered in the developing of corresponding functions and forms:

1. The national security system and therefore the NSPEMS should be thought of and managed as a system.

2. The executive and legislative branches of government should act as full partners in achieving this purpose and in overseeing the system's components that make up the whole.

3. The national security system and its NSPEMS should fundamentally be about the entire end-to-end process of integrating Ends (national vision & goals) to the Means (national resources including Congressional support) in appropriate Ways (national courses of action).

4. The national security system and its NSPEMS leadership at all levels should emplace and maintain an effective incentive, recruitment, education, and training regime backed by human capital that fosters trust, cooperation and collaboration across all departments in order to create necessary long term cultural shifts that support the NSPEMS achieving its overarching purpose.

5. The national security system and its NSPEMS should utilize one primary national chain of command at a time for clear and unambiguous support*ed* and support*ing* organizations to address national security matters across the entire United States Government (USG) seamlessly amongst the multiple layers between the field and Washington.

6. The national security system and its NSPEMS should more directly match the human and financial resources (Means) directly to the accomplishment of actions to meet articulated goals and objectives (Ends) with as few bureaucratic and political layers in between as possible.

7. The national security system and its NSPEMS should emplace a formal system to augment the informal system of decision-making that either eliminates or significantly reduces cognitive biases for irrational choices.

8. The national security system and its NSPEMS should be able to see signals – even, or especially the weak signals - and make sense of the entire world in context (should be Perceptive in Nature)

9. The national security system and its NSPEMS should be built for change with unprecedented core and surge capacities both physically and mentally – culture will follow (should be Agile in Behavior)

10. While visionary, the national security system and its NSPEMS should know how to filter and be pragmatic (should be Selective in Behavior)

11. The national security system and its NSPEMS should take advantage of mission style execution (should be Decentralized in Execution)

12. The national security system and its NSPEMS should be built for agility with unprecedented core and surge capacities in both structure and culture – culture will follow (should be Agile in Behavior)

13. The national security system and its NSPEMS should view itself and the external environment as a complex adaptive system (should be Comprehensive in Ability)

14. The national security system and its NSPEMS should transcend peer competition to get things done (should be Transcendent in Authority)

15. The national security system and its NSPEMS should not allow any Achilles' heels in national security (should be integrated Across all Seams)

16. The national security system and its NSPEMS should include all agencies that can contribute to national security no matter how small (should be Balanced in Composition)

17. The effective legislative and internal executive oversight of the national security system and its NSPEMS should be balanced with efficiency in the face of crisis (should be Streamlined in Accountability)

18. The national security system and its NSPEMS should separate and value long term thinkers apart from short term thinkers with appropriate incentives and interactions between the two in order to keep both halves aware of the whole and therefore relevant to one another.

19. The national security system and its NSPEMS cannot rely on Presidential policy statements alone (ie, PDs, EOs) to provide for responsible management of the system across multiple administrations. The NSPEMS should, then, find a cultural and transcendent home in doctrine.

20. To support the national security system and its NSPEMS emphasis on agility and decentralized execution, the USG should become a home of core capabilities, structures, leadership and processes (both physical and mental) able to quickly assimilate and manage (in both thinking and doing) other contributing surge capabilities, structures, leadership, and processes from across the spectrum of private and public sectors.

21. To support the national security system and its NSPEMS, every department and agency in the USG has a duty to determine how it could, if called upon, operate in either a core or surge manner to support the fullest spectrum of contributions to the national security whether it be to protect or respond to threats or to exploit opportunities. Consequently, every department and agency should continuously identify and plan for the integration of its Ends, Ways, and Means for these potential or existing contributions.

22. The national security system and its NSPEMS should have a set of permanent parallel planning and reach back support capabilities resident internally to and across all of the domestic agencies in order for the whole-of-government to become a reality in both planning and execution.

23. The national security system and its NSPEMS should not create separate planning and execution product formats and processes tailored to different issues and missions. This leads to confusion and waste of energy and resources including time. Only the substance should change within the common formats and processes.

24. The national security system and its NSPEMS should be supported by an easily scalable classified and unclassified standardized backbone of information architecture.

25. As a rudimentary checklist, the NSPEMS should answer continuously:

- What is driving the national security system – its purpose/s (Ends)?
- What does the United States need to do to achieve this purpose/s (Means)?
- What infrastructure and other resource capabilities are necessary (Means)?
- How much should the nation spend (risk) to develop those capabilities (Ways/Means)?
- How should the United States develop and employ those capabilities (Ways)?

The Functions of the NSPEMS Applicable Equally in both Steady State and Contingencies:

The NSPEMS applies to the entirety of potential national level actors in the United States but includes chiefly the Executive Office of the President, State governments, federal departments and agencies, various appointed Presidential Issue Teams, and various executive and legislative advisory and oversight organizations in the "interagency space." The NSPEMS would be managed by the newly proposed Director for National Security (DNS) and in no way would either the DNS or the NSPEMS supersede or interfere with the cabinet, NSC staff (in most variations, the PNSR proposes the NSC now be termed the Presidential Security Council or PSC after combining both the current Homeland and National Security Councils into one), or the inner sanctum of key advisors and informal policy-makers to the President. The NSPEMS would, however, seek to become so useful to the President that he/she would come to rely as heavily on the formal processes as he/she does the informal.

As the hub of national security system management, the following elements of the NSPEMS are described from the perspective of the DNS while identifying the necessary coordination with the entire cast of supporting actors. The functions of the proposed NSPEMS would include:

1. ***National Assessments*** of both geographical and functional threats & opportunities spanning the concentric and inclusive spectrums of space, the globe, specific regions and/or sub-regions, specific countries within regions, and the U.S. Internally (this list of concentric spectrum will be referred to by the acronym: SGRCI) in the Near, Mid, and Long Term.

2. *National Policy Formulation* starting with an articulation of the President of the United State's (POTUS) 50, 25, 10 Year National Security Visions (detailed descriptions of all the parts of the national security system working together as a whole successfully in different future contexts). In addition to these Visions, the POTUS also articulates his/her overarching intent (clear descriptions of end state conditions for success with overarching purposes for key goals (Ends), broad outlines of basic methods (Ways), and the broad scope of resources willing (at what risk) to commit (Means)) across SGRCI in near, mid, and long-term divisions of the immediate 10 years for the strategic level but in consultation with the actors at the operational and tactical levels. [NOTE: The term operational here is not specifically associated with an organizational or geographical level but rather the mental ground between strategic and tactical where the former meets the latter and bridges are created so that both interact while not interfering with one another].

3. *National Strategy Making* or the articulation of the specific "how" and "who" of the national integration of Ends (Goals), Ways (Courses of Action), and Means (Resources including Congressional Support) in support of overarching Presidential Vision & Intent (policy guidance) across the SGRCI at the strategic level but in consultation with the actors at the operational and tactical levels for the near, mid, and long term.

4. *National Planning Support* to State Government, U.S. department, agency, and/or Presidential Issue Teams in the creation of their own strategic, operational and tactical plans for the Immediate to Near, Mid, and Long Term across SGRCI that articulate a clear integration of their Ends, Ways, and Means.

5. *National Implementation Support* to the actions and actors implementing the Ends, Ways, Means across the organizations operating in the different SGRCI spectrums at the strategic, operational, and tactical levels.

6. *National Operational Analysis* of all the elements of the NSPEMS processes through to implementation across the spectrums of SGRCI using lessons learned with agreed upon metrics to identify necessary system improvements in the near, mid, and long term.

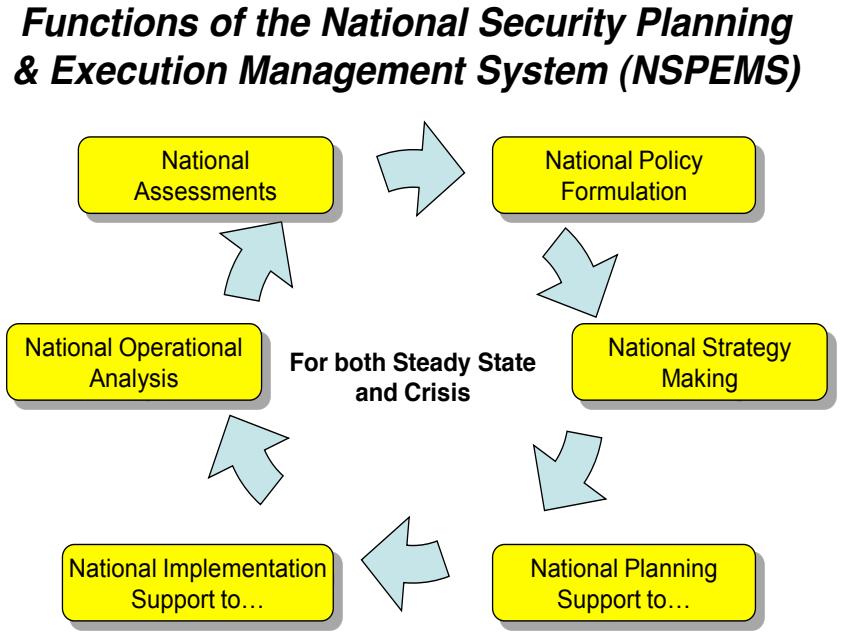


Figure 1

Products from the NSPEMS in Steady State and in Contingencies:

1. National Assessments

Steady State:

- ODNI – *"Living" Intelligence Community Assessment Report* on Threats & Opportunities across the spectrums of space, the globe, regions and sub-regions, specific countries, and U.S. Internal as authorized at strategic, operational, and tactical levels for near, mid, and long term.
- NAVIC (the proposed National Assessment, Visioning, and Integration Center). – *"Living" Whole-of-Government Interagency and Private Sector Assessment Report* (outside of the Intelligence Community) on Threats & Opportunities across SGRCI matters at Strategic, Operational, and Tactical levels for near, mid, and long term.

Contingencies:

- ODNI – Draw upon the same reports but for specific SGRCI sectors.
- NAVIC – Draw upon the same reports but for specific SGRCI sectors.

NOTE: Crisis assessments are made infinitely more possible because of the "Living Report" managed during steady state. "Living" implies that all necessary baseline information on U.S. and multinational public and private sector roles, missions, and capabilities already reside on a master database from which to quickly assess and reassert new direction.

2. National Policy Formulation

Steady State:

- The POTUS's 50, 25, 10 Year *Vision for the National Security System* (a detailed description of all the parts of the national security system working together as a whole successfully in different future contexts) developed by the POTUS, his cabinet and PSC staff, and coordinated by the DNS in sessions facilitated by permanent professionals from the NAVIC. Notwithstanding the political nature of changing administrations and corresponding will of the people, this process should endeavor to find some semblance of lasting effect through the transparent nature of the Vision published for all the people of the United States to read and understand. After all, the realization of such a national vision will require the people's consent and participation. In effect, national elections should become in part a referendum on these visions. This document is created by the DNS and the PSC with assistance from the NAVIC professional facilitators and outside experts from the appropriate fields of expertise in both the public and private sectors as necessary.
- A *"Living" National Planning Guidance (NSPG) for National Security Missions* articulating only the POTUS's overarching Intent (clear descriptions of end state conditions for success with overarching purposes for key goals (Ends), broad outlines of basic methods (Ways), and the broad scope of resources willing (at what Risk) to commit (Means)) in the near, mid, and long term for each of SGRCI sectors at the strategic level but in consultation with the actors at the operational and tactical levels and including any additional *Mission Specific Guidance Statements* to particular lead department, agency, Presidential Issue Teams, or State Governor as needed. This consultation process should also be formalized with executive and legislative advisory and oversight organizations to promote early and high, transparent and parallel support. This document would be created and distributed to all these participating organizations in both a classified and unclassified form by the DNS and the PSC with assistance from the NAVIC professional facilitators and outside experts from the appropriate fields of expertise in both the public and private sectors as necessary.
- Red Teaming/Scenario-based Policy *Game Results Reports* from the NAVIC.

- Presidential Resource Requests (*Annual Budget Request, Six Year Budget Request, along with 10, 25, 50 year Budget Estimates* all contained in the *National Security Resource Document*) orchestrated by the DNS with OMB six months after the latest "Living" NSPG is issued to allow consultation with informed participating national security departments, agencies, Presidential Issue Teams, State Government, General Accounting Office (GAO), OMB, and the PNSR proposed Select Committee for Interagency Affairs in the Congress. This unprecedented involvement of congressional oversight offices "early and high" in the executive process along with the increased long term budget estimates coinciding with the POTUS's Vision and after the issuance of the NSPG will force transparency & long-term contextual thinking in both branches of government while mitigating competition & building trust.

Contingencies:

- In addition to the *NSPG*, the POTUS would only issue individual *Mission Specific Guidance Statements* to lead department, agency, Presidential Issue Teams or State Governments as needed. These statements would still focus on providing only overarching Intent to allow maximum flexibility in subordinate planning and eventual execution. This document is still created by the DNS and the PSC for the POTUS's signature with assistance from the NAVIC professional facilitators and outside experts from the appropriate fields of expertise in both the public and private sectors as necessary.
- Still conduct limited Red Teaming/Scenario based Policy *Games* and report *Findings* from the NAVIC.
- Submit *National Security Crisis Budget Requests* to Congress for a particular crisis separate from the complete *National Security Resource Document* across all SGRCI sectors and, or;
- Immediately issue *Presidential Crisis Fund Allocations Documents* to the various national security actors for use in their subordinate crisis planning as appropriate.

3. National Strategy Making

Steady State:

- Create and distribute a *"Living" National Security Grand Strategy (NSGS)* to replace the defunct NSS. The NSGS is based on the NSPG, which describes the POTUS's Intent for the integration of the national Ends, Ways, Means (EWM), and turns them into actual task and/or mission assignments to specific national security actors across SGRCI sectors

at the strategic level but informed by operational and tactical levels as appropriate for the near, mid, and long term. The NSGS process is facilitated by permanent professionals from the NAVIC and is distributed at both the classified and unclassified levels.

- Red Teaming/Scenario based *Game Reports* on all aspects of the NSGS executed and reported on by the NAVIC professionals.
- Issue *Approved Budget Guidance* (Annual and 6-Year as recommended by the PNSR Report) created by the DNS, the various national security actors and oversight organizations with OMB and approved by the POTUS.
- *National Security Strategic Human Capital Plan* created by the DNS and consultation with the Office of Personnel Management (OPM).
- *National Security Knowledge Management Plan* created by the National Decision Support Office (NDSO) in the NAVIC.

Contingencies:

- Using the professionals and NAVIC venue to facilitate, instead of a NSGS, a single mission *National Campaign Strategy* integrating the EWM for the appropriate SGRCI at the strategic level for the near, mid, and long term, but informed by operational and tactical levels as appropriate.
- Still include oversight and participating national security actors in the process. In fact, this becomes even more important in crisis to eliminate or "flatten" information and decision chains.
- Still conduct short Red Teaming/Scenario based table top exercises on basic strategy and key contingencies or branches.
- Still publish approved *Budget Guidance* created by the DNS and OMB and approved by the POTUS supporting the *Campaign Strategy*.

4. National Planning Support

Steady State:

- Provide support (from the NAVIC) to State Government, U.S. department, agency, and/or Presidential Issue Teams in the creation of their own supporting strategic, operational and tactical plans for the immediate to near, mid, and long term across SGRCI all sectors.

- Provide reach back Red-Teaming/Scenario based Game Reports from the NAVIC to State Government, U.S. Department, Agency, and Mission Teams as requested.
- Provide assistance teams as possible to conduct short term on-site independent observation and coaching in planning and execution management as well as support to facilitated mission rehearsals. Offer NAVIC facilities for facilitated rehearsals as space is available.

Contingencies:

- Still provide support (from the NAVIC) to State Government, U.S. department, agency, and/or Presidential Issue Teams as designated in the creation of their own strategic, operational and tactical plans for the Immediate to Near, Mid, and Long Term in the appropriate SGRCI sector.
- Still provide reach back Red-Teaming/Scenario based Game support lead team as requested from the NAVIC.
- Still provide expeditionary assistance teams as possible to conduct persistent on-site independent observation and coaching in planning and execution management as well as support to facilitated mission rehearsals. Offer NAVIC facilities for facilitated rehearsals as space is available.

5. National Implementation Support

Steady State:

- Provide full support (from the NAVIC) to State Government, U.S. department, agency, and/or Presidential Issue Teams with managing reach back answers to Requests for Information.
- Provide full support (from the NAVIC) to assist the DNS and the PSC in developing, issuing and tracking Policy Adjudication Papers where national level contradictions and conflicts arise affecting subordinate actors.
- Provide full reach back support (from the NAVIC) to Red-Teaming/Scenario based Gaming and Reports in support of the actions to integrate the Ends, Ways, Means across the organizations operating in the different SGRCI spectrums at the strategic, operational, and tactical levels.
- Provide assistance to teams as possible to conduct short term on-site independent observation and coaching in planning and execution management as well as support to

facilitated mission rehearsals. Offer NAVIC facilities for facilitated rehearsals as space is available.

- Provide connectivity of operational and tactical implementation budget obligations, requests for fund transfer, additional budget forecasts, and tracking of implementation progress according to agreed upon measureable metrics tied to key objectives and goals. Offer NAVIC metrics professionals to assist.

Contingencies:

- Still provide full support (from the NAVIC) to State Government, U.S. department, agency, and/or Presidential Issue Teams with managing reach back answers to Requests for Information.
- Still provide full support (from the NAVIC) to assisting the DNS and the PSC in developing, issuing and tracking Policy Adjudication Papers where national level contradictions and conflicts arise affecting subordinate actors.
- Still provide *limited* support (from the NAVIC) to Red-Teaming/Scenario based Gaming and Reports in support of the actions to integrate the Ends, Ways, Means across the organizations operating in the appropriate SGRCI sector at the strategic, operational, and tactical levels.
- Provide expeditionary assistance teams as possible to conduct persistent on-site independent observation and coaching in planning and execution management as well support to facilitated mission rehearsals. Offer NAVIC facilities for facilitated rehearsals as space is available.
- Offer expeditionary experts from the NAVIC to set up and begin process of establishing connectivity of operational and tactical implementation budget obligations, requests for fund transfer, additional budget forecasts, and tracking of implementation progress according to agreed upon measureable metrics tied to key objectives and goals. Offer expeditionary metrics teams as available from the NAVIC.
- Facilitate expeditionary support of national KM packages for national Command and Control linkage to operational actors.

6. National Operational Analysis

Steady State:

- A *"Living" National Security Review* (NSR capturing baselines of operational roles, missions, and capabilities of the U.S. national security system actors) conducted by

offices in the NAVIC. This one element of the NSPEMS combined with the "Living" Assessments are chiefly responsible for enabling the "living" *National Security Planning Guidance* and the subsequent *National Security Grand Strategy*. This "living" process enables unprecedented smooth transitions from steady state to crisis responses and back to steady state across the entirety of the USG.

- An *Annual Lessons Learned Report on National Security* across SGRCI at Strategic, Operational, and Tactical levels of missions and systems using appropriate metrics also conducted by offices in the NAVIC.

Contingencies:

- As detailed earlier, instead of *a "Living" National Security Review*, conduct a *National Campaign Review* capturing baselines of operational roles, missions, and capabilities of the U.S. Interagency participants in the campaign at the Strategic, Operational, and Tactical levels.
- Instead of *Annual Lessons Learned Report*, conduct a biannual *Report on Campaign Lessons Learned* in the appropriate SGRCI sector at Strategic, Operational, and Tactical levels using appropriate metrics.

Key Actors and Roles of the NSPEMS Applicable in both Steady State and Contingencies:

The new Director for National Security (DNS) is responsible for the management of the NSPEMS. As stated earlier, the NSPEMS is not the national security system but the management of the process of planning and execution of that system. The specific duties of the DNS are spelled out within the PNSR Report but for the NSPEMS, but while the DNS is responsible for the overall system management, he/she and the PSC offices working with the President and the cabinet may spend the majority of his/her time in the Policy Formulation phase with an emphasis on all the various aspects of garnering Congressional support for resources & appropriate oversight as well as early and high process participation from the whole of government & multilateral/multinational actors – in other words coordinate the interagency in policy formulation as well as ensure Congressional support. Again, the NSPMES proposes leaving policy formulation squarely in the domain of the President, his wider supporting staff and the cabinet members. There is no attempt to create additional offices or bureaucratic processes to slow the efforts towards decentralized actions in a timely manner.

However, to assist the DNS in the management of the various aspects of the planning and execution of the *entire* national security system across *all* key elements, NSPEMS should be augmented with key assistants to the DNS all supporting this process under one tent of activities

and facilities called the NAVIC. Each of the following proposed assistants would be responsible for providing specific additional management of the six cross-government functions of the NSPEMS described previously.

From the previous descriptions, it isn't difficult to understand that each of these six functions will require enormous facilitation to achieve the desired effect across all the SGRCI at the strategic, operational, and tactical levels for the near, mid, and long term with actors from both the private and public sectors as well as with multilaterals and multinationals as appropriate. These six Assistant Directors (whose appointments should be Senate confirmed for 15-year tenures and whose positions would reside within the NAVIC) would not supplant any part of the Presidents relationship to and with his/her cabinet or PSC staff and visa versa. Instead, if correctly implemented, will provide the unprecedented near real-time assessment, advice, unbiased devil's advocate, whole of system connectivity, professional cadre of permanent assistance to subordinates, and coherency of each of the overarching functions across the USG in the NSPEMS with minimal intrusion into existing authorities and minimal bureaucratic "pull" requirements such as meetings, reports, reviews, etc… Instead these six assistants operating in the NAVIC would provide additive "push" services to the existing and traditional systems of decision-making and authorities. The six assistants include:

1. *Assistant Director for National Assessments (ADNA)* [Office of National Assessments]

Steady State:

- Directs the creation of the NAVIC *"Living" Whole-of-Government Interagency Public and Private Sector* (outside of the Intelligence Community) *Assessment* on threats & opportunities for each SGRCI sector at the Strategic, Operational, and Tactical levels and coordinates it with the ODNI *"Living" Intelligence Community Reports* on threats & opportunities for each SGRCI sector at the Strategic, Operational, and Tactical levels. The ADNA correlates all assessments with multilateral and multinational assessments of a similar nature as available. The two reports remain separate and distinct although executive summaries are produced for each. Trying to combine them would result in a "dumbing" down of the results.
- Provides "Living" assessments (or assessments updated and available real time) to the POTUS and all national security planning and executing actors and oversight organizations. Both reports are disseminated in classified and unclassified versions for greatest system awareness necessary for true decentralized behaviors.

Contingencies:

- Because assessments are "living" in a master data-base at the NAVIC, the ADNA as well as all other functional Assistant Directors can draw upon the same information in real time but dialed in for specific SGRCI sectors as required thereby saving enormous time and energy. The ADNA can rapidly produce scaled reports as necessary for particular crisis needs.

NOTE: The ADNA directs all office activities utilizing the collaborative and NSPEMS-wide National Ends, Ways, and Means Development & Integration System (NEWMDIS) [Proposed to be developed] which is owned and managed by the Assistant Director for Strategy Making (ADSM) and is described in greater detail in ADSM section of this publication. The NEWMDIS is the backbone information and knowledge management architecture of the NAVIC and the NSPMES covering the entire range of processes and product creation and dissemination and offers access to all the Assistant Directors and their staffs through to the various national security actors (DNS, PSC, various executive and legislative advisory and oversight organizations as well as the Departments, Agencies, and Presidential Issues Teams).

2. *Assistant Director for National Policy Formulation (ADNPF)* [Office of National Policy Formulation]

Steady State:

- Facilitates policy formulation by the President and his circle of actors using state of the art facilities of the NAVIC to help envision and produce the POTUS's 50, 25, 10 Year *President's Vision for the National Security System* (a detailed description of all the parts of the national security system working together as a whole successfully in different future contexts).
- Also facilitates the effort to produce the "Living" *National Security Planning Guidance* as needed capturing the President's overarching Intent (clear descriptions of end state conditions for success with overarching purposes for key goals (Ends), broad outlines of basic methods (Ways), and the broad scope of resources willing (at what risk) to commit (Means)) in the near, mid, and long term across SGRCI and including any additional *Mission Specific Guidance Statements*.
- As requested by the DNS in support of the PSC and cabinet level participants, the ADNPF develops and conducts professional Red Team analysis in the NAVIC (providing the "devils advocate" viewpoint) to all proposed policy guidance and visions.
- As needed using state of the art facilities and experienced professionals in the NAVIC, design, approve, and conduct table top exercises using creative scenarios to "game"

policy for Feasibility (can be accomplished with national means available), Acceptability (most acceptable to all partners involved), and Suitability (will most likely produce the desired results).

- Produce analytical game and red teaming results reports within 72 hours.
- The ADNPF compares and contrasts Presidential Resource Requests (1 & 6-Year Budgets, along with 10, 25, 50 year Estimates captured in the *National Security Resources Document* prepared by the DNS & OMB with all other executive and legislative actors and oversight organizations participating "high and early") and/or *Presidential Crisis Fund Allocations Document* stating existing authorities and funding available to the POTUS without additional Congressional approval. The ADNPF may chose to use gaming of budget proposals as well to assist the DNS in identifying early funding gaps.

Contingencies:

- Instead of the full *NSPG*, ADNPF assists the DNS in assisting the POTUS in issuing individual *Mission Specific Guidance Statements* still focusing on the President's overarching Intent which is even more critical during high pace, high stakes, but decentralized planning and execution.
- The ADNPF will facilitate limited Red Teaming exercises and Scenario based Policy Games and issue findings within 24 hours executed by the permanent professional gaming staff in the NAVIC.
- Instead of the *National Security Resources Document*, the ADNPF will assist the DNS & OMB in developing *National Security Crisis Budget Requests* to Congress for the particular mission or national campaign. The ADNPF will still announce immediate *Presidential Crisis Fund Allocations* as appropriate.

3. *Assistant Director for National Strategy Making (ADNSM)* [Office of National Strategy Making]

Steady State:

- Directs a professional cadre within the NAVIC in the development of the *National Security Grand Strategy* (NSGS) based on the NSPG which describes the POTUS's Intent for the integration of the national Ends, Ways, Means (EWM) and turns them into actual task and/or mission assignments to specific national security actors across SGRCI sectors at the strategic level but informed by operational and tactical levels as appropriate

for the near, mid, and long term. The NSGS is also informed by the National Assessments and the National Operational Analysis.

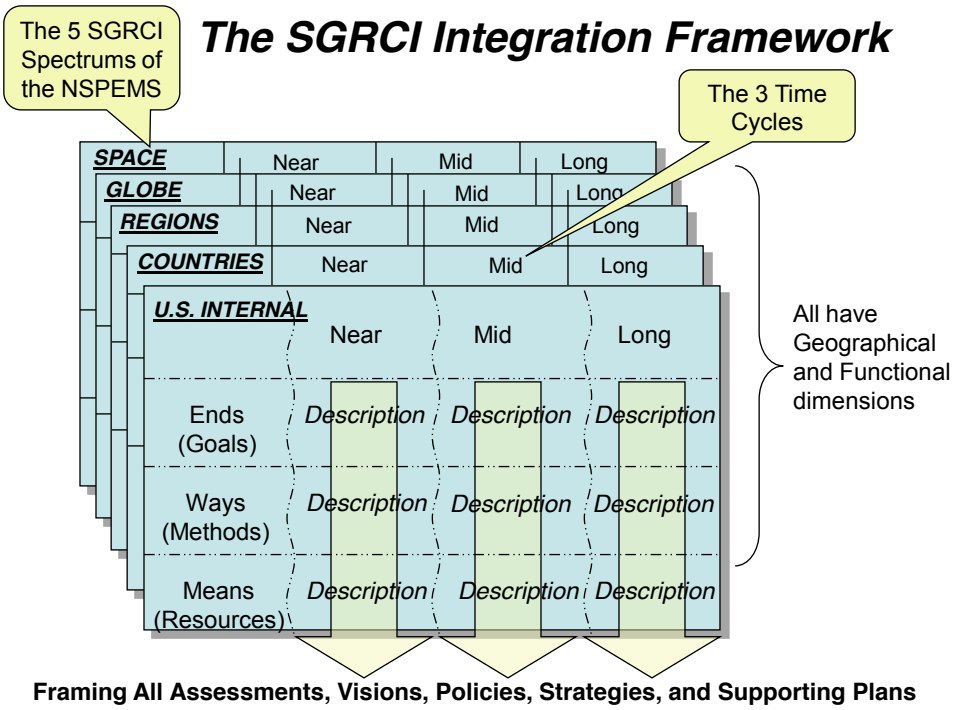


Figure 2

- The ADNSM uses the SGRCI & EWM Integration Framework (shown above) to ensure all aspects of strategy making follow a general comprehensive path of development.
- The ADNSM employs a permanent cadre of generalist experts representing all aspects of national EWM throughout the internal strategy making methodology [whose specifics are not intended to be described or prescribed here]. This cadre works with planners from across the interagency including the PSC Lead Departments, Agencies, State Governments, designated Presidential Issue Teams as well as multilateral and multinational planners and oversight and advisory organizations in the executive and legislative branches as necessary to support all of the Presidential near, mid, and long term priorities and aims articulated in the NSPG and any additional mission specific statements for the strategic level but in coordination with actors from the operational and tactical levels for perspective.

- The ADNSM facilitates the integration of the *National Security Strategic Human Capital Plan* created by the DNS in coordination with the Office of Personnel Management (OPM) into the NSGS.
- The ADNSM also facilitates the integration of the *National Security Knowledge Management Plan* created by the National Decision Support Office (NDSO) in the NAVIC into the NSGS.
- The ADNSM uses the DNS and the National Security Advisor (NSA) as immediate informal sounding boards in lieu of the President throughout the process as required. The ADNSM archives and maintains status of all national strategies for steady state and contingencies for all sectors of the SGRCI.
- The process of strategy making is both complex and potentially time consuming and if done poorly can be extremely bureaucratic, highly compartmentalized or overly centralized with the increased likelihood of inserting human cognitive biases on the outcomes. The ADNSM utilizes the 15-year tenured *National Ends, Ways, Means Integration Oversight Council (NEWMIOC)* made up of four representatives each from both the executive and legislative branches to provide mitigation of such cognitive bias influences on major national courses of action. The NEWMIOC is *not* a decision-making body and serves only to provide apolitical, independent, "devil's advocate" perspectives. The President should want to ask during deliberations on matters of national security, "what did the NEWMIOC say about this policy, or that course of action…"

To achieve the necessary timely outputs through such a complex system of inputs, the internal process of this strategy making should be disciplined and run by professionals. Consequently, the ADNSM relies on cutting edge facilities within the NAVIC and highly trained generalist strategists capable of taking any situation and developing appropriate strategies from end-to-end. The "end" in this case is the completion of the aim and includes the iterative planning and re-planning of effects in coordination with the *National Implementation Support Office*. This is where the strategy meets execution and as it operates as a seamless process of give and take between the two.

There are many styles and steps of strategy development and this document will leave the particulars up to future workshops. Whatever the style or series of steps adopted, they should adhere to a general process that allows for a "conveyor belt" of strategy making from the long to mid and then on to the near-term. Separate planners should be positioned at each of these basic three stages of strategy development. The ADNSM should consider dividing the three by time of focus – for example, the near term strategists might be focused on the next year while the mid

term strategists focused on the following 5 years (out to the 6 years of the *National Security Resources Document*) and the long-term beyond to 10, 25 and 50 years as supporting the President's Visions.

The NSC official of tomorrow can no longer embody all the near, mid, and long term strategic thinking in one body. These all require nuanced techniques and skill sets. The near term strategist focuses much more heavily on current assessments, hot political presidential priorities, and operational analysis of on-hand capabilities. The crisis strategist is related to the near term strategist and should deliver immediate results based on intuition and best available information from the "living" assessments. The mid to long term strategists can afford more time to apply more creative thinking and gaming to develop, and then compare and contrast options. The ADNSM should use all of these and emplace a system of passing long term thoughts along the conveyor belt of strategy making to the mid term strategists as execution horizons seem to move closer and then again from mid term strategists to near term strategists as the horizon nears even more.

As noted earlier, the ADNSM also directs all strategy making processes utilizing the collaborative and system-wide *National Ends, Ways, and Means Development & Integration System (NEWMDIS)* [Proposed to be developed]. The NEWMDIS would be the backbone informational and knowledge architecture of the NAVIC and the NSPEMS covering the entire set of process and functions of the NSPEMS to include tracking subordinate system planning and implementation and assignment of national core and surge assets to national operational concepts for any use on any issue whether steady state, crisis, foreign or domestic. NEWMDIS would be a collaborative classified and unclassified system with participating members from each of the other offices of the NAVIC, key PSC "planners," key "planners" from the OMB, key planning members/staff from the Congressional Select Committee for Interagency Affairs, and key planners from Departments & Agencies, and executive/legislative advisory as well as oversight organizations as required. All participating planners in all other organizations would be permanently assigned to and rated by ADNSM leadership *but occupying offices primarily* at their host organization locations while holding a secondary office space in the NAVIC. This will allow for the most departmental/agency neutral and interagency mission focused planning across the whole of government. The NEWMDIS provides real-time collaboration by being the virtual home to all the Assistant Directors and planners across the multiple levels ready to query as necessary.

Within the NEWMDIS, a separate and focused collaborative virtual system will be housed called the *National Security Mission & Infrastructure Development System (NSMIDS)* and the Deputy ADNSM will serve as the NSMIDS Manager. He/she will use the NSMIDS to

make *recommendations* on the nation's procurement and employment of effective national security related infrastructure and systems (public and private sector people, processes, and materiel, national industrial and technological base, etc..) supporting national security missions. This critical national capability and management sub-system will provide integrated capabilities throughout the U.S. interagency mission structure. NSMIDS is a formal executive & legislative process and is managed in close partnership with the OMB and with assistance from the Agency for Science and Technology, the Congressional Select Committee on Interagency Affairs as well as other particular Departments and their corresponding congressional committees of jurisdiction. The ADNSM utilizes the *Missions & Infrastructure Oversight Council (MIOC)* also comprised of four legislative and executive Branch 15 year appointees to provide cognitive bias mitigation on major national infrastructure recommendations. This builds executive – legislative trust "early and high" in the interagency space. The MIOC is *not* a decision-making body. The reports and insights gained through this overall process helps the entire system better understand the status of critical infrastructure and supporting systems across the United States both in the public but perhaps more importantly, in the private sector as well.

Because the ADNSM is responsible for ensuring the Ends, Ways, and Means of National Security are integrated, his/her role includes assisting the DNS in the management of the overall resourcing or Means to ensure strategic success towards the President's national Vision and Intent. The Federal Resource Allocation Process with amended executive procedures and House & Senate rules to be refined this year through the PNSR recommendations and the new administration will provide the detailed foundation for this Means integration in both Strategy Making and Support to Subordinate Planning under the management of a future ADNSM.

4. *Assistant Director for National Planning Support (ADNPS)* [Office of National Planning Support]

Steady State:

- The ADNPS's chief role is to provide support to State Government, U.S. department, agency, and/or Presidential Issue Teams in the creation of their own strategic, operational and tactical plans for the immediate to near, mid, and long term across SGRCI.
- The ADNPS will work with these organizations and offer the professional offices and facilities of the NAVIC to assist with reach back analytical support, answering questions to Request for Information to national authorities, and in developing *Policy Adjudication Papers* for the DNS and PSC consideration in the deconfliction of potential policy positions affecting the subordinate organizations. The NAVIC will also always offer

Red-Teaming/Scenario based game support with analytical reports as requested based on time and space available.

- Chief among the ADNPS's concerns is the facilitation of the ADNSM in the continued tracking of resource requirements as they are considered at the operational and tactical levels.

Contingencies:

- The ADNPS still provides support to State Government, U.S. department, agency, and/or Presidential Issue Teams as designated in the creation of their own strategic, operational and tactical plans for the Immediate to Near, Mid, and Long Term in the appropriate SGRCI sector. Still provides reach back, policy adjudication, and Red-Teaming/Scenario based games as requested.
- Where and when necessary, the ADNPS may offer on-site planners to assist the subordinate teams in their planning processes for the first 90 days of their new mission planning, and can continue to track and assist in the monitoring of resource needs at the operational and tactical levels.

5. *Assistant Director for National Implementation Support (ADNIS)* [Office of National Implementation Support]

Steady State:

- The ADNIS provides full support (from the NAVIC) to State Government, U.S. department, agency, and/or Presidential Issue Teams by managing reach back answers to Requests for Information.
- He/she assists the DNS and the PSC in developing and tracking Policy Adjudication Papers where national level contradictions and conflicts arise affecting subordinate actors during implementation.
- Provides reach back support (from the NAVIC) to Red-Teaming/Scenario based gaming and reports in support of the actions to integrate the Ends, Ways, Means across the organizations operating in the different SGRCI spectrums at the strategic, operational, and tactical levels.
- Offers NAVIC facilities for facilitated rehearsals as space is available.
- Provides connectivity of operational and tactical implementation budget obligations, requests for fund transfer, additional budget forecasts, and tracking of implementation

progress according to agreed upon measureable metrics tied to key objectives and goals. Offer NAVIC metrics professionals to assist.

Contingencies:

- The ADNIS would still provide full support (from the NAVIC) to State Government, U.S. department, agency, and/or Presidential Issue Teams with managing reach back answers to Requests for Information.
- Still provides support (from the NAVIC) in assisting the DNS and the PSC in developing, issuing and tracking Policy Adjudication Papers where national level contradictions and conflicts arise affecting subordinate actors.
- Still provides *limited* support (from the NAVIC) to Red-Teaming/Scenario based gaming and reports in support of the actions to integrate the Ends, Ways, Means across the organizations operating in the appropriate SGRCI sector at the strategic, operational, and tactical levels.
- Provides expeditionary assistance teams as possible to conduct persistent on-site independent observation and coaching in planning and execution management as well support to facilitated mission rehearsals. Offer NAVIC facilities for facilitated rehearsals as space is available.
- Offer expeditionary support package of experts from the NAVIC to set up and begin process of establishing connectivity of operational and tactical implementation budget obligations, requests for fund transfer, additional budget forecasts, and tracking of implementation progress according to agreed upon measureable metrics tied to key objectives and goals.
- Offer expeditionary metrics teams as available from the NAVIC.
- Facilitates expeditionary support of national KM packages for national Command and Control linkage to operational actors.

6. *Assistant Director for National Operational Analysis (ADNOA)* [Office of National Operational Analysis]

Steady State:

- The ADNOA directs the development of the *"Living" National Security Review* (capturing baselines of operational roles, missions, and capabilities of the U.S. Interagency) conducted by offices in the NAVIC. This "living" process enables

unprecedented smooth transitions from steady state to crisis responses and back to steady state across the entirety of the USG.

- The ADNOA also directs the development of the *Annual Lessons Learned Report on National Security* across SGRCI at Strategic, Operational, and Tactical levels of missions and systems using appropriate metrics.

Contingencies:

- During contingencies, separate from the *"Living" National Security Review*, the ADNOA directs the development of a *National Campaign Review* capturing baselines of operational roles, missions, and capabilities of the U.S. Interagency participants in the campaign at the Strategic, Operational, and Tactical levels.
- Also, instead of *Annual Lessons Learned Report*, the ADNOA will direct and develop a biannual *Report on Campaign Lessons Learned* in the appropriate SGRCI sectors at Strategic, Operational, and Tactical levels of using appropriate metrics.

Resource Integration:

Of all of the functional areas within the Ends, Ways, and Means integration process, none causes more headaches than Means. Matching resources better to action is the essential ingredient to a "better" national security system. Said another way, without the close and efficient alignment of means to ways, no ends can be accomplished and no amount of reform in any area from leadership to structure to process will make up for this one deficiency. One might argue that if only this one area were improved upon, no other reform would be as necessary and not other reform is worth anything without it. There must be a closer linkage in terms of fewer steps separating the actor and his/her means – period.

It is for this reason in this chapter that we wish to offer a very short address on this subject. Here we will highlight both the Federal Resource Allocation System as we know it and the improvements to that system that the PNSR December 2008 Report recommendations coupled with this publication's introduction of the NSPEMS will bring. The following is an amended description of the current resource allocation system in its four phases:

Phase 1:

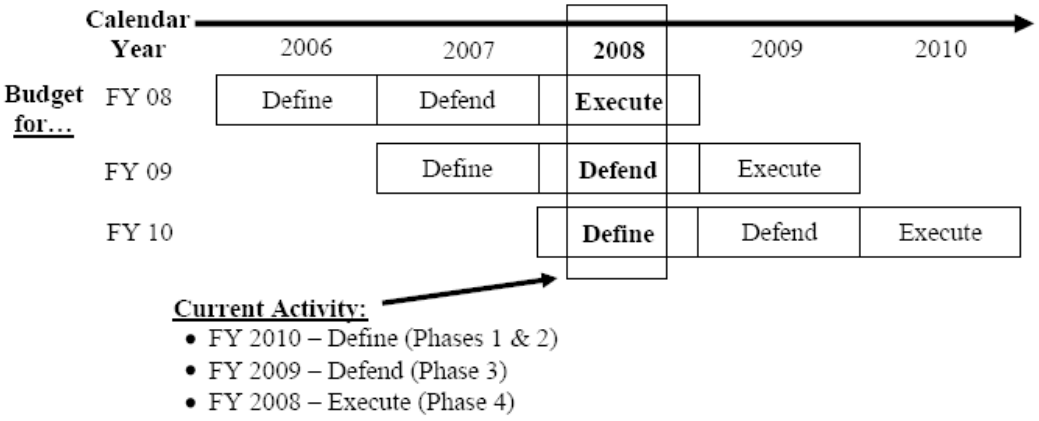
Agencies prepare budget requests: These requests in some cases are based on various guiding documents including the…,

> …National Security Strategy (mandated by Congress) the National Homeland Security Strategy, and at least nineteen other national strategy documents

> including the strategies for victory in Iraq, combating terrorism, combating weapons of mass destruction, combating terrorist travel, maritime security, aviation security, counterintelligence, information sharing, the physical protection of critical infrastructure and key assets, securing cyberspace, public health and medical preparedness, public diplomacy and strategic communication, internationalizing efforts against kleptocracy, and pandemic influenza. A careful reading of these strategies shows that they do not provide guidance that can be used for building budgets or making tradeoffs. GAO found…for example, while the strategies identify goals, subordinate objectives, and specific activities, they generally do not discuss or identify priorities, milestones, or performance measures—elements that are desirable for evaluating progress and ensuring effective oversight.[1]

Yet beyond the submission, it is important to understand the context of the environment of budget forecasting to Congress by each department and agency. At any one time during this phase, each submitting organization is simultaneously in three stages of budget actions:

> Defining, defending, and executing - Participants in each of these parallel processes focus primarily on their own process, paying attention to the other two only when their own institutional roles dictate that they be involved. During August 2008, for example, agencies were defining their budget request for fiscal year (FY) 2010, defending their budget requests for FY 2009, and executing their appropriated funds for FY 2008, as shown in Figure below.[2]



[1] PNSR Nov 08 Report *Forging a New Shield,* pp. 337.
[2] Ibid, 375.

Figure 3[3]

Phase 2:

OMB and the President decide on final budgets and submit them to Congress:

Most agencies submit their budget requests to OMB. OMB divisions then present their findings and recommendations to the OMB director in Director's Review sessions, which are also attended by top OMB officials and relevant EOP offices, including the NSC for traditional national security sessions. Guidance going into these reviews and decisions coming out of them aim to align spending and policy targets at the presidential level.

These budget reviews focus on narrow assessments. One of the most important outcomes of the OMB budget process is ensuring that no questionable funding remains in the President's budget, which would invite Congress to cut those funds and reallocate that budget authority for other purposes, not the President's. That is a primary reason why budget reviews focus extensively on obligation and expenditure rates as a measure of program success.

In late fall, OMB 'passes back' to each agency the EOP decisions on its budget request. Agencies may appeal, as the 'pass backs' usually contain reductions or changes to the agency budget requests. Generally, however, OMB pass backs form the basis of the President's budget request and appeals are sustained only a small percentage of the time. Cabinet secretaries traditionally take their most important appeals directly to the president.

The agencies provide volumes of material justifying their budgets; that material supplements OMB's justification to Congress and it further accompanies the President's budget request. However, much of the agency justification material is not ready for delivery on the day the budget request is announced and delivered to Congress. In some cases, the material arrives weeks or even months later. [Regardless], congressional committees conduct hearings, mark up bills, bring them through committee to the floor, pass those bills, go to conference, and vote on the conference results, sending enrolled bills to the president for enactment. [4]

Phase 2a:

[3] Ibid, 376.
[4] Ibid, 376.

OMB reviews the final budget for the Department of Defense and the Intelligence Community. The DoD components (the military departments, defense agencies, and other DoD entities) develop their budgets as part of a *six-year* projection of programs and budgets, known as the Future Years Defense Program (FYDP). The FYDP, accompanied by a detailed first-year budget, is submitted to the Office of the Secretary of Defense and OMB.[5]

Phase 3:

Congress appropriates funds. Over the course of the session, Congress produces the appropriations bills to fund and operate the government based on the President's budget request. Congress passes a budget resolution directing targeted mandatory funding levels for each of the authorization committees. It also allocates a share of the discretionary budget to the twelve appropriations subcommittees.[6]

Phase 4:

The executive branch executes the approved budget. Once appropriations are enacted, the execution phase of the resource allocation process begins. The President's signing of appropriations acts may be accompanied by signing statements, which indicate the executive branch's intentions for implementation. OMB apportions funds to the agencies. The agencies distribute the funds according to the appropriations acts, then obligate and expend those funds. This complex procedure is designed to ensure that appropriated funds are not spent for purposes other than those for which they were appropriated, in accordance with the Constitution and in compliance with the Budget Act of 1974.

Reprogramming, the transferring of funds across agency accounts, should be requested through OMB and approved by Congress. In some instances, a reprogramming also may require new statutory authorities. However, in the interest of preserving funding in future budgets, agencies prefer to keep funds appropriated to their accounts, regardless of whether some other, higher priority for those funds might exist elsewhere. Unobligated funds can be used for emerging priorities, and interagency needs might be such an emerging priority. In some cases, agencies have statutory authority to reallocate funds for purposes

[5] Ibid, 379.
[6] Ibid, 380.

other than those for which they were appropriated. This authority is known as "transfer authority" and is limited by statute.[7]

With this short introduction to the Federal Resource Allocation System, we simply want to add a few comments on how the proposed NSPEMS and its NAVIC would improve on both the budget forecasting and detailed submissions within the context of a strategic planning and execution system.

First, the NSPEMS is a holistic system. The NSPMES, therefore, provides for unprecedented end-to-end integration ends, ways, and means by putting forth a process and a venue (both physically and virtually) that enables top-to-bottom, early and high involvement of critical executive and legislative actors under one roof. From a budgeting standpoint, such a process would reduce or eliminate the "program-specific" agency and committee focuses that dominate the current system.

Additionally, for the first time both the implementation and the planning are considered and treated as equal partners with processes that are well understood, standardized, and transferable from one to the other among actors and organizations in the interagency space and beyond. This improvement will bring those designing the budget forecasts and detailed submissions closer together with those who will be implementing and providing immediate feedback on budget execution and gaps. The single information architecture (NEWMDIS) will bring in all the resource, oversight, and accountability organizations into a collaborative domain with each of the six major functions of the process. This will include the proposed Select Committee on Interagency Affairs, the Congressional Budget Office, the Inspector General, the Congressional Research Service, and any special commissions as designated all tied into these NSPEMS processes and functions.

The NSPEMS and the NAVIC calls for replicated Think Rooms in every department, agency, Presidential Issue Team and state government. This unprecedented redundancy and transparency will improve the entire system by furthering its ability to understand itself, its direction, and its resource capabilities in order to support more coherent grand strategic choices and guidance to allow for increased decentralized implementation. Additionally, the NAVIC will provide strategic support to subordinates with state of the art but often low-tech gaming techniques for policy formulation, resource forecasts, strategy, and implementation. This will allow for more accurate assessments of both needs from wants, along with consumptions rates.

[7] Ibid, 383.

The NAVIC functions and DNS delineation of roles to the Deputy DNS to run the NAVIC along with his/her Assistant Directors are intended to ensure that the system links previous performance and expenditures at the implementation levels to future forecasts and provides a single and complete, physical and virtual system which everyone can see and participate in. Furthermore, the NSPEMS process is strengthened by the proposal for two specific oversight councils (the Ends, Ways, Means Integration Council & the Mission and Infrastructure Oversight Council) with membership from both the *executive* and *legislature* that would focus on outcomes over expenditure rates. Neither of these will have decision-making authority but their joint composition and 15-year Senate confirmations make these two bodies alone enormously important to ensuring unprecedented cooperation on matters of resources.

Where the PNSR recommends to push all budgeting forecasts out to 6 years to help alleviate the define, defend, execute compressed schedule, the NSPEMS is well positioned to assist and has even included providing additional context for this forecasts through suggesting additional financial estimates to accompany the President's 10, 25, 50 year visions. The NAVIC will provide the President and his/her PSC the persistent support necessary to visualize such future possibilities. This will provide unparalleled context in both time and environmental expectations and possibilities for both the Six-Year Forecast and the Annual Budget submissions.

Finally, the NSPMES calls for "Living" Assessments, "Living" National Security Reviews, to support "Living" National Security Guidance and Strategies. All of these essentially mean that capabilities of the entire government (and private sector where possible) are mapped into a data base and updated along the lines of the DoD's TPFDL "troops to task" concepts so that any President can have a near real-time assessment of his/her on-hand capacity as a nation to include such things as the industrial base for mass mobilization, etc… This unprecedented capacity allows for quick and efficient assignments and reassignments of government means to appropriate missions complete with price tags. For the private sector, it allows the Congress to work with the President using political capital to muster whole of nation resources when necessary all with associated price tags.

Conclusion:

This chapter intends to introduce the NSPEMS along with its components and processes. While the November 2008 PNSR Report describes many of the components of planning and then execution throughout its 800+ pages, this publication attempts to pull it all together in one place, showing how all the parts work together as a whole.

PART II: National Assessment, Visioning, and Integration Center (NAVIC)

Introduction:

The process of thinking about the NSPEMS and the NAVIC as well as national security will become a creative endeavor requiring a creative facility to house the work of the NAVIC. It is well known that ergonomics affect the way people think and act which is precisely the purpose of the NSPEMS.

If the NSPEMS is the central hub for the DNS & PSC management of National Security and its *National Ends, Ways, and Means Development & Integration System* (NEWMDIS) is its informational backbone, then the NAVIC is its home both physically and, for most participating elements, virtually. Furthermore, if the POTUS uses this hub to center his network of national security processes and people in the integration of the nation's ends, ways, and means for national security, then both the NSPEMS and the NAVIC should occupy a central and prominent position in the U.S. Government and in Washington D.C.

Overview:

The NAVIC will support the integration of the nation's ends, ways, and means in the near, mid, and long-term through the national security planning & execution management system based on pragmatic internal (U.S.) and external (the world) assessments and aspirational visions of what the future could be. The Center will endeavor to help translate policies made by the various EOP offices and the President into plans for the interagency space.

The NAVIC process can be alternatively described as supporting the NSPEMS in applying its six functions to the benefit of the President and all supporting actors in both the "thinking" and "doing" of national security. The Center provides the POTUS with an ability to immediately take stock of the status of both the internal system and the external environment, as well as to understand the decision points necessary to maintain his policy objectives in the near, mid, and long-term across the whole of the national security system in the five spectrums (SGRCI) of the NSPEMS.

To do this, the Center would employ state-of-the-art facilities and decision support tools operating in both classified and unclassified collaborative domains. Its data would be virtually shared and its processes replicated in similar sites around the country. In fact, any appropriate site in the world will be able to replicate this capability offering near-perfect resiliency, scale, and uninterrupted service to the POTUS during any emergency. As such, its processes and data would be shared and replicated in the White House Situation Room as well as in Air Force One, Camp David, etc... in a real-time persistent manner. The NAVIC would be the model for complete refurbishment of the present Situation Room in order to accomplish this. All of the President's key deliberation offices would share the exact same NEWMDIS collaborative information backbone as well as advanced visual knowledge sharing systems for command & control and advanced networked analysis. Moreover, each of the departments and agencies as well as the State Governors will replicate similar capabilities in their domains. At any time, any of these could become the President's command and control center if needed in an emergency. As Presidential Issue Teams are formed, the Decision Support Office in the NAVIC will be ready with exportable KM packages of both hardware and software to bring these teams on line within 24 hours. The proposed Select Committee for Interagency Affairs would also have its own replicated connectivity to achieve the unprecedented new collaboration called for in the NSPEMS. Finally, all subordinate elements of the NSPEMS from the Strategic to the Tactical would find connectivity into the NSPEMS so that bottom up ground truth would only be a click away.

The Center Director would be a Senate confirmed member of the EOP Executive Secretariat working as the Deputy DNS. With the exception of the politically appointed Assistant Directors and the two 15-year appointed oversight councils (MIOC & EWMIOC), the rest of the staff would be majority full-time civil servants to provide continuity between administrations.

The NAVIC will consider the President and his PSC staff as its primary customer. At all times the NAVIC should be seen as following, not leading the POTUS and his staff of policy designers, and would endeavor to be value-added in both timeliness and substance to the particular decision-making processes put in place by the President. The NAVIC's secondary but equally important customers will be the remaining legislative and executive actors in the national security community as designated.

The staff size would be significant given the functions required. Consider a single COCOM staff of hundreds just to keep up with the integration of the ends, ways, and means of a single regional military policy. The six broad NSPEMS functions with the proposed product outputs will determine the final form but one can imagine the immense work load. A very rough

order of magnitude is that 225-250 permanent personnel will be required. Advisors and contractors from outside of government would likely be a part of this workforce and may represent as much as 20% of its hires primarily as part-timers in order to keep the Center nimble and on the cutting edge of evolving technologies and processes for its mission accomplishment. New structures will need to be created to allow for the individual office spaces but also for numerous medium to large collaborative working spaces and briefing rooms each with all the necessary visual brainstorming equipment ergonomically designed to elicit the best thinking (there will be many existing and future designs to review).

As stated, the Center would essentially be designed around the six functions and functional directors of the NSPEMS:

7. *National Assessments* (Assistant Director of National Assessments – ADNA of the Office of National Assessments) coordinating both geographical and functional threats & opportunities spanning the concentric and inclusive spectrums of space, the globe, specific regions and/or sub-regions, specific countries within regions, and the U.S. internally (SGRCI) in the near, mid, and long term.

8. *National Policy Formulation* (Assistant Director of National Policy Formulation – ADNPF of the Office of National Policy Formulation) facilitating first the articulation of the POTUS's 50, 25, and 10 year National Security Visions (detailed descriptions of all the parts of the national security system working together as a whole successfully in different future contexts). In addition to these Visions, the Center will assist the POTUS in articulating his overarching intent (clear descriptions of end state conditions for success with overarching purposes for key goals (ends), broad outlines of basic methods (ways), and the broad scope of resources willing (at what risk) to commit (means)) across SGRCI in near, mid, and long term divisions of the immediate 10 years for the strategic level but in consultation with the actors at the operational and tactical levels.

9. *National Strategy Making* (Assistant Director of National Strategy Making – ADNSM of the Office of National Strategy Making) directing the articulation of the specific "how" and "who" of the national integration of ends (Goals), ways (Courses of Action), and means (Resources including Congressional Support) in support of overarching Presidential Vision & Intent (Policy Guidance) across the SGRCI at the strategic level but in consultation with the actors at the operational and tactical levels for the near, mid, and long term of the next 10 years.

10. *National Planning Support* (Assistant Director of National Planning Support – ADNPS of the Office of National Planning Support) coordinating the national support to State Government, U.S. department, agency, and/or Presidential Issue Teams in the creation of their

own strategic, operational and tactical plans for the Immediate to Near, Mid, and Long Term across SGRCI that articulate a clear integration of their ends, ways, and means.

11. *National Implementation Support* (Assistant Director of National Implementation Support – ADNIS of the Office of National Implementation Support) coordinating the national support to the actors implementing the ends, ways, and means across the organizations operating in the different SGRCI spectrums at the strategic, operational, and tactical levels.

12. *National Operational Analysis* (Assistant Director of National Operational Analysis – ADNOA of the Office of National Operational Analysis) coordinating all the elements of the NSPEMS processes through to implementation across the spectrums of SGRCI using lessons learned with agreed upon metrics to identify necessary system improvements in the near, mid, and long term.

Each Assistant Director would have a deputy and staff of approximately 30 personnel. Each of these would be a validated member of the new National Security Professional Corps. Each of these Assistant Directors should be at an SES rank commensurate with the level needed to garner the support required to achieve their specific functions across the breadth of the national security establishment (and perhaps with private sector and international partners).

As noted already, the NAVIC will not be focused solely on long-term planning. The Center will be in the middle of the entire NSPMES process helping all to use the basic framework of integrating the ends, ways, and means across the 5 NSPEMS spectrums. Using this framework allows for the simplest yet most comprehensive organization of the entire national security system's "thinking and doing." It serves as a guide or a checklist, but it is not meant to be prescriptive. In other words, it can and must evolve. It should be considered as a minimum standard. However, by achieving this minimum standard, almost any issue area – functional or geographical – can fit into this framework and be treated by the system in a responsible and holistic manner. As stated, the system is encouraged to learn and grow, but this framework is intended to provide a useful foundation.

One of the advantages of the NSMPEMS and the NAVIC is that it encourages end-to-end and cross-functional collaboration by being under one tent, both figuratively and literally. As stated before, its physical or ergonomic set up deserves additional attention of its own.

Vignette:

To go where we wish the reader to journey in this description, one must first imagine the NAVIC as the "place" where the President "goes" to get his *fix* on national security. Jargon aside, at anytime the POTUS should be able to turn to the Director of the NAVIC for an objective

comprehensive picture – sometimes literally - of how his government's national security ends, ways, and means are being addressed across all SGRCI spectrums according to his policy priorities. There is presently no place like this for a President. He/she may receive a series of briefings and memos or reports around a table in the very small Situation Room using a VTC or perhaps a computer screen projection but he doesn't really "see" his system. If he can't "see" it then he can't use it and manage it effectively. To help the reader understand how it might be done, the following vignette is offered.

Imagine entering a comfortably small, lightly-colored, carpeted room with earth tone walls and tiered lighting that covers the area in a pleasant glow. The furniture is mostly modern art deco leather, moderately plush all with wheels on the bottom so that the room can take any shape depending on the moment's needs. There are no tables except for the small pull-out table tops on each leather arm chair that can switch over to either left or right-handed users each complete with drink holder to contain the beverage offered upon entering. Upon sitting, and with a push of button, screens lower and lights dim for an "opening" 10-min presentation by the automated pre-briefing multimedia show. The President hears the proposed agenda of the meeting he is about to chair in the next room (The NAVIC's most inner sanctum called the Think Room) along with a pre-screening of the likely talking points of the members about to join him. A short discussion ensues with his closest advisors.

At this same moment across the way inside the Think Room, the remaining meeting participants are receiving a similar preparation in order to set the proper mood and group dynamics. This group is joined by two senior NAVIC professionals assigned to play key roles in shaping the group dynamics. The first role is that of "blocker" or "challenger" to the issues about to be discussed. He/she hails from the NAVIC's Red Team. This blocker role is done with appropriate aplomb commensurate with Presidential decision-making, but this role player of some stature of his own will ensure no group think goes unchallenged and may encourage others to expound on their own points of differing perspectives. The second role player is that of the observer. He/she will be expected to observe silently the proceedings looking for the objective results through the haze of sometimes irrational thinking. He/she is an expert on group dynamics and cognitive bias psychology while also a valuable member of the planning staff in the NAVIC.

Both presentations end and the two groups join each other in the Think Room. All of these rooms are located below surface level but the shape, air flow, coloration, egg-shaped ergonomics and tiered lighting along with the multiple layers of various automated visual aids and circular head table make for an inviting experience. The emphasis is on achieving the most efficient transfer of information from the sender to the receiver at all times. The chairs here are more of an office desk setting with mesh backings and customized adjustment fittings. In front

of each seat on the table is a computer screen and keyboard with an attached electronic drawing pad & pen and beside it lays a multimedia remote wand. Large screens occupy a prominent position on both ends of the circular table, but with a push of a button, additional screens descend down behind each seat to create an even more intimate setting and allowing each participant to have his/her own information shown on the personal screen. All participants (no more than 12 at a time at the table) have corresponding screens. Special additional light fixtures, moveable and flexible in the ceiling, are automatically adjusted with a click by the room manager as the meeting gets on the way.

Others invited – up to 25 – positioned around the room view the proceedings on screens fashioned on interior pillars but on rollers allowing for 360 degree rotation of the screens around the pillar in order adjust to any direction for any viewing. These screens and others positioned around the room provide the same view on the outside of the inner circle as what those on the inside are seeing. All screens are able to accommodate multiple presentations using split screen technologies.

Any participant can use the drawing pad at any time to "drive" a drawing on screen at full screen mode so that every participant can see the sketch on 24 inch monitors or on the lowered 5X7 foot screens. The computer screens are all inset into the desks at appropriate angles and levels to allow eye-to-eye contact with all members and the President during these discussions.

Sound performance matches Blu-Ray-like visual technologies so that any virtual attendance is shown with near perfection and life-sized from screens emanating from the floor upwards in the open center space of the circular table set up. These wide screens with surround sound beam in all other meeting participants from anywhere around the world.

The screens lift, the discussions end, the data is captured and all notes and assignments are already resident in the collaborative NEWMDIS so that every participant can either access them immediately by authorized mobile devices on the way out the door or at their parent organization PC when they arrive. All this has saved time and allowed for maximum focus.

But the gathering doesn't completely end; it only shifts to the next room. The next room, however, is no longer subterranean. The inner 12 ascend to the top floor of the newly built NAVIC to an admiring skyline viewed through the floor to ceiling windows spanning a 45 foot panoramic vista. The conversation continues unclassified and refreshments are made available. The President departs after 20 minutes and the rest continue their talks for the remaining hour.

Meanwhile the Director of the Center has moved on to her office just adjacent to the social room to tend to the next series of priorities leaving her Deputy behind to finish the formal duties with the guests. The Director decides to visit her Assistant Director for Strategy Making.

On her way down the elevator, she passes by each floor housing a different Assistant Director and his/her functional staff. By the time she gets to the third floor above deck, she steps off and heads towards the ADSM's office. The Director notes with some interest that many of the gaming rooms are occupied with studious professionals covering the floor to ceiling white board walls with dry erasable ideas. She passes through the center of these several rooms all outwardly facing with views to the noon day spring sun shining on the Mall. The interior office setting is filled with open egg-shaped team areas that house most work stations comprised of various composite members of the national security community. The Director recalls that at the last staff meeting, the workforce expressed their satisfaction with the open workspace environment given the augmentation of the multiple available gaming rooms complete with remote phone and computer set ups so that any user can retreat to as needed for more private work and conversations on a temporary basis. The workforce further commented how the upper deck coffee house also allows for both an escape and an additional work venue of a different kind, enormously important to a creative thinking environment.

After this visit, the Director decides to get a bite to eat down on the ground floor before her panel discussion in auditorium #4 with the World Futurists Society whose DC office is now located on the main floor just above the lobby. This floor also houses the World Futurists Society Museum and Foundation, the former being open to the public. The Foundation, in conjunction with the President's initiative on Future Innovations for National Security across the new broader scope of national security from Education to Global Warming, honors annually the person or persons who have contributed the most to U.S. and world security with the President's World Futurist Medal of Honor. Today, the Director will be discussing this upcoming event for the 2010 awardees.

As the day comes to a close, the Director notices out her left window as she drives away on the GW Parkway that the NAVIC stands out as a modern colorful reminder on the DC skyline that this nation has finally found a way to make a small but important step towards transparency, and community organizing at the U.S. Government level that is breeding a new trust and confidence across the aisles. The Director feels in her gut that the 21st Century has finally started to slip from its past sister century towards real change but there is much work to be done.

Processes:

This short vignette provides a mental image of the kinds of structural and organizational dimensions that a NAVIC could bring to enhance the virtual connectivity described in the NEWMDIS in Chapter One. The vignette also serves as useful introduction and transition to a

brief discussion about some of the unique processes the NAVIC will utilize in order to provide the best service possible to its customers.

The "visioning" component of the NAVIC is a unique and unprecedented contribution to national security and it will be discussed in more detail in Chapter Three. As the reader will come to understand, visioning is an aspirational form of scenario use. In fact, the most useful way to introduce the use of scenarios is to note that scenarios are utilized by the NAVIC in one of two primary ways: 1) to stress test both policy and strategic plans' courses of action, and 2) to assist the President and any other national security organization in developing Visions for their organizations.

In the first case (stress test scenarios), trained professionals would design stories of situations that replicate the most likely environment for a potential course of action or policy objective. This process can be lengthy but there are a number of varying degrees of sophistication for any scenario design and use. The NAVIC will likely focus more on the less sophisticated in terms of both length and number of "role players" that might act out the parts of the scenario during a table top exercise or more comprehensive Red Team supported game. The NAVIC would more often trade sophistication for timeliness but even the simplest games orchestrated by the permanent NAVIC professionals would be infinitely more revealing than anything yet available within the interagency space of today's system. These scenarios and their table top exercises might last a ½ day or more if necessary and would be focused to elicit very specific insights to key aspects of any policy or plan. Suffice it to say in this publication that there are a number of variations to this concept but the importance here is only to understand that scenario use in this fashion would be available and on-going daily on several fronts for multiple plans and customers at one time in the NAVIC facility.

In the second case (aspirational scenarios), trained professionals would employ specialized workshop techniques with key participants on developing Visions using multiple, plausible visualization of futures. These futures may take the form of stories created in some distant time complete with sub-story lines that depict the use of, or encounter with, likely and desired aspects of a future system working together successfully as a whole. The emphasis on the use of scenarios in this manner is to help organizational leaders "play out" future think on their particular system and what it might evolve into and how it might interact with itself and others in a future environment under different variations of that future environment. The purpose of this is to exercise and stretch the collective minds of organizations and their leaders to see the realm of the possible. From the created Visions, organizations and their leaders can return to their home base and work on creating strategic movement towards that aspirational view of themselves in that future. This becomes the beginnings of grand strategic thinking. It is

important to understand that unlike stress test scenario use, the storylines in these scenarios are meant only to bring about a positive visualization – something to aim for.

Conclusion:

As described in Chapter One, the NAVIC will have multiple roles and relationships to maintain. Its roles and relationships will differ from one organization to the next, primarily based on the particular function it is working on. For example, in the subordinate planning and implementation stages, the NAVIC essentially offers a friendly hand and takes its cues from those planning organizations and their needs. To each it will offer its scenario use support as well as its professional Red Teaming capabilities along with its mission rehearsal skills and its facilities. As with all things, resources are limited and choices will have to be made on which organizations and missions receive priority support. In every case, the professionals from the NAVIC to include the Assistant Directors will only offer support and not usurp the authorized chain of command dictated by the President to his administration. The NAVIC Directors exercise the appropriate authorities only as directed. This unprecedented capability will be transformational in the way that the overall national security system is managed.

PART III: Scenario Use in the National Security System and in the PNSR

Introduction:

This chapter demonstrates how scenarios were used in the development of the PNSR recommendations and how they will one day be used within the NAVIC to support the President and his NSPMES. Scenario-based tools can be useful in determining the raison d'être of a system; a necessary step within a strategic management process. Among the many techniques available, scenarios can be utilized in planning (See Appendix C for a complete review of the literature regarding scenario based planning) and execution, as well as in steady state and contingency contexts.

Uses of Scenarios:

Since there are many different kinds of scenario-based processes used for different purposes, the NAVIC will focus its scenario work in two overarching categories. The first category is the creation of "visions" in an aspirational context; answering "what do we want in the future?" The second category is used for stress-testing proposed policies, strategies, plans, and courses of action. The latter is the category that was employed for the PNSR study, a process described in more detail later in this chapter.

Scenarios may be used primarily in these two different ways, but the processes of developing them are very similar. Done correctly, scenario development involves techniques applied in a disciplined series of steps that generally come in the form of answering questions. The questions are simple in construction, but can demand thoughtful and often complex answers. The very notion of answering any question about a future is inherently challenging. Yet the essence of scenario use is about peering into an unknown and wrestling with what might be, absent the comfort of facts. The further one peers into the future, even sound assumptions can begin to seem unreliable. However, over time, scenario-based processes have demonstrated their utility for multiple purposes and in numerous contexts.

The scenario process can be summed up in the following steps: 1) Determine the purpose and scope (in years and breadth of actors or system components to be visualized) of the exercise;

2) Development of a questionnaire to be given to experts; 3) Development of a list of experts across many fields; 4) Invitation to experts to develop timelines into the future; 5) Aggregation, analysis and synthesis of data to develop scenarios; 6) Stress testing the scenarios; 7) and stress testing a particular course of action within the scenarios or developing a new vision. The following section describes these steps in more detail.

1. *Determine the purpose and scope* of *the exercise* (in years and breadth of actors or system components to be visualized, number of scenarios to use, and iterative time blocks to be studied along the way): In this step, one might begin by stating that there is a need to look out 25 years (or more or less) into the future regarding the state of affairs for the Department of X. The purpose then, of the exercise, would be to determine how all the system components, whatever they might be in 25 years, could be operating successfully in a particular or multiple contexts. The scope might be stated in terms of how many component parts of the Department of X should be visualized – perhaps the vision would only be for a sub-system of a large departmental system that is in question. The scope might also be stated in terms of how many different scenarios one might wish to use to develop a composite view of the environmental factors in 25 years. Finally, the scope may be described in terms of how many time iterations from now until 25 years the exercise will examine. For example, it may wish to examine the leading decades preceding the 25 year end state – the 10 year mark, the 20 year mark and then the 25 year mark. Once these pieces are in place, a statement of purpose and scope is developed to guide the remaining steps.

2. *Development of a questionnaire*: As noted earlier, this next step becomes the hub of the visioning process. The right questions will guide all the other steps and will act as the keel upon which all the scenario details will be built. These questions might include: What is going on in the world that the system needs to know about today and into the different futures – 10, 20, 25 years? How does the system work today? How will the system change over these time blocks? What does the system need to know today to be successful? What will the system need to know in the future to be successful? What does the system need to do starting today to improve the probability that the system can shape the future that it wants? All of these are put into a questionnaire that will be used to canvass the very best minds in the appropriate fields pertaining to these future environments. Their answers will eventually populate a data base that when spread visually over the course of a linear 25 year calendar is the beginning of what can be called, "a future history."

3. *Development of a list of experts across many fields*: Perhaps the most counterintuitive step in the entire visioning process is in this step of gathering of experts "in appropriate fields." What may be counterintuitive is the fact that there may not be any expert that isn't relevant when it comes to scenario development. As an inherently systems theory-

based process, it is recognized that even the most odd or tangential fields can have dramatic second and third order effects on any primary environmental area of interest. Music, for example, may have as much global political ramifications as religion. Or, NASA's programs may have connections to the citrus fruit industries in China and the United States. The question then becomes how to appropriately limit this scope to what is manageable in the exercise while casting as wide a net as possible.

4. *Experts are invited to develop timelines into the future*: This is the part of the exercise where real creativity is used most and there are few limits. "Timelines into the future" is synonymous with "future histories." Both are simply timelines looked at from one of two perspectives: from now forward to 25 years, or from 25 years looking backwards to now. In either case, the process is essentially the same although the two perspectives can make for some interesting nuances in creativity. The steps here are to conduct individual interviews with each expert in a different field in a room with post-it notes and a long piece of paper taped to a wall. The expert is given a pen and told to post ideas about his/her field along the time line with an emphasis in our example on the three sub time blocks of 10, 20 and 25 years. Once that is achieved, the expert is asked to fill in the blank spots as much as possible with ideas or innovations upon which each of his future ideas would depend. For example, if the expert put down, "in 20 years from now, we will have flying cars," he/she might then put down a note, "in 10 years we will have the technology to create really small and light car engines with the same power as today." These dependant links are critical to creating a more seamless narrative of that expert's field between now and 25 years. The sum total of this work would then become either a future history or a timeline to the future depending on your preferred perspective. And the sum total of over 100 different expert timelines becomes the purpose of this entire step in the scenario development process. In the case of PNSR, 133 timelines were developed.

5. *The aggregation, analysis and synthesis of data to develop scenarios*: The 100 expert timelines when populated in a data base becomes a composite scenario of the future in these various fields. Once organized, trends usually appear. Notes are taken and the scenarios are sent out to the experts for review.

6. *Stress testing the scenarios*: The review process becomes a test drive of the scenario. Each of the experts refines and then comments on the trend analyses and the scenario plausibility. Once all is consolidated, the scenario is ready for use by other customers.

7. *Stress testing a particular course of action or creating a new system vision*: Now we arrive at the point where the scenario can be used in either of the two categories discussed earlier. In the case of creating a vision, an organization's leadership would conduct a series of

facilitated workshops of what could be called, scenario emersion by all the members of that group. In our example, the upper tier of Department X management might lock themselves in a room for 3 hours a day over the course of two days living and breathing, almost role playing in this hypothesized world of the future scenario. The facilitated discussions, in our case by professionals from the NAVIC, would allow for a step by step process of discovery in how that future world might affect Department X and better yet, how Department X can best position itself in process, structure, people, etc…to be most successful in that future. Finally, Department X can begin to consider steps as part of a future plan to build organizational improvements over the course of the next several years aiming towards a new vision of itself emanating from this experience.

In the category of stress testing a course of action, the same process may be used where instead of a blank sheet of paper and a wide open discovery process of how the future could unfold, the participants lock down to essentially game out their already proposed course of action of policy and/or strategy against the different futures. In this process, the facilitator may spend a bit more time conducting and then recording a more typical sequence of action, reaction, counter-reaction of one part of a course of action against several parts of a given future in various areas of interest. For example, the group may say that Department X will create a widget in 5 years and sell it to all 3rd world markets. The reaction to that by the facilitator now playing a role player or red team, would be that this widget causes an unfortunate secondary reaction to eliminate local cottage industries causing violence and unrest to spread. The counter reaction might then be to not flood the market but to build the industries in those countries so that they can actually create jobs. The problem is wrestled with from all angles using scenario-based stress testing.

Because few organizations or governments actually go through such steps to search for the answers to these deeper questions, their ability to accomplish any objectives in the long term and often even in the near term become significantly lost in the myopias of the immediate. Scenario use transforms minds and hearts as well as leads others to practical actions towards concrete aims.

It is important to remember that there are an infinite number of potential futures, so a scenario of the future is not a forecast or a prediction but a planning tool to think about events that could happen in the future before they occur. Many seem to intuit this and in the case of stress testing current courses of action; most are not too concerned about whether it is a prediction or not because they are just happy to have anything to game against that is at least plausible. But in the case of creating a vision, there still exists systemic confusion over just what a vision is and whether it is worth the effort in creating one especially if the future is so difficult

to ascertain with any semblance of certainty. Just consider how many got the recent market decline wrong.

To that end, there are really two major uses of the word "vision" in today's world. One is the rather popularized "vision" statement for a company or organization... such as the kinds of statements appearing in an organization's annual report that talks about what their members want their organization to become over the next several years... like, "the leader in transportation products and services..." to borrow an example from General Motors. These statements can be used to help communicate where the organization is going and build consensus with key stakeholders, employees, suppliers, unions, constituents, stockholders and so on. The visioning process is especially useful for large complex organizations where multiple systems must come together to create the ultimate product or service for the customer. The process of visioning is sometimes more important than the vision itself and enables side-by-side learning of employees with senior leadership together, as a team. Yet, too often these visions are created by public relations firms or planning staffs without the benefit of the actual process itself.

Examples of Scenario Use in Action:

We will now describe the same 7-step process using real examples of scenarios developed and utilized by the PNSR leadership to stress test the project findings and proposed recommendations for the new national security system.

Determine the purpose and scope of the exercise: This process began by enlisting the assistance of experts in many fields including a cross section of the sciences and engineering. On behalf of Lt. General Brent Scowcroft and Dr. John Hennessy, the co-chairs of the Committee on Scientific Communication and National Security (CSCANS), Patricia S. Wrightson, Ph.D., Director, Committee on Scientific Communication and National Security at The National Academies invited a select group of scientists to participate in a daylong workshop on the future of science and security, co-sponsored by CSCANS and PNSR. On Wednesday, April 9, 2008, the scientists participated in a meeting at the National Academies in which the future was explored. Facilitated by Jim Burke, the director of the TASC Futures Group of Northrop Grumman IT, the scientists explored issues of the past, present and the future.

CSCANS, a standing committee of the National Research Council, worked with the Vision Working Group (VWG) of PNSR to address how scientists understand and assess the future. The two groups co-hosted the joint-futures and forecasting workshop on the Future of Science and Security. The agenda included lively dialogue and ways to solicit scientists' and other experts' views of emerging trends and future events that could affect national security.

This series of events helped the VWG develop the purpose and the scope of the eventual scenario development to include what questions should be included in the questionnaire.

Development of a questionnaire: Following these events, the VWG working with colleagues from the Northrop Grumman IT TASC Futures Group, determined the best approach for a survey instrument in which individuals from many fields would participate in an online questionnaire. Based on feedback from the National Academies workshop previously and the NGIT TASC Futures Group, a questionnaire was finalized that would be used to populate a data set depicting different events through the eyes of multiple experts across a 50 year timeline into the future.

Development of a list of experts across many fields: Following the development of the questionnaire, the VWG created a list of leading national experts in many disciplines across the sciences, engineering, futurists, and other fields too numerous to list here.

Experts are invited to develop timelines into the future: The questionnaire was sent to about 1500 experts by email. The goal set was for a 2-3% return – enough to claim a valid sampling. The VWG actually obtained a 9% (133) response rate (See Appendix D for a listing of those experts who gave permission to use their identity).

The aggregation, analysis and synthesis of data to develop scenarios: The experts' insights on future trends and milestones were aggregated, analyzed and synthesized to build a composite future scenario and to develop trend analyses. The trends identified by the experts were then woven into the nine scenarios representing the three time horizons; 2020, 2040 and 2060.

Stress testing the scenarios: Before the scenarios could be used to stress test the recommendations of the Project, the VWG asked the Commandants of three schools at the National Defense University to choose selected faculty who teach in the national security curriculum of each school to review all nine scenarios and provide feedback regarding their validity. This faculty included those from: 1) The National War College; 2) The Industrial College of the Armed Forces, and; 3) The Joint Forces Staff College. Based on the feedback of the faculty, many changes were made to the scenarios.

Stress Testing the Major PNSR Solution Sets: Finally, the VWG used the nine scenarios to stress test the major recommendations of the PNSR over the course of three sessions using all of the chief concept developers for the project study (including those in structure, human capital, knowledge management, congressional services, and process). The scenarios were intentionally designed to stress the concept developers' study recommendations from several angles: 1) what did they think were the key stressors in the scenario from their sub-system perspective such as

human capital reforms? 2) how well was their sub-system able to anticipate the scenario problems? 3) if unable to prevent/remove the threat, how well was their sub-system able to react? 4) how well was their sub-system able to recover? 5) how well does the overall national security system proposed by the PNSR function as a whole in these scenarios?

The initial letter below was given to the PNSR concept developers (the PNSR Working Group Leaders) to start the process.

> Dear PNSR Working Group Chairs and Members:
> The Vision Working Group has developed the following alternative future national security scenarios for your consideration. These brief scenarios are designed to provide a range of perspectives on how the next few decades might unfold. The purpose of these scenarios is to assist you in the hard work of creating PNSR policy recommendations that will stand the test of time.
> The National Security Act of 1947 has survived largely in tact for 60 years, despite major social, technological, economic, environmental, and political changes. These cumulative changes are a primary reason why the Project on National Security Reform is necessary.
> Similarly, we will face extraordinary changes in the next 60 years. In fact, many futurists, forecasters, and technologists believe that the rate of change in the next decades will be faster than the decades preceding.
> It is with this in mind that we were asked to create a set of scenarios that would provoke discussion and debate within your working groups and hopefully lead to better, more resilient policy recommendations.
> As a caveat, these scenarios have been intentionally designed to stress your recommendations from several angles. The scenarios should not be viewed as predictions of a probable future, but rather glimpses into plausible alternative futures. The scenarios are intentionally inconsistent and oft times bleak, all in the interest of provoking a wider range of conversation.
> Each scenario is followed by specific discussion questions to ponder. Some questions may be more applicable to your working group than others. Here are some general questions you can use when reading each scenario: 1) how would my working group's recommendations function in the scenario presented? 2) are there problems or solutions identified here that we have not addressed? 3) if this future is not desirable, what choices should we be making today to avoid it?
> In an effort to make the scenarios more accessible and tangible, we have generally used the actual names of countries and locations. Other names could easily be substituted for the ones used.
> Last, but not least, I would like to thank the National Academies for their help in eliciting the future insights of dozens of leading scientists and engineers for this effort. In addition, we received insights from forward-thinking contributors in other fields too numerous to mention, as well as review comments from the Industrial College of the Armed Forces, the National War College, the Joint Forces Staff College and Argonne National Laboratory. I hope you find these scenarios interesting and useful.
> Sincerely,
> Dr. Sheila R. Ronis, Chair
> PNSR Vision Working Group

Throughout all the steps, the VWG benefited from the expert assistance from Northrop Grumman IT's TASC Futures Group led by Jim Burke and Chris Waychoff with Matthew Russell and John Meagher in the development of the Pre-Reform scenarios. The final Post Reform Alternative National Security Scenarios (2020-2060) were developed by Chris Waychoff. Dr. Sheila Ronis, the Chair of the VWG and Jim Burke, Northrop Grumman's Senior Futurist, facilitated the discussions with the PNSR concept developers. As the PNSR concept

developers worked through the scenarios, it was clear that each of the PNSR recommended solutions performed differently in the different scenario situations. Strengths and weaknesses of the solution sets gradually emerged leading to eventual adjustments to PNSR recommendations before publication.

The Pre & Post Reform Scenarios

The PNSR concept developers were presented first with scenarios during the initial process of developing recommendations. These scenarios were called the Pre-Reform Scenarios. Later, the VWG updated these same scenarios based upon the final PNSR recommendations. In other words, several selected final recommendations were actually written into the scenarios to see how they would stand in future. These final scenarios were called Post-Reform scenarios. The-Post Reform scenarios were developed by asking: "would this have happened in the same way had these PNSR recommendations been in place starting in 2009?" These updated Post-Reform scenarios focused on the major impacts of the PNSR recommendations on the scenarios.

As with any use of scenarios, they are only intended to be suggestive and not definitive. They do not represent a complete narrative of every system impact in any future. In our case, these nine simply gave us a glimpse into a plausible reaction to the PNSR recommendations.

The Pre-Reform Nine Scenarios are:

2020

Scenario 1: Red Death

Scenario 2: People's War

Scenario 3: A Grand Strategy

2040

Scenario 4: A New Economy

Scenario 5: Pax Robotica

Scenario 6: Who Holds the High Ground

Scenario 7: A Brave New World

2060

Scenario 8: A Warm Reception

Scenario 9: It's a Small World

A Special Note on the Possibility of a Technological Singularity by 2060

Scenario 1 2020

Red Death

In this scenario, we meet a country struggling to get back on its feet after a major biological attack and witness a debate about the future role of the US government both at home and abroad.

Dr. Meishan Prosper, MD, ScD, cycled through the various web feeds of the inaugural Strength Through Unity Summit looking for anyone she knew. She assumed it would be unlikely given the death toll over the last three years. The first response and medical communities had been the hardest hit, but no group of Americans had gone untouched.

The word that was usually used was "decimated," but she knew that decimated literally meant the death of 1 in 10 people. The Red Death, attacking the victims' central nervous systems, had taken one quarter of the world's population seemingly overnight and left an additional quarter paralyzed with few people to care for them.

It had struck with no warning. It hadn't been picked up directly by any of the urban or airport biosensors put in place over a decade ago when the United States had feared an imminent biological attack following 9/11. After Bin Laden had been found dead in a tribal village in Pakistan, the desire to improve the biosensors' capabilities had waned and other priorities had risen to the top.

Of course, the sensors of those days would not have picked up the bio threats of 2017. Biological research had made massive strides in the intervening decade and a half. Genetics, proteomics, and synthetic biology had all surged forward with the increasing automation and miniaturization of biological research.

By 2017, biological research had become much more the domain of information hackers than of beakers and glass vials. Following an exponential rate of change, the capability to manufacture and modify biological agents had long since become cheap and easy to acquire despite international prohibitions. The attack could have come from anywhere.

Even if most of the survivors hadn't been told to stay in their homes, there were not enough people to maintain transportation, distribution, and public order. There were not enough skilled workers to run farms or factories or public water and sanitation systems. Trade ceased. Foreign oil supplies ran out. Power plants and generators went silent. For all intents and purposes, the world had stopped. People looked inward and national governments gradually dissolved. The global, national, and local economies collapsed, causing widespread starvation, disease, and violence. The situation was desperate and hopeless.

The United States had fractured along state and then local lines. Some communities, closer to their rural roots and managing their own security, began to show signs of recovery as soon as the virus had burned itself out a year ago. Larger, more urban areas had been mostly deserted as food stocks ran out and only now were showing signs of life.

Today, the US federal government was making its first tentative efforts to reestablish centralized national governance. Some parts of the country were eager to return to the way life had been before the Red Death. Other parts were leery of their neighbors and thought that the Red Death was proof that a centralized government was not the answer. Some pockets of Americans had declared their independence and were preparing to defend themselves against all comers.

This pattern was replicated around the world. New political boundaries were being established. Many national borders, drawn a hundred years earlier by departing colonialists, were now being redrawn by local tribes and ethnic groups. In most places, the populations were too exhausted to fight over this new political reality, but in other regions warlords, demagogues, and nationalist leaders seized the opportunity to engage in horrific acts of ethnic cleansing.

A vocal minority at the Summit argued vehemently for the need to reestablish a strong federal government to face this new world. They feared that the United States' leadership of the world over the prior 80 years would be supplanted by whichever major power could recover first. Dr. Prosper allowed herself a brief smile over this "recovery gap."

Dr. Prosper, representing the Empire State of Georgia, could be counted among the remaining representatives to the Summit who were varying shades of "isolationist." They wanted no part of the wider world, except perhaps for trade on the strictest of terms.

Dr. Prosper knew this attitude did not come from the objective, scientific part of her brain, but rather from seeing her family, friends, and colleagues die around her. She didn't want to risk that ever happening again.

Dr. Prosper had been at her office at the Center for Disease Control in Atlanta when the first hints of a major pandemic had been picked up through syndromic surveillance systems, first in Washington, DC, and then from all the capitals of the world.

She spent the next two months dividing her time between the CDC's Biosafety Level 4 lab and its telepresence media center before the remnants of her team and the Army team at Fort Detrick determined that the pathogen was artificial and had been released at what turned out to be the last meeting of the United Nations General Assembly.

Occurring just before a scheduled recess, dozens of infected diplomats had returned to their capitals to report on their activities to department executives. These executives in turn briefed their heads of government and within two weeks time, the world's governments were largely decapitated.

With the US federal government reeling, the state governments acted with varying degrees of effectiveness to the profound threat. Some states had inadequate or poorly resourced plans and succumbed immediately. Others were able to maintain ring quarantines and sanctuaries for a time, but with individuals evading checkpoints to find loved ones, the Red Death eventually came to every corner of the country.

Dr. Prosper shifted in her seat to listen more closely to the representative of the Free State of the Rockies. She could tell by his full MOPP gear—gas mask and full body suit—that the Free State was not going to swallow a new national government easily. Its people were skeptical that a newly formed federal government would do what it needed to to keep them safe. Many Free Staters had died from untested vaccines the federal government had rushed to many parts of the country. Now, they were unconvinced by any federal assurances.

Despite, or perhaps because, she had designed both the unsuccessful and eventually successful vaccines, Dr. Prosper understood their concerns. After all, the world was full of people with the means and motivation to attack again and the original perpetrators of the Red Death had never been found.

Discussion

How can the US plan and prepare for a catastrophe so devastating that it would shatter national governments worldwide?

Is the US leadership adequately protected?

How resilient should continuity of government plans be? Should they extend beyond the federal government?

How do you balance the roles of the federal, state, and local governments during a catastrophic disaster? Government and industry?

How do you maintain the medical infrastructure when you have millions of incapacitated patients?

How long would it take the world to recover from this catastrophe and which countries will end up on top? What will happen to the world if the US loses its leading status?

Do biological defense strategies anticipate emerging bio agent design and production capabilities?

How do you gain and maintain political support for investment programs when the threat is either novel or not viewed as urgent?

Scenario 2 2020

People's War

In this scenario, the United States faces global asymmetric warfare against a nuclear-armed great power. The entire federal government is caught in the conundrum of how to respond to anonymous attacks at home and abroad while avoiding an escalation to nuclear war.

Intelligence Specialist Robert Wong slammed his hand down on his desk. The meeting in the Director's office had not gone as planned. For the past three weeks he had raised red flags only to be shot down by his more senior peers. He was being rash. He didn't understand the bigger picture. It was a local police matter. He didn't have evidence. And now they were looking at him suspiciously!

Well, what evidence did you need when key US government personnel were being selectively assassinated by Chinese nationals? Just because the Chinese government claimed the assassins were grad students acting on their own patriotic initiative, that did not mean we should believe them.

At least this time he had arm-wrestled a footnote with his dissenting opinion into the latest estimate. Why couldn't they see it? Just because the attacks weren't being carried out by soldiers in uniform, it didn't take a genius to figure out that China was fighting a conventional war by other means.

The war had begun five weeks ago, just as the new, nationalist Taiwanese President was to declare his nation's independence. Before he could make his address, the power went off across Taiwan and defense radars went down. The US Pacific Fleet, which had been sent into the Taiwan Straits before the speech as a show of support, were driven back out of strike range by a sudden and overwhelming barrage of intelligent, supersonic cruise missiles from land, sea, and air. The missiles had saturated the US fleet's air defenses, exhausted its defensive batteries, and sunk a number of ships before the fleet could stage a tactical withdrawal. This left the Taiwanese government to fight street by street with embedded sleeper agents and Chinese special forces paratroopers.

The US President, hoping to avoid a larger and possibly nuclear war, waived off long-range counterstrikes by the US fleet and Air Force in the hopes that a negotiated settlement could be reached. China, claiming a misunderstanding, readily agreed to talks, while fighting continued on Taiwan.

Two weeks later, Wong started to see patterns of a wider covert war in sporadic events occurring on US soil and with US interests abroad. The increasing murders were the first clue. Key intelligence and military officials, leading doctors and engineers, and operations managers of critical manufacturing plants were killed according to some indecipherable plan.

Next came seemingly random power outages and overloads and the shutdown of public safety, aviation, and industrial systems. Anonymous commands from hackers around the

world had been sent through secret backdoors embedded in computer chips years ago. Businesses and government agencies that had consolidated their information systems around a single, dominant operating system were shut down by a torrent of viruses, worms, and Trojan horses.

It was obvious to Wong that China was playing hardball to get the United States to acquiesce to its "reunification" of China, reduce US influence in Asia, and accept its full parity on the world stage. Around the world, Chinese allies and partners were halting mineral and gas shipments to the United States and its allies in Europe and Japan. Global industrial supply chains were being shut down at the lowest tiers, halting production of numerous US weapon systems and other critical items. Chinese ships had "accidentally" broken down in the Panama Canal and Panama was making no effort to clear the way. Piracy in the shipping lanes had spiked. Maoist guerillas had started new offensives in several countries in South America, Africa, and Asia.

It was clear to Wong that China was flexing new-found muscles and was going to squeeze the United States both at home and abroad until it achieved its ends. When would the country wake up and do something?

Discussion

How do you approach an asymmetrical war fought abroad or on US soil with a major nuclear power?

At what point do economic and cyber attacks become grounds for a larger conventional or nuclear war?

How do you safeguard your international supply chains when the world is increasingly interdependent and the lowest tiers are all but invisible?

In government discussions, how do you balance the need for consensus and the need to hear all voices?

How are the roles of the military, law enforcement, and intelligence coordinated?

How do you protect your critical infrastructure and key personnel from sleeper agents on US soil?

How do you balance human rights and security when dealing with a potentially hostile subgroup within the émigré community?

Could the US acquiesce to Chinese demands in such a situation and maintain its credibility?

Scenario 3 2020

A Grand Strategy

In this scenario, we explore the utility of an integrated grand strategy development capability for smoothing the transition from one Presidential Administration to another.

President-Elect Anne Cummings stepped down into the well of the large conference room with her entourage. The lush blue carpet and warm wooden panels created a hushed effect, almost like entering an old library or a church. A bird fluttered across the oval skylight. "*Was that real sky?"* she wondered.

Tom Hughes, the Director of the National Strategy Integration & Visioning Agency, strode across the carpet and extended his hand. "Welcome back, Governor. We are honored to have you here today."

"It is my pleasure, Tom. It's good to see you again in person. It's been a couple years since we held the Governors Convention here," she said with a warm smile. "You know Dr. Tyrone Chandra, my national security advisor, Ms. Catalina Sharp, my economic advisor, and Ms. Akemi Takahashi, my long-range planner?"

"Yes, good to see you all again. Akemi has been working very closely with us and her predecessor to refine the underlying model assumptions. I'm happy to say that not much tweaking was necessary. We paid pretty close attention to the campaign," beamed the Director.

"I'd also like to welcome the folks conferencing in," the Director said, indicating the faces strung out along the top edge of the screen that wrapped floor-to-ceiling 270˚ around the conference room. "We are pleased to have your transition liaisons join us from the various department strategy offices, along with senior representatives of the outgoing Simpson Administration. Welcome all."

"My mission today is to acquaint you with the general operation of the National Strategy Integration & Visioning Agency and its departmental satellite offices," announced the Director.

"NSIVA was created in 2013 to assist the President and his Administration in developing a dynamic national grand strategy. The ability to create such a strategy was complicated by interagency stovepipes and rice bowls, political constraints on free and open discussion, and the technical difficultly of developing an integrated strategy in an increasingly complicated and interconnected world.

"The hope for the new organization was that it would not only be a safe place to debate, develop, test, and monitor long-range strategies, but that it could be an objective source of information that could withstand a change in administration. The problem, of course, was that pure objectivity was a mirage. Despite the best intentions and the selection of generally open-minded staff, bias and ideology always crept back in.

"The answer was to embrace varying points of view…to model and evaluate all points of view, rather than trying to find the one correct view," continued the Director.

"As I hope Akemi has told you, our bipartisan or rather multi-partisan process is now ensured through our agency's host of checks and balances. These measures touch on all our activities from how we hire and rotate our staff to how we build our models and debate the results.

"We also found that an open process keeps us honest, so we have developed an extensive outreach process to participants across the political spectrum, in government, industry, and academia. Our public discussion boards are particularly lively–there is nothing some posters like better than catching us with an unsupported assumption or an incorrect application of an algorithm," chuckled the Director.

"So are all points of view deemed to be of equal value and effectiveness?" asked Dr. Chandra, the incoming national security advisor.

"I wouldn't put it that way. While all points of view are captured and modeled, their value and effectiveness is determined by many other factors within the modeling system. Positions must be supported by evidence or coherent logic paths. If they are simply assertions, they will be flagged as such," replied the Director. "Why don't we look at an example?"

Swiping the screen of his wristwatch, the Director brought the main wall to animated life as a timeline stretched from 1980 at one end to 2080 at the other.

"Let's run a quick 'what if' scenario," said the Director as he walked to a large, inclined touchscreen table in the center of the room. Waving his hand over a world map, he highlighted the countries of the nascent Latin American Union. The main wall glowed with event and trend markers in a rainbow of colors.

"This view here is as close to a normative, objective view as we can produce. As you see, it's pretty sparse and contains only elements that are demonstrable, accepted facts or trends that have been broadly agreed upon within the statistical boundaries indicated."

"If we call up your Administration's view," the Director said as he subvocalized a command to the wall, we see there is much more detail at this level. We can also cycle through the department views…notice the intersections where one department's strategy runs into another department's."

"What are the flashing icons?" asked Dr. Chandra.

"The flashing icons represent new elements that have been placed on the wall by the system's estimation engine, but have not yet been validated by our team members. This one here is an analysis by the State Department's Latin America Desk of General Secretary Chávez's recent address to the LAU General Assembly. As you can see, if I tap on the icon there is a complete argument map supporting the analysis, plus a video of the speech."

"Do you get a feed of all operational and intelligence information?" quizzed Dr. Chandra.

"No, we don't. We are neither an operations center, nor an intelligence fusion center. We are strictly an open source, meta analysis center, integrating the best analysis of our government and public partners. We find that what we lose in not having access to the latest classified information is more than compensated for by our ability to have an open dialogue with a wide variety of experts and stakeholders. Moreover, our timeline is a little longer. We are not overwhelmed by the day's in-basket. We have the luxury, as well as the responsibility, to look longer term."

"Can we look at the trends from an economic point of view?" queried the President-elect's economic advisor.

"Certainly. Here are the Administration's economic trend lines under the 'what if' assumption that Mexico joins the LAU embargo of oil to the United States."

"What is that red line receding into the background?" she asked.

"That indicates a strong sensitivity between this economic scenario and domestic politics in the US Southwest," the Director replied.

"Have you gotten to the point where the grand strategy writes itself?" joked the President-Elect.

"Hah, hah, no, no, the primary job of the models, analysis, and visualizations you have seen is to get our collective thinking organized. There are too many options, too many impacts, too many interrelationships for the human mind to follow without assistance.

"The Agency helps avoid repeatedly reinventing the wheel and arguing past one another. The real work, the work of finding common ground, crafting solutions, and implementing these solutions to achieve national objectives only begins here with your people, aided by our staff. Decision making remains the domain of the President and Congress."

Discussion

How important is having a dynamic national grand strategy?

What is the relationship among national security strategy, economic strategy, diplomatic strategy, public health strategy, etc.?

How can the strategies of the federal agencies be integrated better? The strategies of the executive branch and Congress? States? Industry?

What can be done to smooth the transition between administrations?

How can knowledge developed over one administration be shared with another?

Is it possible to have open, honest, rational political debate within the government?

Should the public be invited to take part in strategy development?

Can technology be used to extend the understanding and thinking of policymakers?

Can the United States look beyond
2-year and 4-year political cycles?

Scenario 4 2040

A New Economy

In this scenario, the United States faces its worst economic crisis since the Great Depression. The crisis is a perfect storm of the unintended consequences of new technologies, policies, court decisions, and popular expectations.

Ron Guilder craned his neck to get a better view of the podium on the stage in front of the Washington Monument. He could have gotten a better view if he'd stayed home and jacked into his home virtuality system.

"What do we want?" challenged the speaker.

"JOBS!" responded the sea of angry faces.

"When do we want them?"

"NOW!"

Guilder always felt a little awkward chanting and didn't join in. It seemed so, so proletarian to him. He had been, after all, the Chief Financial Officer of a Fortune 500 company and did not consider himself working class.

"1, 2, 3, 4, WE WANT LIFE AS BEFORE," the speaker and crowd chanted in unison. "5, 6, 7, 8, GIVE US JOBS OR MEET YOUR FATE."

Guilder was not alone in the crowd. Many of the protestors in fact were former white collar workers who had been displaced years ago by the ever increasing acumen of enterprise management systems. In this crowd and concurrently around the country, former managers intermingled with touch labor and service workers, all eased out of their jobs by smart machines and smarter software.

At first, Guilder had embraced his new life of early retirement and leisure. He had known for a while that automated management systems could do a better, faster job of financial planning than he could. Robotic manufacturing and intelligent management systems had streamlined business, lowering prices on goods and services to the point where everyone had the basics plus many luxuries too. A monthly government stipend was all that was necessary to live the good life.

Of course, it had not been like that in the late 20s and early 30s when intelligent machines first started to displace workers in droves. Unlike the gradual disappearance of telephone switchboard operators and secretarial pools in the 20th century, the rapid displacement of blue collar and service workers left a large portion of the population suddenly without jobs and no hope for future employment. Food riots, martial law, tent cities, work relief programs, robot sabotage, and union busting became a sign of the times.

The Income Preservation Act of 2034 was Congress' first attempt to stabilize the situation. Businesses were required to maintain a specific percentage of workers, whether there was work for them to do or not, and provide mandatory pensions for the rest. In addition, annual stipends were disbursed from the Treasury to unemployed individuals. The newly repurposed Department of Labor and Leisure actively promoted the benefits of a leisure society to ease the transition from the standard 3-day work week to not working at all. Most people couldn't have been happier: unlimited free time, cheap goods and services, and fully immersive, sensual virtual entertainment.

To pay for this government largess, taxes were raised on businesses, and those few individuals who still had jobs (designers, innovators, entertainers, athletes), owned or operated businesses, or lived off family wealth. The combined federal and state tax rates soared over 90% as the government strove to pay for escalating stipends to keep the public happily at home. The tax increases, the restricted labor market, and the looming threat of industrial nationalization had the effect of closing some businesses and compelling others to flee to tax havens overseas. Businesses raised prices in an attempt to keep up with the rapidly changing tax structure. As the tax base dried up, the President pressured a weak Federal Reserve to increase the money supply. Slowly, but surely, inflation rose.

Over time, the previously mollified public began to feel the pinch. Stipends were not keeping up with prices. In 2039, an appeal to the US Supreme Court found a Right to Food and Shelter in an emanation of a living Constitution. The government began to print more money to meet these new entitlements. Last month, the automated investment management systems around the world monitoring this latest dilution of the value of US currency began to dump dollars onto the world market. The US stock markets crashed. US Treasury securities, municipal bonds, and corporate bonds all dropped to their lowest possible ratings. Businesses closed, trade ceased, world markets collapsed—a vicious cycle of hyperinflation took hold pushing 100,000 percent.

Guilder seethed with unfocused anger. A loaf of 14-grain artisan rye bread now cost him $2 million dollars. Somebody needed to do something! But what? As a former CFO, he understood the economics, he understood the trap the country had fallen into. He himself had enjoyed the benefits of the new economy. Now this! He couldn't feed his family. His life savings were gone. Where could he find hope?

In the distance, he saw black smoke rising from the burning effigy of the President. A young Silverite thug, looking for a fight, shoved past him toward the acrid smoke. A surveillance drone hummed overhead.

Discussion

What is the role of national economic health in national security?

How would a world with large-scale unemployment affect national security?

How would a major financial crisis affect our position in the world?

Can the US political system survive without a middle class?

What is the role of the military in a national uprising?

What interagency mechanisms are affected by long-term changes in workforce composition and structure? In unions?

Given the shut down of the nation's economy, how would federal, state, and local governments handle a nationwide emergency relief effort? How would state and local governments fund their own activities?

How would we coordinate with international organizations and foreign countries offering aid?

Would we restrict emigration of people from the United States? The rich? The poor? The educated? The innovative? Businesses?

Will surveillance systems reduce the likelihood of violent uprisings?

Scenario 5 2040

Pax Robotica

In this scenario, we explore the intersection of unmanned, robotic warfare and on the ground diplomacy. This scenario depends upon the continuation of current accelerating trends in robotics and sensors technology, as well as a public policy choice to enable greater real-time interaction between the military, diplomatic, and intelligence arms of the US government.

Total dominance of the battlefield had been achieved in just three days. From command bunkers in Colorado, override controllers watched as autonomous robotic swarms annihilated the loyalist Homeland Guard with minimal collateral damage. The remainder of the Chuntu Army saw what was coming, listened to the broadcast warnings, dropped their weapons, and ran home as fast as they could. The genocidal Chuntu leadership was captured or killed in brief, but brutal, house-to-house fighting with wheeled, crawling, and airborne robots.

Now, two weeks after the UN-sanctioned invasion, the process of recovery was in full swing. Engineering robots cleaned the battlefield of damaged equipment and unexploded ordinance and set about repairing damaged infrastructure. Diplomatic Officers were sent into the field to address humanitarian needs and political reconciliation.

Diplomatic Officer Amanda Huygens rode her FCV-30 Forward Control Vehicle into the seemingly deserted village of Saya and dismounted. Her cotton uniform blouse fluttered in the gentle breeze as she scanned her environment. Saya was a single street tribal village far off the beaten path.

Known to be sympathetic to Homeland Guard insurgents, the village had been under close observation since the initiation of hostilities. As the first American on the scene, Amanda had been sent to assess the humanitarian needs of the village and render assistance as needed.

Her Army GuardBot escort team scurried and hovered ahead, investigating the road, the buildings, and obstacles along the road. Amanda's retinal scan indicated that the path to the local tribal chieftain's concrete and tin house was clear. Reminders of local etiquette scrolled across her lens as her heightened senses strained to hear any impending danger.

Knocking on the door, she called out “Yo soy un diplomático de los Estados Unidos. Estoy aquí bajo orden 235 de la O.N.U.” Her universal translator converted her West Texas drawl into a reasonable facsimile of rural Chuntu. A tall man in his early forties answered the door. As he extended his right hand in a gesture of friendship, the Army GuardBot closest to her detected an added weight in his left. As a machete came into view, the GuardBot overrode its standing rules of engagement and sprayed the chieftain with 1,000 paralytic microflechettes, instantly bringing him to his knees.

An Army Colonel, overseeing the escort operation from Colorado, reacquired control over the GuardBot and cautioned the chieftain through the GuardBot’s onboard translator

not to struggle and the effects of the drugs would be reversed. Instead, the chieftain began to subvocalize a command to his home communication network. The Colonel twitched his eye and the microflechettes anaesthetized the chieftain completely. He then commanded the rest of the robotic escort team to jam communications and lock down the house.

He quickly saw however that he had been too late. The message must have gotten out, because almost immediately he began to pick up a feed from nearby aerial surveillance drones that a group of vehicles violating curfew were heading towards the village. Microbots dispersed throughout the battlespace, hitched a ride on the vehicles and determined their armament, confirming their hostile intent according to the rules of engagement and the announced curfew. Amanda, reviewing the sitrep in coordination with intelligence and diplomatic officers, stood by as the Colonel sent a real-time request for a military strike against the convoy. With no override order coming from Washington, the request was passed to a circling UCAV squadron, which carried out a high-energy laser strike within five minutes of the initial sighting.

Amanda leaned over the chieftain and wondered at his reaction. Surely, by now he would have understood the complete dominance of US forces. He should know that she was only there to provide his people aid and a chance at a fresh start. She shivered at the thought of the machete, not wanting to be the war's first American casualty. She got back up and signaled to the rear humanitarian group to send forward the robotic reconstruction convoy and the standard class 3 rural supply package.

Discussion

How will military, intelligence, and diplomatic branches interoperate (or even merge) if diplomatic officials are the only Americans on the ground in war zones?

What will be the role of the soldier if the battlefield is dominated by unmanned intelligent robotic combat and sensor systems?

How much freedom of action should autonomous robots have on the future battlefield?

How will coordination and decision making occur when decision cycles are measured in minutes, seconds, or even microseconds? How does this impact the chain of command?

How will coordination and decision making occur when local decision making can be overseen in real time from around the world?

How would less-than-lethal weapons change the nature of warfare and post-war reconstruction?

What are the international legal and political implications of a graduated approach to less-than-lethal and lethal force? Would its use constitute torture?

Scenario 6 **2040**

Who Holds the High Ground

In this scenario, we envision major competitive changes in the Earth-Moon system from the perspective of a traditional interagency space working group.

It's hard to put a finger on just when the land grab for the moon began. It might have begun with the arrival of private lunar rovers. At first, these companies made money by giving internet users an opportunity to remotely navigate the lunar surface from the privacy of their own dens. After several rovers were driven off cliffs, the owners reorganized to make money by claiming lunar real estate for those willing to buy an unenforceable deed and pay a continuing "maintenance of claim" fee.

The land grab might also be timed to the arrival of permanent moon bases by China, Russia, India, Brazil, the Islamic Republic, and the EU. Yet, these bases and their declared "territorial buffer zones" still only occupied a small percentage of the lunar surface.

Regardless of when the land grab began, it took off in earnest with the development of second-generation fusion reactors on Earth, which used Helium-3 as fuel. He-3 deposits were known to be more abundant and accessible on the moon than on Earth.

Almost immediately, the moon bases began to send out rovers to test the lunar soil for He-3. The Group, a shadowy consortium of transnational corporations and wealthy individuals from all corners of the globe, seeing the potential for cornering a major new fuel market, bought their own passage to the moon and set up large-scale industrial strip mining operations, visible from Earth.

Despite a strong outcry by lunar environmentalists and poets alike, the Earth's unquenchable thirst for energy and the massive profits involved kept the pressure on to mine.

"If we don't get going soon, there won't be any place left for us to land!" exhaled Assistant Secretary Ted Benson of the Department of Commerce in exasperation.

"We shouldn't have left in the first place! We were sitting on a gold mine and we didn't even know it," echoed Rascal Schwarski, NASA's Chief Engineering Officer.

"NASA had a choice to make and you chose Mars and robotic space exploration instead of extending the useful life of the Asimov moon base," chided Dan Higgs, Deputy Undersecretary of Defense for Space Acquisition.

"Extending the moon base would have required an act of Congress. It doesn't matter how much you are authorized to spend, if they don't appropriate any funds!" Schwarski said defensively.

"Besides, we all know the DoD makes all the real funding decisions with Chairman Russell behind closed doors," added Schwarski.

"I wish that were so," chortled Dan. "Then, I wouldn't be sitting here with you knuckleheads every week for the past year trying to make a decision on the new space architecture."

"Can we all at least agree on a general goal, say 'return to the moon by 2045?'" pleaded Ross LaPorte, the President's Science Adviser. "We need to show some progress here."

"We won't have a launch system that can support that," Schwarski frowned. "The space elevator program award is still undergoing a challenge and won't come on line until at least 2050"

"I still don't understand why we can't just kill the elevator and take a low tech approach like our competitors," said the Commerce rep. "Or better yet, let's just buy commercial services."

"We've tried, but The Group has bought up all commercial flights for the next 20 years. I'm not sure if they need the flights or just want to keep us off the moon," said Schwarski.

The US lead in space exploration and launch was lost as early as 2015, when China came online with its first hypervelocity sling. The mechanical "slingatron" allowed the Chinese to continuously hurl satellites and fuel for reusable launch vehicles to low Earth orbit (LEO). (It also provided China with a global conventional strike weapon.)

By 2020, other countries and companies, seeking to get to space on the cheap and tired of waiting on bureaucratic international collaboration efforts, bought their own slings and quickly began to fill LEO and later geosynchronous orbits with a host of satellites.

The United States did get to the moon in 2019, using the Constellation System, but the system was soon phased out as Moonbase Asimov was shut down and the DoD chose to pursue its own new set of high-performance rockets.

The space elevator was going to be the long-term solution to the waning presence of America in space. A 60,000 mile high, carbon-fiber ladder to the stars, the elevator would dramatically lower costs to orbit and make space travel truly routine. And, unlike those crude slings, the elevator would be an engineering project for the ages. A new world wonder. An unprecedented achievement. The only problem was that they couldn't get it to work and they couldn't get past the endless bid protests. The 10 trillion dollar elevator would be a major contractor prize, if the General Accounting Office would just sanction an award.

"Can't you help NASA out with a few rides, Dan?" asked Presidential Adviser LaPorte.

"Our birds are focused on acquiring the remaining few geostationary orbits and defending our others from potential high energy laser anti-satellite weapon attacks. A

number of EU satellites have been mysteriously winking out, when a Russian bird gets too close. Ross, we just don't have the capacity for a new mission," replied Higgs.

"Then I guess we table the discussion until our next weekly meeting. I trust you all will look for a solution with your internal process teams," prodded LaPorte. "Hopefully, we won't be looking at another recompete on the elevator."

Discussion

What is the national security role of space transportation and exploration?

How will the emergence of a dynamic Earth-Moon system affect the roles and missions of the various US departments and agencies?

How should competing departmental interests and goals be managed? Can these goals be aligned with national goals?

How will an increase in international and commercial space activities affect US national space interests?

How is public and congressional support for major, long-term space initiatives maintained?

What should be the government role in developing and providing launch services?

Scenario 7 2040

Brave New World

In this scenario, we examine a plan to apply proven neuroscience, psychiatric, and medical techniques to the control of pathological behaviors in a world of readily accessible weapons of mass destruction.

Colonel Samuel R. Wright, Commander Neuro-Psychological Operations, Special Forces Command

Statement Before the Senate Global Relations Committee
Martinsville, WVA 14 June 2040

Colonel Wright: Ms. Chairwoman, Senator Wilkes, and Members of the Committee, I appreciate the opportunity to address you at this important moment in our history.

The recent unfortunate release of classified mission information by the Google Times has compromised our efforts to help bring about the end of the threat of weapons of mass destruction in our time. I will not be able to go into detail about our mission in open session, but the general outlines are already well known.

I would like to summarize my testimony and submit the full text for the record.

Chairwoman: Without objection, it will be received and added to the record. You may proceed, Colonel.

Col. Wright: Thank you, Ms. Chairwoman.

London. Jakarta. Beijing. Detroit. Sioux Falls. You all know the names. Cities that have been destroyed or made shadows of their former selves by terrorists and individuals seeking to wreak havoc on the rest of humanity.

London came first in 2012. A 15-kiloton improvised nuclear device detonated outside St. Paul's Cathedral. The remnants of Al Qaeda were suspected, but forensic evidence was inconclusive. 150,000 dead, 500,000 injured and diseased. 3,500 square miles contaminated.

A weapon with the same fingerprint killed another 200,000 in Jakarta just two years later. Again, many suspects, but nothing conclusive enough for retaliation.

In 2016, a modified form of the Bubonic Plague swept through Beijing, killing tens of thousands before burning itself out. The culprit: a disaffected 19-year-old medical student experimenting with a home biolab kit.

Detroit was abandoned in 2018, when radioactive cesium was found dispersed throughout the city. No one knew how it got there and despite massive efforts by federal, state, and

local agencies to clean up the city, the people decided not to return and the once great industrial and music hub Motown was no more.

After Detroit, the United States tightened border controls and immigration, but that did not stop the release of smallpox in Sioux Falls by an anarcho- environmentalist group seeking to rid the planet of the "human infection." Fortunately, a series of ring quarantines prevented a wider spread of the disease.

These major city attacks, as you know, have only been the tip of the iceberg. Suicide bombings and mass murders have become rampant in certain parts of the world. Ethnic cleansing occurs all too frequently in underdeveloped regions.

In the United States alone, attempts to explode dams and nuclear power plants, poison public gathering places and farms, and destroy national landmarks grew throughout the 2020s. Advanced, ubiquitous public surveillance systems and expanded law enforcement prevented many great disasters.

The violent tide began to turn, however, in the developed world, as unprecedented changes in the attitudes and behavior of the general population became manifest in the 2030s. These fundamental changes had been brought about quietly by advances in medical science and the development of a full understanding of the workings of the human mind.

Beginning in 2016, parents, who were already accustomed to eliminating genetic diseases from their unborn children, became enthusiastic supporters of new screening tests for the genetic and epigenetic markers of neurological disorders and violent pathological tendencies. How many parents want their kid to grow up to be the schoolyard bully or spend their adult life behind bars?

By 2030, the incidence of youth violence across the developed world showed a precipitous drop. It became clear that the vast majority of violent youth crime was being committed by a fairly small slice of the population, a part that had not been treated as children. New laws were enacted giving convicted adult felons the choice of incarceration or treatment. Recidivism rates became negligible among those treated.

Today, in the United States, in Europe, and in the Pacific Rim, we find ourselves in a new age of unprecedented peace and positive collaboration with all the benefits that entails. Like penicillin a century earlier, the so-called Healthy Mind and Body Revolution has changed personal and public health in ways that have yet to be counted.

Random acts of violence that had become common in the preceding decades have now all but disappeared in the developed world, which brings us back to the crisis we face today.

On April 23 of this year, the Google Times leaked details of Operation Mercy, cutting it off prematurely. This covert operation was undertaken with the full consent of the UN Public Health and Bioethics Council and with the participation of our European and Asian allies.

As far back as the early 2020s, the World Health Organization has been using aerosol techniques to disperse vaccines and genetically modified viruses to treat many of the underdeveloped world's worst diseases. Operation Mercy's mission was to adapt these techniques to apply neuro-therapeutic measures to failed states around the world, starting with the Abbasid Republic. Not only has this pariah state refused to help its own people, it has been actively fueling racial and ideological hatred within its population through pharmacological means.

While historically we have often turned a blind eye to the internal affairs of sovereign nations, this fevered hatred, combined with the increasing accessibility of cheap, home kits for genetic engineering, chemical manufacture, and nanoparticle design, have made it essential for civilized nations to act. No longer can we tolerate individuals with bloodlust in their hearts and the means to create new, untold horrors in the privacy of their basements. How long do we have before one of these twisted, damaged souls unleashes a holocaust on this earth, one from which we cannot recover?

It is our duty to help these people, to bring them in from the cold. If their own governments won't help them, then we will. The leak will obviously make this task much harder. Already several nations are putting their nations on a war footing. It won't be easy to send vaccine-dispersal drones over these countries now, even for routine disease control. I ask that you support our efforts in this important public health initiative.

If you have questions, I'd be glad to answer them now.

Chairwoman: Thank you, Col. Wright, for your testimony. As you know, we are on a short clock here this morning, so I think we should just jump right into questions. Let me begin by commending you on this important public service and your efforts to keep our nation safe. I, myself, lost a sister in Detroit.

To put it bluntly, we are running out time. The advancements in biology, chemistry, and nano-manufacturing over the last two decades have put the power to destroy civilization into the hands of people who cannot control themselves and hold only contempt for the rest of the world. Senator Wilkes?

Senator Wilkes: Thank you Ms. Chairwoman.

Col. Wright, what you are proposing is altering the minds of people you don't like against their will. How do you square this mission with the medical oath you took to "do no harm?"

Col. Wright: These are people who already don't have a choice. Their governments are indoctrinating and drugging their children. Their economies are in collapse. They need our help.

Sen. Wilkes: Colonel, the road to Hell is paved with good intentions. Are we so arrogant as to believe our way is the right way?

Col. Wright: If by "our way" you mean the approach adopted by leaders of both parties in closed session and by the UN and our allies, then yes, we do believe "our way" is the right way.

Sen. Wilkes: But why, Colonel, did you feel the need to target the Middle East for your operation? Surely, there are unstable people in many parts of the world?

Col. Wright: That's true, but there is a particular threat in that region. The Abbasid Republic has not recovered from the devastation and humiliation of the Second Yom Kippur War in 2027. While Israel lost Jerusalem and Haifa, all the major cities of the Abbasid Republic were destroyed in the nuclear exchange. Instead of turning outward for help, the Abbasid Republic turned inward, refusing aid and stoking resentments in their children.

While most of the rest of the world has chosen a path of growth and global community, the Abbasid Republic has retreated into poverty, corruption, and abuse. Right now, as I speak, their children are being trained for suicide missions. I don't think we can afford to find out where they will attack next.

Chairman: That buzzer is our final call for the floor vote on the motion to condemn this operation. Colonel, we will have to continue this another day. This meeting is adjourned.

Discussion

What is the role of government in controlling pathological and anti-social behavior worldwide?

If we develop the capability to cure pathological behaviors, will we use it and how will we use it? What are the unintended consequences?

How will pathological behavior be defined? Who will define it?

What moral, ethical, and legal issues does this raise in regard to the US population? …the world population?

What would our response be to another country using these techniques to control their own population?

How would we defend our own population against adversaries?

What will be the role of law enforcement and the military if pathological behaviors are reduced or eliminated globally?

How would the US gather the necessary intelligence to determine the psychological health of a non-cooperative foreign population?

What would be the impact on the economy of a non-pathological, or even happy, populace?

How would these changes affect the Congressional committee structure and oversight functions of Congress?

Scenario 8 2060

A Warm Reception

In this scenario, we focus on the challenge of developing international consensus for action on the issue of global climate and the possibility of unintended consequences.

Special Envoy Amanda Huygens stepped out on the balcony of the US Embassy in New Delhi. The reception was in full swing inside and she needed to catch a breath of fresh air. As dusk gathered, she looked wistfully over the city towards the New India Gate, rebuilt painstakingly after the war with Pakistan in 2038.

Tensions were building again now. The negotiations were not going as planned. In fact, all the simulations had proven wrong. The Bangladeshi foreign minister was being surprisingly stubborn and had found staunch allies in Canada and the Soviet Republic.

Despite decades of good intentions, as well as political posturing on the importance of "doing something" about global warming, nothing significant had been done. Yes, there were treaties that reduced the rate of growth of greenhouse emissions at the margins and new technologies that had raised the efficiencies of power generation and usage, but the growing prosperity (and the corresponding fossil fuel emissions) of Asia, Latin America, and more recently the Central African Union, had dwarfed these efforts.

"If the temperature rise just hadn't stalled in the first two decades of the century," Amanda whispered to herself, "we could have resolved this years ago."

"That may be wishful thinking," chimed Marta, her "automated personal access liaison" or aPAL. "There is little evidence to suggest that there was any more political will to act in 2015 than there is today."

"Marta, you're such a cynic," thought Amanda. "Link me to the Director, we need to get back to work."

"The Director's assistant tells me that he is in conference. Do you wish to speak with his aPAL, Bobby?"

"Sure…. Bobby, is the Director going to be able to talk to the President today about our negotiating position on the latest dumping of fertilizers into the Indian Ocean? Tell him that we agree with the integrated value analysis by the US Internal Climate Security Working Group that shows that Bangledesh needs to be stopped soon."

In 2051, the Bangledeshi government had decided they had waited long enough for the world to act on global warming. Their country was 5 percent under water. Taking matters into their own hands, they started dumping thousands of tons of iron oxide and chemical fertilizers into the ocean with the intent to cause a massive algae bloom that would absorb excess CO_2 from the air and reverse rising temperatures. Instead, they were shocked to discover that their fertilization of the ocean had supercharged the regional ecological

system with the effect of pumping into the atmosphere massive new amounts of methane—a greenhouse gas much more severe than CO_2.

The result was a sudden spike in global temperature. Gradual global melting that the world had largely ignored now became a torrent. Sea levels began to rise faster than coastal areas could respond, even in the wealthiest countries. Some major cities, like London, New York, Washington, DC, and Los Angeles struggled to hold back the sea. Other areas, such as the Netherlands and large parts of Florida, were abandoned.

The rising temperatures and shifts in regional climates had also dramatically affected agriculture and fisheries. Some areas had too much rain, others too little. Some had too long winters, others had too short. The loss of pollinating species alone had led to the collapse of local ecosystems and major famines. Social unrest and displacement were rampant, leading to conflicts around the globe.

Bangledesh itself by 2060 was inundated, losing 20 percent of its territory to rising waters. A steady surge of refugees tried to cross into neighboring countries, but was stopped by armed border guards. Still, Bangladesh did not stop the dumping. The crisis had finally gotten the world's attention and they were intent to keep the pressure on.

"Excuse me, Amanda. The Canadian Ambassador has arrived for your party and has requested to see you," interrupted Marta.

Ambassador, welcome to the Embassy. Enjoy the refreshments. I'll be with you shortly, thought Amanda. "Marta, what's your analysis of convincing the Ambassador to accept a blockade of Bangledeshi ships?"

"One moment please while I access the US Atmospheric Carbon Sequestration Agency and coordinate with State, Defense, and Intelligence…. I project low confidence that the Ambassador will change his position. Canadian oil, gas, and mineral interests in the newly thawed regions of the Arctic, combined with the increasing probability that Canada will become the breadbasket of the world over the next 20 years, argues for continued opposition."

"I guess that leaves us with the joint EU/Pan-Asia proposal to launch a 2,000-mile-wide solar parasol to shade the Earth directly," sighed Amanda. "Do you think the Canadians would go along with that?"

"I estimate similar opposition by the Canadians, but I have high confidence that they will not directly interfere. There is a strong risk, however, that the Soviets will shoot the parasol down," assessed Marta.

Discussion

What will be the role of national security in addressing global commons issues?

What are the limits of national sovereignty when the "commons" are threatened?

How should environmental matters be addressed in a national security framework?

How can the US achieve its international goals, if international organizations cannot reach consensus to act?

With the aide of real-time networking and intelligent assistants, will gaining the President's attention be the chief limiting factor to decision making?

Scenario 9 2060

It's a Small World

In this scenario, we explore the implications of a very different future, wherein small, molecular scale machines (nanotechnology robots or "nanobots") have become ubiquitous.

In 2037, the age of nanotech almost came to a screeching halt, when unmoderated, self-replicating nanobots escaped accidentally from a design plant and converted a large chunk of the outskirts of Mexico City into gray slag.

The so-called "gray goo" expanded from the plant in an ever increasing arc of destruction as each individual nanobot reproduced itself thousands of times per second using the raw materials available in the soil, roads, and buildings of Mexico City.

After several attempts at stopping the nanobot ooze, high-temperature thermite bombs were dropped to create a firebreak and all of the nanobots were vaporized. Unfortunately, the resulting citywide conflagration continued the devastation that the nanobots had begun.

Looking back, it was still hard for United States CFO Miranda Chavez to understand how this seminal event had led to a global political movement to ban the continued development of nanotechnology. These "neo-Luddites," as they came to be called, thought only about the downside of these new technologies and always in the bleakest possible light. The fact that the gray goo event had not gobbled up the entire globe as most neo-Luddites had predicted, did not seem to moderate their views in the slightest: "if you can't see it, you shouldn't build it" was their unofficial motto.

Only the inexorable demand by consumers for new products and new cures and the need of business for new products to sell staved off a tidal wave of reaction against these invisible machines. Three years later, the movement disbanded, only to be reborn a decade later to call attention to the rise in nanobot and bioorganic smog.

The smog was the result of the undeclared Nano Wars of 2045-2052. Miranda had only been a teenager when the war broke out or rather bubbled to the surface.

To feed the growing resource needs of the early nanofabrication industry, some companies had decided to send small nanobots into the world's oceans to scavenge for heavy metals, rare earth elements, and certain naturally occurring molecules. Larger nanobots and microscopic robots would then collect the fully loaded scavenger nanobots and bring them back for processing.

The trouble began in 2040, when coastal governments around the world began to complain that minerals were being harvested from their territorial waters. The complaints, however, went nowhere because the scavenger companies were careful to leave no identifying marks on their equipment.

Finally, the Japanese government took matters into its own hands and granted the first privateering charters to its own nanotech companies, allowing them to send out nanobots to scavenge other companies' nanobots found in Japanese territorial waters.

Other countries quickly followed suit, sending out their own nanobot patrols. Some of these patrols extended their reach beyond their own territorial waters, forcing even responsible nanotech corporations to add protective capabilities to their own nanobots.

The ensuing global free-for-all filled the oceans with an entire new ecology of nanoscale robotics and synthetic biological creatures in a continuous life and death struggle unbeknownst to the natural life forms that continued to thrive in parallel.

In 2052, the International League of Democracies agreed to a set of guiding principles for scavenging and released its own nanobots into the ocean to police the worst offenders. This force was dubbed "the blue goo."

Since that time, global nano competition had extended beyond the oceans and into the earth's crust. Governments followed with additional guiding principles, regulations, and laws fashioned to keep subterranean nano-miners from undercutting houses, sewers, and feedstock lines and from draining natural aquifers.

Finally, nanobots and synthetic bioorganisms had been introduced to the air. At first this was a defensive effort to watch for and contain biological or nanotechnology attacks. Later it became a means to increase natural immunities and pass health treatments among the population, like iodine had been added to salt and fluoride to water. Eventually, just as in the oceans and under the earth, the air hosted a constant and relentless struggle between good particles and bad.

Miranda half expected the nano competition to extend someday into space, but it was of no concern to her. On occasion she'd smelled a faint miasma, the results of a skirmish too small to see, or she'd trip on a small sinkhole that had yet to be repaired. But again, this was a small price to pay for a world without hunger, poverty, disease, and aging, all thanks to the everyday miracles of nano production.

Miranda had taken a leading role in licensing nano assemblers to make the basic human necessities freely available worldwide through a consortium of industrial and religious organizations. Simultaneously, global competition ensured the spread of more sophisticated nano production facilities worldwide, making even luxury goods available for a song.

The efficiencies of nanotechnology had brought the cost of most goods down below the former price of the constituent raw materials. Nano production required significantly less energy than traditional macroscopic production and resulted in no appreciable waste. The need for transportation was also largely eliminated by the ability to make products just about anywhere.

Nano businesses primarily made their money through creating new and more fashionable products. Older designs were quickly copied and made available for free to anyone on the mesh network.

Real estate was the only remaining high priced good and even that was changing now as the nano industry honed its ability to design and "grow" new land out of the sea floor and in less hospitable regions of the world. Deserts and tundra alike were becoming paradisiacal oases, for the right price.

Discussion

How will government be redefined in a world of ubiquitous nanotechnology?

Will nations seek to control nanotechnology to forestall economic or military rivals?

Will there be any "great powers"?

Will traditional militaries be replaced by molecular machines?

What will be the role of the military, police, and intelligence in a world where every cubic inch contains myriad sensing and surveillance devices?

How will diplomacy change in a world without a need for trade?

Is there a role for economic sanctions when most things are made locally and at almost no cost?

What form of government will be needed in world of plenty?

Will anyone work in a world where basic needs are met for free?

What will be of value in a world of free products?

Is it possible to balance the benefits of nanotechnology with their impact on the environment?

A Special Note on the Possibility of a Technological Singularity by 2060

The authors of this set of scenarios have intentionally omitted any scenarios driven by what has been dubbed a "technological singularity" or, more grandiosely, "The Singularity." Several technologists estimate a singularity occurring within the period covered by these scenarios. Although there are many definitions, in general, a technological singularity is said to occur when intentional, intelligent machines take over their own development, and due to their superior memories and processing abilities, quickly advance to states beyond human comprehension. It is hypothesized that such superintelligent entities will reshape the world as they see fit, with or without human input.

The decision to omit a singularity scenario was based on practicality, rather than a determination that such a scenario is implausible. The range of post-Singularity predictions is too broad and speculative to be of use to the current job of rewriting the 1947 National Security Act in 2008. If a singularity occurs and humanity, in some form, survives, it may be time then to revisit the question of interagency cooperation and communication on national security affairs. For now, we will just note the possibility in the interest of inclusiveness.

The Post Reform Nine Scenarios are:

2020

Impact on Scenario 1: Red Death

Impact on Scenario 2: People's War

Impact on Scenario 3: A Grand Strategy

2040

Impact on Scenario 4: A New Economy

Impact on Scenario 5: Pax Robotica

Impact on Scenario 6: Who Holds the High Ground

Impact on Scenario 7: A Brave New World

2060

Impact on Scenario 8: A Warm Reception

Impact on Scenario 9: It's a Small World

Impact on Scenario 1 2020

Red Death

In the original scenario, we met a country struggling to get back on its feet after a major biological attack and witnessed a debate about the future role of the US government both at home and abroad. In the update to the scenario, measures have been put into place to prevent such an attack.

Dr. Meishan Prosper, MD, ScD, pulled into the driveway of the Center for Disease Control in Atlanta still puzzling over the last meeting of the Bioterror Interagency Team. An al Qaeda splinter group was trying its hardest to infect world leaders with homemade biological agents using locally infected diplomats as carriers. They kept trying despite the seeming futility of such efforts.

Three attempts had been made in the last six months resulting only in the deaths of some low-level Iranian and Syrian diplomats who had not been treated in time. These officials had become the unwitting pawns in a deadly global game of move/countermove. Apparently, the terrorists hadn't gotten the word that US and allied officials were now protected by several layers of sophisticated sensing and detection devices developed by private industry and Argonne National Laboratory, so small as to be hardly noticeable. The very fabric of the President's and his adviser's clothes was treated to both detect and destroy airborne and contact pathogens.

The air at the White House, State Department, United Nations and other diplomatic meeting spots was constantly circulated through filters with sensors and tested for old and new viruses, bacteria, and prions. New agents were neutralized and gene sequenced and their composition transmitted to labs around the world in real time, including here at the CDC.

Dr. Prosper and her team were three for three in identifying, neutralizing, and developing treatment protocols for the attacks. Still, the terrorists might just get lucky someday.

She voice activated her car's view-screen and patched in the team. "We need to do some more gaming on possible infiltration scenarios. I'm worried that we might be missing something, that these attacks might be lulling us into a sense of complacency."

Col. Andrews out of Fort Detrick, MD responded, "Let's do that. I'll set it up with the National Assessment & Visioning Center. We should bring in the unexamined threats team to generate some unconventional inputs into the game."

Impact on Scenario 2 2020

People's War

In the original scenario, the United States faced global asymmetric warfare against a nuclear-armed great power. The entire federal government was caught in the conundrum of how to respond to anonymous attacks at home and abroad while avoiding an escalation to nuclear war. In the update to the scenario, the national security interagency process enables a better-informed and agile interagency response.

When National Security Professional Corps Intelligence Specialist Robert Wong worked the wall, the entire room paid attention. He was a blur of motion as he pulled up information on the latest fleet situational reports, news reports and broadcasts of domestic assassination and sabotage, and statistical analyses of the likelihood that these were isolated events. It was hard to argue with the picture he painted: the United States was in a global, undeclared war with China.

The truce following the triumph of the US Pacific Fleet over the Chinese incursion had apparently been empty rhetoric on the part of Chairman Tang. China had claimed that the surprise attack on Taiwan was an internal matter and that US forces had accidentally gotten in the way. Specialist Wong showed that the Chinese had never taken the truce seriously and had not hesitated to continue its war by other means.

Based on this analysis, General Garzoff, the Chair of Interagency Crisis Task Force Gold sanctioned a Red Homeland Alert under the National Operational Framework and patched in the President's Director of National Security to recommend that the President be briefed on options to raise the national defense posture and protect US supply chains and interests overseas. Garzoff then triggered the Business Emergency Management Assistance Compact to release additional government assets to help companies fight the information assault on their systems.

After a brief video conference with the President and his Director of National Security, Garzoff ordered a restructuring of the Gold Team. Strategic nuclear and conventional warfighting issues would be managed directly by the President through the traditional combatant commands, supported by a new Silver Team that would provide connectivity to the other agencies and the Gold Team.

Asymmetric warfare would become the primary focus of the Gold Team, which would be expanded to include additional affected agencies, such as the Departments of Transportation, Energy, and the Treasury. The Gold Team would have three suborbinate teams, one working defensive operations, one working offensive strategy, and the other coordinating Chinese-US negotiations. State Department negotiators would coordinate their efforts with both the Gold and Silver Teams going forward. The Director of National Security through General Garzoff would bridge the two Teams. Intelligence Specialist Wong was rewarded for his keen insights by taking the lead of the Gold Team's offensive strategy development.

Impact on Scenario 3 2020

A Grand Strategy

In the original scenario, we explored the utility of an integrated grand strategy development capability for smoothing the transition from one Presidential Administration to another. This update to the scenario required only modest revisions to map to a post-PNSR world.

President-Elect Anne Cummings stepped down into the well of the large conference room with her entourage. The lush blue carpet and warm wooden panels created a hushed effect, almost like entering an old library or a church. A bird fluttered across the oval skylight. *Was that real sky?* she wondered.

Tom Hughes, the Director of the National Assessment & Visioning Center, strode across the carpet and extended his hand. "Welcome back, Governor. We are honored to have you here today."

"It is my pleasure, Tom. It's good to see you again in person. It's been a couple years since we held the Governors Convention here," she said with a warm smile. "You know Dr. Tyrone Chandra, my national security advisor, Ms. Catalina Sharp, my economic advisor, and Ms. Akemi Takahashi, my long-range planner?"

"Yes, good to see you all again. Akemi has been working very closely with us and her predecessor to refine the underlying model assumptions. I'm happy to say that not much tweaking was necessary. We paid pretty close attention to the campaign, " beamed the Director.

"I'd also like to welcome the folks conferencing in," the Director said, indicating the faces strung out along the top edge of the screen that wrapped floor-to-ceiling 270˚ around the conference room. "We are pleased to have your transition liaisons join us from the various department strategy offices, along with senior representatives of the outgoing Simpson Administration. Welcome all."

"My mission today is to acquaint you with the general operation of the National Assessment & Visioning Center and its departmental satellite offices," announced the Director.

"NAVC was first funded in 2009 to assist the President and his Administration in developing a dynamic national grand strategy. The ability to create such a strategy was complicated by interagency stovepipes and rice bowls, political constraints on free and open discussion, and the technical difficultly of developing an integrated strategy in an increasingly complicated and interconnected world.

"The hope for the new organization was that it would not only be a safe place to debate, develop, test, and monitor long-range strategies, but that it could be an objective source of information that could withstand a change in administration. The problem, of course,

was that pure objectivity was a mirage. Despite the best intentions and the selection of generally open-minded staff, bias and ideology always crept back in.

"The answer was to embrace varying points of view…to model and evaluate all points of view, rather than trying to find the one correct view," continued the Director.

"As I hope Akemi has told you, our bipartisan or rather multi-partisan process is now ensured through our agency's host of checks and balances. These measures touch on all our activities from how we hire and rotate our staff to how we build our models and debate the results.

"We also found that an open process keeps us honest, so we have developed an extensive outreach process to participants across the political spectrum, in government, industry, and academia. Our public discussion boards are particularly lively–there is nothing some posters like better than catching us with an unsupported assumption or an incorrect application of an algorithm," chuckled the Director.

"So are all points of view deemed to be of equal value and effectiveness?" asked Dr. Chandra, the incoming national security advisor.

"I wouldn't put it that way. While all points of view are captured and modeled, their value and effectiveness is determined by many other factors within the modeling system. Positions must be supported by evidence and coherent, logical paths. If they are simply assertions, they will be flagged as such," replied the Director. "Why don't we look at an example?"

Swiping the screen of his wristwatch, the Director brought the main wall to animated life as a timeline stretched from 1980 at one end to 2080 at the other.

"Let's run a quick 'what if' scenario," said the Director as he walked to a large, inclined touchscreen table in the center of the room. Waving his hand over a world map, he highlighted the countries of the nascent Latin American Union. The main wall glowed with event and trend markers in a rainbow of colors.

"This view here is as close to a normative, objective view as we can produce. As you see, it's pretty sparse and contains only elements that are demonstrable, accepted facts or trends that have been broadly agreed upon within the statistical boundaries indicated."

"If we call up your Administration's view," the Director said as he subvocalized a command to the wall, we see there is much more detail at this level. We can also cycle through the department views…notice the intersections where one department's strategy runs into another department's."

"What are the flashing icons?" asked Dr. Chandra.

"The flashing icons represent new elements that have been placed on the wall by the system's estimation engine, but have not yet been validated by our team members. This one here is an analysis by the State Department's Latin America Desk of General

Secretary Chávez's recent address to the LAU General Assembly. As you can see, if I tap on the icon there is a complete interagency argument map supporting the analysis, plus a video of the speech."

"Do you get a feed of all operational and intelligence information?" quizzed Dr. Chandra.

"No, we don't here. Downstairs we have a parallel center that takes our feed behind the Common Secured Environment firewall and integrates it with classified, sensitive, and operational information. Up here, we are neither an operations center, nor an intelligence fusion center. We are strictly an open source, meta analysis center, integrating the best analysis of our government and public partners. We find that what we lose in not having access to the latest classified information is compensated for by our ability to have an open dialogue with a wide variety of experts and stakeholders. Moreover, our time line is a little longer. We are not overwhelmed by the day's in-basket. We have the luxury, as well as the responsibility, to look longer term."

"Can we look at the trends from an economic point of view?" queried the President-elect's economic advisor.

"Certainly. Here are your Administration's economic trend lines under the 'what if' assumption that Mexico joins the LAU embargo of oil to the United States."

"What is that red line receding into the background?" she asked.

"That indicates a strong connection between this economic scenario and domestic politics in the US Southwest," the Director replied.

"Have you gotten to the point where the grand strategy writes itself?" joked the President-Elect.

"Hah, hah, no, no, the primary job of the models, analysis, and visualizations you have seen is to get our collective thinking organized. There are too many options, too many impacts, too many interrelationships for the human mind to follow without assistance.

"The Center and its partner centers in each agency help avoid repeatedly reinventing the wheel and arguing past one another. The real work, the work of finding common ground, crafting solutions, and implementing these solutions to achieve national objectives only begins here with your people, aided by our staff. Decision making remains the domain of the President and Congress."

Impact on Scenario 4 2040

A New Economy

In the original scenario, the United States faced its worst economic crisis since the Great Depression. The crisis was a perfect storm of the unintended consequences of new technologies, policies, court decisions, and popular expectations. In this update, government, industry, and the public work together to find solutions to a new economic reality.

Ron Guilder laid back in his favorite arm chair, which shifted to better conform to his thin frame. Ron knew the meeting didn't start for another five minutes, but he always jacked in early to meetings and couldn't help himself. This despite the fact that he knew others on the Homeland Security Collaboration Subcommittee were equally susceptible to being 10 minutes late.

Ron liked to complain about the virtual meetings, how sometimes they were tedious and how they took up all his time, but secretly he looked forward to the meetings. They gave him purpose, something to do. And he knew they were important.

Ron had been the Chief Financial Officer of a Fortune 500 company before automated intelligent enterprise systems and robots made him obsolete. Like others, at first he had embraced his new life of early retirement and leisure.

Robotic manufacturing and intelligent management systems had streamlined business, lowering prices on goods and services to the point where everyone had the basics plus most luxuries too.

Ron, however, suspected that no work and all play would make him and everyone else a dull boy, so he was grateful when his name came up to participate in a regional economic subcommittee of the Homeland Security Collaboration Committee. The subcommittee worked with committees across the country networked through the federal collaborative information knowledge management system. Their mission: figure out how to maintain a healthy, productive, and free society with nearly unlimited wealth and leisure and few opportunities for employment.

The arguments at times were fairly heated. Some advocated a laissez faire approach, maximizing individual freedom and minimizing government intervention. Others took an opposite tack, arguing for a greater government role. The most extreme holders of this view thought the government needed to get people off their couches, unhook them from their varied electronic forms of nirvana, and force to them to improve themselves through education and art projects.

The greatest thing about these discussions was that the entire debate was captured and analyzed by an intelligent assistant. It noted when lines of argument were duplicated, when they violated previously argued positions, and when evidence was lacking. This meant that the meetings actually made progress, that nonsense could be discarded, and that common ground might ultimately be found.

Ron's concerns were focused on economic issues. He was worried that the new economic realities were unprecedented and hence unpredictable. He worried that life right now was a little too good to be true. He shared his views with like minded individuals, who got him started modeling his concerns and then expanded his group to include others who thought him Malthusian. The result was a vigorous, quantitative debate that seemed to be making headway. In fact some of their findings last year had helped undermine a US Supreme Court case on a constitutional right to food and shelter. More recently, their work made its way into a revision of the Income Preservation Act of 2034.

Ah, well, since the meeting was going to start late anyway, Ron decided to grab a quick bite to eat. With a series of rapid eye movements and guttural remarks Ron ordered his home robotic system to bring him a nice vat-grown pastrami sandwich on that 14-grain artisan rye bread he enjoyed so much.

Impact on Scenario 5 2040

Pax Robotica

In the original scenario, we explored the intersection of unmanned, robotic warfare and on the ground diplomacy. This scenario depended upon the continuation of current accelerating trends in robotics and sensors technology, as well as a public policy choice to enable greater real-time interaction between the military, diplomatic, and intelligence arms of the US government. In this update to the scenario, more authority for post-war operations is granted to a strengthened Department of State that now includes all non-military functions of foreign affairs.

Total dominance of the battlefield had been achieved in just three days. From command bunkers in Colorado, override controllers watched as autonomous robotic swarms annihilated the loyalist Homeland Guard with minimal collateral damage. The remainder of the Chuntu Army saw what was coming, listened to the broadcast warnings, dropped their weapons, and ran home as fast as they could. The genocidal Chuntu leadership was captured or killed in brief, but brutal, house-to-house fighting with wheeled, crawling, and airborne robots.

Now, two weeks after the UN-sanctioned invasion, the process of recovery was in full swing. US Department of Defense engineering robots cleaned the battlefield of damaged equipment and unexploded ordinance, while State Department robots set about repairing damaged infrastructure. Diplomatic Officers were sent into the field to address humanitarian needs and political reconciliation.

Diplomatic Officer Amanda Huygens rode her FCV-30 Forward Control Vehicle into the seemingly deserted village of Saya and dismounted. Her cotton uniform blouse fluttered in the gentle breeze as she scanned her environment. Saya was a single street tribal village far off the beaten path.

Known to be sympathetic to Homeland Guard insurgents, the village had been under close observation since the initiation of hostilities. As the first American on the scene, Amanda had been sent to assess the humanitarian needs of the village and render assistance as needed.

Her Army GuardBot escort team scurried and hovered ahead, investigating the road, the buildings, and obstacles along the road. Amanda's retinal scan indicated that the path to the local tribal chieftain's concrete and tin house was clear. Reminders of local etiquette scrolled across her lens as her heightened senses strained to hear any impending danger.

Knocking on the door, she called out “Yo soy un diplomático de los Estados Unidos. Estoy aquí bajo orden 235 de la O.N.U.” Her universal translator converted her West Texas drawl into a reasonable facsimile of rural Chuntu. A tall man in his early forties answered the door. As he extended his right hand in a gesture of friendship, the Army GuardBot closest to her detected an added weight in his left. As a machete came into view, the GuardBot overrode its standing rules of engagement and sprayed the chieftain with 1,000 paralytic microflechettes, instantly bringing him to his knees.

An Army Colonel, overseeing the escort operation from Colorado, reacquired control over the GuardBot and cautioned the chieftain through the GuardBot's onboard translator not to struggle and the effects of the drugs would be reversed. Instead, the chieftain began to subvocalize a command to his home communication network. The Colonel twitched his eye and the microflechettes anaesthetized the chieftain completely. He then commanded the rest of the robotic escort team to jam communications and lock down the house.

The Colonel quickly saw however that he had been too late. The message must have gotten out, because almost immediately he began to pick up a feed from nearby aerial surveillance drones that a group of vehicles violating curfew were heading towards the village. Microbots dispersed throughout the battlespace, hitched a ride on the vehicles and determined their armament, confirming their hostile intent according to the rules of engagement and the announced curfew.

Amanda, reviewing the situation report in coordination with intelligence and diplomatic officers, stood by as the Colonel sent a real-time request for a military strike against the convoy. With no override order coming from Amanda or Washington, the request was passed to a circling UCAV squadron, which carried out a high-energy laser strike within five minutes of the initial sighting.

Amanda leaned over the chieftain and wondered at his reaction. Surely, by now he would have understood the complete dominance of US forces. He should know that she was only there to provide his people aid and a chance at a fresh start. She shivered at the thought of the machete, not wanting to be the war's first American casualty. She straightened herself and signaled to the rear humanitarian group to send forward the robotic reconstruction convoy and the standard class 3 rural supply package. The tribal leader was now the Colonel's responsibility.

Impact on Scenario 6 2040

Who Holds the High Ground

In the original scenario, we envisioned major competitive changes in the Earth-Moon system from the perspective of a traditional interagency space working group. In this updated scenario, a standing Interagency Team has been formed to bridge differences in agency priorities.

It's hard to put a finger on just when the moon became so important, but the trend lines were clearly visible in the long-range forecasts of the National Assessment & Visioning Center. Based on a strategic review of these trends in 2010, the President's Security Council ordered the formation of a standing Interagency Team, dubbed Team Eagle.

The Team was designed to navigate the shoals of competing agency priorities and make unified recommendations to the Office of Management and Budget for funding in the National Security Resource Document, the rolling integrated national security resource strategy.

The Team included all the usual suspects: representatives from the Department of Defense, the Office of the Director of National Intelligence, NASA, NOAA, and the Department of Commerce. This traditional group was augmented by the Assistants for National Security for Energy, State, and Treasury once deposits of Helium-3 were found on the moon.

He-3, the fuel of second-generation fusion reactors on Earth, was the first significant resource found in outer space. Available in abundance on the lunar surface, it provoked a land grab among countries and companies alike.

Realizing the strategic importance of this development, Team Eagle developed a two track strategy to modernize its space transportation system and to negotiate a global treaty on shared access to lunar resources. China, Russia, India, Brazil, the Islamic Republic, the EU, and a private consortium called simply The Group all had moon bases these days and were looking for a better path than a dangerous land grab.

"What's the status of the latest round of negotiations?" queried Assistant for National Security Ted Benson of the Department of Commerce.

"Most of the delegations are on board with the latest draft, but Brazil is still holding out for a larger stake," reported Rascal Schwarski, NASA's Chief Engineering Officer.

"I think it's just a matter of time before they agree," offered Dan Higgs, Deputy Undersecretary of Defense for Space Acquisition. "Let's turn our attention to securing our launch capacity. Space elevator construction is well underway, but we have a disagreement over cislunar and translunar transportation. We need the capability to put

objects into geosynchronous and Lagrangian orbits. NASA is focused on Asimov moonbase resupply and a run at Mars."

"Congress is not in the mood to fund two solutions," Schwarski said defensively.

"That's why we need to work together to form a win-win proposition that is too good for Congress to ignore." offered Ross LaPorte, the Special Assistant for Space to the Director of National Security. Ross was a member of the National Security Professional Corps and a recent detailee from the Office of Science & Technology Policy. Ross chaired Team Eagle and sought ways to break through roadblocks wherever they occurred.

"I think if we can model our solutions in the context of the changing strategic environment, we will have a better chance of convincing Chairman Russell and his House Select National Security Committee on Space of the importance of space in the coming decades," continued LaPorte. "We need to show him the tangible economic benefits of moving forward and national security costs of standing still. He's a patriot and concerned for his constituents. If we can make the case, I think he'll make the appropriate decision."

Impact on Scenario 7 2040

Brave New World

In this scenario, we examined a plan to apply proven neuroscience, psychiatric, and medical techniques to the control of pathological behaviors in a world of readily accessible weapons of mass destruction. In this update to the scenario, the National Operational Framework, the National Security Planning Guidance, and the National Security Resource Document have provided the foundation for keeping the United States and its allies free from severe terror attacks for several decades; however, modeling in the National Assessment & Visioning Center reveals that an attack from the underdeveloped world will eventually get through if the underlying neuro-psychological conditions are not addressed.

Colonel Samuel R. Wright, Chair Neuro-Psychological Health Interagency Team

Statement Before the Senate Select National Security Committee for Neuro-Psychological Operations
Washington, DC 14 June 2040

Colonel Wright: Ms. Chairwoman, Senator Wilkes, and Members of the Committee, I appreciate the opportunity to address you at this important moment in our history. I would like to summarize my testimony and submit the full text for the record.

Chairwoman: Without objection, it will be received and added to the record. You may proceed, Colonel.

Col. Wright: Thank you, Ms. Chairwoman. I come before you today with a proposal to end global conflict and violence. In the United States, in Europe, and in the Pacific Rim, we find ourselves in an age of unprecedented peace and positive collaboration with all the benefits that entails. Like penicillin a century earlier, the so-called Healthy Mind and Body Revolution has changed personal and public health in ways that have yet to be counted.

We in the Administration believe it is time to share this miracle of modern science with the rest of the world, the part of the world that still suffers from casual violence, that still threatens violence against its neighbors, the source of terrorist attacks that continue to this day.

As you are well aware, beginning in 2016, parents, who were already accustomed to eliminating genetic diseases from their unborn children, became enthusiastic supporters of new screening tests for the genetic and epigenetic markers of neurological disorders and violent pathological tendencies. How many parents want their kid to grow up to be the schoolyard bully or spend their adult life behind bars?

By 2030, the incidence of youth violence across the developed world showed a precipitous drop. It became clear that the vast majority of violent youth crime was being committed by a fairly small slice of the population, a part that had not been treated as

children. New laws were enacted giving convicted adult felons the choice of incarceration or treatment. Recidivism rates became negligible among those treated.

This dramatic change in human motivation combined with sophisticated policing and ubiquitous terror detection technology has largely ended the threats within our borders, but this is not the case in the underdeveloped parts of the world.

You know the history. A 15-kiloton improvised nuclear device destroyed Chittagong, Bangladesh's main seaport, in 2012. 100,000 dead and injured. A weapon with the same fingerprint killed another 200,000 in Jakarta just two years later.

In 2016, a modified form of the Bubonic Plague swept through San‘a, the capital of Yemen, killing tens of thousands before burning itself out. The culprit: a disaffected 19-year-old medical student experimenting with a home biolab kit.

Radiological attacks in Mandalay, Burma and Harare, Zimbabwe lead to few deaths, but mass panic and abandonment of those cities. Neither government had the wherewithal or motivation to clean them up.

These major city attacks, as you know, have only been the tip of the iceberg. Suicide bombings and mass murders have become rampant in certain parts of the world. Ethnic cleansing occurs all too frequently in underdeveloped regions.

Which brings us to the proposal before you today. Working with your staff, the Neuro-Psychological Health Interagency Team has developed a three-point plan to end the scourge of violence from the Earth once and for all.

First, we propose that the United States work with the UN Public Health and Bioethics Council and our European and Asian allies to establish the goal of 100% national participation in a new Operation Mercy before the decade is out.

Second, Operation Mercy will establish a common global fund to assist poor countries in setting up neuro-psychological treatment centers in hospitals and prison facilities. This fund will depend upon national aid programs and private donations.

Third, we propose that the UN develop contingency plans for inoculating the populations of any pariah nation that does not voluntarily participate in the program and continues to try to export terror, threaten foreign invasion, or terrorizes its own populace. We will use the same aerosol dispersion techniques the World Health Organization has been using for the past two decades to distribute vaccines and genetically modified viruses to treat many of the underdeveloped world’s worst diseases.

While historically we have often turned a blind eye to the internal affairs of sovereign nations, this fevered hatred, combined with the increasing accessibility of cheap, home kits for genetic engineering, chemical manufacture, and nanoparticle design, have made it essential for civilized nations to act. No longer can we tolerate individuals with bloodlust in their hearts and the means to create new, untold horrors in the privacy of their

basements. How long do we have before one of these twisted, damaged souls unleashes a holocaust on this earth, one from which we cannot recover?

It is our duty to help these people, to bring them in from the cold. If their own governments won't help them, then we will.

Thank you. If you have questions, I'd be glad to answer them now.

Chairwoman: Thank you, Col. Wright, for your testimony. As you know, we are on a short clock here this morning, so I think we should just jump right into questions. Let me begin by commending you on this important public service and your efforts to keep our nation safe.

To put it bluntly, we are running out of time. The advancements in biology, chemistry, and nano-manufacturing over the last two decades have put the power to destroy civilization into the hands of people who cannot control themselves and hold only contempt for the rest of the world. Senator Wilkes?

Senator Wilkes: Thank you Ms. Chairwoman.

Col. Wright, what you are proposing is altering the minds of people you don't like against their will. How do you square this mission with the medical oath you took to "do no harm?"

Col. Wright: These are people who already don't have a choice. Their governments are indoctrinating and drugging their children. Their economies are in collapse. They need our help.

Sen. Wilkes: Colonel, the road to Hell is paved with good intentions. Are we so arrogant as to believe our way is the right way?

Col. Wright: If by "our way" you mean the approach adopted by leaders of both parties in closed session and by the UN and our allies, then yes, we do believe "our way" is the right way. "Our way" is the way of peace and cooperation. It is the path towards making positive contributions to society.

Sen. Wilkes: Yes, yes, peace and cooperation. Sounds very nice until it is your mind that is being altered. Doesn't this all sound a little Orwellian to you?

Col. Wright: I admit the third step makes most people uneasy, but the techniques have been proven safe with our very own children, they have passed through numerous trials and commissions. And remember, all the models show we are facing an existential threat here. The question is not "if" an individual or nation unleashes an attack on all mankind, but "when."

Chairman: Excuse me, Colonel, that buzzer is our final call for the floor vote on the confirmation of the new Director of National Security. Clearly, that's an important interruption. Colonel, we will continue this another time. This meeting is adjourned.

Impact on Scenario 8 2060

A Warm Reception

In the original scenario, we focused on the challenge of developing international consensus for action on the issue of global climate and the possibility of unintended consequences. In this update to the scenario, we see a world where global climate change has been muted in part by effective interagency teamwork and diplomacy.

Special Envoy and Green Earth Team Lead Amanda Huygens stepped out on the balcony of the US Embassy in New Delhi. The reception was in full swing inside and she needed to catch a breath of fresh air. As dusk gathered, she looked wistfully over the city towards the India Gate.

Through the closed French doors, she could hear the string quartet playing her favorite Strauss waltz as the festivities continued without her.

Decades of hard work from her and her interagency team had paid off. Planetary carbon dioxide levels had dropped off to pre-1970s levels, temperatures were back to and stabilized at pre-industrial levels. While some countries grumbled that world was now too cold and that the lower temperatures were affecting their agricultural sectors, the consensus was a sigh of relief.

New nanotechnological materials had been the key. They enabled cleaner, more efficient, and distributed power, supporting a new hydrogen and solar economy. When the price point for hydrogen power dropped below the price of fossil fuels without subsidy, the entire world seemed to shift overnight.

Amanda and her team worked both domestically and internationally to develop the new technologies and smooth the transition to hydrogen power. She negotiated reductions with the oil rich countries. Russia and Saudi Arabia were the last to give up on fuel oil and did so only when they were shown that they were losing money.

The lower average temperatures were a real victory, but the real celebration was that the world had met the challenge of global climate change and maintained economic growth at the same time. Instead of locking the world into an austere version of the 1960s, Amanda and her team had focused their attention on win-win opportunities, allowing the underdeveloped world to develop and release greenhouse gases until remediation technologies could be put in place.

In 2060, the world was richer and cleaner than it had ever been. The only "underdeveloped" countries left in the world were those led by autarkic dictators and thugs. They were too few and far between to affect the climate on their own.

"I guess I've got to get a new job," Amanda whispered to herself.

"That may be wishful thinking," chimed Marta, her "automated personal access liaison" or aPAL. "The Earth's magnetosphere appears to be weakening."

"Marta, you're such a downer," thought Amanda.

"Excuse me, Amanda. The Canadian Ambassador has arrived for your party and has requested to see you," interrupted Marta.

Ambassador, welcome to the Embassy. Enjoy the refreshments. I'll be with you shortly, thought Amanda as she turned back to the party.

Impact on Scenario 9 2060

It's a Small World

In the original scenario, we explored the implications of a very different future, wherein small, molecular scale machines (nanotechnology robots or "nanobots") had become ubiquitous. In this updated scenario the Director of National Security has created a standing Nanotech Interagency Team to smooth the transition to a nanotech world.

In 2037, the age of nanotech could have come to a screeching halt, when unmoderated, self-replicating nanobots escaped accidentally from a design plant on the outskirts of Mexico City.

The so-called "gray goo" would have expanded from the plant in an ever increasing arc of destruction had the US Nanotech Fast Response Team not been established in 2011. Over the following decades, the N-Fast Team had trained local first responders and industry around the world in effective techniques and tools for combating runaway nanobots. N-Fast also provided safety guidelines and certifications that most countries, including Mexico had adopted. The result was that the Mexico City leak had been detected almost as soon as it occurred. It was rapidly contained and neutralized and only made page A-12 of the *New York Times* and *Gazette* feed.

Miranda Chavez, the US Chief Nanotech Officer and head of the interagency N-Fast Team smiled with pride when she stumbled across the old electronic clipping. She had only been a junior member of the National Security Professional Corps at the team, but the N-Fast Team had been her first assignment. It was exciting in those days, because everything was so new and changing so rapidly. It really was a different time.

Over the next twenty years, nanotech had transformed the world in ways too numerous to count and N-Fast had been there to ease the path forward. In conjunction with the National Assessment & Visioning Center, it monitored and extrapolated emerging technology trends and designed policy pathways that would enable the technologies without sacrificing safety and the environment.

Working with the International League of Democracies and the United Nations, N-Fast and the State Department negotiated a series of treaties determining how the world's resources would be managed and how to avoid conflict in the future. Together they establish a "blue goo" nanobot force to enforce international law in the sea, in the air, and beneath earth's surface.

Within this framework, ever more sophisticated nanotech spread throughout the world with minimal impact on the environment and without the threat of warfare.

The efficiencies of nanotechnology had brought the cost of most goods down below the former price of the constituent raw materials. Nano production required significantly less energy than traditional macroscopic production and resulted in no appreciable waste. The need for transportation was also largely eliminated by the ability to make products just about anywhere.

The world grew richer and healthier by leaps and bounds. The world of 2060 was a world without hunger, poverty, disease, and aging.

Beginning in the 2040s, N-Fast, through a consortium of industrial and religious organizations, had taken a leading role in providing free nano assemblers worldwide to produce the most basic human necessities. Simultaneously, global competition ensured the spread of more sophisticated nano production facilities worldwide, making even luxury goods available for a song. Nano businesses primarily made their money through creating new and more fashionable products. Older designs were quickly copied and made available for free to anyone on the mesh network.

Real estate was the only remaining high priced good and even that was changing now as the nano industry honed its ability to design and "grow" new land out of the sea floor and in less hospitable regions of the world. Deserts and tundra alike were becoming paradisiacal oases, for the right price.

Miranda wondered if the nanotech revolution would turn to space next. She wondered what the future would hold.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