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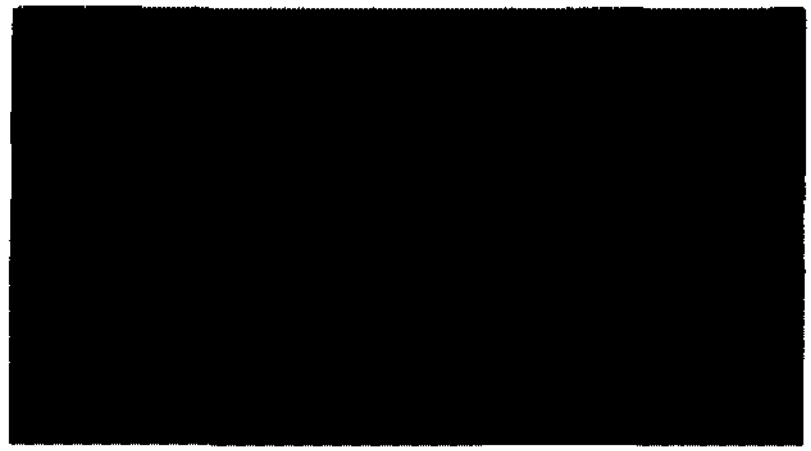
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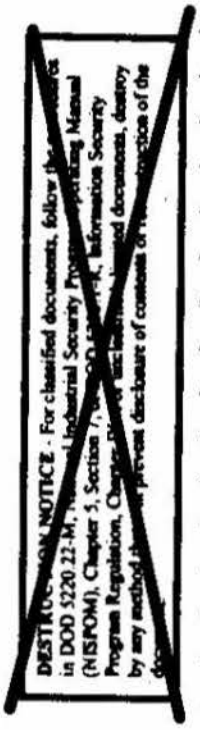
CSBA CENTER FOR STRATEGIC AND BUDGETARY ASSESSMENTS

TRANSFORMATION STRATEGY

OUTPUT & INSIGHTS FROM GAME IV

Game Conducted
June 22-24, 1998
at The National Defense University
Washington, DC



Game and Insights developed by
The Center for Strategic and Budgetary Assessments (CSBA)

Prepared for OSD (Net Assessment)

December 1998

Contract No. DASW01-96-D-0039 DO 3

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I. Introduction

BACKGROUND

The fourth policy-planning game in the "Transformation Strategy" series was held at the National Defense University, Washington, DC, during the period June 22-24, 1998. This event, prepared and conducted by the Center for Strategic and Budgetary Assessments (CSBA), was part of a larger study on the Revolution in Military Affairs (RMA) sponsored by the Office of Net Assessment in the Office of the Secretary of Defense.

This event built upon three previous policy-planning games. The first two were focused exclusively on developing and assessing strategies for transformational change of the U.S. military in response to an emerging RMA. Participants in these games considered the composition of, and trade-offs among research and development, procurement, force structure, and readiness over the time period running from 1998-2025.[1] Their fundamental task was to meet the long-term challenge of transforming the U.S. military to cope with the threats, and take advantage of the opportunities, engendered by the RMA while also satisfying short- to mid-term security requirements. The first game evaluated potential transformation strategies against a full spectrum of national security challenges ranging from operations other than war (OOTW) to large-scale theater warfare. The second focused mainly on the mid- to high-end of the threat spectrum.

In the third game, based on the output from these preceding events, a transformation path for the U.S. military was scripted into the scenario. In addition, a parallel military transformation path for an emerging peer competitor, in this case, China, was also provided. The transformation of the Chinese military postulated in this game was not meant to predict the modernization course that the People's Liberation Army (PLA) of today will actually follow, but rather to illustrate the types of options that

[1] For more information on the prior games in this series see: "Competing for the Future: A Strategy for Transformation -- Final Reports, Games I and II," Center for Strategic and Budgetary Assessments, 1997.

could become available to a rising power. Given their respective transformation paths, participants on each team explored how the transition from one military regime to another over the next two-to-three decades could affect strategy. The participants explored a range of topics such as how perceptions of the military balance might change over time, options for shaping the behavior of military competitors, shifts in alliance relationships, and the changing character of deterrence. While the participants concluded that this game was a valuable tool for exploring strategic aspects of the transformation process, they strongly believed that options for departing from the "scripted" transformation path in response to the force modernization decisions made by the opposing team would have improved the competitive dynamics of the game.

In this, the fourth game, we addressed that perceived shortfall by allowing both the U.S. team *and* the China team to craft their own transformation path, and then assess the implications of their chosen path on defense strategy. In short, we developed a hybrid game by combining the approaches of Games 1 and 2 with that of Game 3. To make this possible, it was necessary to craft an entirely new set of materials for the China team that tried to realistically capture current PLA thinking about the RMA; identified likely short- to mid-term defense requirements as viewed from Beijing; summarized current PLA force structure and modernization plans into a planning baseline; and presented reasonable programmatic adjustment options to China's defense plan (see Tabs Q-V).

This last task proved particularly challenging because of the large uncertainty surrounding key variables such as the initial size of China's defense budget, the anticipated rate of growth of the Chinese economy over the next 25 years, the impact of rising personnel costs and inflation on China's defense budget, the costs associated with indigenous production of various military weapon systems, the types and price of weapon systems which China might be able to purchase from abroad, and projected operation and maintenance costs for the PLA. As a result, assumptions had to be made about these variables, often with sparse or conflicting information. For example, estimates of China's annual defense expenditures today vary widely from less than $10 billion to almost $90 billion. Nevertheless, with few exceptions, the assumptions used

in this game, and the programmatic adjustment options derived from them, were uniformly judged by the participants to be credible, albeit speculative. While one or more of the underlying assumptions may prove to be "off-the-mark," the basic dynamic explored during the game is unassailable – i.e., a rising China will have progressively greater financial resources available for defense spending, and thus, a wider menu of modernization options from which to chose. The critical planning uncertainty is how China will decide to expend its growing resources in its effort to transform the PLA into military organization capable of fighting a "modern war under high-tech conditions." How might a rising China apportion funding across R&D, procurement, force structure, and training and readiness as part of a long-term competition with the United States? It was precisely this question which was explored as a central component of this game.

GAME MECHANICS

This game was divided into four moves: two "planning" moves which covered the periods 1998-2010 (FY 1999-2011) and 2011-2024 (FY2012-2025) and two "crisis event" moves. The moves were arranged as follows:

Move 1	Strategic Planning: 1998-2010
Move 2	Strategic Posturing & Exploitation: Crisis Event of 2008
Move 3	Strategic Planning: 2011-2025
Move 4	Strategic Posturing & Exploitation: Crisis Event of 2023

Participants on both teams acted as members of a high-level, NSC-equivalent, working group in their respective country. Pitted against each other, the fundamental task of both teams was the same — to develop a plan for military transformation and leverage it for the greatest possible strategic benefit.

As a starting point, both teams inherited a baseline military (see Tabs M and S) which was consistent with current force structure and modernization plans. In Move 1, they could depart from this baseline force as part of a transformation strategy by

making changes in R&D investments, Service budget shares, force structure levels, modernization plans, and readiness. The players had wide latitude in this regard.

The U.S. team could, for example, make cuts in force structure as deep as 50 percent, cancel most major weapon systems, procure several new weapon systems, create new military organizations, expand research and development (R&D) funding by up to 25 percent, and reduce readiness spending by as much as 25 percent. Infrastructure, precision-guided munition (PGM) inventories, and personnel entitlements, however, were considered "off the table." The China team could increase R&D funding by up to $100 billion over the course of the planning period, reduce force structure by more than 25 percent, and procure a wide-range of modern weapon systems including ballistic and cruise missiles, fourth-generation fighter aircraft, aircraft carriers, attack submarines, destroyers, and advanced main battle tanks.

In addition to deciding upon the programmatic adjustments they perceived as necessary to transform their respective militaries, both teams were also asked a series of questions pertaining to their broader transformation strategy. For instance, they were asked how experimentation might be incorporated into their strategy, and what types of institutional changes might be necessary to implement the transformation successfully.

The players were confronted with a crisis – an unexpected Taiwanese declaration of independence in 2008 – at the start of Move 2 (see Tab X). The teams not only had to respond to the crisis itself, but were also asked to address a series of questions related to their overall defense strategy such as their assessment of the U.S.-China military balance at that point in time and how they might leverage their respective transitions in force posture to "shape" the other side's behavior.

Move 3 was essentially a replay of Move 1 except that the timeframe shifted forward to 2011-2025. Prior to commencing Move 3, each team received new planning materials updated to the year 2011 including competing visions of the *ongoing* transformation in military affairs, revised Defense Planning Guidance documents, new

program adjustments and R&D options, and a description of emerging systems and organizations.

Move 4 was similar to Move 2 except that the year was assumed to be 2018, and the crisis centered on an imminent Chinese invasion into the newly-independent, resource-rich Siberian Republic (see Tab X).

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II. Strategic Planning – Proposed Transformation Paths

PATH DESCRIPTION (U.S. TEAM, MOVE 1)

The U.S. team assessed that it was unlikely that the vital national security interests of the United States would be seriously threatened during the first planning period, 1998-2011. In their view, conflicts over this period would in all likelihood be fought against "non-peers." This relatively benign threat environment afforded an opportunity to scale back planned procurement and cut force structure without exposing immediate strategic vulnerabilities. The team did assess, however, that it would not be prudent to cut too deeply into force structure because of the need to honor U.S. security commitments to friends and allies; the probable involvement of the U.S. military in Operations Other Than War (OOTW) including Peacekeeping, humanitarian missions, and noncombatant evacuations (NEOs); and finally, the need to sustain a sufficient military presence around the world to assure allies, bolster deterrence, and preserve regional stability. For similar reasons, the U.S. team also opted to preserve readiness funding at current levels to maximize the combat effectiveness of the downsized force.

In essence, the team was willing to trade a slight increase in risk over the next decade for the chance to free up resources for expanded R&D investments (a $80 billion plus-up over the period) as well as to cover the anticipated $20 billion annual budgetary shortfall in the QDR defense plan. As one member of the team asserted, "we must invest in expanded R&D in order to hedge against a future in which we may fight near peers, or even peers."

Force structure was the key bill payer, representing about 75 percent of total savings over the period. As shown in its Force Structure Adjustments for Move 1 (*see insert below*), the U.S. team cut the Army and the Navy force structure by about 20 percent, or two divisions and two aircraft carrier battlegroups (CVBGs), respectively, while the Air Force was trimmed by only ten percent, or two fighter wings. In terms of actual dollar value, the elimination of two Army divisions represented about 45 percent

of the force structure savings that accrued to the U.S. team during this period. The elimination of two CVBGs represented about 30 percent of force structure savings while the phasing out of two fighter wings accounted for only ten percent.

U.S. Team Force Structure Adjustments (Move 1)

- **Cut 2 Fighter Wings**
- **Cut 2 Army Divisions**
- **Cut 2 Aircraft Carrier Battle Groups (CVBGs)**
- **Cut 1 Marine MEB**

In respect to the scaling back of previously planned procurement (*see insert below*), the largest reduction, representing over 55 percent of the savings, was in the current tactical aircraft modernization program. The reasoning behind these aggressive cuts was two-fold. First, the team estimated that current generation tactical aircraft, albeit with service life extensions and upgrades, were more than sufficient to deal with projected threats over the short term. Second, in respect to preparing for the mid- to long-term, the team considered the current modernization program to be needlessly redundant.

U.S. Team Procurement Cuts (Move 1)

- **Reduce Buy of F-22 to 160**
- **Defer Joint Strike Fighter**
- **Reduce Buy of F-18 E/F to 270**
- ***Crusader* Artillery System**
- **CVN-77**
- **Slow NSSN buy**
- **Reduce Buy of V-22 to 229**
- **Cancel THAAD Missile Defense**

The *Crusader* self-propelled artillery system was canceled because the team assessed that its military value would likely depreciate rapidly in the future owing to its limited striking range, high signature and resulting vulnerability to precision attack, and daunting logistical support requirements in terms of both fuel and ammunition. Moreover, in their view, the fire support mission could be accomplished by a number of other means. The THAAD missile defense system was cancelled because of its poor testing track record to date, concerns over the deployability and survivability of THAAD in an "anti-access" environment, and the cost of expensive kinetic kill interceptors relative to increasingly capable, low cost ballistic *and* cruise missiles which may

incorporate various countermeasures (e.g., early-release submunitions, chaff, maneuvering RVs, etc).

As a result of their force structure and procurement cuts, the U.S. team had sufficient funds to plus-up R&D and cover the anticipated plans-funding shortfall, but not enough to expand modernization or invest in potential "leap ahead" weapon systems. New system procurement was restricted to deployment of the Navy's Theater-Wide (NTW) missile defense (partially to offset cancellation of THAAD) and a limited national missile defense system.

PATH ASSESSMENT (U.S. TEAM, MOVE 1)

As compared to previous exercises in this game series, the U.S. team adopted a very modest transformation strategy both in terms of rate and scope. This might be attributed to the fact that they failed to develop an early consensus view about the opportunities and challenges likely to characterize the future warfare environment. Lacking such a vision, they plotted a transformation path which, at its midpoint in 2011, called for a U.S. military that was slightly smaller, but nearly identical to today's. Moreover, the team sacrificed an important learning opportunity by forgoing procurement of even small numbers of potential leap ahead systems with which to conduct experiments such as weaponized unmanned aerial vehicles (UAVs), airborne lasers (ABL), and surface arsenal ships. Rather incongruously, the team subsequently identified experimentation with "rapid response precision strike capabilities" as a critical component of their overall transformation strategy. Apparently, they planned to limit experimentation to currently fielded precision strike systems.

PATH DESCRIPTION (CHINA TEAM, MOVE 1)

Unlike the U.S. team which, at a minimum, had to generate enough savings to cover a plans-funding shortfall of $300 billion, the China team enjoyed an anticipated budget surplus of $250 billion over the course of this planning period. The team opted to divide these funds roughly equally between expanded R&D, new system procurement, and increased spending on readiness and training.

The China team felt that expanded R&D would be essential for "leap frogging" from its current outmoded military posture into the emerging warfare regime. Consequently, they selected the maximum R&D plus-up available, or an additional $100 billion in new R&D funding spread over the period 1998-2010. After making all of their other programmatic adjustments for Move 1, the China team earmarked $14 billion in remaining funds toward a further expansion in R&D above and beyond the original $100 billion plus-up. Specifically, they planned to invest this sum into the following areas:

- Manufacturing-related R&D;
- Counter-stealth technologies;
- Expanded R&D on "magic weapons" such as radio-frequency and directed-energy weapons; and
- Accelerated development of a family of electronic combat systems including satellite communication, GPS, and radar jammers.

New procurement spending over this planning period, 1998-2010, totaled over $100 billion. Criteria used by the China team in making procurement decisions tended to fall into one of three categories: 1) the extent to which a given system or capability would enable the People's Liberation Army (PLA) to better handle near-term contingencies (e.g., preventing Taiwanese independence); 2) the technology transfer opportunity involved; and 3) the perceived ability of the weapon system to retain its military utility after the transition from the current warfighting regime to the next.

Rather than attempt to modernize all branches of the PLA equally, the China team distributed resources unevenly (*see insert below*). For instance, air force-related procurement accounted for approximately 49 percent of new spending, while expenditures directed toward modernization of the Navy and Army represented only 24 and 12 percent, respectively. Interestingly, while the procurement of 1,500 ballistic and 1,400 cruise missiles accounted for less than four percent of new spending, it was viewed by both the China team and the U.S. team alike as one of most significant aspects of China's military modernization effort. While this expansion in China's missile arsenal was certainly notable, the China team passed over an option to procure 600 additional ballistic missiles in the 5,000 to 12,000 km range class. Interestingly, this decision was not driven by a lack of financial resources, but the desire to avoid appearing "overly provocative" to neighboring countries and the United States.

China Team Procurement Adds (Move 1)

- 1,000 Ballistic Missiles (300-600 km range)
- 500 Ballistic Missile (1,800 km range)
- 1,000 Short-range Cruise Missiles
- 400 Low-Observable Cruise Missiles (750 km range)
- 48 Theater Missile Defense Batteries
- 300 Advanced SAM Firing Units
- 400 Su-27 Fighters (co-produce)
- 400 Modern Ground Attack Aircraft (purchased)
- 100 Modern Ground Attack Aircraft (reverse-engineered)
- 6 Early Warning / Battle Management Aircraft
- 100 2nd Generation ISR UAVs
- 24 Air Refuelers
- 24 Heavy Transports
- 300 Land-Based, Anti-Ship Missile Firing Units
- 1 Small-deck Aircraft Carrier
- 20 Additional Advanced Attack Submarines (co-produce)
- 8 Additional Indigenous-Design Attack Submarines
- 20 Modern Destroyers (co-produce)
- 16 Additional Frigates
- 24 Additional Fast Attack Missile & Torpedo Craft
- Upgrade Surface Combatants with advanced ASCMs
- 5 Semi-Modern Amphibious Assault Ships
- 600 IFVs / APCs
- 500 Modern MLRS Firing Units
- 100 E-FOGM Equivalent Firing Units
- 300 Advanced, All-Weather Attack Helicopters
- 3 Military Communication Satellites
- 4 Military ISR Satellites (E-O, SAR, SIGINT/ELINT)

In respect to air force modernization, the China team tried to balance three different aircraft procurement strategies: outsourcing, co-production, and indigenous

development. The overarching objective of these parallel investments was to quickly move from foreign dependency to self-reliance in designing and manufacturing state-of-the-art aircraft. The team anticipated a number of important technological spin-offs from this investment in advanced aeronautics including the development of more capable UAVs and cruise missiles.

The outsourcing route was illustrated by the purchase of 400 modern ground attack aircraft (e.g., Su-30/34s) from Russia. Outsourcing was attractive to the China team for two reasons. First, they felt that outsourcing was the only way to quickly field enough modern aircraft to improve significantly the effectiveness of the PLA's air force branch in *near-term* contingencies such as a crisis over Taiwan. Second, by putting modern aircraft into the hands of operational units sooner then would otherwise be the case, outsourcing could provide a valuable learning opportunity. For instance, the air force could get a "leg up" on the future by training a cadre of pilots with modern aviation skills, gaining experience with information-age weapons such as precision-guided munitions (PGMs), and developing tactics and operational concepts appropriate to the "Chinese way of war."

The primary attraction of coproduction agreements, exemplified by the team's decision to build some 400 Su-27 aircraft with Russia, was the chance to absorb advanced foreign technologies which could in turn be used to accelerate and enhance indigenous production capabilities. The third path, indigenous production, was illustrated by the decision to reverse-engineer and manufacture 100 Su-30/34s. While they recognized that this would likely be a slow and laborious process, the team felt it was imperative in order to develop a large pool of technically-competent engineers and technicians as well as to recapitalize existing production infrastructure. As alluded to previously, this investment in human and physical capital was expected to not only pay dividends in respect to the production of modern combat aircraft, but would also be transferable to other projects such as bombers, UAVs, and cruise missiles.

System procurement for the navy was weighted heavily, over one-third of new spending, toward the expansion and modernization of China's attack submarine fleet.

The team chose not only to co-produce the maximum number of modern attack submarines (e.g., *Kilo-class* submarines with Russia, or *Type 212s* with Germany), but also to expand indigenous production of the *Song-class* attack submarine. The China team strongly believed that the future measure of naval power would likely center on stealthy submerged platforms vice high signature surface combatants.

It was for this reason, coupled with the desire to not appear aggressive, that the China team decided to forego acquisition of a large-deck aircraft carrier during the 1998-2010 planning period. While they did opt to procure an indigenously designed and built small-deck carrier in the 30,000 ton displacement class, they did not expect this carrier to transition well into the future warfare regime. In spite of that assessment, they decided to buy it for two reasons: 1) the opportunity to develop more advanced shipbuilding and systems integration skills; and 2) the desire to gain regional prestige and stature over the short term. The team's decision to co-produce twenty modern destroyers (e.g., Sovremenny-class) with Russia was similarly justified, plus it had the added benefit of providing a valuable technology transfer opportunity in respect to both ship design and advanced, anti-ship cruise missiles. In addition, the team believed that modern destroyers would prove useful in extending China's naval presence and influence in the South China Sea and other adjacent waters over the short- to mid-term. They opted to forego acquisition of modern amphibious assault ships from abroad, in favor of developing a less provocative, home-grown amphibious assault capability.

While the China team had the option of procuring up to 2,400 additional main battle tanks (e.g., T-90II), they opposed any expansion of incremental tank modernization. In their view, as foreshadowed by the Gulf War, tanks would likely become extremely vulnerable in the future as modern militaries continue to field increasingly capable ISR systems linked to sophisticated precision guided weapons. Given this trend, the China team planned to embark upon a radical transformation of the PLA — shifting away from the manpower intensive force of today toward a smaller, information intensive fighting organization characterized by mobility, precision striking power, decentralized command and control, and non-linear operations.

Symbolic of this transition, the team opted to procure an additional 300 advanced, all-weather attack helicopters, the maximum number available in this exercise, because of their speed, operational agility, and firepower. In addition, they bought 500 modern MLRS firing units and 100 E-FOGM firing units to enhance the PLA's long-range, precision striking power. At first glance, the decision to procure a limited number of modern infantry fighting vehicles and armored personnel carriers would appear inconsistent with the ground force transformation described above. However, the China team did not view these heavy ground vehicles as useful for "high technology" warfare, but as a tool for improving the PLA's ability to maintain internal security (i.e., rapid response to urban riots, etc.) as well as for participating in regional humanitarian and peacekeeping activities.

PATH ASSESSMENT (CHINA TEAM, MOVE 1)

The China team felt that the PLA was saddled with a huge pool of relatively unskilled personnel as well as sizable inventories of practically unusable, antiquated weapon systems. As a result, they concluded that large force structure cuts across all branches of the PLA were not only desirable, but essential in order to transform the PLA successfully. Capping rapidly rising personnel costs was seen as particularly important.[2] In terms of salary growth alone, the marginal cost of each soldier in the PLA was expected to rise by $25,000 over the period 1998-2010, and by more than twice that, or $52,000, between 2011-2024. In the view of the China team, if unchecked, these rising costs could completely stymie the PLA's transformation. By cutting 6 Group Armies in Move 1, the China team saved approximately $30 billion over the period 1998-2010, and an additional $75 billion over the period, 2011-2025, in personnel costs. And as a secondary benefit, by streamlining the PLA, they could also afford to spend more per capita on professional military education (PME) and training.

[2] During the period 1998-2010, the salary for the average PLA soldier was assumed to rise approximately 8 percent per annum; keeping pace with comparable growth in the Chinese economy. Over the period 2011-2024, salary growth was assumed to be about 5 percent per annum.

By divesting the PLA of excess troops and outmoded equipment, the China team was able to "jump start" the PLA's transformation through a massive upsurge in R&D funding coupled with the selective procurement of modern weapon systems. As alluded to earlier, the team's procurement strategy sought to balance the long-term goals of technological self-sufficiency and eventual military superiority over prospective rivals (e.g., India, Japan, and the United States) with the more immediate requirement of modernizing the PLA to better handle near-term contingencies (e.g., preventing Taiwanese independence).

To expedite their rise, the China team planned to systematically pursue a strategy of "learning from others" by maintaining a robust program of military-to-military contacts and exchanges; encouraging military education abroad; exploiting open source intelligence, especially that pertaining to the Revolution in Military Affairs (RMA) and military experiments; and even by buying foreign military training assistance.[3]

By the end of this planning period in 2010, the China team had positioned the PLA well along the path toward fielding a multidimensional, anti-access capability with which to frustrate the power projection efforts of prospective adversaries. The objective of this "keep out" or "theater denial" strategy was not only to prevent foreign forces from violating the territorial boundaries of the Chinese homeland (including Taiwan), but also to deny or frustrate the deployment of power projection forces into neighboring counties (e.g. Japan, Korea, India) or nearby littoral waters.

[3] The China team's view in this game seems to be supported by ongoing activity by the PLA. According to China's recently released Defense White Paper, "China has set up military attaches offices in more than 90 Chinese embassies abroad...In the last 20 years, more than 1,300 Chinese military delegations, of which some 180 were headed by senior officers, have visited over 80 countries." See China – Defense White Paper, *Beijing Xinhua Domestic Service* (in Chinese), July 27, 1998, as translated by FBIS, July 28, 1998, p15.

Strides made in assembling a modern C4ISR network over the course of this planning period were essential to the creation of such an anti-access architecture. In addition to taking full advantage of emerging space-based communication services (e.g., Teledesic and Iridium) as well as commercial space-based remote sensing services, the China team procured a number of "leap ahead" C4ISR-related systems including military communication and ISR satellites, long-loiter ISR UAVs, and early warning and battle management aircraft.

In their view, by wiring these systems together into a shared C4ISR network, the PLA could not only detect the presence of foreign military units at ports and airfields within the region, but would also be able to detect, track, and target high-signature military platforms such as wide-body aircraft, large surface ships, and slow-moving, mechanized ground units. Cued with the requisite targeting information, the PLA could attack enemy power projection platforms with a number of different air-, sea-, and ground-based weapons systems. As of 2010, the strike component of the PLA's anti-access architecture could be described as follows:

- ***Anti-air element***: 1,500+ ballistic missiles and 1,400 cruise missiles with which to deny access to, and use of regional airfields; an advanced SAM belt consisting of several hundred launchers with an engagement range out to nearly 200 km; Patriot-equivalent theater air and missile defense batteries; and a relatively small, but increasingly capable air force.

- ***Anti-navy element***: almost 400 ground-based, anti-ship cruise missile (ASCM) launchers capable of engaging surface ships to a distance of 300 km; a fleet of over 30 advanced attack submarines (German *Type 212*, Russian-design *Kilo-class*, and indigenous variants); and over 300 fast attack missile and torpedo craft armed with ASCMs with an engagement range over 100 km (e.g., C-802 and SS-N-22).

- ***Anti-ground force element***: 1,500+ ballistic missiles and 1,400 cruise missiles as well as over 500 modern ground-attack aircraft equipped with precision-guided munitions (PGMs) capable of damaging or destroying regional points of disembarkation (e.g., ports and airfields), supply depots, and troop assembly areas.

The basic transformation philosophy of the China team during this planning move could be summarized as an aggressive streamlining of bloated force structure, rapid divestiture of outmoded systems, and selective investment in promising technologies and weapon systems.[4] The China team invested heavily in missile forces during this planning period. The Air Force, while smaller by 15 fighter wings, was modernized dramatically with the incorporation of over nine wings of much more capable aircraft. The Army lost over 18 divisions, but gained valuable precision strike and mobility assets (e.g., MLRS, E-FOGM, and attack helicopters). The Navy was expanded and modernized both above and below the ocean's surface with the commissioning of 36 major surface combatants (i.e., destroyers and frigates) and nearly 30 advanced attack submarines.

[4] Interestingly, this appears to be precisely the path upon which today's People's Republic of China (PRC) claims to be embarking. The Chinese Defense White Paper released in July 1998 states that "reducing quantity and improving quality is a basic principle upon which the army is to be modernized...The PLA will strive to make the transition from a numerically superior type to a qualitatively efficient type, and from a manpower-intensive type to a technology-intensive type," China – Defense White Paper, *Beijing Xinhua Domestic Service* (in Chinese), July 27, 1998, as translated by FBIS, July 28, 1998, p7.

PATH DESCRIPTION (U.S. TEAM, MOVE 3)

While the U.S. team did make some sizable cuts in incremental modernization during this planning period such as cancelling the JSF program, they relied mostly on force structure reductions to finance new system procurement as well as to cover the anticipated $300 billion budgetary shortfall in the QDR defense plan. Force structure cuts in fact accounted for over 87 percent of the total savings which accrued over this period (*see insert right*). The decision to disband four Army divisions generated about 44 percent of force structure savings (or 38 percent of total savings). The majority of that savings, however, was consumed by the expense of creating six Advanced Deep Strike Brigades (DSBs) and nine Combined Arms Regiments (CARs).[5] As a result, the biggest net bill payer was actually the Navy. The removal of three CVBGs accounted for about 25 percent of total force structure savings between 2011-2025.

U.S. Team Force Structure Adjustments (Move 3)

- **Cut 4 Fighter Wings**
- **Retire B-52 Bombers**
- **Retire B-1Bs**
- **Cut 4 Army Divisions**
- **Cut 3 Aircraft Carrier Battle Groups (CVBGs)**
- **Cut 1 Marine MEB**
- **Retire Minuteman III ICBM**
- **Cut 4 Trident SSBNs**
- ***Create 6 Advanced Deep Strike Brigades***
- ***Create 9 Combined Arms Regiments***

These rather substantial cross-service force structure cuts were apparently motivated by the team's perception that tactical fighter aircraft, heavy ground units, and carrier battlegroups would have difficulty performing their respective missions in the future as military competitors developed increasingly robust anti-access capabilities.

[5] The Advanced DSB and CAR were two new combat organizations originally created for the Future Warfare 20XX wargame series and incorporated into this transformation exercise. The Advanced DSB consisted of 72 extended-range, advanced attack helicopters (follow-on to *Comanche*); 54 stealthy, electric-drive missile launchers; and 96 high-altitude, long endurance UAVs. The CAR consisted of 108 air-droppable, low-observable, electric drive, electromagnetic gun-equipped advanced combat vehicles; 27 stealthy, electric drive missile launchers (100 km range); and 27 stealthy UAVs. For more details on these organizations see Tab P.

For instance, given current trends, it seemed likely to the U.S. team that future adversaries would be able to destroy the airfields, ports, supply depots, assembly areas, and other fixed sites upon which these forces depend with barrage missile attacks. In addition, the threat posed by increasingly capable sea-skimming anti-ship cruise missiles, mines, and advanced attack submarines could force high-signature U.S. naval vessels out of littoral waters.

Savings carried forward from Move 1 combined with force structure and procurement cuts during Move 3 made over $661 billion available for force modernization during the 2011-2025 period *after* deducting the anticipated budgetary shortfall of $300 billion. The U.S. team opted to invest $80 billion into expanded R&D while the remainder was allocated to weapons procurement as well as force structure expansion and re-organization in selected areas.

Procurement spending was roughly split between the Air Force and the Navy, 43 percent and 38 percent, respectively (*see insert below*). The team justified the acquisition of 20 B-X Bombers as well as Low-Observable Airlifters and Aerial Refuelers as part of its longer term goal of shifting the composition of the Air Force in favor of long-range, low-observable platforms. (They were also motivated in part by the perceived need to replace aging B-1Bs and B-52s). The purchase of 200 weaponized UAVs, 20 Low-Observable UAV Tenders, and 20 Low-Observable UAV Transports was representative of a parallel conceptual shift toward

U.S. Team Procurement Adds (Move 3)

- **20 B-X Bombers**
- **200 Additional Strike UAVS**
- **4 Low-Observable ABLs**
- **20 Low-Observable UAV Tenders**
- **120 Low-Observable Airlifters**
- **100 Low-Observable Aerial Refuelers**
- **200 Low-Observable UAV Transports**
- **1,200 Remote Missile Pods**
- **12 Stealthy Sea Control Frigates**
- **25 Additional SSNs**
- **12 Submersible Arsenal Ships**
- **200 Anti-Navy UAVs**
- **Land- & Sea-based Cruise Missile Defense**
- ***Starlite* Space-Based Radar (SBR)**
- **8 Trans-Atmospheric Vehicles (TAVs)**
- **90 Rapid Launch, Light Satellites**

increased reliance on unmanned systems.[6] The team procured the ABL not only to enhance its overall theater ballistic missile defense (TBMD) capability, but also as a "testbed" for experiments with directed energy.

The team opted to procure twelve *submerged* arsenal ships principally to boost the Navy's ability to conduct high volume, long-range precision fires. Barring dramatic advances in anti-submarine warfare (ASW), they assessed that the "stealthiness" inherent to operating beneath the ocean's surface would allow submerged arsenal ships to evade detection considerably better than surface ships, especially early on in a conflict when an adversary's anti-access or sea-denial capability would likely be operating at a peak level of effectiveness.[7] Conversely, the team believed that particularly high signature surface combatants such as aircraft carriers and destroyers would become increasingly vulnerable as a consequence of the proliferation and growing sophistication of land- and sea-based antiship cruise missiles. The U.S. team also acquired an additional 25 NSSNs not only to augment the Navy's submerged power projection capabilities, but also to counter anticipated qualitative and quantitative improvements in attack submarines operated by emerging military competitors. In their view, the United States simply could not risk losing control of the undersea dimension of the battlespace.

At first glance, the Army received only about 5 percent of new procurement spending during this planning period. However, this figure is deceptive because, as mentioned earlier, the addition of 15 new combat organizations to the Army's force structure involved major outlays for new systems such as a follow-on to the *Comanche* armed-reconnaissance helicopter, electric-drive missile launchers, semi-robotic advanced combat vehicles (ACVs) equipped with electromagnetic guns, and various types of robotic forces (for detailed information on these systems, see Tab P).

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[6] The UAV Tender was a new aerospace platform originally created for the Future Warfare 20XX wargame series and incorporated into this exercise. The UAV Tender was described as a stealthy, intercontinental range, transport and battle management aircraft capable of launching, controlling, recovering, and refueling/rearming up to 10 multirole UAVs. See Tab P for more information.

[7] Each submerged arsenal ship was equipped with a mix of 500 advanced ballistic and extended-range cruise missiles.

There was no such "hidden" modernization for the Marine Corps, however. With the possible exception of UAV Transports, the U.S. team did not procure any new weapons systems for the Marine Corps during this move beyond that included in the baseline modernization plan.

PATH ASSESSMENT (U.S. TEAM, MOVE 3)

The transformation path pursued by the U.S. team was relatively uneven across the Services; the rate and scope of change varied considerably. The Air Force's transformation matured with the incorporation of the B-X bomber, airborne UAV Tenders, low-observable airlifters and aerial refuelers, and both weaponized and transport UAVs. The U.S. team considered all of these systems as integral to its vision of a future Air Force which would no longer rely upon in-theater basing for projecting power at extended ranges from the continental United States (CONUS).

With the incorporation of 25 additional nuclear-powered attack submarines (SSNs) and 12 Submerged Arsenal Ships into the fleet, the U.S. team began to reorient the Navy toward submerged power projection. Submerged Arsenal Ships, each armed with up to 500 ballistic and cruise missiles, promised a step-function increase in the Navy's ability to conduct long-range strikes from beneath the sea.

The transformation of the Army into a light weight, mobile, decentralized ground force commenced in earnest during this period with the introduction of CARs and advanced DSBs. The Marines, however, had not even started to transform as of 2025 If the team had invested in a higher level of R&D in Move 1, they would have had the opportunity to equip individual Marines with bio-mechanical exoskeletons over the course of this planning period.[8]

[8] Exoskeletons were a new ground combat system originally created for the Future Warfare 20XX wargame series and incorporated into this exercise. Exoskeletons were described as armored, climate-controlled "suits" worn by individual soldiers to enhance their operational and tactical mobility as well as to provide them with integrated weapons, communications, and information warfare systems.

Perhaps the most critical transformation issue that surfaced during this move was the U.S. team's inability to contest control of space. As alluded to earlier, the team opted to forego investment in R&D related to the weaponization of space in Move 1. As a result, while alarmed by Chinese developments, the U.S. military was not in a position to procure space warfare capabilities during this period such as the SBL; ground-based, directed-energy, anti-satellite (ASAT) systems; submersible launchers for light satellites or ASATs; information warfare satellites; and space-to-ground attack satellites (see Tab P for descriptions).[9]

SUMMARY (U.S. TEAM, END-STATE)

At the end of the game in 2025 (*see insert right*), the U.S. team ended up with an Air Force that was partially transformed. While platforms consistent with the emerging warfare regime had been incorporated, the Air Force still retained 14 tactical fighter wings; very few of which were even upgraded with F-22s. A transformation toward submerged power projection appeared to be underway. However, the Navy was still very much dominated by surface combatants (e.g., six legacy CVBGs and some 64 Surface-Combatant 21s). In terms of fielding a light, rapidly

U.S. Team -- End State (2025)

- 14 Tactical Fighter Wings (about 15% F-22s)
- 21 B-2 Bombers
- 20 B-X Bombers
- 200+ Weaponized UAVs
- 4 Low-Observable Airborne Lasers (ABLs)
- 20 Low-Observable UAV Tenders (w/1200+ UAVs)
- 120 Low-Observable Airlifters
- 100 Low-Observable Aerial Refuelers
- 200 Low-Observable UAV Transports

- 6 CVBGs (3 with CVX) equipped with JSF
- Navy Theater-Wide TMD Deployed
- 12 Stealthy Sea Control Frigates
- 12 Submerged Arsenal Ships
- 200 Anti-Navy UAVs
- 64 Surface-Combatant 21s
- 62 SSNs
- 10 SSBNs

- 7 Legacy Marine MEBs w/V-22 Osprey & JSF
- 4 Legacy Army Divisions
- 1,200 Remote Missile Pods
- 6 Advanced Deep Strike Brigades
- 9 Combined Arms Regiments

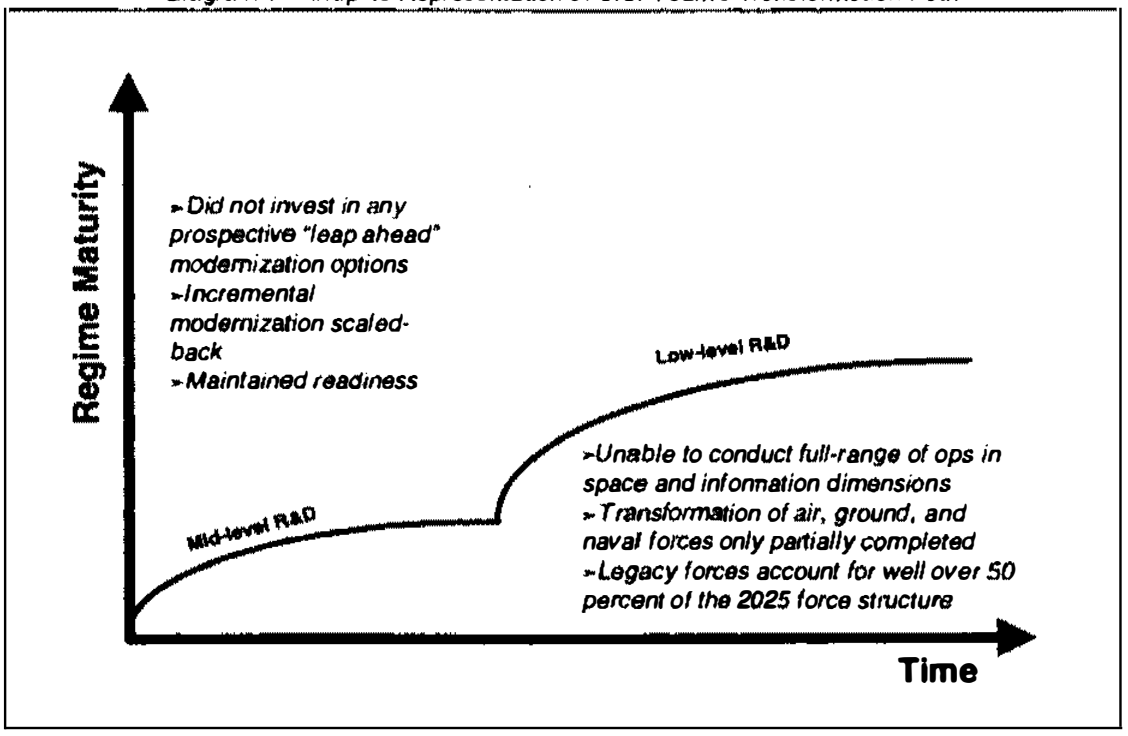
- *Starlite* Space-Based Radar (SBR)
- 8 Trans-Atmospheric Vehicles (TAVs)
- 90 Rapid launch, Light Satellites

[9] The team requested, and was granted, a special dispensation by the Control team which permitted them to procure eight trans-atmospheric vehicles (ACVs) even though they had not invested in the requisite R&D in Move 1.

deployable, mobile, decentralized ground force, the Army had benefited from the incorporation of DSBs and CARs, but was still somewhat hamstrung by four legacy divisions. The Marine Corps, while slightly smaller, was still organized and equipped much like today.

As depicted in the diagram below, the slope of the U.S. team's transformation path over the period 1998-2011 was shallow, reflecting their decision to not procure any leap ahead military systems. Over the period, 2012-2025 the rate of change was relatively greater as the team capitalized on early R&D investments and procured a number of RMA systems (see pg. 19). Nevertheless, the overall rate of change was modest, and as a result, the transformation of the U.S. military was incomplete as of 2025.

Diagram 1 – Graphic Representation of U.S. Team's Transformation Path



PATH DESCRIPTION (CHINA TEAM, MOVE 3)

China's defense budget was scripted in the game scenario to rise from $90 billion in FY 2011 to about $200 billion by FY 2025. With this expanding defense budget, it was assumed that the China team would have about $675 billion available (including a $26 billion carry forward from Move 1) for new spending *after* subtracting cost growth in the baseline defense program, inflation, and increasing personnel expenses. The China team invested $150 billion, the highest option available, into expanded R&D in hope of catching up, or in some cases, pulling ahead of the United States in the development and application of militarily-relevant technologies.

Once again, the China team opted to cut deeply into legacy force structure *(see insert right)*. These reductions were shouldered disproportionately by the ground component of the PLA. The elimination of 15 tank / mechanized divisions and 36 infantry divisions (or 12 Group Armies) accounted for roughly 95 percent of total force structure savings, or $250 of the $264 billion saved over the FY 2011-2025 planning period. However, almost all of this savings was subsequently expended on fielding combat units which were more consistent with the emerging warfare regime. Of all the branches of the PLA, the Army was overhauled the most, incorporating 11 brigades and eight divisions equipped with advanced equipment (e.g., Comanche-equivalent attack helicopters, E-FOGM equivalent anti-tank missile launchers, advanced combat vehicles, electric-drive EM guns, and various types of UAVs). In short, PLA ground combat units became dramatically lighter, more mobile, and more lethal than their predecessors (See Tab V

China Team Force Structure Adjustments (Move 3)

- Cut 10 Fighter Wings
- Cut 15 Tank / Mechanized Divisions
- Cut 36 Infantry Divisions (12 Groups Armies)

- *Create 6 Sea Control Brigades*
- *Create 2 Advanced Airborne Brigades*
- *Create 9 Mobile Strike Brigades*
- *Create 4 Aerial Strike Force Divisions*
- *Create 4 Mobile Strike Force Divisions*
- *Create 6 Specialized IW Brigades*

for detailed descriptions of these forces). The transformation of PLA ground forces consumed about 85 percent of total force structure savings during this period.

The China team did not, however, neglect the Navy and the Air Force. Both branches were transformed substantially by an infusion of new system procurement *(see insert below)*. The Air Force absorbed about 23 percent of increased procurement spending, while the Navy benefited from about 31 percent. The procurement of over 700 UAVs of various types was illustrative of the China team's gradual shift away from manned tactical aircraft. Four characteristics of UAVs appeared particularly important: 1) the comparative ease with which UAV "operators" could be trained; 2) the ability of UAVs to loiter over target areas for an extended period of time; 3) tactical maneuverability unlimited by human physiology (e.g., the absence of G-force restrictions); and 4) reduced support and maintenance requirements, facilitating the operation of UAVs from bases dispersed throughout Chinese territory. In addition to increased reliance on unmanned platforms, the China team also continued to invest in state-of-the-art SAMs as part of its multidimensional anti-access strategy.

China Team Procurement Adds
(Move 3)

- **500 Ballistic Missiles (2,500-5,000 km range)**
- **500 Ballistic Missiles (5,000 km range)**
- **2,000 VLO Cruise Missiles (1,500 km range)**
- **500 Extended-Range, VLO Cruise Missiles**
- **14 THAAD-Equivalent TMD Batteries**
- **300 Additional Advanced SAMs (SA-X)**
- **24 Wide-Body ALCM Trucks**
- **12 Airborne Laser Platforms**
- **200 Advanced ISR UAVs**
- **24 Information Warfare UAVs**
- **200 Weaponized UAVs**
- **100 Modern Air Refuelers**
- **100 Modern Airlifters**
- **300 Anti-Ship / ASW UAVs**
- **2 Wide-Area, Underwater Sensor Nets**
- **Additional 32 Advanced SSNs**
- **20 Advanced ASW Frigates**
- **24 Battle Dominance Ships (DD-21 equivalent)**
- **16 Advanced Amphibious Assault Ships**
- **24 Space-Based Lasers**
- **4 Space-to-Ground Attack Satellites**
- **8 Trans-Atmospheric Vehicles**
- **80 Rapid Launch, Light Satellites**
- **12 Advanced Military Communication Satellites**
- **12 Advanced ISR Satellites**

The China team dedicated approximately $92.5 billion to naval expansion and modernization. The transformation of the Navy toward increased reliance on undersea platforms initiated in Move 1, matured significantly over the period FY 2011-2025. In fact, over 65 percent of navy-related procurement was focused on submarine warfare. As mentioned already, the China team strongly believed that control of the undersea would be a critical element of great power competition in the future. Thus, it is not surprising that they opted to procure an additional 32 attack submarines, UAVs optimized for antisubmarine warfare (ASW), underwater "sensor nets," and advanced ASW frigates.

As in Move 1, the team did not include large-deck carriers as part of their transformation strategy. Presented with the option of procuring up to two Nimitz-class carriers during this planning move, they decided to forego them entirely. In addition to the ASW frigates mentioned previously, the only surface ships they acquired were DD-21-equivalent, guided-missile cruisers (i.e., Battle Dominance Ships) and advanced amphibious assault ships. They planned to use the missile cruisers for surface sea control missions (e.g., SLOC protection) and "presence" missions abroad. The China team also estimated that these cruisers could augment the PLA's regionally-focused TMD capabilities since they were equipped with an Aegis-equivalent upper and lower tier air defense system. The amphibious assault ships were procured in order to improve the PLA's ability to project power regionally, as well as to conduct NEOs and peacekeeping missions. While the team did not specifically procure land-based, anti-shipping cruise missiles as a procurement line-item in this turn, expanded acquisition was inherent in the incorporation of six Sea Control Brigades into the Navy's force structure.[10]

The size of the PLA's missile stockpile more than doubled over the course of this planning move. However, the total cost associated with the addition of 1,000 ballistic missiles and 2,500 missiles represented less then seven percent of new system

[10] The Sea Control Brigade was new combat organization originally created for the Future Warfare 20XX wargame series and subsequently incorporated into this exercise. The Sea Control Brigade consisted of an EM-Gun Battalion with 18 mobile, electromagnetic guns (750 km range) and a Cruise Missile Battalion armed with 18 mobile, ground-based cruise missile launchers (4,000 km range).

procurement. This expansion in the PLA's long-range precision striking power was characterized by two trends: 1) increased investment in cruise versus ballistic missiles; and 2) increased reliance on stealth and penetration aids to improve the prospects of piercing an enemy's missile defenses.

This planning period also saw the emergence of PLA's warfighting capabilities in two new dimensions of the battlespace: space and the infosphere. In stark contrast to the U.S. team which abandoned R&D related to space warfare technologies in Move 1 (e.g., directed-energy, adaptive optics, high-energy propellants, etc.), the China team made this early investment and was able to capitalize on it over the course of the 2011-2025 timeframe. In fact, they allocated over $93 billion, or more than 30 percent of new procurement spending, on systems with which to contest control of space. The team also created six specialized information warfare (IW) brigades and fielded 24 IW UAVs which could be used to degrade, disable, manipulate, or destroy the information systems of prospective adversaries.

After making all of their desired programmatic adjustments, the China team still had approximately $130 billion in funding available for the planning period 2011-2025. While some members of the team advocated another round of procurement spending, the majority of the team favored using the surplus to recapitalize military-related infrastructure (fiber optic networks, roads, bridges, ports, air fields, etc.) and to plus-up spending on professional military education and training.

PATH ASSESSMENT (CHINA TEAM, MOVE 3)

The transformation of the PLA into a light weight, mobile, decentralized ground force commenced in earnest during this period with the introduction of Mobile Strike Brigades, Aerial Strike Force Divisions, and to a lesser extent, Mobile Strike Force Divisions (see Tab V for detailed information on these units). The Air Force was transformed into a progressively more unmanned force with increasingly robust long-range precision strike (e.g., ALCM trucks) and anti-access capabilities (e.g., air-to-air UAVs, airborne laser platforms, and advanced SAMs). With the incorporation of 32

nuclear-powered attack submarines (SSNs), for a total of more than 70 advanced attack submarines (including AIP and diesel types), the China team was clearly in a position to contest control of the undersea not only in their littoral, but probably well into the western Pacific Ocean.

Bolstered by the addition of 1,000 ballistic missiles with a range over 2,500 km and 2,500 very low observable (VLO) cruise missiles, the PLA's missile force could reliably hold at risk high signature targets (e.g., ports, airfields, depots, enemy force concentrations, etc) throughout the region. For instance, given the requisite targeting information, the PLA could launch barrage attacks against targets in India, Pakistan, Vietnam, Indonesia, Japan, and Korea. The PLA's sizable, but more limited stockpile of extended-range missiles (4000 to 5,000 km) could be used to strike targets as far away as Saudi Arabia, Iran, Turkey, and most of Russia.

And finally, as of 2025, the China team's weaponization of space was relatively comprehensive with the fielding of space-to-ground attack satellites, transatmospheric vehicles, and a SBL constellation capable of conducting both anti-satellite (ASAT) and ballistic missile defense missions (see Tab V).

The multidimensional, anti-access architecture which the China team began assembling in Move 1 matured considerably over the FY 2011-2025 period. Not only was each of the existing legs of the architecture strengthened, but the "anti-space" leg was added. By the end of this planning period, the PLA had in place a very robust anti-access capability with which to frustrate power projection efforts of potential adversaries. The ISR network was populated with almost 900 advanced ISR UAVs (includes those organic to ground units), 20 ASW frigates with both acoustic and nonacoustic "sub hunting" capability, extensive underwater "sensor nets" which could be deployed in littoral waters, 24 Battle Dominance Ships with powerful phased-array radars, 80 light satellites, 12 additional military communication satellites, and 12 improved ISR satellites.

As of 2025, the strike component of the PLA's anti-access architecture could be described as follows:

- ***Anti-air element***: 2,500+ ballistic missiles and nearly 4,000 ground-launched cruise missiles – including 2,500 VLO cruise missiles – with which deny access to, and use of regional airfields; 200 weaponized UAVs; 12 airborne laser platforms; an advanced SAM belt consisting of several hundred launchers with an engagement range out to nearly 400 km; 48 PAC 3 and 14 THAAD-equivalent theater air and missile defense batteries.

- ***Anti-navy element***: Six Sea Control Brigades each fielding an EM-gun battalion capable of shooting five inch, high-explosive, precision-guided projectiles out to 750 km and a Cruise Missile Battalion armed with 4,000 km range ASCMs; 300 anti-ship UAVs each equipped with 12 anti-ship PGMs; a fleet of over 70 advanced attack submarines; over 300 fast attack missile and torpedo craft armed with ASCMs; and 400 ground-based, ASCM launchers with 300 km range.

- ***Anti-ground force element:*** 2,500+ ballistic missiles and nearly 4,000 ground-launched cruise missiles; 24 wide-body ALCM Trucks each equipped with 40, 100 km range ALCMs; 200 weaponized UAVs capable of loitering overhead (e.g., above likely amphibious insertion points, airfield, and ports) for extended periods; 20 Battle Dominance Ships equipped with 2,000 km range, stealthy land attack cruise missiles; nine Mobile Strike Brigades armed with electric-drive, EM-gun systems with a range of 1,000 km; and four space-to-ground attack satellites and eight TAVs capable of launching pinpoint strikes against terrestrial targets with high velocity, kinetic-energy projectiles.

- ***Anti-space element***: a constellation of 24 SBL platforms capable of engaging enemy space-launch vehicles and satellites at the speed of light as well as eight TAVs capable of kinetic energy attacks against satellites in low-earth orbit (LEO) and mid-earth orbit (MEO).

SUMMARY (CHINA TEAM, END-STATE)

China Team -- End State (2025)

- 1,500 Ballistic Missiles (<2000 km range)
- 1,000 Ballistic Missiles (>2,000 km range)
- 1,000 Short-range Cruise Missiles
- 400 Low-Observable Cruise Missiles
- 2,500 VLO Cruise Missiles
- 48 PAC-equivalent TMD Batteries
- 14 THAAD-equivalent TMD Batteries

- 15 Manned Fighter Wings (about 75% modernized)
- 700+ Advanced SAM Firing Units
- 24 Wide-body ALCM Trucks
- 300 ISR UAVs
- 24 Information Warfare UAVs
- 200 Weaponized UAVs
- 12 Airborne Laser Platforms
- 6 Early Warning / Battle Management Aircraft
- ~260 Air Refuelers / Airlifters

- 1 Small Deck Carrier
- 40 Diesel-Powered Attack Submarines
- 32 Nuclear-Powered Attack Submarines
- 380+ Land-Based Anti-Ship Missile Launchers
- 300 Anti-Ship / ASW UAVs
- ~100 Major Surface Combatants
- 300+ Fast-Attack Missile/Torpedo Craft
- 20 Amphibious Assault Ships (plus 25 LSTs)

- No Legacy Tank Divisions
- 12 Legacy-Rapid Reaction Divisions (equipped with IFV/APCs)
- 24 Legacy Infantry Divisions
- 7 Modernized Helicopter Regiments
- 14 Artillery Divisions (equipped w/ MLRS & E-FOGM)
- 5 Airborne Brigades
- 9 Mobile Strike Brigades
- 4 Aerial Strike Force Divisions
- 4 Mobile Strike Force Divisions

- 6 Specialized IW Brigades
- 24 Space-Based Lasers
- 4 Space-to-Ground Attack Satellites
- 8 Trans-Atmospheric Vehicles
- 80 Rapid Launch, Light Satellites
- 15+ Military Communication Satellites
- 16+ Advanced ISR Satellites

At the end of the game in 2025 (*see insert above*), the China team ended up with missile force totaling over 6,000 missiles of varying range. Limited by industrial output constraints and technological obstacles, the composition of the PLA's missile arsenal was necessarily weighted toward ballistic missiles between 1999-2010, but over time the composition shifted. By 2025, cruise missiles, particularly stealthy ones, constituted more than half of China's missile arsenal. Concerned about the regional proliferation of missiles (e.g., India, Korea, etc), the China team fielded a tiered missile defense capability -- the SBL and ABL could attempt to intercept an enemy's ballistic missiles while they were still in their boost phase; Battle Dominance Ships (Upper Tier) could engage remaining missile during the mid-course phase of their trajectory; and THAAD, PAC, and Navy Lower Tier equivalent terminal defenses could attempt to destroy any "leakers."

A transition toward UAVs and stand-off strike platforms (e.g., ALCM Trucks) was clearly underway within the PLA's air force. Nevertheless, manned fighters and ground attack aircraft still figured prominently, accounting for over 80 percent of the air force's "shooters."

The Navy was bifurcated with a substantial surface fleet as well as an increasingly powerful submerged fleet. The trend appeared to be away from surface ships and toward still greater reliance upon submerged vessels, however.

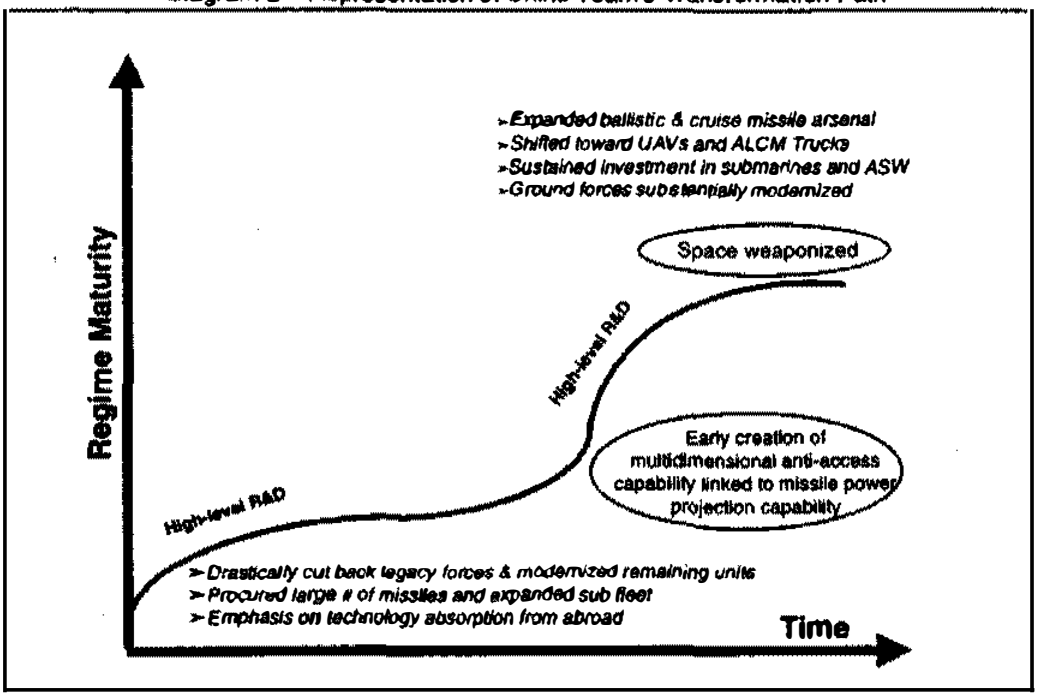
Of all the branches of the PLA, the army was probably the most radically transformed. By 2025, no legacy tank divisions remained and the number of infantry divisions had been scaled back tremendously. In fact, between 1999-2025, the China team opted to disband a total of 54 infantry divisions. As seen in the insert above, legacy units were essentially "swapped out" for new combat organizations which were more mobile and lethal.

A graphical representation of the transformation path pursued by China team over the period 1998-2025 is depicted below. While the China team procured a wide array of weapon systems during the period 1998-2010 (see pg. 11), the majority of these acquisitions fell within the contemporary warfighting regime. Procurement was focused mainly upon catching up, not leaping ahead into the emerging RMA regime. They did, however, invest considerable resources into submarine warfare and missile-based power projection, both of which could be considered elements of the RMA. For all of these reasons, the diagram below depicts a relatively modest rate of change over this period.

However, the China team's massive investment in R&D set the stage for discontinuous change in the later period, 2011-2025. All the branches of the PLA benefited substantially from leap ahead procurement (e.g., VLO cruise missiles, ALCM trucks, SSNs, electromagnetic gun-equipped artillery). Most of PLA's legacy ground forces were replaced by fighting units that were much more consistent with the RMA. In

addition, the China team also weaponized space and fielded a range of IW capabilities. Accordingly, the diagram below depicts a rapid rate of change during this period. While the PLA's transformation was still not complete as of 2025, one could reasonably argue that the China team had caught up, or even surpassed, the U.S. team in respect to exploitation of the RMA.

Diagram 2 – Representation of China Team's Transformation Path



III. Strategic Posturing & Exploitation

RESPONSE TO THE "TAIWAN CRISIS OF 2008" (U.S. TEAM)

During the course of Move 2, the U.S. and China teams were confronted with a strategic crisis — in 2008, a Taiwanese nationalist from the Democratic Progressive Party (DPP) was elected president of Taiwan and advocated independence from the mainland. According to the scenario, the new government in Taipei held a national plebiscite on the question of independence and 58 percent of the population voted for independence. With the support of the national Assembly and the Legislative Yuan, the president officially declared Taiwan's independence from the PRC.

Interestingly, the response of both teams was surprisingly measured (see Tab G). The overwhelming preference of both teams was to resolve the potential crisis through diplomatic channels. Nevertheless, during the exercise, it seemed likely that they would have inadvertently stumbled into a large-scale, high intensity war.

The China team planned to announce to the world community that the Taipei's declaration of independence was manufactured and "did not represent the view of the majority of the island's population." They would then ratchet up pressure on Taiwan through a *de facto* embargo imposed under the guise of conducting air and sea "inspections" to prevent the introduction of subversives or contraband into Taiwan. As long as the United States did not challenge the *de facto* embargo, or otherwise signal its intent to intervene militarily, the China team planned to respond proportionately to any Taiwanese attacks on the mainland. Their plan was to wear down the "illegitimate" Taiwanese government over time via the embargo and sustained, low-level missile harassment.

For its part, the U.S. team planned to convey to Taiwan its lack of support for its "reckless" declaration and encourage Taipei to commence diplomatic talks immediately with Beijing. Meanwhile, the U.S. team planned to publicly discourage Chinese use of force to seize Taiwan, but tacitly condone a Chinese blockade through military inaction.

In other words, the objective of the U.S. team was limited to deterring, and, if necessary, preventing an outright Chinese invasion of Taiwan. The U.S. team was willing, however, to allow China to use economic and military coercion to force the leadership in Taipei to disavow the declaration and submit to integration along the lines of "one China, two systems." In order to deter outright invasion as well as to reassure regional allies, the U.S. team decided to deploy U.S. forces to the area including airlifting TMD systems to Japan, positioning bombers in Guam, and, assuming they were welcome, stationing U.S. ground forces in Japan.

The China team generally anticipated, and was willing to accommodate, such a deployment *except* for the stationing of ground troops in Japan. To the China team, the movement of U.S. ground troops to Japan clearly signaled an intention to intervene militarily. As a result, they felt compelled to proceed immediately with Option B – a large-scale, ballistic and cruise missile barrage attack against Taiwanese airfields, ports, and other major military installations; a strategic information warfare attack against Taiwanese communications and economic infrastructure; and an aggressive anti-access campaign waged against U.S. forces attempting to enter the theater. In short, they were willing to escalate to full-scale war with the United States to decide the Taiwan issue once and for all. In their view, preventing Taiwanese independence was a matter of regime survival.[11]

PERCEPTION OF THE MILITARY BALANCE (U.S. TEAM)

In assessing the military balance as of 2008, the U.S team judged that from a force-on-force perspective it had a significant qualitative lead over the PLA across all dimensions of the battlespace — i.e., ground, sea, air, space, and information. The U.S. team was concerned, however, about China's ability to use its growing stockpile of cruise and ballistic missiles to hold at risk the airfields, ports, supply depots, assembly

[11] As referred to earlier (p. 5), this exercise also presented the participants with a crisis in the year 2023 – an imminent Chinese invasion of a new regional ally of the United States, the resource-rich Republic of Siberia. In addition, by that point in time, the China team had moved first to weaponize space with a constellation of space-based lasers (SBLs) and a range of other space control capabilities. Due to time constraints, however, the players were not able to address this crisis in detail.

areas, and other fixed sites upon which U.S. and allied forces would depend for projecting power. In their view, China possessed enough missiles to simply overwhelm U.S. theater missile defense systems by exhausting immediately available stocks of interceptors. By 2023, the U.S. team assessed that the balance between China's missile forces and U.S. TMD capabilities had shifted even further against them.

Perception of the Military Balance (China Team)

As of 2008, the China team assessed the United States still had "clear military superiority over China." In their judgment, China was only beginning to develop niche RMA capabilities such as submarines and LRPS systems which might eventually tip the balance. They considered China to be "far behind" in respect to most force-on-force comparisons (i.e., surface combatants, tactical aviation, and ground combat systems).

However, the team was optimistic that China's military modernization program would allow them to catch up relatively quickly in several areas. For instance, in respect to naval warfare, they believed that the acquisition of large numbers of anti-ship cruise missiles, advanced attack submarines, wake-homing torpedoes, and "smart" mines would allow them to dominate their littoral waters out to nearly 300 kilometers in the near future. (Not coincidentally, pushing naval aircraft aboard U.S. carriers beyond easy striking range of Taiwan). Similarly, they calculated that the fielding of land-based cruise and ballistic missiles would soon allow them to project power against regional neighbors with near impunity.

As was the case with the U.S. team, over the 2011-2024 period, the China team focused its assessment on the competition between their burgeoning missile arsenal and U.S. TMD capabilities. The China team assessed that, on balance, they had a strong advantage in this regard for several reasons:

1) The Chinese missile force was large, mobile, and dispersed and would be difficult for the U.S. military to disarm;

2) Precision strike attacks by the PLA could prevent the deployment of most U.S. TMD assets into the theater in the first place (e.g., PAC, THAAD, and Aegis)

3) TMD assets which actually gained access to the theater could be rendered inoperable by damaging their sensitive electronics with radio-frequency weapons (e.g., high-power microwave or conventional EMP weapons), or by directly attacking their powerful radars with barrages of stealthy, anti-radiation missiles; and

4) Those few TMD systems which did survive could probably be overwhelmed with all-aspect, missile barrage attacks incorporating low-observable cruise missiles and ballistic missiles equipped with assorted penetration aids.

The China team was very concerned, however, that if the United States developed an effective TMD system, perhaps based on directed-energy technologies, it could completely upset China's missile-based power projection strategy. Accordingly, as will be discussed later, the China team planned to try to derail U.S. deployment of a space-based laser (SBL). However, they also consciously hedged against such a development by shifting missile production in favor of cruise missiles and by emphasizing development of TMD countermeasures (e.g., spinning missiles on their longitudinal axis, reflective coatings, early-release submunitions, maneuvering warheads, chaff, and decoys).

By 2023, the China team assessed that it had a mature, multidimensional anti-access architecture with which to oppose the entry of U.S. military forces into the theater. Like the U.S. team, they judged that competition for undersea control had become tighter and could be pivotal to the outcome of future conflicts.

Shaping The Competition (U.S. Team)

The U.S. team concluded early on this exercise that the United States "cannot prevent China's rise, we can only try to shape it." To this end, they planned to "engage"

China through diplomatic dialogue, economic development and investment, trade, military-to-military exchanges, arms control and nonproliferation treaties, and a range of confidence and security building measures (CSBMs). In their view, the basic objective of engagement was to inculcate the Chinese leadership with the notion that "everyone benefits from the preservation of peace and stability in Asia."

SHAPING THE COMPETITION (CHINA TEAM)

The China team's primary goal was to avoid precipitating a vigorous military competition with the United States over the 1998-2010 period. Accordingly, they planned to forego acquisition of "overly provocative" power projection systems such as long-range ballistic missiles (greater than 1,800 range), large-deck aircraft carriers, and advanced amphibious assault capabilities. Unlike the Soviets, who galvanized Western opposition by aggressive actions in eastern Europe at the dawn of the Cold War, the China team planned to be as non-confrontational as possible both in respect to the United States as well as neighboring regional powers. They were apprehensive that Soviet-like mis-steps would trigger and facilitate U.S. efforts to "contain" China politically and economically. The China team did not want regional states to be fearful of China's rising power, and therefore, more inclined to "bandwagon" with the United States. In their view, failure to prevent such a coalition from forming would inevitably result in stunted economic growth and technological development.

The second major "shaping" goal of the China team over the 1998-2010 period was to delay or derail U.S. deployment of effective theater missile defense (TMD) or space control capabilities. Their primary strategy for accomplishing this objective was to engage the U.S. government in arms control talks focused on restricting the interceptor speed of TMD systems, preventing the application of space-based interceptors or directed-energy beams to TMD, and banning outright the weaponization

of space.[12] The publicly stated motivation for these arms control talks would be to preserve deterrence and prevent an unwanted "destabilization" of the strategic nuclear balance between the United States and China. Failure to reach an agreement on these issues, they planned to argue, would compel China to expand its strategic nuclear strike capabilities to restore deterrence and provide for its "legitimate right of self-defense." The true inspiration behind these talks, however, was actually to "buy time" for China to develop competing or countervailing capabilities.[13]

Another goal of the China team over this period was to erode U.S. forward presence and deployments in the Asia-Pacific region. The team planned on providing covert financial and intelligence support to groups opposed to U.S. military presence in Japan, Philippines, South Korea, and elsewhere in the region. They were particularly interested in hastening the withdrawal of U.S. troops from South Korea. Meanwhile, the China team hoped to cultivate deeper political-economic-military relationships with Malaysia, Singapore, and Thailand.

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[12] Beijing is currently calling for just such a prohibition. China's 1998 Defense White Paper states, "China stands for the complete prohibition and thorough destruction of weapons deployed in outer space. It opposes the development of anti-satellite weapons. China maintains that the international community, the big powers with the capacity to utilize outer space in particular, should take the following realistic steps to prevent a weaponized outerspace: a complete ban on weapons of any kind in outer space, including anti-missile and anti-satellite weapons, so as to keep outer space free of weapons; ...and all countries should undertake neither to experiment with, produce or deploy outer space weapons nor, to utilize outer space to seek strategic advantages on the ground, for example, using disposition of the important parts of ground anti-missile systems in outer space for the purpose of developing strategic defensive weapons. See China -- Defense White Paper, *Beijing Xinhua Domestic Service* (in Chinese), July 27, 1998, as translated by FBIS, July 28, 1998, p22.

[13] According to a recently released DoD report, China is reportedly "acquiring a variety of foreign technologies which could be used to develop an anti-satellite capability." In particular, Beijing may have acquired "high-energy laser equipment and technical assistance which probably could be used in the development of ground-based ASAT weapons." The report also indicates that "China already may possess the capability to damage, under specific conditions, optical sensors on satellites that are very vulnerable to damage by lasers." See "Future Military Capabilities and Strategy of the People's Republic of China," DoD Report to Congress, November 1998 as reported in *Defense News Online*, November 11, 1998.

IV. Insights & Observations

One new insight involving the dynamics of transformational change vis à vis a rising competitor, and two insights regarding the "shaping" dimension of U.S. national security strategy were derived from this game. Each of these will be explained in turn immediately below. In addition, as will be discussed later in this section, this game confirmed many insights and observations drawn from previous games in the Transformation Strategy series.

Relative fiscal stance may provide a greater impetus to military transformation than the absolute quantity of financial resources available.

The fiscal stance of the U.S. team in this game could be summarized as the absence of budgetary growth coupled with a significant deficit. Divestment was the only source of funding for rectifying an annual plans-funding mismatch of over $20 billion, as well as for investing in a transformation of the U.S. military. In contrast, the fiscal stance of the China team was one of progressively larger defense budgets which more than compensated for rising costs in its defense program. While they too could divest themselves of legacy systems and force structure, the China team enjoyed budgetary surpluses which grew steadily over time. As a result, although the China team had *less than half* of the cumulative financial resources to work with as compared to the U.S. team, the perception of "resource slack" seemed to make it easier for them to adopt an aggressive military transformation program. Conversely, despite substantial financial advantages and a considerable "head start" in the emerging RMA, the U.S team only managed to fund a comparatively modest transformation.

With few exceptions, members of the U.S. team believed that the QDR force posture they inherited was preeminent relative to other competitors in the *current* warfare regime. Over the period, 1998-2011, they did not foresee the rise of any competitor who could challenge the dominant position of the U.S. military. For instance, when asked about the military balance vis à vis China in 2008, the team

concluded that they had a significant qualitative lead over the PLA across *every* dimension of the battlespace. Objectively, that was probably an accurate assessment.

However, the U.S. team also inherited a defense program with an estimated annual plans-funding mismatch of over $20 billion, amounting to a $300 billion budgetary shortfall over each of the planning periods addressed during this exercise. Therefore, absent an increase in the defense budget top-line (fixed at $250 billion per annum in this game), the U.S. team had to make significant procurement and force structure cuts just to make the current defense plan fiscally solvent. Given that nearly every capability slated for possible divestiture was perceived as having real military value, at least over the short- to mid-term, it was difficult for the U.S. team to make the requisite cuts. For the most part, they agonized over each and every choice.

Their task was only exacerbated by the financial reality that they would have to cut even deeper in order to free up resources needed to transform the U.S. military. Given their fiscal stance -- a straightline defense budget that was already over committed -- financing the transition to the next military regime necessarily meant sacrificing military capability that was highly-valued at present for the uncertain promise of heightened military effectiveness in the future. The U.S. team was reluctant to make such a trade, particularly in light of the current operations tempo (OPTEMPO) of U.S. forces. The reallocation of resources (i.e., transferring funds from force structure to R&D and selected "leap ahead" modernization) necessary to fund a more aggressive transformation strategy seemed to carry an unacceptably high risk of inducing organizational shock and demoralization within the ranks. In other words, faced with the strong probability of a discontinuous change in the conduct of warfare, or a revolution in military affairs, they attempted to adjust the U.S. military incrementally to minimize organizational disruptions.[14]

[14] It is useful here to consider analysis of how private sector companies successfully change during periods of disequilebrium. As David Nadler and Michael Tushman have observed, "The demands of a radically changing environment require equally radical changes in the organization. The organization is not trying to improve fit but rather to build a whole new configuration...this type of change involves a complete break from the past and a major reconstruction of almost every element of the organization" in David A. Nadler and Michael L. Tushman, "Types of Organizational Change: From Incremental Improvement to Discontinuous Transformation," in *Discontinuous Change -- Leading Organizational*

The price the U.S. team paid for taking the incremental route was time. When the game concluded in 2025, the transformation of the U.S. military was far from complete. In the event war broke out, the U.S. military would have been ill-prepared to fight in the new warfare regime. And ironically, if the game had continued beyond 2025, the team probably would have been forced to make truly "radical" program adjustments and endure major organizational perturbations in a struggle to catch up. As a general rule, in terms of minimizing organizational shock and anxiety, it is probably preferable to anticipate discontinuous change rather than react to it later on.[15]

While there are numerous historic analogs to the U.S. team's incremental approach, perhaps the most obvious is the failure of Britain to capitalize on its lead in naval aviation following World War I. As of 1918, the Royal Navy possessed "a fleet of nearly a dozen carriers of one sort or another at a time when no other naval power had even one."[16] They had also developed a cadre of naval aviators who had accumulated considerable operational experience. Despite this tremendous head-start in an emerging warfare area, however, the Royal Navy entered World War II with only four first-line carriers and three obsolescent ones.[17]

Like the U.S. team in this game, the British Admiralty faced tight economic constraints (i.e., declining defense budgets following the conclusion of World War I) and the fiscal reality that investing in the future (e.g., modernizing aircraft carriers and naval aircraft), would necessarily decrease the resources available for competing priorities (e.g., routine fleet operations, battleship modernization, etc). As a result, they adopted what one historian has termed a policy of "excessive gradualism" regarding carrier modernization.[18] Rather than embrace promising technologies which ultimately

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Transformation, ed. David A. Nadler, Robert B. Shaw, and A. Elise Watson (San Francisco, CA: Jossey-Bass Publishers, 1995), p. 22.

[15] Ibid, p 23-29.

[16] Geoffrey Till, "Adopting the Aircraft Carrier – The British, American, and Japanese Case Studies," in *Military Innovation in the Interwar Period*, ed. Williamson Murray and Allan R. Millet (Cambridge, UK: Cambridge University Press, 1996), p. 194.

[17] In addition, the Royal Navy's carrier aircraft were few in numbers and markedly inferior in quality as compared to those of the Americans and Japanese. See Williamson Murray and Barry Watts, "Military Innovation in Peacetime," unpublished draft, January 1995, p. 62.

[18] Geoffrey Till, "Adopting the Aircraft Carrier," p. 198.

revolutionized carrier aviation (e.g., arrester wires, catapults, open hangers, large-deck carrier designs, etc.), the Admiralty decided to retain its older, increasingly outmoded carriers. They consciously adopted a policy of "leaving it to the Americans and Japanese to set the pace."[19]

But, in fact, the Admiralty failed to keep pace by continually delaying retrofits and new carrier building programs. And unlike previous periods in British history, they no longer had the industrial capacity and financial resources to catch up to competitors once it became necessary. Although the Admiralty tried to close the gap in the mid-1930's, the Royal Navy was still well behind both the United States and Japan in respect to carrier aviation by the time Britain went to war in 1939.[20] Fortunately, Britain lucked out on two counts: first, the United States was an ally; and second, because of that relationship, the Royal Navy could gracefully bow out of the coming contest with Japan in the Pacific.

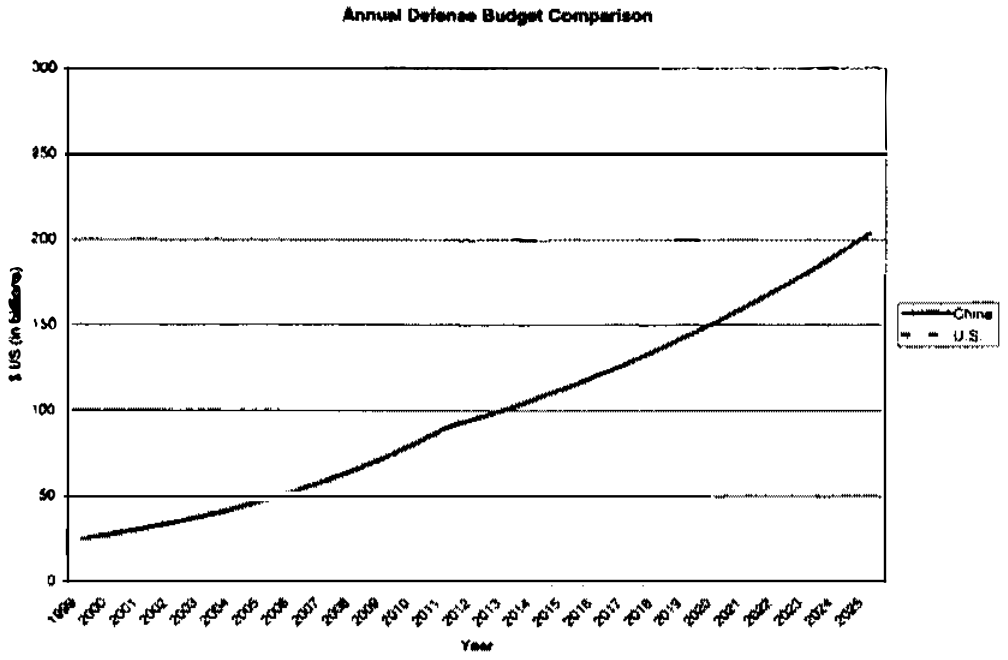
In contrast to the U.S. team, which was endowed with a cutting edge military at the start of this game, the China team inherited a military which they considered to be hopelessly obsolete by contemporary standards. In their view, the sooner they could divest themselves of legacy force structure and equipment, the better. Unlike the reluctant U.S. team, they were eager to make deep cuts to free up resources to help the PLA "leap frog" into the next military regime.

In addition, unlike the shortfall with which the U.S. team was saddled, the China team could anticipate steadily larger budgetary surpluses over time. The PLA's defense budget was expected to rise from $25 billion in 1998 to $90 billion by 2011, and then grow (at a slightly reduced rate) to over $200 billion by 2025 (see chart below). As a result, even after accounting for major cost growth in the baseline defense

[19] Ibid, p198-199.

[20] A similar outcome has been observed with companies that put off difficult organizational changes when faced with destabilizing events or other major industry-wide shocks. As Nadler and Tushman have concluded, "companies that wait until later in the period of disequilibrium experience the stress of dealing with new environments, and therefore frequently find themselves running out of the resources (capital, people, time, reputation) needed to make the change." See David A. Nadler and Michael L. Tushman,

program generated by increased personnel costs and higher operation and maintenance (O&M) expenses, the China team still enjoyed significant budgetary surpluses (i.e., $250 billion between FY 1999-2011, and $650 billion between FY 2012-2025).



Given this fiscal stance, the China team could dedicate progressively greater resources to "transformation" without having to sacrifice military assets that were highly valued in the current warfare regime. From their perspective, the wholesale scrapping of legacy forces in exchange for new combat organizations was both strategically necessary and financially affordable. While the China team aggressively reorganized and downsized legacy forces, they did so because these units were considered to be militarily worthless, not out of financial necessity. As compared to the U.S. case, the combination of low-valued legacy forces and resource slack generated by a steadily growing budget seemed to make the change endemic to military transformation much less traumatic.

"Types of Organizational Change: From Incremental Improvement to Discontinuous Transformation," p.21.

While there are a number of historical analogs to China's meteoric rise during the 25 years covered in this exercise, perhaps the most apt is the transformation of the U.S. Navy over a similar span of time, 1890-1915.

In 1890, ironically, the same year that Alfred Mahan published his book, *The Influence of Sea Power upon History*, the U.S. Navy had no more than 44 ships in service or under construction.[21] Most of these ships were of outmoded, wooden-hulled designs intended for commerce raiding and coastal defense. The Secretary of the Navy at that time, Benjamin Tracey, reckoned that the United States stood twelfth among naval powers, immediately after Austria-Hungary and somewhere below Turkey and China. Great Britain, as a point of comparison, led the world with a total of 367 warships, 76 of which were armored.[22]

Reaping the benefits of the maturing industrial revolution, the economy of the United States more than doubled between 1890 and 1915.[23] Like the China team in this exercise, the fiscal stance of the U.S. Navy over this period featured progressively larger budgets and the perception of considerable "financial slack." Guided in part by Mahan's emphasis on fleet engagements and the growing need to defend U.S. interests abroad, the U.S. Navy embarked upon an aggressive shipbuilding program over the course of the next two decades.

By 1900 the United States stood sixth among the world's naval powers in respect to battleships commissioned or under construction.[24] The transformation of the U.S. Navy was spurred on by the sinking of an American oil tanker, the *Gulflight*, by a German submarine on May 1, 1915, followed by a similar attack on the British passenger liner *Lusitania* a week later.[25] Responding to the public outcry, President Woodrow Wilson took on the cause of naval expansion, promising to build up the U.S.

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[21] Kenneth J. Hagan, *This People's Navy – The Making of American Sea Power* (New York, NY: The Free Press, 1991), p. 195.
[22] Ibid, p 195.
[23] Argus Maddison, *Monitoring the World Economy: 1820-1992* (Paris, France: Organization for Economic Co-Operation and Development, 1995), p.182.
[24] Opcit, p. 232
[25] Ibid, p. 248.

Navy until it was "second to none." This goal was effectively realized with the Naval Act of 1916 which authorized an unprecedented five-year building program for 10 dreadnoughts, 6 battle cruisers (of which the United States then had none), 10 scout cruisers to screen the battle fleet's flanks, 50 destroyers, and 67 submarines.[26]

Within the span of about 25 years, the U.S. Navy not only transformed itself from a largely antiquated fleet restricted to coastal defense and commerce raiding to a true blue water navy capable of global power projection, but it also arguably surpassed nearly a dozen other countries in terms of aggregate fleet strength.

The current U.S. policy of "engaging" China may have negative consequences when assessed from a long-term perspective.

As was mentioned earlier in this report, the U.S. team in this game hoped to "shape" China's behavior by "engaging" Beijing through diplomatic dialogue, economic development and investment, trade, military-to-military exchanges, arms control and nonproliferation treaties, and a range of confidence and security building measures (CSBMs). The basic objective of this engagement strategy was to convince Beijing that the preservation of peace and stability in Asia was in its self interest. In short, the U.S. team hoped to give China a stake in the preservation of the status quo. This strategy closely mirrors current U.S. government policy vis à vis China.

If the views expressed in this exercise by several members of the China team is any indication, this approach may be fundamentally flawed. While China will probably accommodate U.S. engagement efforts and generally respect the status quo over the short-term (e.g., the Taiwan question, border disputes, etc.), this is unlikely to be the case over the long run for one basic reason – the influence of anti status-quo and irredentist elements upon Chinese foreign policy. Both political elites and a large

[26] George W. Baer, *One Hundred Years of Sea Power* (Stanford, CA: Stanford University Press, 1994), p.60.

portion of the broader population view the last several hundred years as centuries of shame in which China was stripped of her sovereign territory throughout Asia by a series of humiliating, "unequal" treaties. It comes as no surprise, therefore, that China has unresolved border and territorial disputes with at least ten countries including Japan, Vietnam, Brunei, Malaysia, the Philippines, India, Kazakhstan, Kyrgyzstan, Tajikistan, and Russia.[27] Eventually, China will likely attempt to redress some of these deep-seated grievances, and regain its rightful place as the "middle kingdom" of Asia.[28]

Domestic political pressures may already be pushing Beijing in this direction. As a result of the ideological vacuum created by the global collapse of communism and the manifest failure of Maoism, Beijing has turned toward state-inspired, patriotic nationalism as a source of regime legitimization over the course of the last decade.[29] The seizure of Mischief Reef in 1995 and the ballistic missile firings against Taiwan in 1996 were probably motivated, at least in part, by such political considerations. In all likelihood, assuming the domestic political landscape does not appreciably change, the current regime will remain implacable on the Taiwan issue – assiduously avoiding even the slightest appearance of being "soft" on Taipei – and will continue to probe into contested territories (e.g., Spratlys) in order to burnish its nationalist credentials. Given these domestic pressures, it is certainly conceivable that future U.S.-Sino relations may be characterized more by competition and confrontation than by harmonious co-existence and cooperation.

If this turns out to be the case, engagement may prove to be a counter-productive strategy for a number of reasons. Promoting dual-use exports, for instance,

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[27] For more information on Chinese irredentist claims and their link to "state-nationalism" see: Maria Hsia Chang and Xiaoyu Chen, "The Nationalist Ideology of the Chinese Military," *The Journal of Strategic Studies*, Vol. 21, No.1, March 1998, p44-64.

[28] A recent DoD report submitted to House National Security Committee summarized China's security strategy as follows: "China's primary national goal is to become a strong, unified, and wealthy nation that is respected as a great power in the world and as *the preeminent power in Asia*." Emphasis added. See "Future Military Capabilities and Strategy of the People's Republic of China," DoD Report to Congress, November 1998 as reported in Defense News Online.

[29] Ibid, p44-64. The authors provide an in depth discussion of the Chinese Communist Party's use of patriotic nationalism to compensate for the erosion of the ideological integrity of Marxism-Leninism-Maoism.

may accelerate China's technological development. By learning from U.S. companies, either through reverse-engineering or outright technology transfer, Chinese companies and laboratories may be able to stretch internal R&D funding, as well as develop products faster and more reliably than would otherwise be the case.

To guard against this possibility, it would seem prudent for the U.S. government to be somewhat more selective in the types and numbers of export licenses it grants to U.S. corporations trading with China. For instance, the threshold for categorizing dual-use commodities as "sensitive" may need to be lowered, particularly in respect to exports which are susceptible to reverse-engineering. Moreover, a strong presumption of denial should exist regarding export license requests which explicitly include technology transfer provisions. As Admiral Joseph Prueher, the Commander-in-Chief (CINC) of U.S. Pacific Command, recently observed about U.S. technology transfer controls vis à vis China, "Our system in the U.S. needs improvement for protecting our military dominance...If it's of military significance, maybe we ought to hold it a little closer to ourselves."[30]

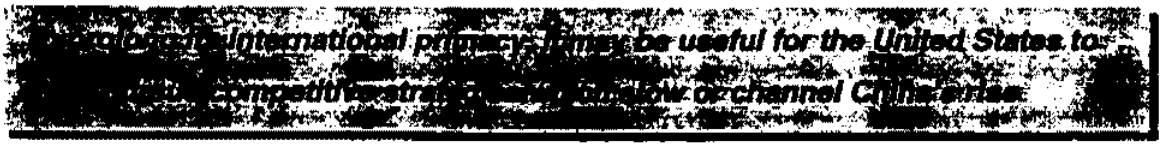
In essence, a better balance may need to be struck between the conflicting priorities of sustaining U.S. economic competitiveness through trade promotion and preserving the current U.S. lead in selected, militarily-relevant technologies. The gravity of this challenge will likely increase over time as U.S. military superiority becomes more closely linked with inherently dual-use commodities such as data processing software, information security systems (e.g., encryption tools), advanced electronic components, systems integration expertise, manufacturing techniques, alternative fuels and energy storage, novel materials, biotechnologies, etc.

Expanding military-to-military contact with China may also have unintended, long-term consequences. While exposing China's military officers to numerous U.S. ground, air, and naval exercises may well have the intended short-term effect of creating a sense of awe regarding U.S. military capability, and thereby bolstering

[30] Tony Capaccio, "U.S. Firms Marginally Helped China ICBMs," as reprinted in *Defense News*, October 26, 1998, p. 10.

conventional deterrence, it also provides an invaluable learning opportunity. These officers almost certainly obtain insights about how to "professionalize" the PLA. More importantly, they may also gain a deeper, more accurate understanding of U.S. military routines and procedures. This familiarity could significantly improve their ability to anticipate how the U.S. military will respond in the future under a given set of circumstances. Lastly, military contacts may also allow China to glean substantive insights about the emerging Revolution in Military Affairs (RMA), and U.S. efforts to exploit the RMA in particular. By either direct exposure (i.e., "observing" U.S. military exercises), or indirectly, through conversations with military personnel, the PLA could develop a better appreciation of those capabilities which appear to be panning out in terms of the RMA versus those which appear to be "dry holes."

Over the long-term, engagement may also benefit China by "opening the door" to U.S. friends and allies in the region. By condoning, if not explicitly encouraging, closer diplomatic and economic cooperation between China and close regional allies (e.g., Republic of Korea and Japan), the United States may be undermining its own long-term position. What happens when China becomes the number one trading partner of key allies in the region? Clearly, the power and influence of the United States will be diminished. Of course, one could argue that the fantastic growth of the Chinese economy combined with demographic trends ultimately makes the emergence of such trade relationships inescapable. Indeed, to some degree, China's rise to "peerdom" may be inevitable. Nevertheless, it seems rather foolhardy to expedite China's rise and prematurely surrender American primacy. The key question, therefore, becomes how to forestall, delay, or shape China's rise so that it is least inimical to U.S. interests. It is precisely this issue which is addressed in the pages that follow.



To maintain, or at least prolong, its primacy, the United States will need to consider how to compete effectively over the long haul and better manage the rise of China. For instance, several players suggested that the United States should pursue competitive strategies aimed at slowing down or channeling China's growth. The danger here, however, is that overly aggressive or provocative actions by the United States early on could make the rise of a hostile China a self-fulfilling prophecy.

The expression "competitive strategy" is intended to convey the notion of building upon one's enduring strengths and exploiting the enduring weaknesses or vulnerabilities of an opponent as part of a long-term competition, typically during peacetime.[31] Effective competitive strategies often have a cost-inducing aspect in that they compel an opponent to expend relatively more resources (e.g., funds, materials, labor, or political capital) over time.

Although handicapped by the lack of specifics regarding the long-term competition with China outlined in this game, the U.S. team developed several possible competitive strategies that might merit further consideration. These included exploiting information technologies to undermine Beijing's central authority; taking advantage of economic disparities, ethnic divisions, and other fissures within China to instigate political opposition movements and internal insurgencies; and lastly, to impose costs on China by bolstering the defensive capabilities of regional allies and by compelling Beijing to increase its expenditures on defensive weapon systems. Each of these competitive strategies will be discussed in turn. However, it should be emphasized that these strategies are not mutually exclusive. To the contrary, while they could be pursued independently, it would be preferable to implement them as synergistic components of an integrated, long-term strategy.

[31] See A.W. Marshall, "Competitive Strategies – History and Background," Internal Department of Defense Document, March 1988.

Exploit the Information Revolution to Undermine Central Authority and Weaken State Structure

This strategy would build upon and expand the current U.S. policy of encouraging the widespread diffusion of advanced personal communication systems (PCS) and information technologies (e.g., the Internet) within China.[32] As foreshadowed by the creative use of facsimile machines during and after the uprising in Tiananmen Square in June 1988, these technologies could be used by disaffected groups within China to gain domestic and international support for their cause, as well as to organize and coordinate their activities to a degree and scale that has heretofore been impossible.

Once in the hands of dissidents, PCS terminals would be extremely difficult, if not impossible, for the Chinese government to locate, cut off, or jam. The primary difficulty, therefore, would be bypassing tight government restrictions on their commercial sale and distribution within China. Assuming Chinese authorities cannot be persuaded to relax these restrictions voluntarily, smuggling hand-held PCS terminals into China and distributing them to selected individuals would seem to be a plausible, albeit challenging, covert operation. In the event that an occasional shipment was intercepted by internal security police, it would be difficult to tie it to the U.S. government. Moreover, even if such a link could be established, it probably would not be viewed as a hostile act by the international community.

Similarly, the Internet could also be leveraged by dissidents for intelligence gathering and sharing, coordinating anti-government activities across geographically

[32] Several commercial providers of space-based communication services are expected to come "on-line" over the next decade including Motorola's *Celestri* and *Iridium*, Bill Gates and Craig McCaw's *Teledesic*, Loral and Qualcomm's *Globalstar*, and TRW and Teleglobe's *Odyssey*. These and other personal communication system (PCS) providers will offer voice, data, fax, and paging services, and in some cases, pinpoint the user's location on the ground. It should be noted that while this strategy calls for the introduction of foreign PCS products and services within China, most likely against the will of Beijing, it does not espouse the outright transfer of PCS production technology to China.

dispersed locations, and gaining domestic and international support.[33] Indeed, this may already be occurring. For example, VIP Reference, an electronic pro-democracy magazine run by Chinese students and scholars in Washington, DC, is e-mailed to more than 100,000 Internet users in China every ten days.[34]

The number of Internet users in China is reported to have jumped to 1.2 million as of the end of June 1998, up from 505,000 at the beginning of the year. Of the total users, 83.2 percent were under 35 years old, and 58.9 percent had bachelors degrees. Industry analysts claim that the number of Internet users could reach seven million by 2001.[35] For internal security reasons, Beijing is reportedly attempting to mold the Internet into more of an internal "intranet" carefully monitored and regulated by the government. For instance, in 1996, the State Council issued a "Provisional Directive on the Management of International Connections by Computer Information Networks in the PRC" which requires all international computing networking traffic, both incoming and outgoing, to pass through telecommunication channels provided by the Ministry of Posts and Telecommunications (MPT).[36]

Chinese authorities responsible for regulating the flow of information over the Internet, however, are already having difficulty keeping up. So far, Chinese government censorship of the Internet has generally taken four forms:

- User registration: all users of the Internet in China are required by law to register with the local police department or their service provider within 30 days. This process entails filling out a questionnaire and signing a commitment to refrain from any activities that might damage the state or

[33] For more discussion on the implications of information technologies on internal conflict see: Michael Vickers and Robert Martinage, *The Military Revolution and Intrastate Conflict*. CSBA Monograph. Washington, DC. October 1997.
[34] Michael Laris, "Internet Police on the Prowl in China," *Washington Post*, October 24, 1998, p.A12.
[35] Some sources indicate that the number of Chinese Internet users could be substantially smaller. The data presented here was provided by the China Internet Information Center, as reported in "China's Internet Explosion," *Wired On-Line News Magazine*, July 13, 1998. Located at http://www.wired.com.
[36] For additional information on this 1996 State Council directive see Milton Mueller and Zixiang Tan, *China in the Information Age – Telecommunications and the Dilemmas of Reform* (Westport, Connecticut: Praeger Publishing, 1997), Chapter 5, pp 81-99.

harm national security such as "producing, retrieving, duplicating, and spreading information that may hinder the public order."[37]

- E-mail filters: an attempt is made to block the distribution of electronic messages and documents originating from external Internet addresses considered "hostile."

- Web site blackouts: users in China are routinely denied access to the web sites of foreign new organization, media outlets, and other "subversive" sites on the Internet.[38]

- Key word screening: information uploaded and downloaded from the Internet over routers controlled by the MPT is automatically searched for key words such as "Taiwan," "dissident," and "Tibet," and then censored.[39]

Skilled Internet users, however, already manage to find ways around government censorship. For instance, many users circumvent government controls by logging onto the Internet through accounts in Hong Kong. Editors of electronic magazines published abroad, such as VIP Reference, apparently continue to have success reaching readers in China by sending the magazine from constantly changing Internet addresses.[40]

The United States could conceivably exacerbate Beijing's information control problem in a number of ways. The most direct route, but by no means the easiest, would to conduct clandestine offensive information attacks designed to corrupt the software and hardware used by Chinese government censors.[41] As part of these

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[37] Ibid, p91-92.

[38] Apparently the government is particularly concerned about Web sites with Chinese language content – either in written or audio form. See, for example: "China 'Blocks' BBC Website," as reported by BBC Online Network, October 13, 1998, at http://www.bbcnews.org/hi/english/world/asia-pacific/newsid_191000/191707.stm.

[39] "U.S. Urges China Net Freedom," Reuters Wire as published in *Wired News*, June 30, 1998. WWW address for *Wired News* is http://www.wired.com/news.

[40] Michael Laris, "Internet Police on the Prowl in China," *Washington Post*, October 24, 1998, p.A12.

[41] To avoid attracting the attention of Chinese authorities, these attacks would most likely seek to degrade the performance and overall reliability of computer systems used by government censors, rather than attempt to take them completely "off-line."

operations, it might also be useful to upload subversive information onto Chinese servers as part of a long term psychological operations and perception management campaign. To minimize the political risk associated with discovery, these operations could be arranged so as to have the outward appearance of being conducted by civilian "hackers." Given the current popularity of various movements in the United States directed against Chinese oppression (e.g., Free Tibet), this cover story would appear entirely credible and would provide the U.S. government with a degree of plausible deniability.[42] Alternatively, U.S. intelligence operatives could simply instruct dissidents about procedures for circumventing government censorship. This instruction could either take place in a hands-on mode somewhere in Asia, or in virtual classrooms found on the Internet itself.

A more indirect option for complicating Beijing's information control dilemma would be to establish *external* Internet accounts for dissidents through front companies and organizations throughout Asia. When coupled with the distribution of PCS technologies mentioned above, it would not even be necessary to limit the location of front companies to Asia. Dissidents located anywhere in China (or anywhere in the world for that matter) could then link into the Internet via any of a multitude of front companies spread across the globe. In which case, assuming Chinese authorities did not simply abandon censorship of the Internet, they would have to expend a tremendous amount of human and financial resources to have any effect at all on the free exchange of information. The downside of this approach is that while it would create an Internet "haven" for dissidents to organize and share information, it would not facilitate the widespread distribution of subversive information within China itself.

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[42] American hackers are reportedly already engaged in such activity. Recently, China's state-controlled human rights body launched a web site promoting Beijing's official line on human rights. The site contained government documents in Chinese and English, including articles from the state-run media, legislation, and speeches by government officials. However, within a matter of days, a U.S. hacker gained access to the site and replaced the original text with his own statement. It read in part, "China's people have no rights at all, never mind human rights...They censor, murder, torture, maim, and do everything we [thought] left the earth with the middle ages. The Chinese government is...a gang of 100+ year old thugs and bullies who hide in seclusion." The hacker included links to Amnesty International and Human Rights in China as well as a message to the Chinese webmaster which read, "Your security is a total joke! We rooted your box in an all time record. It took us less than 2 minutes!" See "China: We're Only Human," Reuters Wire as reported by *Wired News* at http://www.wired.com/news/print_version/politics/story/15831.html. See also, Niall McKay, "Crackers Attack China on Rights," *Wired News*, http://www.wired.com/news/print_version/politics/story/15857.html.

The apparent need for Beijing to control the flow of information within its borders could be its Achilles' heel as the world collectively heads into the information age. The idea of exploiting commercially available information technologies as part of a long-term competitive strategy for dealing with China's rise appears promising and should be developed in more depth.

Take advantage of economic disparities, ethnic divisions, and other divisive pressures within China to instigate political opposition movements and internal insurgencies

The goal of this strategy would be to focus Chinese government attention and resources inward by exacerbating long standing economic, ethnic, and other divisive pressures within China. Ethnic divisions could also be exploited to foment proxy wars along China's periphery (e.g., Kazakhstan).[43]

For example, existing economic disparities (either real or perceived) within China could be exploited to place Beijing squarely upon the horns of a dilemma: buying off disadvantaged groups clamoring for more assistance, or their "fair share," while simultaneously appeasing demands from prosperous regions for increased autonomy and economic freedom. To bring about this situation, one option would be to nurture the pro-Western, free market segment of the Chinese economy by aggressively promoting (even subsidizing) trade.[44] As discussed earlier, emerging information technologies (e.g. PCS, the Internet) could also be employed to increase the "have nots'" awareness of their relative deprivation, as well as to increase the political clout of "the haves" by enabling them to better organize and coordinate their activities across

[43] One of the potential downsides of supporting insurgencies along China's periphery is that it could provide a convenient pretext for Beijing to invade (and possibly annex) territory of neighboring states as a security measure.

[44] As discussed previously on page 95, while trade should be encouraged in civilian commodities and services, the United States should be cautious about transferring dual-use, militarily-relevant technologies in order to promote trade. To the extent possible, the United States should compel China to expend it own

China. Ideally, pressure from "the haves" combined with the need for additional revenue for redistributive purposes would precipitate a more rapid migration of the Chinese economy toward capitalism, possibly accompanied by a parallel political shift in the direction of liberalism and democratization. Even if such grandiose objectives proved unattainable, however, this strategy would almost certainly compel the Chinese government to expend substantial resources "buying off" economic discontent and suppressing internal movements demanding increased economic freedoms.

Ethnic divisions within China could also be leveraged as part of cost-inducing competitive strategy. U.S. involvement might range from verbal and diplomatic support for internal movements espousing improved human rights and self-determination, to covert financial contributions to dissident groups, and, at the extreme, to various levels of direct support for insurgents involved in armed rebellions or proxy wars. One opportunity specifically mentioned during the game was providing covert support to the Uighur separatist movement in Xinjiang province. Other possibilities might involve providing assistance to rebel movements in Tibet and Inner Mongolia, both of which are on-going sources of unrest and instability within China.

As a practical matter, this strategy would be difficult to implement (especially in a covert manner) and would be fraught with escalatory risk. In a strategic sense, however, this course of action could prove particularly beneficial by compelling the PLA to maintain a *manpower-intensive* internal security force which would consume a progressively larger portion of the Chinese defense budget over time as personnel costs inevitably rise. This expense would, of course, leave considerably fewer financial resources available for investing in the RMA.

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resources on R&D, rather than capitalize on prior investments by American companies through outright technology transfer agreements or reverse-engineering.

Bolster the defensive capabilities of allies and compel China to increase its own expenditures on defensive systems

Specifically, participants suggested that it might be useful to transfer TMD technologies to regional allies (e.g., Taiwan and Japan) in order to devalue China's ballistic missile arsenal and compel investments in costly countermeasures.[45] While the PLA could incorporate a range of penetration aids or TMD counters into ballistic missile payloads, all of these would result in an appreciable incremental expense per missile, and in some cases, degradation in performance (e.g., a reduction in throw-weight and range). The PLA could opt instead to shift missile production toward cruise missiles which are more difficult to intercept, at least with currently envisioned TMD systems. But again, the cost of doing so would likely be substantial in terms of the necessary expansion and retooling of existing production infrastructure. Moreover, this shift in production would also take a significant amount of time.[46]

This strategy could be complemented by compelling China to divert its own resources from offensive to defensive systems. This might be accomplished, for instance, by holding at risk those capabilities and assets valued by the Chinese leadership with survivable U.S. LRPS systems (e.g. stealthy bombers, submerged "arsenal ships", etc). Ideally, this threat would not only compel expensive investments in defensive systems, but also encourage cooperation on arms control agreements favorable to the United States.

[45] China is reportedly concerned about this possibility today. Apparently, Beijing has pressured the Clinton Administration to suspend the sale and/or transfer of TMD technologies to Taiwan. See, for instance, Sean Boyne, "Taiwan's Troubles - National Defence Report Highlights Chinese Threat," Jane's Intelligence Review, September 1998, p. 26.

[46] A similar cost inducing strategy might be possible by relying more upon submerged platforms (e.g., arsenal ships) for power projection instead of surface vessels, thereby rendering a significant portion of China's anti-navy architecture obsolete. In order to contest control of littoral waters, China would have to expand investments in attack submarines and other ASW technologies; an area where the U.S. Navy already enjoys a significant qualitative and quantitative advantage.

This game also reaffirmed several insights related to transformation strategy which surfaced in previous exercises.

As mentioned at the outset of this section, it is also reassuring to note that this game confirmed many of the insights and observations gleaned from earlier games in the Transformation Strategy series. Rather than needlessly duplicate discussion found in previous game reports, these insights and observations are enumerated here in summarized form:[47]

- A formal transformation strategy will likely prove essential if the United States is to fully exploit the RMA to shape the international environment, to resolve crises over time, and to prepare for a very different strategic future. Absent such as a strategy the transformation will likely take significantly longer and consume more resources. In addition, it will be difficult to manage transitions between the so-called current military, the next military, and the military after next.

- A sound vision of the future warfare environment coupled with vigorous R&D and experimentation are indispensable components of a successful transformation strategy.

- Several advantages are likely to accrue to those militaries that move first to re-orient R&D, system procurement, organizations, and concepts of operation in response to a discontinuous change in the conduct of war. By anticipating change rather than reacting to it, "first movers" are rewarded with more time to carry out their transformation. For example, they may be able to experiment *and* fail with new systems and concepts, and still have time to make second attempts. Moreover, in some cases, failure to lead could result

[47] For an in-depth discussion of these findings please refer to the following: "Competing for the Future: A Strategy for Transformation – Insights & Observations from Game I," Center for Strategic & Budgetary Assessments, November 1997, "Competing for the Future: A Strategy for Transformation – Insights & Observations from Game II," Center for Strategic & Budgetary Assessments, December 1997 and "Competing for the Future: Strategy during the Transition – Insights & Observations from Game III" Center for Strategic & Budgetary Assessments, December 1997.

in a dramatic increase in strategic risk. The first country to weaponize space, for instance, may be able to prevent competitors from deploying similar capabilities.

- Considering that a major transformation of the U.S. military will likely take at least 20 to 30 years, the transformation process must be initiated in the very near future in order to field a RMA force by 2025.

- At current budget levels, the transformation process appears to be more of a strategic problem than a financial one. Indeed, a major transformation of the U.S. military appears feasible under a straight line annual defense budget of approximately $250 billion between 1998-2025. Furthermore, financing such a transformation may only require adjusting a modest portion of the overall defense program.

- Relatively modest or revenue neutral investments may pay high strategic dividends, both in near-to-mid term capability as well as in the transition to a new military regime. Early movement toward a smaller, different kind of force may not only better position the U.S. military for a long-term transformation, but may also decrease near-term risk in some cases.

- The "volunteer's dilemma" may be one of the greatest obstacles to a successful transformation of the U.S. military. That is to say, if the Defense Department voluntarily cut force structure and certain "in-kind" modernization programs (e.g., Joint Strike Fighter, *Crusader* artillery system, CVN 77 & 78), it would have no guarantee that the savings would be used by Congress to fund military transformation projects (e.g., expanded R&D, prototyping of emerging weapon systems, "leap-ahead" procurement, and experimentation) and not diverted to other fiscal priorities.

- The dominant deterrence problem of the future may shift from countering invasion and conquest to deterring political-military coercion.

- Perceptions of the overall strategic balance may shift significantly in response to the relatively early development of niche capabilities such as missile-based power projection. For instance, the China team's modernization plan over the period FY 1999-2011 included, among other improvements, an expansion in its missile forces, the incorporation of nine wings of modern fighter aircraft, and the acquisition of modern attack submarines and destroyers. Despite these changes, the only development which the U.S. team felt really shifted the overall military balance was the expansion and modernization of China's ballistic and cruise missile forces. Interestingly, although the U.S. perception of the strategic balance shifted early in response China's initial missile build up of about 3,000 missiles, it did not change dramatically after that point even as China proceeded to double its inventory over the next decade.

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V. Conclusion

The methodology and design of this wargame was generally well-received. The game engaged the participants and forced them to address the challenges involved in devising a transformation strategy for the U.S. military as well as strategic issues likely to be encountered during the transition from the current military regime to the next.

Several participants indicated that it would be useful to replay this exercise and involve high-level military officers and national security policymakers. In addition, participants suggested a number of transformation-related questions that might be worthy of exploration in future games such as:

- How might competitive strategies contribute to the "shaping" dimension of our national military strategy?
- How might adjusting the topline of the U.S. defense budget, either up or down, impact strategies for transformational change of the U.S. military?
- How might multipolar competition (e.g., with China, Russia, India, and Japan) affect the dynamics of military transformation?
- How could the Reserves best contribute to a transformation of the U.S. military? Will their role in future military operations generally increase or decrease? How might the Reserve component be reconfigured to handle specialized functions such as information warfare?
- In what ways might defense infrastructure and the industrial base need to adapt to a transformation of the U.S. military?

The consensus seemed to be that, apart from the insights derived from the game, the game itself was a valuable tool for educating people about both budgetary aspects and strategic implications of the military transformation process.

Hot Wash Briefing

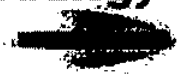
A

Transformation Strategy Game Series Overview & Game IV "Hotwash"

Michael G. Vickers
Director, Strategic Studies
Center for Strategic & Budgetary Assessments

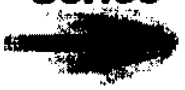
Game Series Sponsored by A.W. Marshall
OSD / Net Assessment

Transformation Strategy



- Plans and actions intended to induce, sustain and exploit revolutionary changes in military capabilities
- Transformation strategy can be either anticipatory or reactive

Transformation Strategy Game Series



- **Game 1 – Transformation Strategy for U.S. Military**
  - **Teams made trade-offs between R&D, procurement, force structure, and readiness in meeting both short- and long-term defense requirements**
- **Game 2**
  - **Similar to Game 1, except focused on the transformation of the "high-end" or RMA component of the U.S. military**

Transformation Strategy Game Series (II)

- **Game 3 – Strategy During the Transition**
  - **U.S. Team pitted against China Team**
  - **Transformation paths of both US & China scripted**
    - **Players provided with force posture overview & summary of global strategic developments for each move : 1997-2008, 2008-2017, and 2017-2025**
  - **Teams explored how to leverage military transformation for greatest possible strategic benefit over time**
- **Game 4 –**
  - **2 Interactive Planning Moves (1998-2010, 2011-2025) in which Teams developed their own transformation path**
  - **2 Strategic Posturing & Exploitation Moves**
    - **Teams assessed how they would respond to crises in 2008 and 2023, given their military forces at that point in time**

Game 3:
U.S. Transformation Path Overview

* 1998-2008
  - 20 FWE to 16 FWE (4 wings of F-22)
  - Non-stealthy bombers reduced from 169 to 36
  - Stealthy bombers rise from 13 to 40
  - 4 ABLs
  - 6 ISR UAVs expand to 48
  - 6 Mech/Armor Divs reduced to 4
  - CVNs reduced from 11 to 9
  - 4 SSBNs converted to Submerged PGM Carriers
  - Surface combatants decline by 24, but include 66 Aegis, 9 SC-21, and 2 surface arsenal ships
  - *Peacekeeper* ICBM retired

* 2008-2017
  - 16 FWE to 8 FWE (8 wings F-22)
  - 4 FWE of UCAVs
  - 12 UAV Tenders
  - Non-stealthy bombers phased out
  - 24 Arsenal Planes
  - 40 to 80 Stealthy Bombers
  - 48 to 144 ISR UAVs
  - 100 LO Transports / Refuelers
  - 4 Mech/Armor Divs reduced to 2
  - 3 Combined Arms Regiments
  - 3 Deep Strike Brigades
  - 6 Ranger Regiments
  - CVNs reduced from 9 to 6
  - SSNs expand from 55 to 70
  - 10 Submerged Arsenal Ships
  - 24 Ground-based ASATs
  - 60 Rapid Launch, Light Sats
  - 12 IW UAVs / 25 IW SOF Groups
  - *Minuteman III* ICBMs retired

Game 3:
U.S. Military End-State 2025

* 8 FWE (all upgraded F-22)
* 6 FWE of UCAVs
* 60 UAV Tenders / 24 Arsenal Planes
* 80 Stealthy Bombers
* 224 HALE ISR UAVs
* 250 LO Airlifters / 100 LO Air Refuelers
* 6 Combined Arms Regiments
* 3 Deep Strike Brigades / 600 Remote Missile Pods
* 9 Ranger Regiments (w/ robotic support)
* 9 Exoskeleton Regiments
* 6 Independent Micro-Robot Regiments
* 4 CVNs
* 80 SSNs
* 20 Submerged Arsenal Ships
* 8 Submerged Amphibious Assault
* 48 Ground-based ASATs
* 4 Space-to-Ground Attack Satellites
* SBL Constellation

Game 3: China's Transformation Path

* 1998-2008
  - 150 to 1150 ballistic missiles
  - 0 to 300 land-attack cruise missiles
  - Fighters from 55 to 30 FWE (4 wings modernized)
  - 2 to 24 ISR UAVs
  - 100 to 300 long-range SAMs
  - 90 to 50 infantry divisions
  - 15 to 11 tank divisions
  - 80 to 160 land-based ASCMs
  - 1 aircraft carrier
  - 61 to 40 attack subs
  - 1 to 2 SSBNs
  - 450 to 650 nuclear warheads

* 2008-2017
  - 1150 to 2400 ballistic missiles
  - 300 to 1200 land-attack cruise missiles
  - Fighters from 30 to 20 FWE (18 wings modernized)
  - 12 intercontinental bombers
  - 24 ALCM trucks
  - 24 to 72 ISR UAVs
  - 300 to 600 long-range SAMs
  - 50 to 24 infantry divisions
  - 11 to 6 tank divisions
  - 100 anti-navy UAVs
  - 160 to 400 land-based ASCMs
  - 1 to 2 aircraft carriers
  - 40 to 50 attack subs
  - 10 light satellites
  - 18 kinetic kill ASATs
  - 1 to 2 SSBNs
  - 650 to 1200 nuclear warheads

Game 3: China's Military End-State (2025)

- 3,800 Ballistic Missiles
- 3,000 Cruise Missiles
- 4,500 LO/VLO Cruise Missiles

- 12 Manned Fighter Wings (mostly JSF equivalent)
- 24 Intercontinental bombers
- 12 Stealthy Bombers
- 48 Wide-body ALCM Trucks
- 144 ISR UAVs
- 24 Information Warfare UAVs
- 72 Weaponized UAVs
- 12 Airborne Laser Platforms

- No Legacy Tank Divisions
- 6 Mobile Strike Brigades
- 4 Aerial Strike Force Divisions
- 4 Mobile Strike Force Divisions
- 2 Airborne Divisions
- 15 Infantry Divisions

- 4 Sea Control Brigades
- 2 Underwater Sensor Nets
- 50 Diesel-Powered Attack Submarines
- 30 SSNs
- 500+ Anti-Ship Missile Launchers
- 300 Anti-Ship / ASW UAVs
- 2 Aircraft Carriers
- ~50 Major Surface Combatants
- 75+ Fast-Attack Missile/Torpedo Craft
- 40 Amphibious Assault Ships

- 6 Specialized IW Brigades
- 36 Kinetic Kill ASATs
- 12 Ground-based, DE ASATs
- 24 Space-Based Lasers
- 4 Space-to-Ground Attack Satellites
- 8 Trans-Atmospheric Vehicles
- 80 Rapid Launch, Light Satellites

- 2500 Nuclear Warheads

Game 3: U.S Perception of the Military Balance

- 1998-2008:
  - Focus on those capabilities that allow U.S. to deny China's power projection, not on countering its theater denial capabilities
- 2008-2017:
  - Balance between China's missile forces and friendly TMD capabilities shifting in favor of China
  - U.S. maintains dominance in space, marginal advantage in air and ground forces
  - IW and regional naval balances draw even
  - Strategic nuclear forces approaching parity
- 2017-2025
  - Preserving U.S. advantage in undersea warfare is critical
  - Ground balance (force on force) shifts in favor of U.S.
  - China extends missile vs TMD advantage
  - China achieves parity in space

Game 3: Changing U.S. View of Deterrence

- 1998-2008:
  - U.S. retains credible deterrent to cross border movement of conventional forces
  - New focus on threat of information warfare
- 2008-2017:
  - Need to demonstrate performance of new capabilities to increase their deterrent value ("Invisible Presence")
  - Reduced response times of conventional LRPS may improve deterrence potential
- 2017-2025:
  - Weaponization of space may change risk calculus for nuclear deterrence -- an incentive may exist to strike first using ballistic missiles or LO cruise missiles

Game 3: Shaping Chinese Behavior

* 1998-2008:
  - ➢ Modernize regional allies (anti-access capabilities)
  - ➢ Use U.S. stealth and LRPS capabilities to prompt Chinese expenditures on defensive systems
  - ➢ Encourage Chinese reliance on U.S.-controlled commercial space systems
* 2008-2017:
  - ➢ Engage China in arms control to restrict conventional strike systems and nuclear weapons
* 2017-2025:
  - ➢ Consider fomenting proxy wars in Central Asia

Game 3: U.S. Alliance Relationships

* 1998-2008:
  - ➢ Increase military technology sharing to help augment indigenous defense capability and increase C4ISR interoperability
  - ➢ Exercises to demonstrate U.S. ability to protect regional SLOCs
  - ➢ Review/revise relationship with Australia, Vietnam, India, etc.
* 2008-2017:
  - ➢ Growing vulnerability of forward bases: re-assess fixed vs expeditionary force mix
* 2017-2025:
  - ➢ Cultivate new power-balancing relationship with Russia, Central Asian Republi a, and India
  - ➢ Attempt to impose "containment strategy"
  - ➢ Nuclear Japan?

Game 3: China's Perception of the Military Balance

- 1998-2008:
  - Building on Desert Storm success, U.S. advantage may increase somewhat over the short term
  - Chinese military modernization (e.g., land-based cruise and ballistic missiles, submarines, mines, ISR systems) starting to be realized
- 2008-2017:
  - China's LRPS / anti-access trumps missile defense
  - U.S. LRPS precludes effective traditional power projection (amphibious assault)
- 2017-2025
  - Undersea forces have enough "mass, survivability, and effectiveness" to frustrate U.S. undersea power projection
  - China's surface sea denial capability will hold U.S. surface force at risk out to 2nd island chain (> 4,000 km)
  - At a minimum, China's anti-air force sufficient to deny non-stealthy U.S. air operations

Game 3: China's Changing View of Deterrence

- 1998-2008:
  - Rely on expanding nuclear capability to deter U.S. conventional LRPS
  - High-altitude EMP as useful escalatory option
- 2017-2025:
  - Conventional deterrence more robust -- "neither side can dominate"
  - Nuclear competition stable -- Chinese has assured second strike capability
  - If China deploys SBL before the U.S., it may have a credible first strike capability
  - Possibility of conventional disarming first-strike against U.S. nuclear forces?

Game 3: Shaping U.S. Behavior

- 1998-2008:
  - Avoid development of "aggressive" power projection systems such as aircraft carriers, long-range bombers
  - Avoid precipitating a "vigorous" military competition with the U.S. in short term -- "avoid making Soviet mistakes"
- 2008-2017:
  - Demonstration of ASAT capability against a *Chinese* satellite
  - Demonstrate genetically-specific biological weapons capability
  - Missile exercises in remote locations
  - Feign inability to detect or track U.S. stealthy forces, encourage U.S. over confidence in stealth

Game 3: Shaping U.S. Behavior (continued)

- 2008-2017 (continued):
  - Divert U.S. attention, create problems for U.S. in other regions -- e.g., RMA technology transfer to Iran
  - Disrupt U.S. alliances and presence in Asia (dislodge U.S. forces from Japan, develop closer ties with Russia)
  - Use entire array of economic power, diplomatic carrots and sticks, and threat of anti-access to convince U.S. that military involvement in a Taiwan conflict is unattractive
- 2017-2025:
  - Block U.S. from being first to weaponize space by all means available
  - Peacefully erode U.S. forward presence and deployments in Pacific -- including declaration of "Chinese Monroe Doctrine"

Game 3: China's Alliance Relationships

- 1998-2008:
  - Technology: Russia, U.S., Israel, Europeans
  - Investment: U.S. & Europeans
  - Trade: U.S.
  - Security: Supplier relationship with Iran, Iraq, and other rogue states
- 2017-2025:
  - Develop Persian Gulf alliance network
  - Be a player in regional military coalitions, or prevent them from forming

Game 3: Observations & Insights (I)

- Deterrence problem shifts from countering invasion to countering political-military coercion
  - Increasing allied intimidation high on list of potential catastrophic failures
- Emerging strategic competitions seem to favor rising power
  - Long-range precision strike
  - Sea denial/ sea control
  - Space
- Perception of overall strategic balance may shift early in response to emergence of niche capabilities (e.g. missiles)

Game 3: Observations & Insights (II)

- Strategic IW -- especially for intimidation of U.S. allies -- presents a real challenge for deterrence
- China's deployment of SBL before U.S. could alter strategic balance
  - U.S. may need to expand non-ballistic missile portion of nuclear force -- e.g., stealthy, submarine-launched cruise missiles
  - U.S. may require countervailing system to Chinese SBL (e.g., ground-based DE ASAT or IW capability) to ensure reconstitution and ability to contest control of space

Game 3: Observations & Insights (III)

- Assuming conflict is inevitable, a strategy of non-confrontation or "peaceful engagement" may be a poor option against a rising competitor
  - By 2025, China became an Asian hegemon and enforced a maritime exclusion zone against U.S. forces out to 2nd island chain. Acceptable?
  - Need new rules to cope with new competitive realities, not more of the same
  - More aggressive competitive strategies may be needed to "brake," forestall, or channel China's rise

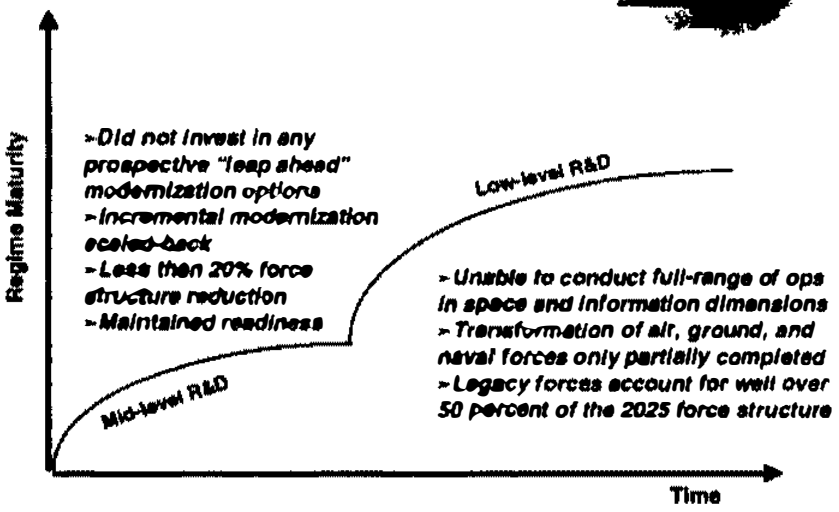
Game 3: Observations & Insights (IV)

- Potential competitive strategies:
  - Hold at risk Chinese capabilities / assets with survivable U.S. LRPS to compel expensive investments in defensive systems & encourage arms control agreements
    - U.S. LRPS must be survivable (e.g., converted SSBNs), otherwise, it will draw preemptive strikes
    - Arms control may "backfire" on the U.S.
  - Proxy wars in inner Asia
  - Technology transfers to allies (e.g., anti-access capabilities)
  - Nuclear armed Japan?

Game 4: Key Assumptions

- U.S. Team
  - 1997 QDR Force and current Service modernization plans as the baseline
  - $245 billion annual defense budget projected out to 2025
  - Annual plans-funding mismatch between $20-25 billion, leads to a $300 billion shortfall in each planning move
- China Team
  - Economy will grow from $1 trillion in 1998 to $2.72 trillion in 2011 (about 8% annually), and to $5.4 trillion by 2025 (about 5% annually)
  - Defense budget will rise from $24 billion in FY 1999 (2.5% of GNP) to about $90 billion in FY 2011 (3.3% of GNP), and to about $200 billion by 2025 (3.7% of GNP)
  - After deducting cost of baseline defense program, growing personnel cost, and inflation -- China benefits from a $250 billion surplus over 1998-2011 period, and $650 billion surplus between 2012-2025

Game 4:
U.S. Team Transformation Path



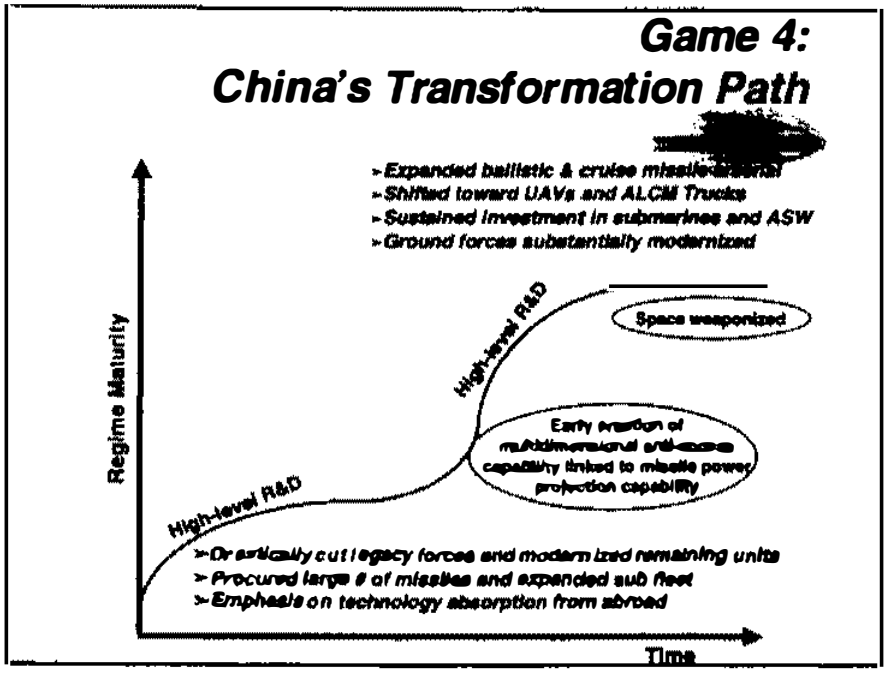
Game 4:
U.S Military End-State in 2025

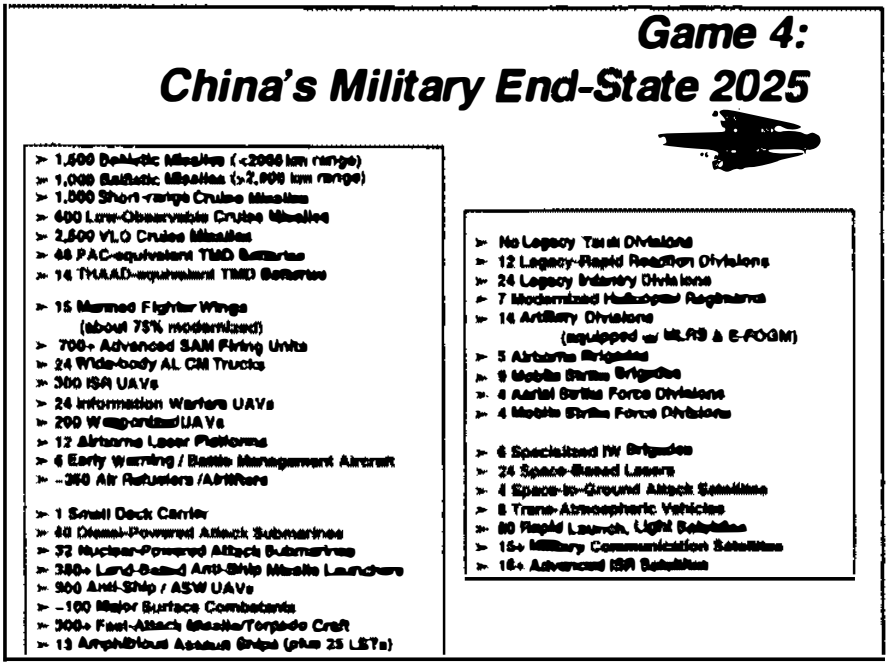
- 14 Tactical Fighter Wings (15% F-22s)
- 21 B-2 Bombers
- 20 B-X Bombers
- 200+ Weaponized UAVs
- 4 Low-Observable Airborne Lasers
- 20 Low-Observable UAV Tenders
- 120 Low-Observable Airlifters
- 100 Low-Observable Aerial Refuelers
- 200 Low-Observable UAV Transports

- 6 CVBGs (3 with CVX) with JSF
- Navy Theater -Wide TMD Deployed
- 12 Stealthy Sea Control Frigates
- 12 Submerged Arsenal Ships
- 200 Anti-Navy UAVs
- 64 Surface Combatant 21s
- 62 SSNs
- 10 SSBNs

- 7 Legacy Marine MEBs w/V-22 & JSF
- 4 Legacy Army Divisions
- 1,200 Remote Missile Pods
- 6 Advanced Deep Strike Brigades
- 9 Combined Arms Regiments

- *Starlite* Space-Based Radar (SBR)
- 8 Trans-Atmospheric Vehicles (TAVs)
- 90 Rapid launch, Light Satellites


Game 4:
China's Transformation Path
[redacted]
➢ Expanded ballistic & cruise missile inventory
➢ Shifted toward UAVs and ALCM Trucks
➢ Sustained investment in submarines and ASW
➢ Ground forces substantially modernized
Regime Maturity
High-level R&D
Space weaponized
High-level R&D
Early creation of multidimensional anti-access capability linked to missile power projection capability
➢ Drastically cut legacy forces and modernized remaining units
➢ Procured large # of missiles and expanded sub fleet
➢ Emphasis on technology absorption from abroad
Time


Game 4:
China's Military End-State 2025
[redacted]
➢ 1,500 Ballistic Missiles (<2000 km range)
➢ 1,000 Ballistic Missiles (>2,000 km range)
➢ 1,500 Short-range Cruise Missiles
➢ 400 Low-Observable Cruise Missiles
➢ 2,500 VLO Cruise Missiles
➢ 48 PAC-equivalent TMD Batteries
➢ 16 THAAD-equivalent TMD Batteries
➢ 15 Manned Fighter Wings (about 75% modernized)
➢ 700+ Advanced SAM Firing Units
➢ 24 Wide-body AL CM Trucks
➢ 300 ISR UAVs
➢ 24 Information Warfare UAVs
➢ 200 Weaponized UAVs
➢ 12 Airborne Laser Platforms
➢ 6 Early Warning / Battle Management Aircraft
➢ ~300 Air Refuelers /AWACs
➢ 1 Small Deck Carrier
➢ 48 Diesel-Powered Attack Submarines
➢ 32 Nuclear-Powered Attack Submarines
➢ 380+ Land-Based Anti-Ship Missile Launchers
➢ 900 Anti-Ship / ASW UAVs
➢ ~100 Major Surface Combatants
➢ 300+ Fast-Attack Missile/Torpedo Craft
➢ 13 Amphibious Assault Ships (plus 25 LSTs)
➢ No Legacy Tank Divisions
➢ 12 Legacy-Rapid Reaction Divisions
➢ 24 Legacy Infantry Divisions
➢ 7 Modernized Helicopter Regiments
➢ 14 Artillery Divisions (equipped w/ MLRS & E-FOGM)
➢ 5 Airborne Brigades
➢ 9 Mobile Strike Brigades
➢ 4 Aerial Strike Force Divisions
➢ 4 Missile Strike Force Divisions
➢ 6 Specialized IW Brigades
➢ 24 Space-Based Lasers
➢ 4 Space-to-Ground Attack Satellites
➢ 8 Trans-Atmospheric Vehicles
➢ 80 Rapid Launch, Light Satellites
➢ 15+ Military Communication Satellites
➢ 16+ Advanced ISR Satellites

Game 4: Insights & Observations

- U.S. perception of military balance influenced early on by China's ability to overwhelm U.S. TMD
- U.S. sought to "shape" China's rise through:
  - Encouraging diffusion of personal communication & information technologies (e.g., Internet) within China
    - Make it more difficult / expensive for government to control flow and content of information
  - Supporting free market / democratic groups in China
- Like Game 3, China Team hoped to avoid provoking military competition with U.S. and other regional powers in short-term (Move 1)
  - Opted not to procure longer-range missiles
  - Opted not to pursue modern amphibious assault capability

Game 4: Insights & Observations (II)

- China Team hoped to "learn from others" as part of its transition strategy:
  - Robust program of military-to-military contacts
  - Follow U.S. military exercises / experiments closely
  - Buy foreign training assistance
- China Team sought to delay / derail U.S. development of effective TMD and space control capabilities through arms control initiatives
  - Hedged against risk of rapid depreciation in missile capital stock by increased reliance on cruise missiles and developing TMD countermeasures

Game 4: Insights & Observations (III)

- **Chinese "first mover" advantage in space**
  - **Impose space blockade on U.S. military?**
- **Competition for undersea control seen as pivotal to both sides**

Participants

B

Participants List

CAPT Joe Bouchard
National Security Council
Old Executive Office Building, Rm 376
Washington, DC 20504
Phone: 202-456-9191

Maj Steve Cunico
USAF-XOOX
1460 Air Force
Pentagon, Rm 4D1072
Washington, DC 20330-1480
Phone: 703-697-2866

LCDR Craig Fuller
Office of the CNO (N513)
The Pentagon, Room 4E514
Washington, DC 20350

Mr. Ian Graham
McKenna & Cuneo
1900 K Street, NW
Washington, DC 20006-1108
Phone: 202-496-7209

CAPT Karl Haslinger
Submarine Plans and Liaison
Office of CNO, N87
2000 Navy Pentagon
Washington, DC 20350-2000
Phone: 703-697-1554

Mr. Andy Hoehn
OASD/S&TR/STRAT
2900 Defense Pentgon, Rm. 4B724
Washington, DC 20301-2900
Phone: 703-697-2467

Col Ron Kurjanowicz
HQ USAF/ XORPB
1911 N. Fort Meyer Drive, Suite 1200
Rosslyn, VA 22209
Phone: 703-526-1416

LTC Tony Echevarria
TRADOC
ATT: ATCD-B
Fort Monroe, VA 23651-1046
Phone: 757-727-2332

Col John Nelsen
Chief, Strategy Division (J-5)
The Pentagon, Rm 2E977
Washington, DC 20318-5126
Phone: 703-697-6126

Maj Phil Smith
HQ USAF / XOCD
1480 Air Force Pentagon, Rm 4C1083
Washington , DC 20330-1480
Phone: 703-697-9701

Col Paul Selva
Military Assistant to the Director
OSD / Net Assessment
Room 3A930, The Pentagon
Washington, DC 20301
703-697-1312

CDR David Spain
Office of the CNO (N513)
The Pentagon, Room 4E514
Washington, DC 20350
Phone: 703-693-7000

Maj Mark Stokes
OSD/ISA/AP
2400 Defense, Pentagon Rm. 4C839
Washington, DC 20301-2400
Phone: 703-697-7757

Mr. James Wirtz
Dept. of National Security Affairs
Naval Postgraduate School
Monterey, CA 93943
Phone: 408-656-3463

Control Team & Observers

Dr. Keith Bickel
Senior Defense Analyst
CSBA
1730 Rhode Island Ave., NW
Suite 912
Washington, DC 20036
202-331-7990

Ms. Anne Bradbury
CSBA Intern
1730 Rhode Island Ave., NW
Suite 912
Washington, DC 20036
202-331-7990

Ms. Elizabeth Demarest
CSBA Intern
1730 Rhode Island Ave., NW
Suite 912
Washington, DC 20036
202-331-7990

Ms. Deborah Foster
Defense Analyst, CSBA
1730 Rhode Island Ave., NW
Suite 912
Washington, DC 20036
202-331-7990

Mr. Erwin Godoy
Research Assistant, CSBA
1730 Rhode Island Ave., NW
Suite 912
Washington, DC 20036
202-331-7990

Mr. Robert Martinage
Senior Defense Analyst
CSBA
1730 Rhode Island Ave., NW
Suite 912
Washington, DC 20036
202-331-7990

Mr. Michael Vickers
Director of Strategic Studies
CSBA
1730 Rhode Island Ave., NW
Suite 912
Washington, DC 20036
202-331-7990

Opening Briefs C

The RMA & Transformation Strategy

June 22, 1998

Michael G. Vickers
Director of Strategic Studies
Center for Strategic and Budgetary Assessments

The Multidimensional RMA

- Unmanned system-dominated, stealthy air operations
- Information-intensive, roboticized ground operations
- Land and space-based defense of the sea / Submerged power projection
- Space warfare -- counterspace operations & space-to-ground attack
- Independent and integrated information warfare
- Independent and integrated biological warfare

The Military Revolution & the Spectrum of Conflict

- The Nuclear Revolution can be expected to have a truncating effect on the strategic scope of the RMA ("nuclear overhang")
- The emergence of new strategic capabilities -- non-nuclear strategic strike, information warfare, and genetically-specific biological warfare -- could substantially increase the risk of homeland attack
- The RMA's impact on state power will likely be centrifugal as well as centripetal, with the capabilities on sub-national forces substantially increased

The Magnitude of Change in Theater Warfare

- Military operations could become dramatically expanded spatially & compressed temporally
  - Theaters of operations could lose much of their strategic autonomy
  - Military operations could increasingly be thought of in terms of *time* and not space
- Strategic and operational sanctuaries, multidimensionality, and increased capital intensity could lead to protracted wars
- Proliferation of "smart" long-range missiles and developments in signature reduction will likely shift the balance in favor of offensive systems

The Magnitude of Change in Theater Warfare (II)

- Operational & tactical maneuvers on information "terrain" may become central to maneuver on physical terrain -- Paradigm shift from physical to information protection
- Lethality of multidimensional warfare could "empty" the battlespace -- Dimensional control will likely be far more difficult to attain

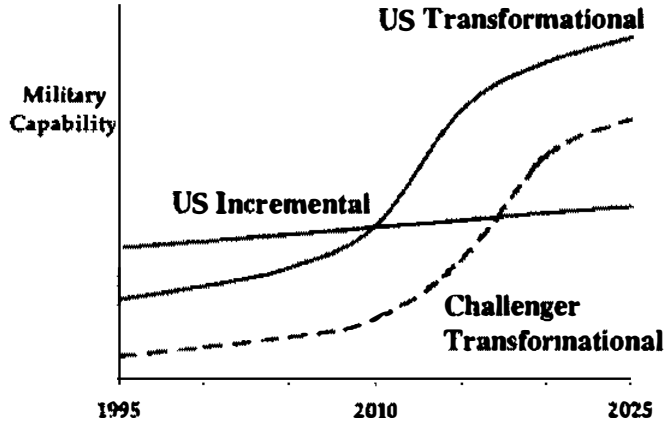
5

Transformation Strategy

Plans and actions intended to anticipate, induce, sustain and exploit revolutionary changes in military capabilities

6

Managing Near and Long-Term Risk



7

Barriers to Transformation

- Competing demands/lack of clear strategic focus
- Regime uncertainty/Self-referential thinking
- Institutional structure
- Resources available

8

Complexity of Transformational Change

- Innovation
- Invention and Innovation
- Invention

9

Elements of a Transformation Strategy

- Develop a vision of the future warfare environment
  - Address future military problems, key trends in warfare, and potential discontinuities
- Establish institutional & political momentum for change
- Reallocate resources to longer-term challenges
- Free up organizational resources

10

Elements of a Transformation Strategy (II)

- Create multidimensional options
- Encourage healthy intra/inter-service competition
- Transform DoD/Industry relationship
- Conduct regular strategy reviews

11

Anticipated Challenges

- Volunteer's dilemma
- Divergent service transformation pace / scope
- New thinking about defense economics
- Units of account change
- Institutional change
  - Simultaneous cultural upheaval in the services
  - Large-scale integration of unmanned and autonomous systems
  - Ability to recruit, train, and retain future military leaders / warfighters

12

Preliminary Findings

- Early start and perceptions of scope of transformation are critical
- Current budgets not a show stopper (14% of Defense Program in Move 1; 27% in Move 2)
- High/low mix divergence
  - Cost of supporting / maintaining legacy forces likely to become prohibitive over time
  - High leverage investments may make near-term MTWs less stressful

Preliminary Findings (II)

- Character of "presence" and deterrence may undergo fundamental change
- New "Grand Strategy" may be needed to rationalize large-scale system choices
- Real or perceived arms control limitations could act as a "brake" on transformation process

U.S. Team
Defense Program Adjustments

D

U.S. Team -- Program Adjustments Move 1

(FY1999-FY 2011)

		Cuts	Additions	Carry Forward Costs
R&D				
Expanded R&D Option 1	$40 billion			0
Expanded R&D Option 2	$80 billion		$80 billion	0
Expanded R&D Option 3	$130 billion			0
Procurement				
F-22				
Cancel 339-plane program	($29 billion)			0
Reduce buy to 160 planes	($9 billion)	($9 billion)		0
Joint Strike Fighter				
Cancel Air Force version	($31 billion)			($70 billion)
Cancel Navy & Marine Corps versions	($23 billion)			($46 billion)
Defer complete procurement beyond FY 2011	($34 billion)	($34 billion)		0
R&D costs this move				
F/A-18E/F				
Cancel 548-plane program	($22 billion)			0
Reduce buy to 270 planes	($10 billion)	($10 billion)		0
B-2				
Procure 20 additional bombers	$25 billion			$14 billion
Procure 40 additional bombers	$42 billion			$28 billion
Airborne Laser Systems				
Cancel 7 systems	($7 billion)			($3 billion)
Procure 20 systems	$6 billion			$8 billion
Strike Unmanned Aerial Vehicles (SEAD & air-to-ground)				
Procure 60 strike UAV systems	$4 billion			$4 billion
Procure 200 strike UAV systems	$8 billion			$13 billion
Comanche				
Cancel 1,292 RAH-66 program	($6 billion)			($15 billion)
Reduce buy to 600 (savings turn 2)	0	0		($8 billion)
Crusader				
Cancel Crusader (824) program	($13 billion)	($13 billion)		0
Reduce buy to 400	($4 billion)			0
Procure 1,000 additional ATACMS (ER & BAT)	$1 billion			0
Cancel CVN 77	($4 billion)	($4 billion)		0
CVX 1	($6 billion)			0
CVX 2	($6 billion)			
Procure 2 Mobile Overseas Bases	$4 billion			0
Convert 4 surplus Ohio-class SSBNs to long-range PGM carriers	$4 billion			0
Arsenal Ships	$9 billion			
Procure 2 arsenal ships	$3 billion			$2 billion
Procure 6 arsenal ships	$9 billion			$6 billion
Slow NSSN Buy	($9 billion)	($9 billion)		($4 billion)
Slow new surface combatant construction	($3 billion)			($5 billion)
V-22				
Cancel 458-aircraft program	($12 billion)			($1 billion)
Reduce buy to 229	($4 billion)	($4 billion)		($1 billion)
AAAV				
Cancel 1,013 AAAV program	($2 billion)			0
Reduce buy to 360	($0.7 billion)			0
Cancel THAAD	($14 billion)	($14 billion)		($3 billion)
Starlite Space-based Radar	$21 billion			$18 billion

		Cuts	Additions	Carry Forward Costs
Deploy Navy Theater Wide (Upper Tier)	$4 billion		$4 billion	
National Missile Defense				
Deploy NMD	$25 billion			$22 billion
Deploy limited NMD	$6 billion		$6 billion	$0.7 billion
Cancel SBIRS-Low	($8 billion)			($9 billion)
Buy 6 additional JSTARS	$3 billion			$3 billion
Procure Land Warrior (Army & MC) for 21st century	$0.5 billion			0
Cancel FY99 & FY02 Milstar Satellites	$3 billion			0
Force Structure				
Create 2 Deep Strike Brigades				
(Comanche, ATACMS and DarkStar UAVs)	$16 billion			$16 billion
Air Force Fighter Wings				
Cut 2 FWs	($28 billion)	($28 billion)		($28 billion)
Cut 6 FWs	($83 billion)			($83 billion)
Cut 10 FWs	($138 billion)			($138 billion)
Retire B-52s	($16 billion)			($23 billion)
Retire B-1Bs	($36 billion)			($51 billion)
Army Divisions				
Cut 1 division	($64 billion)			($64 billion)
Cut 2 divisions	($128 billion)	($128 billion)		($128 billion)
Cut 3 divisions	($191 billion)			($191 billion)
Cut 5 divisions	($318 billion)			($318 billion)
Carrier Battle Groups				
Cut 1 CVBG	($43 billion)			($43 billion)
Cut 2 CVBGs	($86 billion)	($86 billion)		($86 billion)
Cut 3 CVBGs	($128 billion)			($128 billion)
Cut 6 CVBGs	($256 billion)			($256 billion)
Marine Expeditionary Forces & assoc. amphibious lift				
Cut 1 MEF FWD	($45 billion)	($45 billion)		($45 billion)
Cut 3 MEFs FWD	($91 billion)			($91 billion)
Retire Minutemen IIIs	($12 billion)			($17 billion)
Cut 4 Trident Boats (C-4s)	($10 billion)			($14 billion)
Readiness				
Reduce overall readiness				
(move to tiered readiness, change in active/reserve mix, & lower optempo)				
By 15 percent	($35 billion)			($35 billion)
By 25 percent	($60 billion)			($60 billion)

TOTALS

Total Additions		$90 billion	
Total Cuts	($384 billion)		
GRAND TOTAL	($294 billion)		($294 billion)
	$6 billion shortfall		

Note:

*1) At a minimum, the grand total needs to be - **$300 billion** to cover the FY 1999-FY2011 budgetary shortfall.*

2) Savings from cancelled or slowed programs that are replacing current generation systems reflect the cost of upgrades and/or service life extension programs to the existing systems.

$80 b in R&D

Program Adjustments Move 3

(FY 2012 - FY 2025)

Carry Forward from Move 1		($294 billion)	
R&D			
Option 1	$80 billion		$80 billion
Option 2	$120 billion		
Option 3	$150 billion		
Procurement (may include operating costs)			
Buy an additional 400 F-22s	$41 billion		
Joint Strike Fighter			
Cancel Air Force version	($70 billion)	($70 billion)	
Cancel Navy and Marine Corps versions	($46 billion)		
B-2			
Procure 20 additional bombers	$26 billion		
Procure 40 additional bombers	$42 billion		
B-X Bomber			
Procure 20 aircraft	$45 billion		$45 billion
Procure 40 aircraft	$77 billion		
Procure 20 additional Airborne Laser Systems	$16 billion		
Stealthy Airborne Laser Systems (2nd Generation)			
Procure 4 systems	$4 billion		$4 billion
Procure 20 systems	$13 billion		
Procure 200 additional Strike UAVs	$7 billion		$7 billion
UAV Strike Tenders			
Procure 20	$21 billion		$21 billion
Procure 40	$35 billion		
Procure 80	$59 billion		
Stealthy Airlifter			
Procure 120 aircraft	$51 billion		$51 billion
Procure 250 aircraft	$85 billion		
Stealthy Air Refuelers			
Procure 100 aircraft	$13 billion		$13 billion
Stealthy UAV Tranaports			
Procure 200 aircraft	$15 billion		$15 billion
Procure 400 aircraft	$25 billion		
Stealthy Sea Control Frigate			
Procure 12 boats	$17 billion		$17 billion
Procure 36 boats	$39 billion		
Cancel M1A3 Tank & Follow-on Infantry Fighting Vehicle	($17 billion)	($17 billion)	
Cancel Comanche (after 355)	($15 billion)		
Procure 1,200 Remote Missile Pods	$19 billion		$19 billion
Cancel CVN 79 (CVX)	($6 billion)		
Cancel CVN 80 (CVX)	($6 billion)		

$80 b in R&D

Additional NSSNs			
Procure 25 more NSSNs	$68 billion		$68 billion
Procure 50 more NSSNs	$103 billion		
Procure 6 more Surface Arsenal Ships	$9 billion		
Missile Carrier Class Submersible Arsenal Ships			
Procure 12 ships	$42 billion		$42 billion
Procure 24 ships	$73 billion		
Procure 200 Anti-Navy UAVs	$10 billion		$10 billion
Procure land- & sea-based cruise missile defense	$10 billion		$10 billion
Cancel V-22	($1 billion)		
Starlite Space-based Radar	$18 billion		$18 billion
Procure Space-based Lasers & Create Space Defense Wing			
Procure 12 lasers	*$24 billion*		
Procure 24 lasers	*$42 billion*		
Procure 6 Neutral Particle Beams	*$23 billion*		
Procure & Deploy Submersible Lightsat/ASAT Launchers			
Procure 2 launchers	*$11 billion*		
Procure 6 launchers	*$21 billion*		
Procure 8 IW Satellites	*$8 billion*		
Procure 4 Space-to-Ground Direct Attack Satellites	*$6 billion*		
& Create Space Attack Wing			
Procure & Operate 8 Trans-Atmospheric Vehicles	*$14 billion*		*$14 billion*
Procure 90 Rapid Launch, Distributed, Multipurpose Satellites			
	$5 billion		$5 billion
Procure 6 IW UAVs	*$6 billion*		

Force Structure

Air Force Fighter Wings			
ADDITIONAL CUTS TO MOVE 1			
Cut 2 FWs	($28 billion)		
Cut 4 FWs	($56 billion)	($56 billion)	
Cut 6 FWs	($83 billion)		
Cut 10 FWs	($138 billion)		
Cut 16 FWs	($221 billion)		
Retire B-52s	($23 billion)	($23 billion)	
Retire B-1Bs	($51 billion)	($51 billion)	
Army Divisions			
ADDITIONAL CUTS TO MOVE 1			
Cut 1 division	($64 billion)		
Cut 3 divisions	($191 billion)		
Cut 4 divisions	($255 billion)	($255 billion)	
Cut 5 divisions	($318 billion)		
Cut 8 divisions	($508 billion)		
Create 4 Deep Strike Brigades			
(Comanche, ATACMS & DarkStar UAVs	$16 billion		
Create Advanced Deep Strike Brigades			
(next generation helo, missiles, UAVs)			
Create 3 brigades	$52 billion		
Create 6 brigades	$105 billion		$105 billion

$80b in R&D			
Create 6 Army Exoskeleton Regiments	*$60 billion*		
Create Army & USMC Exoskeleton Regiments			
Create 3 regiments	*$30 billion*		
Create 9 regiments	*$91 billion*		
Create Combined Arms Regiments			
Create 3 regiments	$24 billion		
Create 9 regiments	$71 billion		$71 billion
Create 9 Semi-Robotic Combined Arms Regiments	*$71 billion*		
Create Independent Micro-Robotic Regiments			
Create 4 regiments	*$0.7 billion*		
Create 12 regiments	*$2 billion*		
Create Advanced Ranger Regiments w/robotic support			
3 adv. regiments	*$13 billion*		
12 adv. regiments	*$53 billion*		
Create Advanced Marine Infantry Regiments w/ robotic support			
2 adv. regiments	*$13 billion*		
4 adv. regiments	*$26 billion*		
Create Undersea Assault Regiment w/ submersible lift			
1 regiment	*$6 billion*		
2 regiments	*$11 billion*		
Carrier Battle Groups			
ADDITIONAL CUTS TO MOVE 1			
Cut 1 CVBG	($43 billion)		
Cut 3 CVBGs	($128 billion)	($128 billion)	
Cut 6 CVBGs	($256 billion)		
Marine Expeditionary Forces & assoc. amphibious lift			
ADDITIONAL CUTS TO MOVE 1			
Cut 1 MEF FWD	($45 billion)	($45 billion)	
Cut 3 MEF FWDs	($136 billion)		
Cut 5 MEF FWDs	($227 billion)		
Retire Minutemen IIIs	($12 billion)	($12 billion)	
Cut 4 Trident Boats (C-4s)	($10 billion)	($10 billion)	
Readiness			
Enhance overall readiness	$35 billion		
Enhance overall readiness	$60 billion		

TOTALS

Total Additions		$614 billion
Total Savings	($960billion)	
Budgetary Shortfall		$300 billion
Total Expenditures		$914 billion
GRAND TOTAL	($46 billion)	

China Team
Defense Program Adjustments

E

Program Adjustments

(in billions of $)

Budget Overview
Budget expected to rise from $25 billion in FY 1999 to about $90 billion in FY 2011. Total defense budget over this period is approximately $750 billion
Baseline defense program consumes $400 billion
Growing personnel cost plus inflation consumes $100 billion
Remaining Budget Surplus is $250 billion

	Amount	Cost/Savings
R&D		
Expanded R&D Option 1	$25.0	
Expanded R&D Option 2	$50.0	
Expanded R&D Option 3	$100.0	$100.0
PROCUREMENT		
DF-11 and DF-15 Ballistic Missiles (300-600 km range)		
Procure 500 additional missiles	$0.5	
Procure 1000 additional missiles	$1.0	$1.0
DF-21 and DF-25 Ballistic Missiles (1800 km range)		
Procure 500 additional missiles	$0.5	$0.5
DF-35 and DF-45 Ballistic Missiles (2,500-5,000 km range)		
Procure 250 missiles	$0.5	
Procure 500 missiles	$1.0	
DF-31 and DF-41 Ballistic Missiles (8,000-12,000 km range)		
Procure 100 missiles (conventional variant)	$0.5	
C-802 / Land Attack Cruise Missiles (150-300 km range)		
Procure mix of 1,000 additional missiles	$1.0	$1.0
Low-Observable Land Attack Cruise Missiles (750 km range)		
Procure 200 missiles	$0.5	
Procure 400 missiles	$1.0	$1.0
Procure Theater Defense (PAC-2/3) Equivalent		
Procure 24 TMD Batteries	$3.5	
Procure 48 TMD Batteries	$7.0	$7.0
Advanced Surface-to-Air Missiles (e.g., SA-10C/D)		
Purchase 300 firing units from abroad	$1.0	$1.0
J-10 Indigenous Fighter		
Procure 200additional Aircraft	$6.0	
Su-27 / J-11 Fourth Generation Fighter		
Co-produced 200 aircraft	$7	
Co-produced 400 aircraft (100 indigenously)	$15	
Co-produce 600 aircraft (300 indigenously	$33	$15.0
Modern Ground Attack Aircraft (e.g. Su-30/34)		
Purchase 200 aircraft from abroad	$10	
Purchase 400 aircraft from abroad	$20	
Purchase 600 aircraft from abroad	$30	$20.0

Indigenous Ground Attack Aircraft (variant of Su-24)		
Procure 200 aircraft	$8	
Procure 400 aircraft	$16	
Modern Ground Attack Aircraft (reverse engineer Su-30/34)		
Procure 100 aircraft	$6	$6.0
Purchase 6 Early Warning / Battle Management Aircraft		
	$2.5	$2.5
Second Generation ISR UAVs		
Procure 100UAVs	$0.5	$0.5
Procure 24 Air Refuelers	$2.0	$2.0
Procure 24 Heavy Transports	$2.0	$2.0
Land-based Anti-Ship Missile Units		
Procure 300 additional firing units	$0.5	$0.5
Aircraft carrier (45,000 ton class)		
Purchase 1 carrier from abroad	$4.0	
Purchase 2 carriers from abroad	$8.0	
Small Deck Carrier		
Procure 1 carrier	$2.5	$2.5
Attack submarines (Kilo-class / Type 212)		
Purchase 4 additional subs from abroad	$1.0	
Purchase 8 additional subs from abroad	$2.0	
Co-produce 20 additional subs	$6.0	$6.0
Attack submarines (indigenous, Song-class)		
Procure 8 additional subs	$1.5	$1.5
Modern Destroyer (Sovremenny-class)		
Purchase 4 destroyers from abroad	$2.0	
Purchase 8 destroyers from abroad	$3.5	
Co-produce20 modern destroyers	$9.0	$9.0
Procure 8 Luhu-class destroyers	$2.0	
Frigates (Jiangwei-class)		
Procure 8 additional frigates	$1.0	
Procure 16 additional frigates	$2.0	$2.0
Fast-attack Missiles and Torpedo Craft		
Procure 24 additional craft	$1.0	$1.0
Upgrade All Surface Combatants with C-802 or SS-N-22 Anti-Ship Cruise Missiles	$0.5	$0.5
Modern Amphibious Assault Ships		
Purchase 2 ships from abroad	$1.5	
Purchase 4 ships from abroad	$3.0	
Semi-modern Amphibious Assault Ships		
Procure 5 ships indigenously	$1.0	$1.0
Advanced Main Battle Tank (T-90II)		
Procure 600 additional tanks	$2.5	
Procure 1200 additional tanks	$6.0	
Procure 2400 additional tanks	$12.0	
Infantry Fighting Vehicles / Armored Personnel Carriers (Type 95)		
P ocu e 600 I /APCs	$1.5	
Procure 1200 IFV/APCs	$4.0	
Procure 2400 IFV/APCs	$8.0	$1.5
Modern MLRS (e.g. Russian SMERCH)		
Procure 500 firing units with reloads	$1.0	$1.0
Procure 100 E-FOGM equivalent Firing Units	$1.0	$1.0

Advanced, All-weather Attack Helos (e.g., Ka-50/52)		
Purchase 100 helos from abroad	$3.0	
Purchase 200 helos from abroad	$6.0	
Purchase 300 helos from abroad	$9.0	$9.0
Procure 3 Military Communication Satellites	$1.0	$1.0
Procure 2 E-O and 2 SAR Satellites	$3.0	$3.0
Procure 2 SIGINT Satellites	$1.0	$1.0
FORCE STRUCTURE		
PLA Fighter Wings		
Cut 5 FW	-$3.0	
Cut 10 FW	-$6.0	
Cut 15 FW	-$9.0	-$9.0
Surface Combatants		
Cut 15 ships	-$0.5	
Cut 30 ships	-$1.0	-$1.0
PLA Infantry Divisions		
Cut 6 divisions (2 Group Armies)	-$10.0	
Cut 12 divisions (4 Group Armies)	-$20.0	
Cut 18 divisions (6 Group Armies)	-$30.0	-$30.0
READINESS		
Increase Readiness and Training		
$25 billion plus up over the period		
$50 billion plus up over the period		
$75 billion plus up over the period		$75.0
Total Funds Available (budget surplus + cuts)		$290.0
Total New Spending		$276.0
Grand Total		$14.0 (surplus)

Program Adjustments

(in billions of $)

Budget Overview
Budget expected to rise from $90 billion in FY 1999 to about $200 billion in FY 2025. Total defense budget over this period is approximately $2 trillion
Baseline defense program consumes $ 1 trillion between cost growth and inflation
Growing personnel cost consumes $950 billion
Remaining Budget Surplus is $650 billion

Carry Forward from Move 1	$26 billion	
	Amount	**Cost/Savings**
R&D		
Expanded R&D Option 1	$50.0	
Expanded R&D Option 2	$100.0	
Expanded R&D Option 3	$150.0	$150.0
PROCUREMENT		
DF-35 and DF-45 Ballistic Missiles (2,500-5,000 km range)		
Procure 500 additional missiles	$2.0	
Procure 1000 additional missiles	$4.5	$2.0
DF-55 (5000 km range)		
Procure 500 missiles	$2.5	
Procure 1000 missiles	$5.0	$2.5
DF-65 (10,000 km range)		
Procure 250 missiles	$2.0	
Low-Observable Land Attack Cruise Missiles (750 km range)		
Procure1000 missiles	$3.5	
Procure 2000 missiles	$8.0	
VLO, Land Attack Cruise Missiles (1500 km range)		
Procure 1000 missiles	$6.0	
Procure 2000 missiles	$13.0	$13.0
VLO, Extended-Range Cruise Missiles (4000 km range)		
Procure 500 missiles	$4.0	
Procure 1000 missiles	$9.0	$4.0
Procure Theater Defence (PAC-2/3) Equivalent		
Procure 7 TMD Batteries	$10.0	
Procure 14 TMD Batteries	$20.0	$20.0
Advanced Surface-to-Air Missiles (e.g., SA-X)		
Procure 300 firing units	$6.5	$6.5
J-12 Multirole Aircraft (JSF equivalent)		
Procure 400 aircraft	$26.0	
Procure 800 aircraft	$60.0	
Procure 1200 aircraft	$90.0	
Nonstealthy Intercontinental Bombers		
Procure 12	$4.0	
Procure 24	$7.0	

Wide-body ALCM Trucks (each with ALCMs and reloads)		
Procure 12	$4.0	
Procure 24	$8.0	
Procure 48	$16.0	$8.0
Stealthy Intercontinental Bombers		
Procure 6	$8.0	
Procure 12	$13.0	
Airborne lasers		
Procure 6	$5.5	
Procure 12	$9.0	$9.0
Advanced ISR UAVs		
Procure 100 ISR UAVs	$2.0	
Procure 200 ISR UAVs	$4.5	$4.5
IW UAVs		
Procure 12	$1.0	
Procure 24	$2.0	$2.0
Weaponized UAV		
Procure 100 UAVs	$3.0	
Procure 200 UAVs	$5.5	$5.5
Procure 100 Modern Air Refuelers	$10.0	$10.0
Procure 100 Modern Airlifters	$23.0	$23.0
Advanced Land-based Anti-Ship Missile Units		
Procure 300 additional firing units	$1.0	
Anti-Ship / ASW UAVs		
Procure 100	$4.5	
Procure 300	$12.0	$12.0
Wide-Area, Underwater Sensor Nets		
Procure 2	$6.5	$6.5
Nimitz-Class Carrier plus Air Wing		
Procure 1	$14.0	
Procure 2	$25.0	
Missile Barges (each with 500 S/R ballistic missiles		
Procure 2	$1.0	
Procure 4	$2.0	
Procure 6	$3.0	
Advanced Nuclear Attack Submarines (improved NSSN-equivalent)		
Procure 8	$13.5	
Procure 16	$25.0	
Procure 32	$46.0	$46.0
Attack Submarines		
Procure 8	$4.5	
Procure 16	$8.0	
Procure 18	$15.0	
Advanced ASW Frigates		
Procure 10	$3.5	
Procure 20	$7.0	$7.0
Battle Dominance Ships (DD-21 equivalent)		
Procure 8	$5.5	
Procure 16	$10.0	
Procure 24	$15.0	$15.0
Advanced Amphibious Assault Ships		
Procure 8	$4.0	
Procure 16	$8.0	$8.0

Stealthy Armed Reconnaissance Helicopters			
	Procure 100	$3.5	
	Procure 200	$7.0	
	Procure 400	$14.0	
Advanced, Main Battle Tanks (M1A4 equivalent)			
	Procure 600 additional tanks	$5.5	
	Procure 1200 additional tanks	$10.0	
	Procure 2400 additional tanks	$19.0	
Infantry Fighting Vehicles / Armored Personnel Carriers (Type 95)			
	Procure 600 IFV/APCs	$3.5	
	Procure 1200 IFV/APCs	$7.0	
	Procure 2400 IFV/APCs	$14.0	
Advanced Field Artillery Systems (Crusader-equivalent)			
	Procure 100	$1.0	
	Procure 200	$2.0	
	Procure 400	$4.0	
Procure 100 enhanced E-FOGM equivalent Firing Units			
	Procure 200	$3.0	
	Procure 400	$6.0	
Spaced-Based Laser Constellation			
	Procure partial constellation (12 sats)	$13.0	
	Procure full constellation (24 sats)	$35.0	$35.0
Space-Ground Attack Satellites (100 rods each)			
	Procure 4	$4.5	$4.5
Ground-Based, DE ASATs			
	Procure 6	$25.0	
	Procure 12	$45.0	
Direct-Ascent, Kinetic Kill ASATs			
	Procure 48	$0.5	
Trans-Atmospheric Vehicles (Space Planes)			
	Procure 8	$10.0	
	Procure 16	$20.0	$10.0
Rapid Launch, Light Satellites			
	Procure 40	$5.0	
	Procure 80	$9.0	$9.0
Advanced Military Communications Satellites			
	Procure 6	$8.0	
	Procure 12	$15.0	$15.0
Advanced ISR Satellites (E-O, SAR, IR, ELINT)			
	Procure 6	$10.0	
	Procure 12	$20.0	$20.0
Sea Control Satellites			
	Procure constellation of 12 satellites	$20.0	

FORCE STRUCTURE			
PLA Fighter Wings			
	Cut 5 FW	-$7.0	
	Cut 10 FW	-$14.0	-$14.0
Sea Control Brigades			
	Create 2	$8.0	
	Create 4	$16.0	
	Create 6	$30.0	$30.0

Red Team Move 3

PLA Tank / Mech Divisions			
	Cut 5 divisions	-$35.0	
	Cut 10 divisions	-$70.0	
	Cut 15 divisions	-$100.0	-$100.0
PLA Infantry Divisions			
	Cut 12 divisions (4 Group Armies)	-$50.0	
	Cut 24 divisions (8 Group Armies)	-$100.0	
	Cut 36 divisions (12 Group Armies)	-$150.0	-$150.0
Advanced Airborne Division			
	Create 1	$25.0	
	Create 2	$50.0	$50.0
Mobile Strike Brigades			
	Create 3	$11.0	
	Create 6	$20.0	
	Create 9	$30.0	$30.0
Aerial Strike Force Divisions			
	Create 1	$28.0	
	Create 2	$54.0	
	Create 4	$106.0	$106.0
Mobile Strike Force Divisions			
	Create 1	$11.0	
	Create 2	$20.0	
	Create 4	$40.0	$40.0
Specialized IW Brigades			
	Create 2	$2.0	
	Create 4	$4.0	
	Create 6	$6.0	$6.0

READINESS		
Increase Readiness and Training		
$50 billion plus up over the period		
$75 billion plus up over the period		
$100 billion plus up over the period		$100.0

Total Funds Available (budget surplus + carry forward + cuts)	$940.0
Total New Spending	$810.0
Grand Total	$130.0 (surplus)

Player Output
Move 1

F

Transformation Strategy Game IV

OSD/NA Transformation Strategy Series

National Defense University
Washington, DC

June 22-24, 1998

Move 1, Blue Team

CSBA Center for Strategic and Budgetary Assessments

Transformation Strategy

	2010	2025
Who	•Non-State Actors/LIC •Homeland defense •Regional Powers	•More capable Non-State Actors and Regional Powers •Near Peer
How	•Reduced Legacy Forces •Shaping	•Niche/Full-Spectrum RMA Capabilities •Change in Shaping •Legacy Forces

Transformation Strategy Overview

- **Defense program tradeoffs:**
  - R&D (plus)
  - Procurement (flat with adjustments)
  - Force Structure (reduce)
  - Readiness (maintain)
- **Balancing near vs long-term risk:**
  - 1 MRC + (75-80% current force structure)
    - 2 MTW declaratory policy
  - Tradeoffs between giving up certain missions or doing them differently, the what and the how

Program Adjustments

CUTS

Procurement

- F-22: Reduce
- JSF: Defer
- F/A 18 E/F: Reduce
- *Comanche*: Reduce
- *Crusader*: Cancel
- CVN77: Cancel
- NSSN: Slow
- V-22: Reduce
- THAAD: Cancel

Force Structure

- 2 Fighter Wings
- 2 CVBGs
- 2 Army Divisions
- 1 MEF

ADDS

- R&D: $60 Billion (+TAV)
- Limited NMD
- Deploy Navy Upper Tier

Capabilities Development: Experimentation

- **Critical experiments:**
  - Combat identification (battlespace management)
  - Network-centric warfare
  - Targeting for responsive, precision strike
  - Rapid, seamless strategic maneuver
- **Transition Strategy / Organizational Learning:**
  - C4ISR/networking (digitization)
  - Autonomous systems

Capabilities Development: Institutional Change

- **Internal DoD Change:**
  - Increased Jointness -- interoperability, development of joint concepts and capabilities
  - More flexible personnel policy
    - Portable retirement- 401Ks
    - Temporary contracts
    - Integrated civil/military pilot pool
  - Innovative approaches to integrating Guard/Reserve
  - Revisit PPBS system
- **External to DoD:**
  - Complete review of security structure with other security organizations (FBI) re: homeland defense, terrorism, etc.
  - Industry consolidation (more arsenal?) / Preservation of industry capabilities

Force Effectiveness

DPG Planning Scenarios	QDR Force	Adjusted Force
• DPRK invasion of ROK; air & sea ports unavailable due to large scale missile attacks, SOF, and CW • Iraqi invasion of Kuwait & Saudi; air and sea ports unavailable • Iranian blockade of Strait of Hormuz • Chinese missile blockade of Taiwan • Russian threat against Baltic States • Large-scale civil war in Cuba or Mexico		• Better for China missile blockade

Implications for Shaping/Engagement

- **30-40% reduction in shaping operations now may make significant resources available to develop future capabilities (biggest impact on Navy)**
  - **Requires forward basing changes? Decreased in troop presence (100K in Europe/Asia)?**

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Transformation Strategy Overview

- **Defense program tradeoffs:**
  - R&D ↑↑ Procurement ↑ Force Structure ↓ Readiness ↑↑
  - Procurement: Focus on immediate problems (e.g. Taiwan)
  - Do not want to be overly provocative
- **Outsourcing vs. indigenous production:**
  - Outsource --Focus on quality over the short term; learn how to use modern platforms
  - Indigenous -- Maintain domestic production base and absorb modern technology

Transformation Strategy Overview (2)

- **Key hedges:**
  - **Downturn in Sino-Russian relations**
    - ➢Co-production and reverse engineer key platforms
    - ➢Diversify supply base -- obtain other foreign suppliers (e.g., France, Germany, etc)
  - **Hedge against US TMD:**
    - ➢Overwhelming number of missiles to saturate US TMD systems
    - ➢R&D on counter measures (missile spin and fast burn motors)
    - ➢Anti-access -- keep out US TMD in the first place.
- **Key barriers:**
  - **Training, PME and basic education**
  - **Maintaining internal security**

Program Adjustments

Discuss the adjustments you made to the FY 1999-2011 Defense Program.
(See program adjustment worksheet)

- **Large buy of ballistic/ cruise missiles**
- **Reduce the size airforce, but modernize**
- **Large purchase of submarines**
- **Created a modest presence in respect to surface combatants**
- **Partial divestiture of ground forces and very modest modernization**
- **Indigenous space capability**
- **Major plus ups in R&D and training**

Capabilities Development: Experimentation

- **Critical experiments:**
  - **Multi-axis coordinated missile strikes**
  - **Integrated operations capability**
    - **Multi-dimensional sea denial**
  - **Capability to conduct sustained operations in a hostile environment**
  - **C4ISR capabilities to support the above**
    - **Functional exploitation of commercial space**
  - **Develop a logistics capability that can support sustained operations**
- **Transition strategy / Learning from others:**
  - **Maintain a robust program of military-to-military contacts**
  - **Exploit open source reporting**
  - **Buy modern systems (including simulators) with which to train and learn**
  - **Buy foreign training assistance**
  - **Review organizations**
  - **Operational experimentation**

Capabilities Development: Institutional Change

- **Internal Change:**
  - Develop professional cadre; experimental/elite units
  - Expand professional military education (PME)
  - Decentralize command and control
  - Constant experimentation and encourage innovation
  - Quality control
  - Measure of military might no longer as quantitative
- **External:**
  - Introduce market competition to improve quality of military hardware.
  - Encourage foreign education abroad

Force Effectiveness

DPG Planning Scenarios

- Preventing Taiwanese independence
- Indian attack on PRC
- Territorial aggression in the Spratlys
- Intervention in Korean civil war
- Protection of PRC interests in Indonesia
- Border clash with Russians in Siberia or in Kazakhstan
- Protect energy supply from Persian Gulf and Central Asia

Adjusted Force

As measured against the baseline force, the adjusted force produced increased effectiveness for all the DPG scenarios with the exception of protection of energy supply from Persian Gulf and Central Asia

Spending the Surplus

- **Civil infrastructure which supports the military**
- **Manufacturing R&D**
- **Accelerate R&D on "magic weapons"**
  - RF weapons, directed energy weapons
- **Emphasize electronic combat systems, to include SATCOM jammers and array of COMJAM and radar jammers.**

Player Output
Move 2

G

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Move 2, Blue Team

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How do you propose to respond to the Taiwan crisis? What does the outcome of the crisis portend about the U.S. position in East Asia and China's rise as a world power?

- Lead International Diplomatic/Economic Effort
  - Taiwan: Indicate lack of US support for declaration, support for Hong Kong option, convey lack of US action if China blockades?
  - China: Discourage use of force, Pay Ops "strategic SPAM"
- Military Action to reinforce diplomatic effort - deploy US forces to the region?
  - Upper Tier, bombers to Guam, increase US ground forces in Japan
  - In the event of blockade, wait it out? Challenge it?
  - Buy Time – Delay China's action
- No Good Outcomes
- If US doesn't intervene China wins

How would you assess the US-China military balance as of 2008? How might emerging U.S. capabilities (e.g., deep strike, network-based warfare, IW) be exploited strategically? What emerging Chinese capabilities concern you the most? How has deterrence changed as a result of the transition in force postures?

- Niche capability -- Regional Dominance
- Missile Blockade -- number of missiles capable of overwhelming US TMD (US has counterforce options against missile launchers)
- US still dominant undersea

How might the U.S. use the transition to a new force posture to "shape" Chinese behavior in ways most favorable to U.S. interests? (Consider alternative approaches to strategic doctrine, arms control, overseas presence, proxy wars, etc.)

- Constrain/Engage China to corrupt or build vested interest in status quo
  - Maintain strong relationship with Japan, develop strong relationships with Russia and India
    - ➢Change Cold War Triangle : US+Russia vs. China (invite Russia to become part of NATO?)
- Proxy Wars
  - Domestic conflict more likely -- Xinjiang/Central Asia
  - US able to strike in depth to protect interests
- Strategic Arms Control -- it depends ... START IV with China?
  - IW -- no economic warfare?
  - Space? Perhaps ...
- Advanced BW

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Move 2, Red Team

CSBA Center for Strategic and Budgetary Assessments

How do you propose to respond to the Taiwan crisis? What does the outcome of the crisis portend for China's rise as a world power and the U.S. position in East Asia?

- **Step 1:**
  - Deploy maximum ISR assets -- sortie out UAVs, reconnaissance aircraft, and submarines
  - Diplomatic overture to world community -- "Taiwan's declaration was manufactured and does not represent the view of the majority of the island's population."
  - Activate SOF units in Taiwan to create riots and general civil unrest
  - Perception management campaign -- "This is an internal matter and China is concerned with the welfare of its citizens."
    - In particular exploit American media.
    - Confuse the issue for U.S. decision makers
  - Evaluate the world response.

How do you propose to respond to the Taiwan crisis? What does the outcome of the crisis portend for China's rise as a world power and the U.S. position in East Asia? (Continued)

- **Step 2:**
  - Conduct air and sea "inspection" to prevent the introduction of subversives or contraband into Taiwan.
  - Heighten readiness posture (e.g. disperse missile TELs).
  - If any military forces (e.g., Taiwanese) refuse to submit to "inspection"-- the use of force is authorized.
- **Step 3A (If US seems unlikely to intervene):**
  - Proportional Chinese response against Taiwanese attacks. (Wear down Taiwanese will to resist over time)
  - Periodic, low-level missile harassment
  - Avoid inflicting casualties against US and other outside states
- **Step 3B: (If US signals an intent to respond militarily)**
  - Large-scale, ballistic and cruise missile barrage attack against Taiwanese airfields and other major military installations.
  - Strategic IW/ EW attack against Taiwanese communications and economic infrastructure.

How would you assess the US-China military balance as of 2008? How might emerging Chinese capabilities (e.g., deep strike, "anti-navy," IW) be exploited strategically? What emerging US capabilities concern you the most? How has deterrence changed as a result of the transition in force postures?

- **Military Balance:**
  - The US still has clear military superiority over China
  - China only beginning to develop niche capabilities (e.g., submarines and LRPS)
  - China far behind in respect to most force-on-force comparisons: surface combatants, tactical aircraft, ground forces, etc.
  - In short, China would like to avoid war with the US military at this time.
  - But if war comes, *China can't afford to wait while US builds up forces in the region*

How would you assess the US-China military balance as of 2006? How might emerging Chinese capabilities (e.g., deep strike, "anti-navy," IW) be exploited strategically? What emerging US capabilities concern you the most? How has deterrence changed as a result of the transition in force postures?

- **Emerging US capabilities of concern**
  - Advanced C4ISR system of systems
  - Operational readiness
  - Precision strike
  - Effective missile defense
- **Deterrence**
  - China's has significantly *increased the costs* associated with US intervention through the procurement of mines, advanced submarines, and large numbers of missiles

How might China use the transition to a new force posture to "shape" US behavior in ways most favorable to Chinese interests? (Consider alternative approaches to strategic doctrine, proxy wars, arms control, etc.)

- **Raise the cost for the US to get involved with Chinese anti-access capabilities**
- **Complicate the US decision making calculus**
- **Engage US in arms control agreements to curb:**
  - "Destabilizing" TMD capabilities
  - Weaponization of space

What new alliance relationships could China require in light of the emerging strategic competition with the US? What new overseas bases? How could the role of traditional allies change?

- **"Overseas bases" are irrelevant to China at this point.**
  - China does not have global interests -- or the ability to project power overseas
  - More concerned about *regional* capability
- **Alliances:**
  - Move closer to Korea. Ensure US withdrawal from Korean soil
  - Covert support to anti-US groups in Japan and elsewhere in the region
- **Continue to cultivate relationships with Malaysia, Singapore, and Thailand**

Player Output **H**
Move 3

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Move 3, Blue Team

CSBA Center for Strategic and Budgetary Assessments

Competitors/Threats

- Chinese near-peer
  - New forms of operations (space strike/control, heavy regional power projection capabilities), new forms of political-military coercion
- More robust regional competitors
- Porous homeland
- More robust non-state actors
- US loses geographic security

Transformation Strategy Overview

- **US Objectives:**
  - Defend allies and partners
  - Uphold treaties and international agreements (freedom of seas, etc.)
  - Insert forces into distant theaters to protect US national interests
  - Access to energy resources?
  - Prevention of nuclear exchange (China/Russia)?
- **Key hedges:**
  - Missile defense
  - Space defense
  - ASW
  - Homeland BW/IW defense
  - US presence in Central Asia / Russia as surrogate for US power in Central Asia?
  - Space, stealth, submersibles, dispersed

Program Adjustments

ADDS

- R&D plus-up of $80 billion
- 20 B-X
- 4 Stealthy ABL
- 200 Additional strike UAVs
- 20 Strike UAV tenders
- 120 Stealthy airlifters
- 100 Stealthy air refuelers
- 200 UAV transports
- 12 Stealthy frigates
- 1,200 missile pods
- 25 Additional NSSNs
- 12 Submerged arsenal ships
- 200 Anti-Navy UAVs
- *Starlight* SBR

ADDS

- 6 Transatmospheric Vehicles (TAVs)
- Cruise Missile defense
- 90 Light sats
- 6 Advanced DSB
- 9 Combined Arms Regiments (CAR)
- More Airlifters, CVBG, legacy Army division, or UAV Strike Tenders with $56B

CUTS

- AF JSF
- M1A3 Upgrade
- 4 fighter wings
- 4 divisions
- Retire B-52
- Retire B-1
- 3 CVBG
- 1 MEF
- Retire C4s / Minuteman IIIs

Capabilities Development: Systems Choice, Experimentstion & Institutional Change

Institutional change:

- **Increased complexity of command**
  - **C2 - network centric warfare and time lags - what is "forward"?**
  - **Reliance on satellites**
  - **Intellectual demands on commanders increased due to multidimensionality of battlespace**

Force Effectiveness

DPG Planning Scenarios	QDR Force	Adjusted Force
• Chinese first strike in space • Covert economic warfare (Strategic IW/Adv BW) against the U.S. • Chinese LRPS strike on/occupation of Siberia/Southern Kazakhstan • Peace enforcement operations in Indonesia • Opposed mega-humanitarian assistance mission in Central Africa		• Retained 1 MRC capability

Transformation Strategy Game IV

OSD/NA Transformation Strategy Series

National Defense University
Washington, DC

June 22-23, 1998

Move 3, Red Team

CSBA Center for Strategic and Budgetary Assessments

Transformation Strategy Overview

- **Defense program tradeoffs:**
  - R&D ↑↑ Procurement ↑↑ Force Structure = Readiness ↑↑
  - **R&D: Maximum option -- need to maintain and extend advantage over long term**
  - **Procurement: Major acquisition of platforms consistent with new regime**
  - **Force structure: swap old units for new**
  - **Readiness: Maximum plus-up. Training of forces to use new systems & capabilities is essential**
- **Key hedges:**
  - **Hedge against regional missile proliferation by acquiring multiple TMD systems**
  - **Hedge against proliferation / modernization of regional naval capabilities with major procurement of SSNs and Sea Control Brigades**

Program Adjustments

Procurement Adds

- 1,000 ballistic missiles
- 2,500 cruise missiles
- THAAD-equivalent TMD
- SA-X
- 24 ALCM Trucks
- 12 ABL
- 200 ISR UAVs
- 24 IW UAVs
- 200 Strike UAVs
- 200 Air refuelers / airlifters
- 300 ASW UAVs
- Sensor Nets
- *2 Carriers ??*
- 32 NSSN equivalents
- 20 ASW Frigates
- 24 DD-21s
- 16 Amphibious Assault Ships
- 100 *Comanche*-equivalent attack helicopters
- 24 SBLs
- 4 Ground Attack Satellites
- 8 TAVs
- 60 Light satellites
- 12 Military COMSATs
- 12 ISR Sats

Force Structure

- Cut 5 FW, 15 tank divisions, 36 infantry divisions
- Create 6 Sea Control Brigades
- Create 2 Advanced Airborne Divisions
- Create 9 Mobile Strike Brigades
- Create 4 Aerial Strike Force Divisions
- Create 4 Mobile Strike Force Divisions
- Create 6 Specialized IW Brigades

Program Adjustments

- **Limited ballistic missile buy (only 1,000 missiles)**
  - Concerned about developments in TMD. Risk of block obsolescence
- **Emphasized VLO cruise missiles (1,500 additional procured)**
- **Invested in theater missile defense across-the-board**
  - THAAD-equivalent TMD
  - Airborne Laser (ABL)
  - Battle Dominance Ships (DD-21 equivalent)
  - Full constellation of SBLs
- **Maximum buy on all types of UAVs**
- **Shift toward stealthy, submerged power projection for dealing with "high end" threats (32 additional NSSN-equivalent submarines procured)**
- **Reliance on frigates, DD-21, and amphibs for presence, NEO, and low-end contingencies**
  - Procure 2 carriers for low-end options? Prestige?
- **Space weaponized (ground attack SATs, SBL, TAVs)**
- **Legacy ground forces eliminated & replaced with lighter / more mobile units**

Capabilities Development: Systems Choice, Experimentation & Institutional Change

- **Systems choice – how did you choose among competing capabilities?**
  - Prioritized based on:
    - Dealing with strategic threats from India, Korea, and Japan
    - Regional power projection
- **Critical latter phase experiments:**
  - Fleet battle lab experiments
  - Focus experiments on integration of units -- "putting all the pieces together"
  - Experimentation for developing new operational concepts and organizations
- **Institutional change:**
  - Continue to decentralize

Force Effectiveness

DPG Planning Scenarios

- **Space control campaign**
- **LRPS strike on/occupation of Siberia/Southern Kazakhstan**
- **Missile-submarine blockade/pol-mil coercion of Japan**
- **Protection of external sources of energy/LOCs**
- **Peace enforcement operations in Indonesia**
- **Covert warfare (strategic economic and proxy) against U.S. and India**

Adjusted Force

- **PLA forces better equipped & trained across the board:**
  - Space weaponized --robust space control capability
  - Major increase in LRPS capability -- VLO cruise, ALCM trucks, etc
  - Submarine fleet for blockade option
  - Modern surface fleet / Anti-Navy UAVs / Sea Control Brigades for protection & interdiction of SLOCs
  - Amphibs / Surface fleets / new ground units for peace enforcement contingencies

Player Output
Move 4

Transformation Strategy Game IV

OSD/NA Transformation Strategy Series

National Defense University
Washington, DC

June 22-24, 1998

Move 4, Blue Team

How do you propose to respond to the Siberian crisis? What does the outcome of the crisis and China's rise as a world power portend for future U.S. grand strategy?

- **"Shape" China's rise**
  - Engagement: (Encourage) vested interest in international stability, economic integration, non-proliferation, etc.
  - Transform regime: advanced communications, information technologies, economics, democratization

From the vantage point of 2023, how would you modify your transformation strategy? When during the period did you perceive that discontinuous change had occurred?

- **Higher defense budgets (near term/long term)?**
- **Missile defense, prevent weaponization of space**
- **Military capabilities not useful for "shaping"?**
  - ➨ What about changing measures of military power?

Transformation Primer J

Transformation Primer

Introduction

There is increasing sense that a revolution in military affairs (RMA) or transformation of war is underway. When this transformation is complete, the way we fight, the status we ascribe to combatants, and the way we measure military power will all have changed.

The past two centuries have seen six of these transformations, accounting for about half of the revolutions in war for which we have good historical evidence, making this an "Age of Military Revolutions." These revolutions in war have varied fairly widely in endogeneity to the military, institutional scope, level of complexity, temporal distribution among competitors, and relative self-awareness of the actors. This paper is intended as a brief primer on the issues which appear to be central to strategies for transformational change.

Understanding Transformational Change in the Conduct of War

There are two prerequisites to formulating a strategy for transformational change: understanding the strategic problem to be solved and understanding how the transformation process might address it.

The strategic problem to be solved (which could be in the form of a threat or an opportunity) is central to regime transformation, but can easily be misspecified. The strategic problem, for instance, could be to harness societal change for strategic advantage, to out-range an opponent, to restore operational mobility to the battlefield, or to inflict unacceptable damage on an adversary's society. In the current context, the strategic challenge could be to halt or defeat an invading force (air/armored), but may be something much larger such as overcoming an opponent's multidimensional "anti-access" capability. Competitors, moreover, could be faced with different strategic problems, and thus pursue different aspects of the same military revolution.

A useful way of thinking about the process of transformational change is to examine the relationship among the sources and objects of change. Military revolutions are often derived from broader societal transformations. An information revolution may, for example, lead to the development of broad new military capabilities *(e.g.* long-range precision strike) or to the substantially increased importance of certain core warfare functions (*e.g.*, information aspects of war) relative to others. These developments could then lead to the transformation of existing warfare areas and/or to the emergence of new ones.

The actual instruments of change could stem, for instance, from harnessing directly changes in society (*e.g.*, in the nature of citizenship, or in the information infrastructure), from a technological breakthrough, or from the complex interplay of new systems, concepts, and organizations.

The early stages of regime transformation can often be observed in "precursor wars." These in-between wars are limited engagements or wars between revolutionary and non-revolutionary actors which provide an opaque glimpse into a discontinuous future. The Gulf War may have been such an event with respect to stealth and precision guided munitions.

Effecting Transformational Change

Assuming one has correctly specified the strategic problem to be solved and that some understanding of the sources and objects of change has been obtained, four additional concepts are essential to crafting a strategy for discontinuous change: **hedging, organizational learning, "false starts," and intertemporal readiness**.

- **Hedging** is essential not only to guard, if feasible, against catastrophic failure (*i.e.*, against a technological breakthrough such as the atom bomb or a policy surprise such as weaponization of space), but also to cope with regime uncertainty. The latter objective can be accommodated, in part, by vigorous experimentation with new systems, operational concepts and organizations. New classes of systems often experience considerable technological flux before they reach their mature form. In the current context, candidate systems for technological flux could be arsenal ships, UAVs, and C4ISR networks.

- **Organizational learning** refers to the ability of a military organization to discern, share, and pass on insights relevant to the RMA in order to facilitate the adoption of progressively more mature RMA systems and organizations over time. Competing military organizations may vary tremendously in their ability to internalize the right lessons from successes and failures in the field and position themselves to take the next leap ahead in terms of RMA capabilities.

- Also related to the need for hedging and organizational learning is the problem of **"false starts,"** meaning systems that appear to hold the potential to transform war (or prevent its transformation), but which turn out to be less effective than expected. A false start candidate in the current context could be ballistic and cruise missile defense.

- The concept of **intertemporal readiness** can be understood as the effectiveness of a force at a given point in time along a selected transformation path. Simply stated, it is the degree to which a military is prepared to face current threats while in the process of transforming itself to meet future challenges. Competitors who are on the same general transformation path can nevertheless suffer catastrophic temporal failure. Tradeoffs among the so-called "current military," the "next military," and the "military after next" can approach a zero-sum competition during periods of transformational change.

Finally, there is the matter of inducing change. Here, the tradeoff is between the efficiency that can stem from competition and the efficiency that stems from specialization. Competition can be interservice or intraservice. It can be induced from the outside (*i.e.*, civilian intervention) or from the inside (*i.e.*, military elite institution building). A transformation strategy might emphasize *competition* among transforming and emerging warfare areas (until regime uncertainty has been sufficiently reduced) and *specialization* or reform among mature areas. Candidates for competition might, in the current context be interservice (*e.g.*, multidimensional long-range precision strike), or intraservice, (*e.g.*, stealthy advanced combat vehicles vs. personal mobility systems. Specialization could be at the service level (*e.g.*, assigning operations other than war to one service) or at the sub-service level.

CJCS Vision **K**

CJCS VISION OF THE IMPENDING TRANSFORMATION -- 1998

The Emerging Military Revolution

Over the next two-to-three decades, an emerging military revolution could have profound consequences for military operations and global strategic balances. This revolution could both transform war in existing dimensions and bring war into new ones. Several new systems, concepts and organizations could rise to prominence, rendering existing systems, concepts, and organizations obsolete or subordinate.

Two areas appear to be central to this transformation: the development of increasingly sophisticated long-range precision strike capabilities and the increasing importance of the information dimension of war. Long-range precision strike capabilities will be enabled by advances in sensing, data fusion and transfer, stealth and precision force. As LRPS capabilities increase in sophistication and are fielded by multiple competitors, new means of force mobility and protection could become essential.

Information may be used in future war not only to enable long-range precision strikes, but also as a distinct form of strike against opposing information systems at the strategic to the tactical level of war. Information operations in the broadest sense could also be increasingly central to force protection, operationally and tactically.

Whether some new "dominant maneuver" capability will also emerge as part of this transformation is less certain at this point. LRPS may not be decisive by itself, particularly against a similarly-equipped adversary. The form this new maneuver capability assumes, however, will likely be dependent on advances in new means of mobility and protection as well as on the sophistication of the long-range precision strike environment.

A struggle for space control could also transform war. Most future competitors will have access to space, and much of this access will be provided by "neutral" commercial systems. Weaponization of space is also currently proscribed by policy and partially constrained by treaty. Hence, whether space control will comprise more than assured access and relative advantage is uncertain.

The force structure implications of this impending transformation are ambiguous. New systems and organizations could constitute only a small percentage of the future force. Much also depends on how the interaction among future warfare areas evolves, and what new areas emerge.

Core Strategic and Technical Competitions

Three principal "competitions" -- one strategic and the other two technical -- could largely determine the shape of warfare through the first quarter of the next century:

- **Anti-Access versus Power Projection**. Capabilities developed to deny access into a theater of war could make traditional power projection across warfare dimensions very risky, necessitating the development of either new means of force protection or new methods of power projection.

- **Hider versus Finder**. As information becomes increasingly central to war, the competition between "hiders" and "finders" can be expected to sharply intensify. Should the battlespace become transparent, many forms of strategic, operational and tactical mobility could become stymied. On the other hand, an expansion of stealth and new means of integrating information protection and manipulation into combat systems may offer enlarged scope for the hiders.

- **Stealth/Quantity of Missiles versus Active Defense**. The persistence and expansion of stealth, the proliferation of large numbers of missiles, and the extended loitering capability of emerging combat systems could substantially reduce the effectiveness of active defenses. Any combatant, of course, would like to have full dimensional protection. The relationship between offense and active defense could also vary substantially across warfare dimensions. Information defense, for example, may prove more efficacious than active physical defense.

The Military Revolution and Uncertainty

Key uncertainties relate to the distribution, rate, scope, sources, form, and path of the prospective transformation of war. A first order uncertainty is whether the United States will retain strategic monopolies in the key areas of transformational change. Second order uncertainties have to do with the rate, scope, sources, form, and path of potential change. Significant doubt about the former exponentially increases the importance of the latter.

- **Distribution Uncertainty**. Distribution uncertainty affects both the scope of the transformation as well as its international political consequences. Competition in the revolution will almost certainty mean greater change.

Extended U.S. Dominance. If the revolution, indeed, turns out, as some suggest, to be an "American revolution," the impact on the U.S. military would be substantially lessened, with the impetus to change more a function of opportunity rather than threat. Enabled, but secondary warfare areas (i.e., ground maneuver forces), would change more for efficiency reasons rather than out of the need to maintain their strategic effectiveness. If the U.S. does retain a monopoly on this transformation, the international political consequences would likely be extended U.S. dominance.

Rise of a Peer Competitor. The impending military revolution could be the principal means by which a new peer competitor rises to challenge the U.S., or even the means by which the center of gravity of the international distribution of power makes a half a millennial shift from the Atlantic to the Pacific Rim.

Global Anarchy. This impending transformation could also be historically unique in its impact on non-state actors. If this were to be the revolution's dominant international political effect, the result could be global fragmentation.

- **Rate Uncertainty**. Rate uncertainty has to do with the timing of the transformation, and hence, the management of risk and its corollary, intertemporal readiness. Will this transformation evolve gradually enough to avoid a tradeoff between the so-called "next military" and the "military after next," or will the pace of change be so rapid that the distinction between them becomes blurred?

- **Scope Uncertainty**. Scope uncertainty has three components: system uncertainty, dimensional uncertainty, and societal uncertainty.

  System Uncertainty. System uncertainty has to do with what systems, concepts and organizations will dominate future warfare. The first level of system uncertainty is whether new systems will emerge at all. Some see a "hidden" or invisible revolution that is centered not on new platforms, but on sensors, networks and munitions. If new platforms do emerge, will they be new forms of old systems, concepts and organizations (*e.g.*, electromagnetic gun-equipped, stealthy advanced combat vehicles and combined arms regiments), or will they represent a more radical break (*e.g.*, exoskeleton-equipped infantry employed individually as part of a distributed network)? Will unmanned systems displace manned systems?

Dimensional Uncertainty. Dimensional uncertainty has to do with the extent to which combat in more than one warfare dimension will be transformed and whether new warfare dimensions will emerge. Some see the revolution's impact as principally centered on land warfare. That is, capabilities in other dimensions would increase only to the extent that they enable those dimensions to increasingly influence the conduct of war on land, but not so much that war within these other dimensions is also transformed. Dimensional uncertainty adds substantially to the risk of catastrophic failure in defense strategy. Will we, for example, see war in and from space?

Societal Uncertainty. Societal uncertainty relates to uncertainty about the character of the future relationship between military institutions and the larger societies from which they are drawn. Uncertainty about resource availability, human, material, and fiscal, is at the heart of societal uncertainty.

- **Source Uncertainty**. Source uncertainty has to do with the extent to which the impending transformation is exogenous or endogenous to the military. Many of the technological developments underwriting this transformation may originate from outside the defense sector. Source uncertainty also has to do with the larger context of the transformation. While the transformation is expected to derive from developments in information technologies, it could emanate from an entirely different scientific and technical realm such as molecular biology. Still another level of source uncertainty is the extent to which the transformation emanates from a project, an institution, or from society.

- **Form Uncertainty**. Closely related to source uncertainty is form uncertainty. The latter relates to the extent to which the transformation is embodied in a single system or is the product of the interaction of many systems, forming a complex, larger system of systems.

- **Path Uncertainty**. Path uncertainty stems from the interaction of current and emerging warfare areas, as well as from evolving threats. "False starts," defined as systems or new forms of operations which initially appear to offer great promise, but later turn out to rapidly lose effectiveness, should be expected. Transformation paths could thus exhibit both considerable "technological flux" among "sunrise" systems, as well as rapid obsolescence of some emerging systems. Path uncertainty has to take into account the possibility that significant discontinuities could emerge, i.e., weaponization of space.

Potential Transformation Paths

Transformation endpoints and potential transformation paths are uncertain at this point because of rate, scope, source and distribution uncertainties described above. Yet some trends and outlines of the next military regime can be discerned.

- **Long-Range Precision Strike**. Stealth, if it remains practicable, and precision will almost certainly be key capabilities. Mass, meaning quantity of available missiles or UAVs, may also prove decisive. Missiles will likely play an increasingly important role in ground and sea-based strike.

  What is not clear at this point is whether manned, theater-based aircraft will continue to comprise the bulk of the precision strike force; whether surface naval vessels will themselves become vulnerable to stealthy, precision, long-range attack; whether new forms of long-range precision strike (*e.g.*, precision strike from or through space) will emerge; and what the relative contributions of these myriad capabilities will be in a multidimensional long-range precision strike regime. One can imagine precision strike capabilities becoming more stealthy, more extended range, more distributed, more unmanned and more multidimensional with time.

- **Mobility and Close Combat**. It is not clear whether new forms of strategic, operational, and tactical mobility will be required for force insertion, operation, sustainment, and extraction. It is also not clear whether close combat and maneuver will remain important capabilities in high intensity theater war. At one end of the spectrum of possibilities, future ground forces could be relegated to little more than spotters and damage assessors for LRPS systems and to post-conflict occupation duties.

  Alternatively, close combat and ground maneuver could remain important, and new systems, concepts, and organizations adapted to a long-range precision strike environment could emerge. Future close combat forces may be far more air-intensive (*e.g.*, stealthy attack helicopters or weaponized, loitering UAVs). Advanced ground combat vehicles optimized for information-intensive warfare and organized into air-transportable combined arms regiments could displace current ground-based close combat systems. These advanced regiments could in turn be displaced by even more stealthy and distributed forms of ground mobility and combat power such as exoskeleton-equipped infantry and microrobots. Whatever the role of ground forces in post-military revolution warfare, many other military operations will remain soldier-intensive. Even these forces may be organized, equipped and employed differently, however.

- **Dimensional Control.** The character of air superiority could change substantially in a stealth and missile-dominated regime. If missile defenses (cruise and ballistic, stealth and non-stealth) prove feasible, the change will be less dramatic. If anti-navy forces emerge (land and space-based threats to surface ships), sea control will become more multidimensional and difficult to attain. If the battlefield becomes more transparent and long-range precision strike capabilities become more sophisticated, land control may become more indirect. As space and information access becomes more commercialized and robust, space and information control may become more difficult to attain or less decisive once attained.

CJCS VISION OF THE ONGOING TRANSFORMATION -- 2011

The Magnitude of Change

It has become increasingly clear that we are well into a transformation of war that will have profound consequences for military operations and global strategic balances. Within another decade, or two at the outside, the way we fight and who (or what) is doing the fighting should be fundamentally different.

- This revolution increasingly appears to be multidimensional in scope, transforming war in the air, on land, and at sea, and bringing war fully into two new dimensions -- space and the information spectrum. Air warfare appears on a path towards stealth and unmanned system dominance, ground combat will almost certainly become highly distributed and non-linear, naval power projection against a robust anti-navy threat could well be driven sub-surface, and space and the information domain will almost certainly emerge as independent theaters of operation.

- Several new combat systems and organizations are rising to prominence as a result of this revolution: stealthy, extended range aircraft and weaponized unmanned aerial vehicles and UAV strike tenders; arsenal ships and remote, autonomous long-range missile pods; stealthy, information-intensive, roboticized close combat forces; counterspace and space-to-ground strike forces; and independent and integrated information warfare systems and forces.

- The proliferation of long-range missiles and the increasing use of stealth points increasingly to a period of offensive dominance. Fixed sites and high signature targets -- airfields, ports, centralized command and control facilities -- are fast becoming extremely vulnerable to destruction or denial.

- The increasing lethality of future warfare will, of necessity, "empty" the battlefield, with unmanned systems assuming many critical warfare functions.

- Maneuvers on "information terrain" will likely become central to maneuver on physical terrain. Information-based protection may supplant traditional notions of physical protection.

- Dimensional control -- air, land, sea, space, and information -- will become far more problematic.

- The nuclear revolution can be expected to have a continued, truncating effect on the strategic scope of the emerging military revolution. The emergence of new capabilities for strategic warfare, however, has substantially increased the risk of homeland attack.

- Advances in molecular biology and biochemistry may lead to novel forms of biological warfare such as genetically-discriminating weapons (e.g., capable of precisely targeting the specific genetic signatures of ethnic groups or key individuals) and stealth pathogens (slow-acting agents hidden inside other innocuous carriers). Developments in biotechnology could substantially enhance operations in other dimensions as well (e.g., biosensors and biomaterials and performance-enhancing drugs).

Future Force Structures

For theater warfare against a capable adversary, we will need a force that is substantially *smaller*, using the traditional measures of power, but is also fundamentally *different*. These "sunrise" forces, however, will likely constitute only a small percentage of our future force.

The post-military revolution component of our future ground forces could comprise fewer than 25,000 soldiers and Marines. (At the high end, if exoskeleton technology develops as some claim, we may come to think of infantrymen more like individually autonomous, networked fighter pilots than as members of a traditional army formation.) Given the requirement for substantial dismounted infantry strength for lesser contingencies, however, the non-military revolution component of our ground forces will likely be several times the size of our high end force. This is not to say that our more traditional ground forces will not benefit from emerging technologies. For instance, robots may be increasingly used to limit the exposure of our troops to high threat environments, to save labor, and to perform tasks which they can perform better or more reliably than humans.

The post-military revolution component of our fleet — attack submarines, submerged arsenal ships, converted SSBNs (i.e., SSGNs) and other undersea power projection forces — could number fewer than 150 naval combatants. Given the importance of undersea control for submerged power projection, such a fleet will likely be very attack submarine heavy. Undersea control and space may the two areas where force structure actually *increases* substantially.

The manned, theater component of our Air Force will increasingly shrink in relative terms and become stealth-dominant or even stealth-exclusive. Stealth will not be necessary for all operations, however, even in high end theater warfare. Extended range air operations may still rely predominantly on non-stealthy aerial refueling, with stealth reserved for operations only at the very leading edge of the battlespace. Overall, our Air Force, measured in primary combat platforms, could be one fourth or less of its former size.

The Military Revolution and Strategy

The implications of the emerging military revolution for the international distribution of power could be no less profound than were the military revolutions associated with the rise of the West to global dominance half a millennia ago. It appears nearly certain that we will be facing an increasingly assertive China in the decade ahead. It is also very likely that the period of global turbulence is far from over. We can expect to be faced with continued pressure on state integrity in many areas of the world.

Our understanding of the strategic implications of these new ways of war is far behind our understanding of likely changes in operations and tactics. With the substitution of relatively abundant precision capital for precious labor, war at the high end may become far more protracted than we previously anticipated. Future war may paradoxically become tactically more decisive, while at same time becoming strategically less decisive. We will need to give considerably more thought to how wars can be brought to a close, how to conduct limited strategic warfare, how to mobilize war-torn societies for strategic effect, and how to wage coalition warfare in new ways.

U.S. Defense Planning Guidance

Draft Defense Planning Guidance 1998-2010

National Security Objectives:

U.S. forces should be postured to:

- Deter attacks against the U.S. homeland
- Prevent extraterritorial aggression against our friends and allies
- Respond to a wide range of intrastate conflicts
- Deter the emergence of a peer competitor

Roles for U.S. Forces:

U.S. forces may be engaged in a wide range of military activities during a 15-year planning horizon. They may be used in deterrence and presence missions; in countering terrorism and proliferation; in humanitarian, peacekeeping and peace enforcement operations; and in regional contingencies (both lesser and major). They also must remain prepared to execute nuclear war plans. Many operations could involve weapons of mass destruction.

Resource Limitations:

The planning period will be marked by fiscal austerity and transformational change. There will be continued pressure for deficit reduction and continued upward pressure on entitlement spending.

Planning Uncertainties:

This will likely be a period of great uncertainty, both geopolitical and military-technical:

- **Geopolitical**: It is not clear what threats will emerge during the planning period. We are not certain of who our allies will be or what role we will expect them to play.

- **Military**: It is also unclear which forces (kinds and postures) will be best suited for this period. Possible adversaries, threats, and contingencies are unsettled. Measures of effectiveness are equally hazy.

Regional Guidance:

- **The Americas:** Maintain effective military-to-military contacts. Conduct anti-drug operations. Conduct humanitarian operations as needed. Develop contingency plans for ensuring political stability in key neighboring states.

- **Europe:** Continue close ties with key allies in particular and NATO Europe in general. Encourage burdensharing; support joint technology programs. If NATO expands, build appropriate military-to-military relationships.

- **Asia:** Continue to focus intelligence efforts on China. Encourage regional allies to develop systems complementary to ours. Seek strengthened ties with Japan, Korea, and Australia. Be prepared for Korean unification.

- **Southwest Asia:** Plan for continued significant presence in Saudi Arabia, Kuwait, and selected Gulf states. Develop contingency plans for reduced presence due to regime failures and loss of bases. Focus intelligence assets on key regional adversaries.

- **Russia:** Establish/maintain effective military-to-military contacts. Closely monitor nuclear forces and materials. Use intelligence assets to understand military modernization efforts.

Force Planning Guidance:

- Posture forces to fight and win *one major regional contingency* (MRC). An MRC could include:
  - ⇒ Interstate warfare (preventing extraterritorial aggression) or intrastate warfare (intervening in a large-scale civil war.)
  - ⇒ A regional power (Iran, Iraq, North Korea) or an emerging major power (China or Russia)
- ***Illustrative planning scenarios*** include but are not limited to:
  - ⇒ North Korean invasion of South Korea; air and sea ports unavailable to US forces for an extended period as a result of large-scale missile and SOF attacks as well as widespread use of CW by the DPRK
  - ⇒ Iraqi invasion of both Kuwait and Saudi Arabia; air and sea ports temporarily unavailable to US forces
  - ⇒ Iranian blockade of the Strait of Hormuz
  - ⇒ Chinese missile blockade against Taiwan
  - ⇒ Russian threat against the Baltic states
  - ⇒ Large-scale civil war in Cuba or Mexico

Special Problems:

- Planners should *explicitly consider*:
  - ⇒ DoD's role in dealing with new forms of attack on the homeland, i.e. information warfare and BW terrorism
  - ⇒ The emerging anti-access problem faced by US power projection forces
  - ⇒ Means to ensure US access to space while exploring ways to deny others access
  - ⇒ Forces and postures needed to respond to the possible emergence of a peer competitor in the post-2010 period

Exploiting the Emerging Military Revolution:

- Maximize exploitation of the emerging military revolution by:

  ⇒ Experimenting with new systems, concepts and organizations

  ⇒ Hedging against catastrophic failure of the military posture (e.g., weaponization of space)

  ⇒ Fielding new capabilities that significantly enhance force effectiveness during the planning period

  ⇒ Posturing for the most effective transformation to the emerging military regime (this may not be the most efficient path)

Draft *Defense Planning Guidance*
2011-2024

National Security Objectives:

U.S. forces should be postured to:

- Deter attacks against the U.S. homeland
- Prevent extraterritorial aggression against our friends and allies
- Respond to a wide range of intrastate conflicts
- Deter and defeat, if necessary, a peer competitor

Roles for U.S. Forces:

U.S. forces may be engaged in a wide range of military activities during a 15-year planning horizon. They may be used in deterrence and presence missions; in countering terrorism and proliferation; in humanitarian, peacekeeping and peace enforcement operations; and in regional contingencies (both lesser and major). They also must remain prepared to execute nuclear war plans. Many operations could involve weapons of mass destruction.

US forces could be involved in assisting allies in defending themselves against long range precision attacks by what used to be known as pariah states. Dealing with emerging niche and peer competitors will be the primary strategic challenge during this planning period and beyond.

Resource Limitations:

The period will be marked by increasing concerns about the temporal effectiveness of our transformation program, coupled with a continuing need for fiscal responsibility. The President continues to believe that a strong economy is central to our nation's strength, and will divert additional resources to the military only when presented with evidence of a clear and present danger.

Strategic Drivers:

US force planners must increasingly take into account:

- The increasing centrality of East Asia to U.S. security
- The problem of inter-regional alliances by potential adversaries (*e.g.*, China-Korea, China-Iran)
- The proliferation of high tech weapons and weapons of mass destruction
- The broadening of warfare to include the space and information dimensions

Regional Guidance:

- **The Americas:** Provide for border security, as required. Continue nation building efforts in Mexico. Conduct counterdrug operations. Conduct humanitarian operations, as required.
- **Europe:** Leverage ties with European technology development efforts. Encourage Europe to focus on the North African threat as part of larger western strategy to deal with radicalized Islamic-based governments. Provide ISR support for littoral operations.
- **Asia:** Prepare for the emergence of China as a potential peer competitor. Prepare for an anti-U.S.-Japan, China-Korea alliance. Prepare for the conventional strategic defense of Japan. Prepare for Chinese aggression in the Russian Far East, Kazakhstan, or in Southeast Asia. Strengthen military-to-military ties with Australia, develop Australia as a regional power projection base, prepare for coalition operations with Australian forces. Foster military-to-military ties with India.
- **Southwest Asia:** Contain Iranian expansion. Develop means to defeat a niche anti-access strategy that emphasizes WMD use.
- **Russia:** Monitor nuclear forces and materials. Monitor modernization efforts. Develop cooperative programs to counter Chinese capabilities. Encourage and prepare for Russian integration into NATO.

Force Planning Guidance:

Develop and posture forces to fight and win wars against peer and niche competitors. Assume the following about an emerging peer:

- Robust information age economy
- Effective strategic nuclear deterrent for homeland defense and maintenance of strategic sanctuary
- Robust long-range precision strike capabilities; space control capabilities; information warfare capabilities; rapid power projection capabilities; emerging ground/space-based sea denial capabilities

Illustrative planning scenarios include but are not limited to:

- Chinese attack and attempted occupation of Siberia
- Iranian missile attack and occupation of southern Iraq/eastern Saudi Arabia/UAE
- North African Alliance missile and terrorist attack on Southern Europe
- Nuclear terror attack on Israel
- Mega-humanitarian mission in Africa evolving into opposed feeding of starving city
- Peace enforcement operations in Indonesia

Special Problems:

Planners should *explicitly consider*:

- How to deal with a space "Pearl Harbor"
- Countering the sanctuary effect of the nuclear overhang
- The anti-access problem faced by US power projection forces
- How to achieve strategic decisiveness with small deployed close combat forces (5,000 or fewer first echelon soldiers)
- How to attack protected targets
- How to gain control of mass urban areas

Exploiting the Military Revolution:

- Conduct rapid operational experimentation to identify the most promising leap ahead systems and forces

- Make critical choices as to which systems and forces must be procured in operationally useful numbers and which capabilities must be divested in order to transform U.S. military capabilities by 2025

U.S. "QDR" Force -- 1998-2025

QDR Force Overview

The U.S. "QDR" force through 2025 is the baseline long-term defense program from which alternative (*i.e.*, transformational) programs may be developed. The QDR force is consistent with the force structure and modernization plans outlined in the 1997 Quadrennial Defense Review (QDR) as well as more recent service modernization plans. START II is assumed to have been fully implemented. **The mismatch between the anticipated cost of QDR defense program and the defense budget (assumed to be $245 billion through 2025) is projected to be about $300 billion for each of the two periods covered by moves 1 and 2.**

R&D is funded at a steady state level of $25 billion per annum. Baseline R&D funding provides for the following:

- Basic science and technology programs
- Follow-on, within regime, systems development such as future tactical aircraft, main battle tanks, surface combatants, and ballistic and cruise missile defense systems
- C4ISR modernization
- Precision munitions development
- Development of a few *emerging* regime systems and organizations such as an initial class of arsenal ship, strike UAVs, first generation airborne lasers, and first generation deep strike brigades

The United States maintains the force posture goals called for in the 1997 QDR. This force includes:

- 10 active army divisions, 2 armored cavalry regiments, and 15 enhanced readiness reserve component brigades
- 312 naval combatants (including 11 aircraft carriers)
- 4 Marine divisions and 4 air wings (3 active, 1 reserve)
- 12+ active tactical fighter wings and 8 reserve fighter wings

Ground Forces

As detailed below, the ***active*** Army force structure comprises **6 heavy divisions** (2 in Germany and 1 in South Korea at game beginning) and **4 light divisions.**

QDR Army Force Levels

Division Type	Active	National Guard
Armor	2	1
Mechanized	4	3
Air Assault	1	0
Airborne	1	0
Infantry	2	4
	+ 2 Armored Cavalry Regiments	+ 15 Enhanced Readiness Brigades & 3 Separate Brigades

Planned modernization of the QDR force includes:

- Upgrade of 998 M1A2 *Abrams* tanks and 1,602 *Bradley* fighting vehicles (equivalent to four heavy divisions)
- Procurement of 2,500 M1A3, next generation tanks and 1,750 future infantry fighting vehicles (all procured in move 2)
- Procurement of 824, *Crusader*, self-propelled, field artillery systems. (all procured in move 1 for game purposes)
- Procurement of 2,600 extended-range and brilliant anti-armor technology Army Tactical Missile System (ATACMS) Block II missiles
- Procurement of 1,292 *Comanche*, stealthy, armed reconnaissance helicopters (all in Move 1)
- Procurement of 758 non-stealthy *Apache* attack helicopters converted to *Longbow* configuration (digitized target acquisition, all-weather, day/night, fire and forget Hellfire-capable)

Naval Forces

As detailed below, the baseline Navy comprises **11 deployable carriers**, **116 surface combatants**, and **50 attack submarines**.

QDR Navy Force Levels

Platform	Planned Level (Active/Reserve)
Aircraft Carrier	11/1
Carrier Air Wings (F-14 & F/A-18)*	10/1
Attack Submarines (SSN)	50
SSBN	14
Surface Combatants	106/10
Amphibious Ships	36 (12 ARGs)
Mine Warfare Ships	11/5
Logistics / Support Ships	57

* The Navy currently plans to upgrade carrier air wings with the procurement of 548 F/A-18E/Fs over the next ten years. Starting in about 2008, the Navy may transition to the procurement of the Joint Strike Fighter (JSF). If the JSF program encounters production delays, however, the Navy plans to procure up to 785 F/A-18E/F aircraft.

Planned Navy modernization of the QDR force includes:

- Procurement of two additional *Nimitz*-class nuclear-powered aircraft carriers and three CVX, new design carriers
- Procurement of non-stealthy 548 F/A-18 E/F multirole aircraft (all in move 1)
- Procurement of 630 moderately stealthy, Joint Strike Fighters (105 in move 1 and 480 in move 2)
- Procurement of additional *Arleigh Burke*-class AEGIS destroyers and upgrading of combat systems of *Ticonderoga*-class cruisers and *Arleigh Burke*-class destroyers to allow them to conduct theater missile defense operations (70 of 120 surface combatants will be *Arleigh Burke* and *Ticonderoga*-class by the end of move 1; 84 by the end of move 2)
- Procurement of 64 advanced DD-21 / Surface Combatant 21 ships
- Procurement of 46 New Attack Submarines (NSSN), of which 18 are procured in move 1 (3 *Seawolf*-class SSNs are also in the fleet.)

Marines

As detailed below, the baseline **Marine Corps** comprises **3 active divisions and 3 air wings**. (One Division is based in Okinawa, Japan at game beginning)

QDR Marine Force Levels

Component	Active	Reserve
Division	3	1
Air Wing (F/A/-18 & AV-8B)	3	1
Force Service Support Group	3	1

Planned Marine Corps modernization of the QDR force includes:

- Procurement of 348 MV-22 *Osprey* tilt-rotor aircraft (320 in move 1)
- Procurement of 1,013 (all in move 1 for game purposes) over-the horizon-assault-capable, Advanced Amphibious Assault Vehicles (AAAVs)
- Upgrade 100 UH-1Ns utility and 180 AH-1Ws attack helicopters
- Procurement of 609 VSTOL Joint Strike Fighters (133 in move 1 and 476 in move 2)

Air Force

The baseline Air Force comprises **12+ active and 8 reserve tactical fighter wings, 21 stealthy B-2 bombers, 94 B-1B bombers and 71 B-52s.** The B-1Bs are conventional-only capable. The baseline Air Force has 135 C-17 airlifters and an air mobility fleet (airlift and aerial refueling) of nearly 1,000 aircraft.

QDR Force -- Fighter Aircraft

Platform	Active FWE	Reserve/Guard FWE
F-15 *	5.2	.6
F-16 C/D **	5.9	6.0
F-117	.5	0
A-10	.6	1.4

* F-22 slated for initial operational capability in FY 2005
** JSF slated for delivery to units in FY 2008 with initial operational capability in 2010

QDR Force -- Long-Range Bombers

Platform	Primary Mission A/C	Total Aircraft Inventory
B-52	44	71
B-1	70	94
B-2	16	21

Planned Air Force modernization of the QDR force includes:

- Procurement of 339 stealthy F-22s (all in move 1 for game purposes)
- Procurement of 1,709 lower cost, shorter range, less stealthy, Joint Strike Fighters (392 in move 1 and 1,317 in move 2)

Military Space

QDR Space Force Levels

Satellite System	Mission	On-Orbit	Ready for Launch or "In Pipeline"
Defense Support Program	Missile warning	4	5
Global Positioning System (GPS)	Navigation / NUDET	24	23
Defense Meteorological Satellite	Weather	2	7
E-O/IR Satellites (KH-11/12)	ISR	3	
Radar Imaging (Lacrosse)	ISR	2	
Ocean Surveillance System (IR/radar)	ISR	4	
ELINT/COMINT	ISR	6	
Defense Satellite Communications System (DSCS)	Communication	5	5
Milstar	Communication	2	2
Fleet Satcom System	Communication	6	3
UHF Follow-On	Communication	6	3

Planned modernization of the QDR space force includes:

- Development and procurement (beginning in 2002) of Space-Based Infrared System (SBIRS) which would replace aging Defense Support Program satellites. The lower portion of SBIRS, referred to Space & Missile Tracking System (SMTS), would include a constellation of some 24 satellites in LEO (beginning in 2004).
- Procurement of Advanced Wideband System beginning in 2009
- Development and procurement of Global Broadcast System (GBS). GBS would provide high data rate information flow to US forces throughout the world.
- Procurement of follow-on, Block IIF, GPS satellites

Other Programs Included in QDR Force:

Theater Missile Defense

The QDR force's core theater missile defense asset is the Patriot Advanced Capability (PAC)-2/3 missile defense system. Planned modernization includes:

- Procurement of Patriot PAC-3 (Final Configuration) system including 1,200 interceptors (To be fielded in 1999)
- Procurement of Navy Area Defense (NAD) system which includes 650 interceptors placed aboard 22 Aegis cruisers (To be fielded in 2002)
- Procurement of 14 Theater High Altitude Area Defense (THAAD) batteries equipped with a total of 1,233 interceptors (First units to be fielded in 2004 with complete deployment planned for 2008)

C4ISR Modernization

The QDR force budget also includes a number of initiatives to improve the command, control, communications, computers and intelligence, surveillance, and reconnaissance (C4ISR) capability of U.S. armed forces. Among these are:

- The Global Command and Control System (GCCS), which provides U.S. forces with a fused picture of the battlespace
- Several types of extended endurance, unmanned air vehicles (stealthy and non-stealthy)
- 13 E-8C JSTARS surveillance aircraft (2 remaining to be procured in move 1)
- Wider application of the Navy-developed Cooperative Engagement Capability (CEC)
- Integration of Joint Tactical Information Distribution System (JTIDS) into a variety of existing platforms
- Development of a more capable follow-on to JTIDS such as the Multifunctional Information Distribution System

Precision Guided Munitions

The QDR force also includes development and procurement of several new precision munitions:

- The Joint Direct Attack Munition (JDAM) and Joint Standoff Weapon (JSOW) which enable U.S. aircraft to deliver highly accurate weapons at night and in adverse weather
- Sensor Fuzed Weapons (SFW) and GATS/GAM which provide a wide area, air-delivered, antiarmor capability
- The Joint Air-to-Surface Standoff Missile (JASSM) which enhances U.S. forces' ability to launch standoff attacks at extended range. JASSM has autonomous navigation capability and terminal seeker.
- Improved Stand-off Land Attack Missiles (SLAM), a modified Harpoon antiship missile which is deliverable from both undersea and surface platforms
- Wind-Corrected Munition Dispenser (WCMD). Advanced cluster bomb dispenser which provides improved delivery accuracy from higher altitudes.
- Low-Cost Autonomous Attack System (LOCAAS), an advanced PGM with multimode warhead and advanced target recognition capability

Strategic Nuclear Forces

Pursuant to START II, the U.S. strategic force posture comprises:

- 14 *Ohio*-class ballistic missile submarines, carrying 24 Trident II (D-5) submarine-launched ballistic missiles
- 500 Minuteman III intercontinental ballistic missiles, each equipped with a single warhead
- 71 B-52 bombers capable of carrying air-launched cruise missiles
- 21 B-2 bombers capable of carrying gravity bombs

U.S. Program Adjustment Worksheets

Program Adjustments Move 1

(FY1999-FY 2011)

		Cuts	Additions	Carry Forward Costs
R&D				
Expanded R&D Option 1	$40 billion			0
Expanded R&D Option 2	$80 billion			0
Expanded R&D Option 3	$130 billion		———	0
Procurement				
F-22				
Cancel 339-plane program	($29 billion)	———		0
Reduce buy to 160 planes	($9 billion)			0
Joint Strike Fighter				
Cancel Air Force version	($31 billion)	———		($70 billion)
Cancel Navy & Marine Corps versions	($23 billion)	———		($46 billion)
Defer complete procurement beyond FY 2011	($34 billion)	———		0
R&D costs this move				
F/A-18E/F				
Cancel 548-plane program	($22 billion)			0
Reduce buy to 270 planes	($10 billion)	———		0
B-2				
Procure 20 additional bombers	$25 billion			$14 billion
Procure 40 additional bombers	$42 billion		———	$28 billion
Airborne Laser Systems				
Cancel 7 systems	($7 billion)	———		($3 billion)
Procure 20 systems	$6 billion		———	$8 billion
Strike Unmanned Aerial Vehicles (SEAD & air-to-ground)				
Procure 60 strike UAV systems	$4 billion			$4 billion
Procure 200 strike UAV systems	$8 billion		———	$13 billion
Comanche				
Cancel 1,292 RAH-66 program	($6 billion)			($15 billion)
Reduce buy to 500 (savings turn 2)	0	———		($8 billion)
Crusader				
Cancel Crusader (824) program	($13 billion)			0
Reduce buy to 400	($4 billion)	———		0
Procure 1,000 additional ATACMS (ER & BAT)	$1 billion		———	0
Cancel CVN 77	($4 billion)	———		0
CVX 1	($6 billion)	———		0
CVX 2	($6 billion)	———		
Procure 2 Mobile Overseas Bases	$4 billion		———	0
Convert 4 surplus Ohio-class SSBNs to long-range PGM carriers	$4 billion		———	0
Arsenal Ships	$9 billion		———	
Procure 2 arsenal ships	$3 billion			$2 billion
Procure 6 arsenal ships	$9 billion		———	$6 billion
Slow NSSN Buy	($9 billion)	———		($4 billion)
Slow new surface combatant construction	($3 billion)	———		($5 billion)
V-22				
Cancel 458-aircraft program	($12 billion)			($1 billion)
Reduce buy to 229	($4 billion)	———		($1 billion)
AAAV				
Cancel 1,013 AAAV program	($2 billion)			0
Reduce buy to 360	($0.7 billion)	———		0
Cancel THAAD	($14 billion)	———		($3 billion)
Starlite Space-based Radar	$21 billion		———	$18 billion

		Cuts	Additions	Carry Forward Costs
Deploy Navy Theater Wide (Upper Tier)	$4billion			
National Missile Defense				
Deploy NMD	$25 billion			$22 billion
Deploy limited NMD	$6 billion			$0.7 billion
Cancel SBIRS-Low	($8 billion)			($9 billion)
Buy 6 additional JSTARS	$3 billion			$3 billion
Procure Land Warrior (Army & MC) for 21st century	$0.5 billion			0
Cancel FY99 & FY02 Milstar Satellites	$3 billion			0
Force Structure				
Create 2 Deep Strike Brigades				
(Comanche, ATACMS and DarkStar UAVs)	$16 billion			$16 billion
Air Force Fighter Wings				
Cut 2 FWs	($28 billion)			($28 billion)
Cut6 FWs	($83 billion)			($83 billion)
Cut 10 FWs	($138 billion)			($138 billion)
Retire B-52s	($16 billion)			($23 billion)
Retire B-1Bs	($36 billion)			($51 billion)
Army Divisions				
Cut 1 division	($64 billion)			($64 billion)
Cut 3 divisions	($191 billion)			($191 billion)
Cut 5 divisions	($316 billion)			($318 billion)
Carrier Battle Groups				
Cut 1 CVBG	($43 billion)			($43 billion)
Cut3 CVBGs	($128 billion)			($128 billion)
Cut6 CVBGs	($256 billion)			($256 billion)
Marine Expeditionary Forces & assoc. amphibious lift				
Cut 1 MEF FWD	($45 billion)			($45 billion)
Cut 3 MEFs FWD	($91 billion)			($91 billion)
Retire Minuteman IIIs	($12 billion)			($17 billion)
Cut 4 Trident Boats (C-4s)	($10 billion)			($14 billion)
Readiness				
Reduce overall readiness				
(move to tiered readiness, change in active/reserve mix, & lower optempo)				
By 15 percent	($35billion)			($35 billion)
By 25 percent	($60 billion)			($60 billion)

TOTALS

Total Additions		
Total Cuts		
Net		
GRAND TOTAL		

Note:

*1) At a minimum, the grand total needs to be ~ **$300 billion** to cover the FY 1999-FY2011 budgetary shortfall.*

2) Savings from cancelled or slowed programs that are replacing current generation systems reflect the cost of upgrades and/or service life extension programs to the existing systems.

No additional R&D in Move 1

Program Adjustments Move 2

(FY 2012 - FY 2025)

		+/-$
Carry Forward from Move 1		
R&D		
Option 1	$80 billion	
Option 2	$120 billion	
Option 3	$150 billion	
Procurement (may include operating costs)		
Buy an additional 400 F-22s	$41 billion	
Joint Strike Fighter		
Cancel Air Force version	($70 billion)	
Cancel Navy and Marine Corps versions	($46 billion)	
B-2		
Procure 20 additional bombers	$26 billion	
Procure 40 additional bombers	$42 billion	
B-X Bomber		
Procure 20 aircraft	*$45 billion*	
Procure 40 aircraft	*$77 billion*	
Procure 20 additional Airborne Laser Systems	$16 billion	
Stealthy Airborne Laser Systems (2nd Generation)		
Procure 4 systems	$4 billion	
Procure 20 systems	$13 billion	
Procure 200 additional Strike UAVs	$7 billion	
UAV Strike Tenders		
Procure 20	*$21 billion*	
Procure 40	*$35 billion*	
Procure 80	*$59 billion*	
Stealthy Airlifter		
Procure 120 aircraft	*$51 billion*	
Procure 250 aircraft	*$85 billion*	
Stealthy Air Refuelers		
Procure 100 aircraft	*$13 billion*	
Stealthy UAV Transports		
Procure 200 aircraft	*$15 billion*	
Procure 400 aircraft	*$25 billion*	
Stealthy Sea Control Frigate		
Procure 12 boats	*$17 billion*	
Procure 36 boats	*$39 billion*	
Cancel M1A3 Tank & Follow-on Infantry Fighting Vehicle	($17 billion)	
Cancel Comanche (after 355)	($15 billion)	
Procure 1,200 Remote Missile Pods	*$19 billion*	
Cancel CVN 79 (CVX)	($6 billion)	
Cancel CVN 80 (CVX)	($6 billion)	

No additional R&D in Move 1

Additional NSSNs			
Procure 25 more NSSNs	$68 billion		
Procure 50 more NSSNs	$103 billion		
Procure 6 more Surface Arsenal Ships	$9 billion		
Missile Carrier Class Submersible Arsenal Ships			
Procure 12 ships	*$42 billion*		
Procure 24 ships	*$73 billion*		
Procure 200 Anti-Navy UAVs	$10 billion		
Procure land- & sea-based cruise missile defense	$10 billion		
Cancel V-22	($1 billion)		
Starlite Space-based Radar	$18 billion		
Procure Space-based Lasers & Create Space Defense Wing			
Procure 12 lasers	*$24 billion*		
Procure 24 lasers	*$42 billion*		
Procure 6 Neutral Particle Beams	*$23 billion*		
Procure & Deploy Submersible Lightsat/ASAT Launchers			
Procure 2 launchers	*$11 billion*		
Procure 6 launchers	*$21 billion*		
Procure 8 IW Satellites	*$8 billion*		
Procure 4 Space-to-Ground Direct Attack Satellites & Create Space Attack Wing	*$6 billion*		
Procure & Operate 8 Trans-Atmospheric Vehicles	*$14 billion*		
Procure 50 Rapid Launch, Distributed, Multipurpose Satellites	*$5 billion*		
Procure 6 IW UAVs	*$6 billion*		

Force Structure

Air Force Fighter Wings			
ADDITIONAL CUTS TO MOVE 1			
Cut 2 FWs	($28 billion)		
Cut 6 FWs	($83 billion)		
Cut 10 FWs	($138 billion)		
Cut 16 FWs	($221 billion)		
Retire B-52s	($23 billion)		
Retire B-1Bs	($51 billion)		
Army Divisions			
ADDITIONAL CUTS TO MOVE 1			
Cut 1 division	($64 billion)		
Cut 3 divisions	($191 billion)		
Cut 5 divisions	($318 billion)		
Cut 8 divisions	($508 billion)		
Create 4 Deep Strike Brigades			
(Comanche, ATACMS & DarkStar UAVs)	$16 billion		
Create Advanced Deep Strike Brigades			
(next generation halo, missiles, UAVs)			
Create 3 brigades	*$52 billion*		
Create 6 brigades	*$105 billion*		
Create 6 Army Exoskeleton Regiments	*$60 billion*		

No additional R&D in Move 1

Create Army & USMC Exoskeleton Regiments			
Create 3 regiments	*$30 billion*		
Create 9 regiments	*$91 billion*		_____
Create Combined Arms Regiments			
Create 3 regiments	*$24 billion*		
Create 9 regiments	*$71 billion*		_____
Create 9 Semi-Robotic Combined Arms Regiments	*$71 billion*		_____
Create Independent Micro-Robotic Regiments			
Create 4 regiments	*$0.7 billion*		
Create 12 regiments	*$2 billion*		_____
Create Advanced Ranger Regiments w/robotic support			
3 adv. regiments	*$13 billion*		
12 adv. regiments	*$53 billion*		_____
Create Advanced Marine Infantry Regiments w/ robotic support			
2 adv. regiments	*$13 billion*		
4 adv. regiments	*$26 billion*		_____
Create Undersea Assault Regiment w/ submersible lift			
1 regiment	*$6 billion*		
2 regiments	*$11 billion*		_____
Carrier Battle Groups			
ADDITIONAL CUTS TO MOVE 1			
Cut 1 CVBG	($43 billion)		
Cut 3 CVBGs	($128 billion)		
Cut 6 CVBGs	($256 billion)	_____	
Marine Expeditionary Forces & assoc. amphibious lift			
ADDITIONAL CUTS TO MOVE 1			
Cut 1 MEF FWD	($45 billion)		
Cut 3 MEF FWDs	($136 billion)		
Cut 5 MEF FWDs	($227 billion)	_____	
Retire Minutemen IIIs	($12 billion)	_____	
Cut 4 Trident Boats (C-4s)	($10 billion)	_____	
Readiness			
Enhance overall readiness	$35 billion		
Enhance overall readiness	$60 billion		_____

TOTALS

Total Additions		_____
Total Cuts	_____	
GRAND TOTAL		

Note:

*At a minimum, the grand total needs to be - **$300 billion** to cover the FY 2012-FY2025 budgetary shortfall.*

$40 billion in R&D

Program Adjustments Move 2

(FY 2012 - FY 2025)

		+/-$
Carry Forward from Move 1		
R&D		
Option 1	$80 billion	
Option 2	$120 billion	
Option 3	$150 billion	
Procurement (may include operating costs)		
Buy an additional 400 F-22s	$41 billion	
Joint Strike Fighter		
Cancel Air Force version	($70 billion)	
Cancel Navy and Marine Corps versions	($46 billion)	
B-2		
Procure 20 additional bombers	$26 billion	
Procure 40 additional bombers	$42 billion	
B-X Bomber		
Procure 20 aircraft	$45 billion	
Procure 40 aircraft	$77 billion	
Procure 20 additional Airborne Laser Systems	$16 billion	
Stealthy Airborne Laser Systems (2nd Generation)		
Procure 4 systems	$4 billion	
Procure 20 systems	$13 billion	
Procure 200 additional Strike UAVs	$7 billion	
UAV Strike Tenders		
Procure 20	*$21 billion*	
Procure 40	*$35 billion*	
Procure 60	*$59 billion*	
Stealthy Airlifter		
Procure 120 aircraft	*$51 billion*	
Procure 250 aircraft	*$85 billion*	
Stealthy Air Refuelers		
Procure 100 aircraft	*$13 billion*	
Stealthy UAV Transports		
Procure 200 aircraft	*$15 billion*	
Procure 400 aircraft	*$25 billion*	
Stealthy Sea Control Frigate		
Procure 12 boats	*$17 billion*	
Procure 36 boats	*$39 billion*	
Cancel M1A3 Tank & Follow-on Infantry Fighting Vehicle	($17 billion)	
Cancel Comanche (after 355)	($15 billion)	
Procure 1,200 Remote Missile Pods	*$19 billion*	
Cancel CVN 79 (CVX)	($6 billion)	
Cancel CVN 80 (CVX)	($6 billion)	

$40 billion in R&D

Additional NSSNs			
	Procure 25 more NSSNs	$68 billion	
	Procure 50 more NSSNs	$103 billion	
Procure 6 more Surface Arsenal Ships		$9 billion	
Missile Carrier Class Submersible Arsenal Ships			
	Procure 12 ships	*$42 billion*	
	Procure 24 ships	*$73 billion*	
Procure 200 Anti-Navy UAVs		$10 billion	
Procure land- & sea-based cruise missile defense		$10 billion	
Cancel V-22		($1 billion)	
Starlite Space-based Radar		$18 billion	
Procure Space-based Lasers & Create Space Defense Wing			
	Procure 12 lasers	*$24 billion*	
	Procure 24 lasers	*$42 billion*	
Procure 6 Neutral Particle Beams		*$23 billion*	
Procure & Deploy Submersible Lightsat/ASAT Launchers			
	Procure 2 launchers	*$11 billion*	
	Procure 6 launchers	*$21 billion*	
Procure 6 IW Satellites		*$8 billion*	
Procure 4 Space-to-Ground Direct Attack Satellites & Create Space Attack Wing		*$6 billion*	
Procure & Operate 8 Trans-Atmospheric Vehicles		*$14 billion*	
Procure 90 Rapid Launch, Distributed, Multipurpose Satellites		$5 billion	
Procure 6 IW UAVs		*$6 billion*	

Force Structure

Air Force Fighter Wings		
	ADDITIONAL CUTS TO MOVE 1	
	Cut 2 FWs	($28 billion)
	Cut 6 FWs	($83 billion)
	Cut 10 FWs	($138 billion)
	Cut 16 FWs	($221 billion)
Retire B-52s		($23 billion)
Retire B-1Bs		($51 billion)
Army Divisions		
	ADDITIONAL CUTS TO MOVE 1	
	Cut 1 division	($64 billion)
	Cut 3 divisions	($191 billion)
	Cut 5 divisions	($318 billion)
	Cut 8 divisions	($508 billion)
Create 4 Deep Strike Brigades		
	(Comanche, ATACMS & DarkStar UAVs)	$16 billion
Create Advanced Deep Strike Brigades		
	(next generation helo, missiles, UAVs)	
	Create 3 brigades	*$52 billion*
	Create 6 brigades	*$105 billion*
Create 6 Army Exoskeleton Regiments		*$60 billion*

$40 billion in R&D

Create Army & USMC Exoskeleton Regiments			
Create 3 regiments	*$30 billion*		
Create 9 regiments	*$91 billion*		_____
Create Combined Arms Regiments			
Create 3 regiments	$24 billion		
Create 9 regiments	$71 billion		_____
Create 9 Semi-Robotic Combined Arms Regiments	*$71 billion*		_____
Create Independent Micro-Robotic Regiments			
Create 4 regiments	*$0.7 billion*		
Create 12 regiments	*$2 billion*		_____
Create Advanced Ranger Regiments			
3 adv. regiments	*$13 billion*		
12 adv. regiments	*$53 billion*		_____
Create Advanced Marine Infantry Regiments w/ robotic support			
2 adv. regiments	*$13 billion*		
4 adv. regiments	*$26 billion*		_____
Create Undersea Assault Regiment w/ submersible lift			
1 regiment	*$6 billion*		
2 regiments	*$11 billion*		_____
Carrier Battle Groups			
ADDITIONAL CUTS TO MOVE 1			
Cut 1 CVBG	($43 billion)		
Cut 3 CVBGs	($128 billion)		
Cut 6 CVBGs	($256 billion)	_____	
Marine Expeditionary Forces & assoc. amphibious lift			
ADDITIONAL CUTS TO MOVE 1			
Cut 1 MEF FWD	($45 billion)		
Cut 3 MEF FWDs	($136 billion)		
Cut 5 MEF FWDs	($227 billion)	_____	
Retire Minuteman IIIs	($12 billion)	_____	
Cut 4 Trident Boats (C-4s)	($10 billion)	_____	
Readiness			
Enhance overall readiness	$35 billion		
Enhance overall readiness	$60 billion		_____

TOTALS

Total Additions	_____
Total Cuts	_____
GRAND TOTAL	

Note:

*At a minimum, the grand total needs to be - **$300 billion** to cover the FY 2012-FY2025 budgetary shortfall.*

$80 b in R&D

Program Adjustments Move 2

(FY 2012 - FY 2025)

Carry Forward from Move 1

R&D

		+/-$
Option 1	$80 billion	
Option 2	$120 billion	
Option 3	$150 billion	

Procurement (may include operating costs)

		+/-$
Buy an additional 400 F-22s	$41 billion	
Joint Strike Fighter		
Cancel Air Force version	($70 billion)	
Cancel Navy and Marine Corps versions	($46 billion)	
B-2		
Procure 20 additional bombers	$26 billion	
Procure 40 additional bombers	$42 billion	
B-X Bomber		
Procure 20 aircraft	$45 billion	
Procure 40 aircraft	$77 billion	
Procure 20 additional Airborne Laser Systems	$16 billion	
Stealthy Airborne Laser Systems (2nd Generation)		
Procure 4 systems	$4 billion	
Procure 20 systems	$13 billion	
Procure 200 additional Strike UAVs	$7 billion	
UAV Strike Tenders		
Procure 20	$21 billion	
Procure 40	$35 billion	
Procure 80	$59 billion	
Stealthy Airlifter		
Procure 120 aircraft	$51 billion	
Procure 250 aircraft	$85 billion	
Stealthy Air Refuelers		
Procure 100 aircraft	$13 billion	
Stealthy UAV Transports		
Procure 200 aircraft	$15 billion	
Procure 400 aircraft	$25 billion	
Stealthy Sea Control Frigate		
Procure 12 boats	$17 billion	
Procure 36 boats	$39 billion	
Cancel M1A3 Tank & Follow-on Infantry Fighting Vehicle	($17 billion)	
Cancel Comanche (after 355)	($15 billion)	
Procure 1,200 Remote Missile Pods	$19 billion	
Cancel CVN 79 (CVX)	($6 billion)	
Cancel CVN 80 (CVX)	($6 billion)	

$80 b in R&D

Additional NSSNs			
Procure 25 more NSSNs	$68 billion		
Procure 50 more NSSNs	$103 billion		
Procure 6 more Surface Arsenal Ships	$9 billion		
Missile Carrier Class Submersible Arsenal Ships			
Procure 12 ships	*$42 billion*		
Procure 24 ships	*$73 billion*		
Procure 200 Anti-Navy UAVs	$10 billion		
Procure land- & sea-based cruise missile defense	$10 billion		
Cancel V-22	($1 billion)		
Sterile Space-based Radar	$18 billion		
Procure Space-based Lasers & Create Space Defense Wing			
Procure 12 lasers	*$24 billion*		
Procure 24 lasers	*$42 billion*		
Procure 6 Neutral Particle Beams	*$23 billion*		
Procure & Deploy Submersible Lightsat/ASAT Launchers			
Procure 2 launchers	*$11 billion*		
Procure 6 launchers	*$21 billion*		
Procure 8 IW Satellites	*$8 billion*		
Procure 4 Space-to-Ground Direct Attack Satellites & Create Space Attack Wing	*$6 billion*		
Procure & Operate 6 Trans-Atmospheric Vehicles	*$14 billion*		
Procure 90 Rapid Launch, Distributed, Multipurpose Satellites	$5 billion		
Procure 6 IW UAVs	*$6 billion*		

Force Structure

Air Force Fighter Wings			
Additional Cuts to Move 1			
Cut 2 FWs	($28 billion)		
Cut 6 FWs	($83 billion)		
Cut 10 FWs	($138 billion)		
Cut 16 FWs	($221 billion)		
Retire B-52s	($23 billion)		
Retire B-1Bs	($51 billion)		
Army Divisions			
Additional Cuts to Move 1			
Cut 1 division	($64 billion)		
Cut 3 divisions	($191 billion)		
Cut 5 divisions	($318 billion)		
Cut 8 divisions	($508 billion)		
Create 4 Deep Strike Brigades (Comanche, ATACMS & DarkStar UAVs)	$16 billion		
Create Advanced Deep Strike Brigades (next generation helo, missiles, UAVs)			
Create 3 brigades	$52 billion		
Create 6 brigades	$105 billion		
Create 6 Army Exoskeleton Regiments	*$60 billion*		

$80 b in R&D

Create Army & USMC Exoskeleton Regiments			
Create 3 regiments	*$30 billion*		
Create 9 regiments	*$91 billion*		_____
Create Combined Arms Regiments			
Create 3 regiments	$24 billion		
Create 9 regiments	$71 billion		_____
Create 9 Semi-Robotic Combined Arms Regiments	*$71 billion*		_____
Create Independent Micro-Robotic Regiments			
Create 4 regiments	*$0.7 billion*		
Create 12 regiments	*$2 billion*		_____
Create Advanced Ranger Regiments w/robotic support			
3 adv. regiments	*$13 billion*		
12 adv. regiments	*$53 billion*		_____
Create Advanced Marine Infantry Regiments w/ robotic support			
2 adv. regiments	*$13 billion*		
4 adv. regiments	*$26 billion*		_____
Create Undersea Assault Regiment w/ submersible lift			
1 regiment	*$6 billion*		
2 regiments	*$11 billion*		_____
Carrier Battle Groups			
ADDITIONAL CUTS TO MOVE 1			
Cut 1 CVBG	($43 billion)		
Cut 3 CVBGs	($128 billion)		
Cut 6 CVBGs	($256 billion)	_____	
Marine Expeditionary Forces & assoc. amphibious lift			
ADDITIONAL CUTS TO MOVE 1			
Cut 1 MEF FWD	($45 billion)		
Cut 3 MEF FWDs	($136 billion)		
Cut 5 MEF FWDs	($227 billion)	_____	
Retire Minutemen IIIs	($12 billion)	_____	
Cut 4 Trident Boats (C-4s)	($10 billion)	_____	
Readiness			
Enhance overall readiness	$35 billion		
Enhance overall readiness	$60 billion		_____

TOTALS

Total Additions		_____
Total Cuts	_____	
GRAND TOTAL		

Note:

At a minimum, the grand total needs to be ***+ $300 billion*** *to cover the FY 2012-FY2025 budgetary shortfall.*

Program Adjustments Move 2

(FY 2012 - FY 2025)

Carry Forward from Move 1

R&D

		+/-$
Option 1	$80 billion	
Option 2	$120 billion	

Procurement (may include operating costs)

		+/-$
Buy an additional 400 F-22s	$41 billion	
Joint Strike Fighter		
Cancel Air Force version	($70 billion)	
Cancel Navy and Marine Corps versions	($46 billion)	
B-2		
Procure 20 additional bombers	$26 billion	
Procure 40 additional bombers	$42 billion	
B-X Bomber		
Procure 20 aircraft	$45 billion	
Procure 40 aircraft	$77 billion	
Procure 20 additional Airborne Laser Systems	$16 billion	
Stealthy Airborne Laser Systems (2nd Generation)		
Procure 4 systems	$4 billion	
Procure 20 systems	$13 billion	
Procure 200 additional Strike UAVs	$7 billion	
UAV Strike Tenders		
Procure 20	$21 billion	
Procure 40	$35 billion	
Procure 80	$59 billion	
Stealthy Airlifter		
Procure 120 aircraft	$51 billion	
Procure 250 aircraft	$85 billion	
Stealthy Air Refuelers		
Procure 100 aircraft	$13 billion	
Stealthy UAV Transports		
Procure 200 aircraft	$15 billion	
Procure 400 aircraft	$25 billion	
Stealthy Sea Control Frigate		
Procure 12 boats	$17 billion	
Procure 36 boats	$39 billion	
Cancel M1A3 Tank & Follow-on Infantry Fighting Vehicle	($17 billion)	
Cancel Comanche (after 355)	($15 billion)	
Procure 1,200 Remote Missile Pods	$19 billion	
Cancel CVX 3	($6 billion)	
Cancel CVX 4	($6 billion)	

$130 B in Move 1

Cancel CVX 5	($6 billion)		
Additional NSSNs			
Procure 25 more NSSNs	$69 billion		
Procure 50 more NSSNs	$103 billion		
Procure 6 more Surface Arsenal Ships	$9 billion		
Missile Carrier Class Submersible Arsenal Ships			
Procure 12 ships	$42 billion		
Procure 24 ships	$73 billion		
Procure 200 Anti-Navy UAVs	$10 billion		
Procure land- & sea-based cruise missile defense	$10 billion		
Cancel V-22	($1 billion)		
Starlite Space-based Radar	$18 billion		
Procure Space-based Lasers & Create Space Defense Wing			
Procure 12 lasers	$24 billion		
Procure 24 lasers	$42 billion		
Procure 6 Neutral Particle Beams	$23 billion		
Procure & Deploy Submersible Lightsat/ASAT Launchers			
Procure 2 launchers	$11 billion		
Procure 6 launchers	$21 billion		
Procure 6 IW Satellites	$8 billion		
Procure 4 Space-to-Ground Direct Attack Satellites & Create Space Attack Wing	$6 billion		
Procure & Operate 6 Trans-Atmospheric Vehicles	$14 billion		
Procure 90 Rapid Launch, Distributed, Multipurpose Satellites	$5 billion		
Procure 6 IW UAVs	$6 billion		

Force Structure

Air Force Fighter Wings			
ADDITIONAL CUTS TO MOVE 1			
Cut 2 FWs	($28 billion)		
Cut 6 FWs	($83 billion)		
Cut 10 FWs	($138 billion)		
Cut 16 FWs	($221 billion)		
Retire B-52s	($23 billion)		
Retire B-1Bs	($51 billion)		
Army Divisions			
ADDITIONAL CUTS TO MOVE 1			
Cut 1 division	($64 billion)		
Cut 3 divisions	($191 billion)		
Cut 5 divisions	($318 billion)		
Cut 8 divisions	($508 billion)		
Create 4 Deep Strike Brigades (Comanche, ATACMS & DarkStar UAVs)	$16 billion		
Create Advanced Deep Strike Brigades (next generation helo, missiles, UAVs)			
Create 3 brigades	$52 billion		
Create 6 brigades	$105 billion		

$130 B in Move 1

Create 6 Army Exoskeleton Regiments	$60 billion		
Create Army & USMC Exoskeleton Regiments			
Create 3 regiments	$30 billion		
Create 9 regiments	$91 billion		
Create Combined Arms Regiments			
Create 3 regiments	$24 billion		
Create 9 regiments	$71 billion		
Create 9 Semi-Robotic Combined Arms Regiments	$71 billion		
Create Independent Micro-Robotic Regiments			
Create 4 regiments	$1 billion		
Create 12 regiments	$2 billion		
Create Advanced Ranger regiments w/robotic support			
3 adv. regiments	$13 billion		
12 adv. regiments	$53 billion		
Create Advanced Marine Infantry Regiments w/ robotic support			
2 adv. regiments	$13 billion		
4 adv. regiments	$26 billion		
Create Undersea Assault Regiment w/ submersible lift			
1 regiment	$6 billion		
2 regiments	$11 billion		
Carrier Battle Groups			
ADDITIONAL CUTS TO MOVE 1			
Cut 1 CVBG	($43 billion)		
Cut 3 CVBGs	($128 billion)		
Cut 6 CVBGs	($256 billion)		
Marine Expeditionary Forces & assoc. amphibious lift			
ADDITIONAL CUTS TO MOVE 1			
Cut 1 MEF FWD	($45 billion)		
Cut 3 MEF FWDs	($136 billion)		
Cut 5 MEF FWDs	($227 billion)		
Retire Minutemen IIIs	($12 billion)		
Cut 4 Trident Boats (C-4s)	($10 billion)		
Readiness			
Enhance overall readiness	$35 billion		
Enhance overall readiness	$60 billion		

TOTALS

Total Additions	
Total Cuts	
GRAND TOTAL	

Note:

*At a minimum, the grand total needs to be + **$300 billion** to cover the FY 2012-FY2025 budgetary shortfall.*

U.S. R&D Options

O

Move 1 R&D Options

R&D is funded in the base program during the period FY 1999-2011 at approximately $32 billion per annum. This base R&D level funds science and technology programs, ongoing C4ISR modernization, precision munitions development, and engineering development of the major next generation systems in the base force (*e.g.*, JSF, CVX, NSSN, SC-21, Future Main Battle Tank and Infantry Fighting Vehicle, and Ballistic and Cruise Missile Defense).

R&D can be increased during this move by **$40 billion, $80 billion, or $130 billion** over the period in order to finance **expanded/alternative** programs.

System groupings under the three R&D options are based on the projected level of resources required, the degree of technological discontinuity involved and commonality with other systems under development. Accordingly, systems can not be readily shifted among options.

Option 1: **$40 Billion Increase.** This level of increase would extend *existing* technology development programs as well as enable significant progress in fuel cell and electric drive technologies. This R&D expansion would make it possible for the Department to procure several new air, ground, naval, and space systems during the FY 2012-2025 period. Systems than could be procured in operationally meaningful numbers by 2025 with this level of R&D include:

- Extended range/endurance, weaponized naval UAVs for both anti-surface warfare and anti-submarine warfare (Outgrowth of Global Hawk / DarkStar UAV programs)
- Advanced ballistic and cruise missile defense system. (Outgrowth of PAC, THAAD, and Navy Area Defense Programs)
- Submersible arsenal ships equipped with multipurpose advanced cruise and ballistic missiles (Outgrowth of surface arsenal ship and SSBN/NSSN programs)
- Multipurpose, rapid launch, light satellites (Outgrowth of current sensor miniaturization efforts)
- Stealthy, 10 ton, electric propulsion, electromagnetic gun-equipped (10 kilometer maximum effective range) advanced combat vehicles *and* stealthy, electric drive, multipurpose, 100 kilometer range, advanced missile artillery systems

Option 2: $80 Billion Increase. This level of increase positions the Department to procure all of the systems described under Option 1 *plus* several additional advanced platforms made possible by significant technological progress in PGM and sensor miniaturization as well as the application of stealth technologies (both active and passive) to wide-bodied aircraft. Future procurement options for the FY 2012-2025 period enabled by this R&D funding level could include:

- Stealthy airlifters, aerial refueling aircraft, and battlespace control aircraft (*i.e.*, low observable airborne laser platform)
- Stealthy, air-to-air and air-to-ground UAVs which can be launched and recovered from a stealthy, wide-bodied, extended range aircraft (up to 24 short range UAVs per aircraft)
- Stealthy, 500 kilometer range, transport UAVs (capable of transporting 20 combat-equipped troops)
- Large-scale, precision, air delivery utilizing INS/GPS-guided parafoils dropped from stealthy air transports
- Stealthy, extended range, advanced attack helicopters (follow-on to *Comanche*)
- Extended-range version, 500 km, of the stealthy, electric drive, advanced missile artillery system

Option 3: $130 Billion Increase. This level of increase positions the Department to procure all of the systems described under Options 1 and 2 *plus* several additional systems made possible by significant technological progress in directed energy, adaptive optics, high-energy propellants, robotics, high-density energy storage, artificial intelligence, biotechnology, and information warfare technologies. Future procurement options for the FY 2012-2025 period enabled by this R&D funding level could include:

- Space-based laser (space control and ABM)
- Neutral particle beam, ground-based ASAT
- Space-to-ground, direct attack satellites (150 kinetic energy projectiles per satellite)
- Trans-atmospheric vehicles (capable of rapid, global precision strike and limited space operations)
- Submersible ASAT/lightsat launchers
- Stealthy, submersible amphibious delivery (mother ships and ship-to-shore transport for embarked Marines) platforms

- Exoskeleton-equipped infantry (integrated personal operational mobility/combat system)

- Robotic support for light infantry including porters; man-portable UAVs and unmanned ground vehicle (UGV) scouts; and specialized sapper, counter-sniper, and countermine robots

- Autonomous Micro-Robots capable of reconnaissance and surveillance within closed structures, attacking electronic equipment, and killing humans which match their pre-programmed attack profile

- CBW Protection for the Soldier: Rugged, light weight, highly-sensitive biosensors capable of detecting and identifying a wide-range of chemical and biological agents; "breathable" personal protective gear composed of durable biomaterials; and biotech-based decontamination/remediation capability

- Information warfare attack satellites, information warfare UAVs (false image generation, IW strike), and integrated IW systems for other combat systems (*e.g.*, multispectral decoys, false image generation)

Move 2 R&D Options
(If no expanded R&D in Move 1)

Baseline R&D continues to be funded at approximately $32 billion per annum. This R&D level funds science and technology programs, ongoing C4ISR modernization, precision munitions development, and engineering development and evolutionary improvement of the major next generation systems in the base force (i.e., JSF, CVX, NSSN, SC-21, Future Main Battle Tank and Infantry Fighting Vehicle, and Ballistic and Cruise Missile Defense).

R&D can be increased during this move by **$80 billion, $120 billion, or $150 billion over the period** in order to finance expanded/alternative R&D programs.

These R&D options provide an opportunity to begin (or, complete as the case may be), at a lagged rate, the development of a range of potentially transformational systems and forces for procurement in operationally meaningful numbers in the period beyond 2025. Alternatively, if the desired level of emerging regime R&D was already funded in move 1, additional R&D in move 2 can be applied to evolutionary improvement of emerging regime forces, or conceivably, although a strong case will have to be made that this is feasible, development of post-emerging regime forces (the revolution beyond the revolution).

Option 1: $80 Billion Increase. This level of increase positions the Department to field in the period beyond 2025 several advanced air, ground, sea and space systems. The systems include:

- Stealthy (active and passive) wide-bodied aircraft (which can be applied to airlift, aerial refueling, strike, and battlespace control, i.e., airborne laser, missions)
- Stealthy, air-to-air and air-to-ground UAVs which can be launched and recovered from a stealthy, wide-bodied, extended range aircraft (up to 24 short range UAVs per aircraft)
- Precision, stealthy air delivery (precision parafoils, etc.)
- Stealthy, 10 ton, electric propulsion, electromagnetic gun-equipped (10 kilometer maximum effective range) advanced combat vehicles and stealthy, electric drive, multipurpose, 100 kilometer range, advanced missile artillery systems
- Stealthy, extended range, advanced attack helicopters and stealthy, electric propulsion, 500 kilometer range, advanced missile artillery systems

- Stealthy, 500 kilometer range, transport UAVs (capable of transporting 20 combat-equipped troops)

- Extended range/endurance, weaponized naval UAVs (both anti-surface warfare and anti-submarine warfare)

- Submersible arsenal ships (including multipurpose advanced cruise and ballistic missiles)

- Distributed, multipurpose, C4ISR, rapid launch, light satellites

Option 2: $120 Billion Increase. This level of increase positions the Department to field in the period beyond 2025 all of the systems described under Option 1 plus additional sea and space systems. The systems include:

- Space-based laser (space control and ABM)

- Neutral particle beam, ground-based ASAT

- Space-to-ground, direct attack satellites (150 kinetic energy projectiles per satellite)

- Trans-atmospheric vehicles (capable of rapid, global precision strike and limited space operations)

- Stealthy, submersible amphibious delivery (mother ships and ship to shore transport for embarked Marines)

Option 3: $150 Billion Increase. This level of increase positions the Department to procure all of the systems described under Options 1 and 2 plus several additional advanced air, ground, and information systems in operationally meaningful numbers in the period beyond 2025. The additional systems include:

- Exoskeleton-equipped armored infantry and robotics for light infantry (integrated personal operational mobility/combat system, robotic scouts, porters, micro UAVs, etc.)

- Information warfare stealthy attack satellites, submersible ASAT/lightsat launchers, information warfare UAVs (false image generation, IW strike), integrated IW systems for other combat systems (false image generation)

System groupings under the three R&D options are based on the projected level of resources required, the degree of technological discontinuity involved and commonality with other systems under development. Accordingly, with few exceptions, systems can not be shifted among options. The one exception is that the space-based laser can be substituted for the advanced attack helicopters and stealthy long-range, land-based missile systems (and associated ISR and IW UAVs) in option one, but at the risk of a significantly less-effective SBL.

Move 2 R&D Options
(If $40 billion R&D in Move 1)

Baseline R&D continues to be funded at approximately $32 billion per annum. This R&D level funds science and technology programs, ongoing C4ISR modernization, precision munitions development, and engineering development and evolutionary improvement of the major next generation systems in the base force (i.e., JSF, CVX, NSSN, SC-21, Future Main Battle Tank and Infantry Fighting Vehicle, and Ballistic and Cruise Missile Defense).

R&D can be increased during this move by **$80 billion, $120 billion, or $150 billion over the period** in order to finance expanded/alternative R&D programs. These R&D options provide an opportunity to begin the development of a range of potentially transformational systems and forces for **procurement in operationally meaningful numbers in the period beyond 2025.**

System groupings under the three R&D options are based on the projected level of resources required, the degree of technological discontinuity involved and commonality with other systems under development. Accordingly, with few exceptions, systems can not be shifted among options.

Option 1: $80 Billion Increase. This level of increase would expedite existing R&D programs (e.g., UAV, sensor miniaturization, missile defense, underwater platforms) as well as enable significant progress in the following technology areas: fuel cell / electric drive, PGM miniaturization, and application of signature management technologies (active and passive) to wide-bodied aircraft. This R&D expansion could make it possible for the Department to field in the period *beyond* 2025 several advanced air, ground, sea and space systems such as:

- Extended range/endurance, weaponized naval UAVs for both anti-surface warfare and anti-submarine warfare
- Multipurpose, rapid launch, light satellites
- Advanced ballistic and cruise missile defense system.
- Submersible arsenal ships equipped with multipurpose advanced cruise and ballistic missiles.
- Stealthy, 10 ton, electric propulsion, electromagnetic gun-equipped (10 kilometer maximum effective range) advanced combat vehicles *and* stealthy, electric drive, multipurpose, 100 kilometer range, advanced missile artillery systems.
- Stealthy airlifters, aerial refueling aircraft, and battlespace control aircraft (*i.e.*, low observable airborne laser platform)

- Stealthy, air-to-air and air-to-ground UAVs which can be launched and recovered from a stealthy, wide-bodied, extended range aircraft (up to 24 short range UAVs per aircraft)

- Stealthy, 500 kilometer range, transport UAVs (capable of transporting 20 combat-equipped troops).

- Large-scale, precision, air delivery utilizing INS/GPS-guided parafoils dropped from stealthy air transports

- Stealthy, extended range, advanced attack helicopters (follow-on to *Comanche*)

- Extended-range version, 500 km, of the stealthy, electric drive, advanced missile artillery system.

Option 2: $120 Billion Increase. This level of increase positions the Department to field in the period beyond 2025 all of the systems described under Option 1 *plus* several additional systems made possible by significant technological progress in direct energy, adaptive optics, high-energy propellants, and underwater systems. Future procurement options beyond 2025 might include:

- Space-based laser (space control and ABM)

- Neutral particle beam, ground-based ASAT

- Space-to-ground, direct attack satellites (150 kinetic energy projectiles per satellite)

- Trans-atmospheric vehicles (capable of rapid, global precision strike and limited space operations)

- Stealthy, submersible amphibious delivery (mother ships and ship to shore transport for embarked Marines) platforms

- Submersible ASAT/lightsat launchers

Option 3: $150 Billion Increase. This level of increase positions the Department to procure all of the systems described under Options 1 *and* 2 *plus* several additional systems made possible by significant technological progress in robotics, high-density energy storage, biotechnology, and information warfare systems. With this level of R&D, the following advanced air, ground, and information systems could be procured in operationally meaningful numbers in the period *beyond* 2025:

- Exoskeleton-equipped infantry (integrated personal operational mobility/combat system)

- Robotic support for light infantry including porters; man-portable UAVs and unmanned ground vehicle (UGV) scouts; and specialized sapper, counter-sniper, and countermine robots.

- Autonomous Micro-Robots capable of reconnaissance and surveillance within closed structures, attacking electronic equipment, and killing humans which match their pre-programmed attack profile

- CBW Protection for the Soldier: Rugged, light weight, highly-sensitive biosensors capable of detecting and identifying a wide-range of chemical and biological agents; "breathable" personal protective gear composed of durable biomaterials; and biotech-based decontamination/remediation capability

- Information warfare attack satellites, information warfare UAVs (false image generation, IW strike), and integrated IW systems for other combat systems (*e.g.*, multispectral decoys, false image generation).

Move 2 R&D Options
(If $80 billion R&D in Move 1)

Baseline R&D continues to be funded at approximately $32 billion per annum. This R&D level funds science and technology programs, ongoing C4ISR modernization, precision munitions development, and engineering development and evolutionary improvement of the major next generation systems in the base force (i.e., JSF, CVX, NSSN, SC-21, Future Main Battle Tank and Infantry Fighting Vehicle, and Ballistic and Cruise Missile Defense).

R&D can be increased during this move by **$80 billion, $120 billion, or $150 billion over the period** in order to finance expanded/alternative R&D programs. These R&D options provide an opportunity to accelerate and / or expand the development of a range of potentially transformational systems and forces for **procurement in operationally meaningful numbers in the period beyond 2025**.

System groupings under the three R&D options are based on the projected level of resources required, the degree of technological discontinuity involved and commonality with other systems under development. Accordingly, with few exceptions, systems can not be shifted among options.

Option 1: $80 Billion Increase. This level of increase would position the Department to field in the period *beyond* 2025 several additional systems made possible by significant technological progress in direct energy, adaptive optics, high-energy propellants, and underwater systems. Future procurement options beyond 2025 might include:

- Space-based laser (space control and ABM)
- Neutral particle beam, ground-based ASAT
- Space-to-ground, direct attack satellites (150 kinetic energy projectiles per satellite)
- Trans-atmospheric vehicles (capable of rapid, global precision strike and limited space operations)
- Stealthy, submersible amphibious delivery (mother ships and ship to shore transport for embarked Marines) platforms
- Submersible ASAT/lightsat launchers

Option 2: $120 Billion Increase. This level of increase positions the Department to procure all of the systems described under Option 1 *plus* several additional systems made possible by significant technological progress in robotics, high-density energy storage, biotechnology, and information warfare systems. With this level of R&D, the following advanced air, ground, and information systems could be procured in operationally meaningful numbers in the period *beyond* 2025:

- Exoskeleton-equipped infantry (integrated personal operational mobility/combat system)

- Robotic support for light infantry including porters; man-portable UAVs and unmanned ground vehicle (UGV) scouts; and specialized sapper, counter-sniper, and countermine robots

- Autonomous Micro-Robots capable of reconnaissance and surveillance within closed structures, attacking electronic equipment, and killing humans which match their pre-programmed attack profile

- CBW Protection for the Soldier: Rugged, light weight, highly-sensitive biosensors capable of detecting and identifying a wide-range of chemical and biological agents; "breathable" personal protective gear composed of durable biomaterials; and biotech-based decontamination/remediation capability

- Information warfare attack satellites, information warfare UAVs (false image generation, IW strike), and integrated IW systems for other combat systems (*e.g.*, multispectral decoys, false image generation)

Option 3: $150 Billion Increase. This level of increase positions the Department to procure all of the systems described under Options 1 and 2 *plus* more mature versions of existing platforms incorporating evolutionary improvements (e.g., range, speed, stealth, etc).

Move 2 R&D Options
($130 billion R&D in Move 1)

Baseline R&D continues to be funded at approximately $32 billion per annum. This R&D level funds science and technology programs, ongoing C4ISR modernization, precision munitions development, and engineering development and evolutionary improvement of the major next generation systems in the base force (i.e., JSF, CVX, NSSN, SC-21, Future Main Battle Tank and Infantry Fighting Vehicle, and Ballistic and Cruise Missile Defense).

R&D can be increased during this move by **$80 billion or $120 billion over the period**. The lower R&D option provides for significant evolutionary improvements in the first-generation RMA systems now entering the force structure. **With this level of R&D funding, more mature systems consistent with the emerging regime could be procured in the period beyond 2025.**

The higher funding level option provides the opportunity to begin to explore a possible revolution in military affairs based on major advances in biotechnology.

Option 1: $80 Billion Increase. This level of increase would position the Department to field in the period *beyond* 2025 more mature versions of existing platforms which incorporate substantial evolutionary improvements (e.g., range, speed, stealth, etc.)

Option 2: $120 Billion increase. This level of increase positions the Department to procure all of the systems included under Option 1 *plus* several additional capabilities made possible by significant advances in biotechnology:

- Bio-computing and data processing
- Highly sensitive biosensors responsive to a wide range of phenomenology (e.g., acoustic, electromagnetic, olfactory, etc.)
- Multispectral "chameleon suits" for infantry which automatically adapt to their surroundings
- DNA-specific biological weapons
- Adaptable BW defense capability (Identifies and neutralizes attacking pathogens and biochemicals)

U.S. System Descriptions

P

QDR Force -- Selected System & Organization Descriptions

Army

Army Tactical Missile System (ATACMS):

- Ground-based, Multiple Launch Rocket System (MLRS) which fires surface-to-surface guided missiles (2 tubes per launcher)
- Missile range = 63 to 200+ miles
- Missiles can be equipped with anti-personnel, Brilliant anti-armor (BAT) , or other submunitions

***Crusader* (Advanced Field Artillery System):**

- Self-propelled howitzer (155 mm) and armored resupply vehicle (carries 60 rounds of ammunition, propellant, fuel, lubricants, and water)
- Road speed = 67 km/hr, Cross-country speed = 48 km/hr
- Gun range: 5 km (minimum), 40+ km (maximum)
- Transported to theater via C-5 or C-17

RAH-66 *Comanche*:

- Next generation armed reconnaissance helicopter with some low-observability features (all composite airframe)
- Speed = 175 knots (cruise), Endurance = 2.5 hours
- Self-deployment radius = 1,260 nm
- Armament: Air to-ground and air-to-air missiles

Apache Longbow:

- Modification of the *Apache* helicopter to include digitized target acquisition system which can automatically detect/classify targets and guide a fire-and-forget *Hellfire* II missile to specified targets

Deep Strike Brigades (first generation):

- Each brigade consists of 72 *Comanche* armed reconnaissance helicopters, 18 ATACM launchers with 576 extended range missiles (36 tubes with supply of 16 missiles/tube), and 16 low-observable *Darkstar* UAVs

Air Force

Airborne Laser (ABL)

- Wide-body aircraft (modified 747-400) equipped with IR sensors and a chemical oxygen-iodine laser (COIL) for boost-phase intercept of ballistic missiles
- ABL could also be used for air-to-air engagements, air-to-ground attack against soft-targets, or laser designation
- No incorporation of low observability / signature reduction features
- Operating altitude = 40,000 - 45,000 feet
- Maximum laser range = 300 miles (Laser cannot penetrate cloud cover)
- Each aircraft has sufficient fuel for up to 40 engagements

B-1B *Lancer*

- Intercontinental-range, low-flying (automatic terrain following) bomber
- Speed = 900-plus mph, Ceiling = 30,000 feet
- Incorporates some low-observability features and advanced electronic countermeasures to enhance survivability
- Payload: Wide variety of nuclear and conventional munitions can be carried in internal weapons bays including up to 84, GPS-aided 500-lb bombs; 30 cluster bomb units; or 24, 2,000-lb JDAMs
- External hard points can carry an additional 12 weapons

B-2 *Spirit*

- Stealthy, intercontinental-range (9,600 km unrefueled), penetrating bomber
- Low-observable design incorporating radar absorbing composite materials and special coatings to reduce radar cross section (RCS) well below that of B-1B
- Speed = high subsonic, Ceiling = 50,000 feet
- Payload: 40,000 lbs of nuclear weapons or conventional munitions including gravity bombs, sensor-fuzed cluster munitions, GPS-aided munitions (GAMs), JDAMs, and aerial/sea mines

F-117 Stealth Fighter

- Penetrating attack fighter
- Low observable design incorporating radar absorbent composite materials
- Max speed = 646 mph, unrefueled range = 1300 miles (with 5,000 lb weapon load)
- Armament: Full internal carriage of a wide variety of weapons including 2000 lb laser-guided munitions, AGM-65 *Maverick*, AGM-88 HARM

F-15E

- All weather, multirole fighter
- No integration of signature management technologies
- Unrefueled range of 1060 miles (2,878 miles in ferry mode with external tanks)
- Max speed = Mach 2.5+, Ceiling = 60,000 ft
- Typical air-to-air armament options include 4 AIM-7 *Sparrow* and 4 AIM-9 *Sidewinder* or 8 AIM-120 *Amraams*
- Up to 24,000 lbs of ordnance in ground attack role including gravity bombs, cluster munitions, and a wide variety of PGMs

F-16 *Fighting Falcon*:

- Compact, all weather, multirole fighter aircraft
- No integration of signature management technologies
- Unrefueled range of 860 miles (2,000 mile ferry range)
- Speed = 1,500 mph, Ceiling = 50,000+
- Up to 6 missiles can be carried *externally*

Joint Strike Fighter (JSF):

- All-weather, multirole fighter
- Three variants being designed to replace the F-16 (USAF), the A-6 and F-14 (USN), and the F/A-18 and AV-8B (USMC)
- Incorporates some low-observable design features (RCS is less than aircraft it is intended to replace)

F-22 Fighter:

- Low observable, multirole aircraft intended to replace the F-15
- Primary missions: air superiority & precision ground attack. Ancillary missions: Elint & suppression of enemy air defenses (SEAD)
- RCS is significantly lower than the JSF
- Unrefueled range over 2000 miles
- "Super-cruise," able to operate at supersonic speeds for extended periods of time
- Equipped with four internal weapons bays (2 main, 2 side) for carrying medium and short-range air-to-air missiles and/or ground attack PGMs

Naval / Marine Forces

F/A-18E/F *Super Hornet*

- Upgraded version of the F/A-18C/D multirole fighter with greater range and payload
- Radar cross section is smaller relative to the F/A-18C/D, but much larger relative to the JSF or F-22

V-22 *Osprey*:

- Tilt-rotor aircraft that combines the advantages of fixed wing speed and fuel efficiency with the flexibility permitted by the VTOL characteristic of helicopters
- Transports troops (24), equipment, and supplies from off-shore ships and land bases
- Speed = 275 knots
- Range (amphibious assault) = 515 nm, Range (self deployment) = 2100 nm
- Substantial radar cross section

***Ticonderoga*-Class Aegis Missile Cruiser**

- Multi-mission guided missile cruiser (i.e., anti-air, anti-surface, ASW) with powerful SPY-1, phased array radar
- All steel construction. No incorporation of radar absorbing materials or LO design features
- Max speed = 30+ knots
- 122 VLS cells holding a mix of Standard missiles, Tomahawk (surface- and land-attack cruise missiles), and anti-submarine rockets (ASROCs)
- Also equipped with 6 torpedoes and 2 *Phalanx* close-in weapons systems

***Arleigh Burke*-Class Aegis Destroyer (DDG-51):**

- Destroyer equipped with AEGIS combat system (including SPY-1, phased array radar), VLS capability, and anti-submarine warfare capabilities
- All steel construction. No incorporation of radar absorbing materials or LO design features
- Max speed = 31+ knots
- 96 VLS cells holding a mix of Standard missiles, Tomahawk (surface- and land-attack cruise missiles), and anti-submarine rockets (ASROCs)
- Also equipped with Harpoon missiles, 6 torpedoes, and 2 *Phalanx* close-in weapons systems

First-generation Arsenal Ship:

- Large surface vessel equipped with some 500 vertical launch systems (VLS) capable of launching a wide variety of extended-range precision munitions such as TLAM, naval ATACMS, and Evolved Sea Sparrow Missiles
- Low free board, some LO design features and materials
- Highly automated, i.e. crew of less than 100

Advanced Amphibious Assault Vehicle (AAAV):

- Armored, fully-tracked, amphibious assault landing vehicle which replaces aging AAVs currently used by the USMC
- Vehicle carries troops from ship-to-shore through rough water and surf zone
- Provides land mobility once ashore
- Speed on land (roads) = 100 km/hr, cross country speed = 60 km/hr, water speed = 35 knots
- Range (unrefueled) on land = 300-400 miles, range at sea = 75 miles

Missile Defense

Space-based Infrared System (SBIRS)

- Constellation of satellites designed to detect missile launches
- Phase I deployment would consist of 4 IR detection satellites positioned in geo-stationary orbits. Phase II, referred to as the Space and Missile Tracking System (SMTS), would consist of up to 24 satellites in LEO designed to track missiles / re-entry vehicles during the mid-course of ballistic flight as well as cruise missiles and other targets.

Patriot PAC-3

- Follow on Patriot system incorporating the Extended Range Interceptor (ERINT), improved ground radars, and enhanced battle management hardware and software

Theater High Altitude Area Defense (THAAD):

- High-altitude air defense system designed to intercept short-and intermediate-range missile threats
- System consists of a ground based radar unit, Battle Management / C4I trucks, and 4-6 launchers each with 10 interceptors
- Transporting a single THAAD system into theater requires up to 18 C-5, 26 C-17, or 40 C-141 flights
- THAAD may be able to protect an area with a radius between 30-100 miles depending on the type and number of incoming missiles
- THAAD not designed to intercept low-flying threats such as stealthy cruise missiles

Navy Area Defense (NAD) / Navy Theater Wide (NTW)

- NAD: Formerly Navy "lower tier." Sea based missile defense system employing Standard Missiles (Block IV) launched from *Ticonderoga*-class Aegis cruisers.
- NTW: Formerly Navy "upper tier." Extended-range version of the NAD made possible by an added missile stage for the kill vehicle

National Missile Defense (NMD)

- Single-site missile defense system composed of 100 ground-based interceptors, 24 satellite SMTS constellation, and 500 space-based interceptors (i.e., Brilliant Pebbles)

Limited NMD

- Single-site missile defense system composed of 100 ground-based interceptors

United States:
New Systems and Organizations (2011-2024)

Air Dimension

Stealthy Airborne Battle Lasers, UAV Strike Tenders, Airlifters and Refuelers:

Airframe technology for these four platforms grew out of the same wide-body stealth research and development program.

- **Stealthy Airborne Battle Lasers (S-ABL)** are intercontinental range, air control/strike platforms which employ passive (low observable design and materials) and active (on-board signature management equipment) stealth. Lasers can be used for boost-phase intercept of ballistic missiles, air-to-air engagements, air-to-ground attack against soft targets, or laser designation. Maximum laser range is 300 miles. Lasers cannot penetrate cloud cover. Stealth is compromised when firing the laser.

- **UAV Tenders** are stealthy, intercontinental range, transport and battle management aircraft capable of launching, controlling, recovering, and refueling/rearming air control and strike UAVs. Each UAV Tender can carry up to 10 multirole UAVs. Tenders can launch and recover their UAVs up to four times before returning to base.

- **Stealthy Airlifters** are inter- and intra-theater air mobility aircraft capable of precision air delivery (i.e., GPS-guided parafoil) and landing on unimproved, short runways. Airlifters can haul 125 fully loaded combat troops or major equipment (advanced combat vehicles, missile artillery launchers). Air drop is the preferred mode of delivery in order to maintain maximum stealth. Air landing operations (for insertion or extraction) in a long-range precision strike environment require extensive IW operational support (i.e., false landing sites, etc.)

- **Stealthy Refueling Aircraft** can refuel stealthy airborne lasers, UAV Tenders, bombers, long-range fighters (F-22s), and airlifters over contested battlespace. Together with the more numerous, non-stealthy air refueler fleet operating in peripheral areas of the theater, they enable stealthy, extended range air operations.

B-X

- Follow-on to the B-2 incorporating more advanced signature reduction technologies and addition of a "super-cruise" capability

Ground Dimension

Advanced Deep Strike Brigades:

- Advanced Deep Strike Brigades (DSBs) can project power 500 kilometers in any direction, and can maintain indirect land control over deep inland areas
- Advanced DSBs consist of the following:
  - ⇒ 72 stealthy, extended range, advanced attack helicopters (successor system to Comanche)
  - ⇒ 54 stealthy, electric drive, missile artillery launchers each with 12 tubes for firing 500 kilometer range precision-guided missiles. (DSB typically deploys with supply of about 4,500 missiles)
  - ⇒ 96 long-endurance, stealthy ISR and IW UAVs.

Remote Missile Pods:

- Remote missile pods are expendable, automated, unmanned, long-range missile systems.
- Pods are air-droppable over either sea or land
- Each pod can fire six, 500 km range missiles equipped with brilliant submunitions
- Encoded authentication is required for launch. Attempts to gain unauthorized access to system generates a coded warning signal and the pod self destructs
- Remote missile pods are a further evolution of the stealthy, manned, long-range missile launchers (organic to the DSB) which grew out of the earlier ATACMS and stealthy, electric drive, ACV programs.

Combined Arms Regiments (CAR):

- Principal mid-term "heavy" close combat force (CARs could be supplanted by exoskeleton-equipped infantry forces in the longer term) CARs are capable of non-linear, network-based operations. A CAR can project organic firepower 100 km in any direction
- CARs consist of the following:
  - ⇒ 108 stealthy, 10 ton, electric drive, electromagnetic gun-equipped (10 kilometer maximum effective range), air droppable, advanced combat vehicles
  - ⇒ 27 stealthy, electric drive, missile launchers each with 6 tubes for firing 100 kilometer range missiles with brilliant submunitions. (Basic load per regt is 3,000 missiles)
  - ⇒ 27 stealthy, recoverable UAVs with a range of 150 km and a loiter time of 24 hours. UAV have a range of capabilities including multispectral sensing, target designation, communication, jamming and deception.

Advanced Ranger Regiments (Robotic)

- Information-intensive, next generation, light close combat force. They are optimized for combat in urban areas. Existing light forces can be converted into Ranger regiments. Ranger regiments are equipped with robotic support as indicated below:
  - ⇒ ~800 robotic "porters" which carry food, water, and ammo.
  - ⇒ ~100 Micro-UAV/Micro-UGV Robot Scouts: Small, man portable. Performs short-range reconnaissance and surveillance.
  - ⇒ ~100 "Sapper" Robots: Performs small-scale demolition
  - ⇒ ~100 "Countermine" Robots: Tag and/or clear minefields. Uses HPMV and charged particle device to detect and detonate mines
  - ⇒ ~100 "Counter sniper" Robot Units: Mothership plus 24 autonomous micro-robots specialized for counter-sniper role.

Exoskeleton Regiments

- An exoskeleton regiment comprises 800 soldiers equipped with armored and climate-controlled exoskeletons capable of cross-country movement at speeds up to 40 miles per hour. They have integrated dual purpose weapons (anti-armor, anti-personnel), multispectral sensors (including wall penetrating radar), communications, and IW (false image generation) systems.
- Exoskeleton regiments are air-droppable. Exoskeleton design incorporates advanced, multiaspect, passive stealth technology (electrothermochromatic protection).

Independent Micro-Robot Regiments

- Each Independent Robot Regiment consists of 100 air droppable (via gps-guided mini-parafoils) motherships camouflaged as a brick or other common object of similar size.
- Once on the ground, these tracked/wheeled vehicles are capable of moving up to 3 miles to a pre-programmed target destination (e.g. building, DUG facility, C2 bunker, etc) at which point they release 24 autonomous micro-robots (about the size of a large insect, or less than 1 in^3.)
- The individual micro-robots are capable of locomotion up to 1/4 mile and have an endurance of 72 hours. Micro-robots are capable of recon and surveillance within closed structures, attacking electronic equipment, and killing humans who fit their attack profile.

Surface / Undersea Dimension

- ***Stealthy Sea Control Frigates*** are next generation, low-observable frigates (about 5,000 ton displacement) with a low topside profile and angular-shaped hull. Sea control frigates incorporate several other signature reduction measures including extensive use of composite and radar absorbing materials, conformal antennas, sea misting, exhaust cooling, and wake reduction. The result is a dramatically reduced signature – including RCS, underwater electric potential, IR, hydro-acoustic, and EM emissions – relative to conventional surface ships. The signature reduction technologies employed by this vessel are an outgrowth of the DD-21 program.
  - ⇒ Armed with 24 advanced torpedoes and 24 VLS tubes with a mix of stealthy land-attack / anti-ship cruise missiles and surface-to-air missiles
  - ⇒ Equipped with advanced towed sonar array for ASW as well as other passive sensors for clandestine surveillance of maritime traffic
  - ⇒ Primary mission: sea control; Ancillary missions: ASW and maritime fire support

- ***Submersible Arsenal Ships*** are stealthy platforms capable of firing up to 500 advanced ballistic and extended range cruise missiles. Submersible arsenal ships were derived from Trident technology and first generation surface arsenal ships. Submersible arsenal ships are much less vulnerable to anti-surface navy threats. They have limited self-defense capability (they principally rely on passive stealth) and must be protected by attack submarines.

- ***Submersible Amphibious Ships*** also emerged out of the Trident technology base in response to the emerging anti-surface navy threat. They consist of extended range, stealthy mother ships and ship-to-shore UUVs to transport embarked Marines. Submersible amphibious entry is covert.

Space Dimension

Space Based Laser:

- Space-based lasers are configured as a 24-satellite, MEO-based constellation.
- Each deuterium fluoride laser is capable of 300 engagements.
- Integrated sensors allow interception of ballistic missiles in their boost phase, as well as engagement of non-stealthy, space, airborne, and soft ground targets.
- Lasers can not penetrate cloud cover and are vulnerable to other SBLs, NPB, ground-based ASATs, and blinding by IW attack satellites (kinetic kill may follow blinding.)
- Opposing SBL constellations would place a premium on preemptive strike and accordingly would almost certainly spur the development of some form of assured second strike capability

***Starlite* Space-Based Radar (SBR)**

- 36 satellite constellation providing continuous, day-night, all-weather detection of ground vehicles as well as some aircraft and cruise missiles
- Satellite payload includes high resolution SAR and moving target sensors
- SBR cannot reliably track or target stealthy aircraft and cruise missiles
- SBR constellation is a replacement for / complement to the E-3 AWACS, E-8 JSTARS, and E-2 platforms

Space-to-Ground, Direct Attack Satellites and Trans-Atmospheric Vehicles:

- Space-to-ground, direct attack satellites are LEO-based platforms capable of launching 150 high velocity (Mach 25) kinetic energy penetrators against fixed, hardened, terrestrial targets.

- TAVs are single-stage, reusable vertical launch, horizontal recovery, rocket-powered vehicles capable of delivering a payload to the other side of the Earth in less than 1 hour. TAVs carry 50 hypervelocity composite penetrators to attack hardened targets (e.g. DUGs). TAVs can also carry PGMs and attack satellites in LEO/MEO.

Distributed Lightsats, Submersible Lightsat/ASAT Launchers

- Rapid launch, small multipurpose satellites used to reconstitute space-based C4ISR and navigation capabilities.
- Lightsats are short duration (180 days) space platforms. Lightsats can be placed into orbit from multiple launch locations and from submersible lightsat/KE ASAT launchers (converted Trident boats).

Information Dimension

- ***IW Attack Satellites*** are stealthy, maneuverable space platforms that can be used to blind hostile satellites in LEO and MEO. They release attack pods (60 per satellite which attach to the targeted system. IW satellites can also be used for deception and override operations.

- ***IW UAVs*** are stealthy, high endurance platforms capable of operational false image generation, or high power microwave attack. They are linked into the U.S. Global C4I Network and provide essential IW support to other theater forces across warfare dimensions.

- ***Integrated IW*** systems grew out of the IW UAV and exoskeleton programs. These systems are capable of producing tactical false image generation, and can be applied to a number of close combat forces (air control and strike UAVs, advanced attack helicopters, and advanced combat vehicles). Integrated IW substantially enhances the tactical effectiveness of stealthy close combat forces.

Transformation Vision of PLA General Staff

PLA General Staff's Vision for High Technology Warfare (1998)

Over the next two-to-three decades, an emerging military revolution could have profound consequences for military operations and global strategic balances. This revolution could both transform war in existing dimensions and bring war into new ones. Several new systems, concepts and organizations could rise to prominence, rendering existing systems, concepts and organizations obsolete or subordinate. In the near-term, emerging capabilities will provide less advanced forces with asymmetric means to challenge and defeat more advanced forces. In the long-term, these capabilities will enable us to leap ahead of our adversaries and dominate the new military regime.

Two areas appear to be central to this transformation: long-range precision strike capabilities, enhanced by stealth, and the information dimension of war. Information warfare may evolve as a distinct form of strike, targeting the information infrastructures that our enemies rely on for their effectiveness (govemmental, defense and commercial).

A struggle for space control will likely also transform war. In light of current international sentiment against the weaponization of space, vital reconnaissance and communications assets may be provided a haven from attack. However, the importance of space C4ISR assets to military operations will create a great incentive for the development of anti-satellite weapons.

In the near- to mid-term our greatest advantage lies in developing our missile capabilities. Long-range barrage missile attacks will be able to destroy a local adversary's armed forces as well as their govemment's will to resist. Missile and precision-guided munition attacks will play a key role in preventing outside powers from intervening in regional conflicts by denying them access to the theater. A robust reconnaissance-strike architecture comprised of mobile and land-based missiles, satellites, UAVs, and submarines will enable us to contest control of the sea from extended distances form our borders. In addition to their obvious importance in future high-tech warfare, these "anti-navy" capabilities would also give us significant influence over peacetime trade flows.

In the longer-term, increased information flows, increases in the range and lethality of weaponry, and all-weather/day-night fighting capabilities will enormously increase the scope, tempo and efficiency of military operations. As we develop more sophisticated capabilities (i.e., longer-range missiles, advanced space and information warfare capabilities, and advanced undersea warfare capabilities) we will be able to project our anti-access capabilities onto our enemy's shore.

PLA General Staff's Vision for High Technology Warfare (2011)

The ability to locate high-value, time-sensitive, fixed and mobile targets and to destroy them with a high degree of confidence at very long ranges is fundamentally transforming the conduct of war. Fixed sites and high signature targets—airfields, ports, surface warships, large field armies, manned non-stealthy aircraft, unprotected information systems, and low earth orbit satellite constellations—are becoming extremely vulnerable to destruction or denial by high technology forces. States whose armed forces have mastered high technology warfare will become preeminent in the international system.

The emergence of high technology warfare is changing the conduct of theater campaigns in several fundamental ways:

- The proliferation of "smart," long-range missiles coupled with developments in signature reduction is shifting the balance in favor of offensive systems.

- Simultaneous operations can be conducted to the full depth of a theater at the outset of a war. Geographically defined theaters have lost much of their strategic autonomy.

- The boundaries among the dimensions of war, the levels of war, and the orientation of military operations have become substantially eroded.

- The lethality and efficiency of high technology warfare will "empty" the battlefield, with unmanned systems assuming many of the critical warfare functions currently performed by manned systems.

- Stealthy unmanned aerial vehicles and long-range smart missiles would similarly dominate air operations. Large, manned air armadas could become a thing of the past, and what is meant by the term "air superiority" is changing fundamentally in the missile and stealth-dominated world of high technology warfare.

- The ability to control extended sea areas using land- and space-based systems is similarly transforming war at sea. A reconnaissance-strike system of satellites, unmanned aerial and undersea vehicles, and mobile, land-based, terminally guided, long-range missiles will enable powers who possess them to contest control of the sea for extended distances from their borders. The quantity and quality of long-range unmanned systems and the number and quality of nuclear submarines a navy possesses will determine a state's ability to control the seas.

- The emergence of counterspace warfare and space-to-ground attack will transform the military importance of space from a supporting medium to an integrative theater of operations. Counterspace operations will become to 21st century warfare what sea battles were for war in the 17th and 18th centuries.

- The emergence of war in the information spectrum will add qualitatively new means of destroying enemy targets and target systems and disrupting enemy operations. Information operations will be integral to all levels of war and in all dimensions of the battlespace.

- The emergence of advanced biological warfare will provide states with a range of lethal and non-lethal capabilities to achieve objectives across dimensions and at all levels of warfare. The ability to target specific genetic groups, to target agricultural products, to employ novel toxins or stealthy pathogens, as well as the ability to affect human bireugulators, could lead to qualitatively new means of seizing, holding, and destroying enemy targets, economies and even societies.

Defense Planning Guidance from CMC

Draft Defense Planning Guidance - PRC 1998-2010

National Security Objectives:

PLA forces should be postured to:

- Deter attacks against the Chinese homeland[1]
- Prevent Taiwanese independence
- Defeat regional aggression that threatens Chinese interests (including protecting sovereign claims -- e.g. Spratly and Paracel Islands)
- Protect our vital sources and lines of energy supply
- Prevent the emergence of a balance of power arrayed against China

Roles for PLA Forces:

The People's Liberation Army will be engaged in protecting our sovereign rights and defending our country from the aggression of foreign imperialists. Over the next 10-15 years they may be used in deterrence and presence missions; in countering internal subversion; and in regional contingencies (both lesser and major). They also must remain prepared to execute nuclear war plans.

Resources:

The planning period will be marked by extensive fiscal expansion and transformational change. Our military forces can expect to reap their share of recent economic reforms with a rough quadrupling of annual expenditures (from $25 to $90 billion) in our military budgets. Continued, but selective, modernization of our forces remains a priority to ensure that they are sufficiently equipped and trained to defeat any "Gulf War-style adversary."

Regional Guidance:

- **The Americas:** Maintain effective political and military-to-military contacts. Closely monitor nuclear forces and signs of emerging military capabilities. Engage U.S. in arms control talks so long as they do not interfere / hinder PLA modernization. Continue to assuage U.S. political elements of our continued interest in a peaceful re-incorporation of Taiwan into China.

[1] Includes Tibet and Hong Kong.

Continue to enhance American business interest in exporting high technology to China. Increase naval visits to Central and South American countries to enhance visibility of, and appreciation for, trade flows with China.

- **Europe:** Continue political ties with NATO countries in general. Encourage continued expansion of NATO to Eastern European countries. Discourage strongly expansion of NATO to the former Soviet state. Encourage increased trade with China. Maintain European support for historical Chinese claims to the Spratlys.

- **Asia:** Focus intelligence efforts on Japan, Korea, India, and Taiwan. Continue to press for the re-incorporation of Taiwan into the People's Republic. Conversely, prevent Taiwanese independence. Develop stronger political ties with ASEAN. Encourage Korean unification as a means for redirecting South Korean attention and economy away from Western imperialists. Secure Chinese territorial and energy claims from encroachment (e.g., by Vietnam, Philippines, or Malaysia). Continue to bolster (quietly) Pakistan's military as a counterbalance to Indian aggression against China.

- **Southwest Asia:** Expand our political presence in Saudi Arabia, Iran, Iraq Kuwait, and selected Gulf states. Develop military-military ties, encouraging the procurement of Chinese weapon systems for their armed forces. Develop increased commercial ties for Chinese products and technology. Encourage close ties between Chinese energy firms and those of each country.

- **Russia:** Establish/maintain effective military-to-military contacts. Closely monitor nuclear forces and materials. Use intelligence assets to understand military modernization efforts. Seek access by any means to Russian technology capabilities, including joint-ventures, hiring of their scientists, etc.

Force Planning Guidance:

- Posture forces to fight and win *one major regional war.* Illustrative planning scenarios include, but are not limited to:

  ⇒ Preventing Taiwanese independence, including U.S. intervention against the People's Republic and Taiwanese strikes against the homeland

  ⇒ Indian attack on China or its allies

  ⇒ Vietnamese aggression / incursion into Spratly islands

  ⇒ Intervention in a Korean civil war

⇒ Protection of Chinese interests among Indonesian people

⇒ Russian revanchist incursions along the Chinese border

Exploiting the Emerging Military Revolution:

- Maximize exploitation of the emerging military revolution by:

  ⇒ Enhancing the ability of PLA forces to destroy fixed or massed enemy targets in and out of theater

  ⇒ Developing "anti-access" capabilities designed to deny aggressors the ability to enter, base, or supply in theater

  ⇒ Developing complete inter-networking of the People's Liberation Army

  ⇒ Ensuring PLA access to space and/or UAV capabilities for robust C4ISR while denying aggressors the ability to use their aerospace assets to support attacks on our assets

  ⇒ Developing information warfare tools to degrade, manipulate or destroy the information systems of prospective adversaries while defending our information infrastructure against similar attacks

***Draft* Defense Planning Guidance 2011-2024**

National Security Objectives:

PRC forces should be postured to:

- Deter attacks against the Chinese homeland
- Seize control of territory stripped from China under previous "unfair treaties" and defend it from foreign aggression
- Defeat decisively the power projection forces of imperialist powers
- Protect our vital sources and lines of energy supply
- Deter the aggression of imperialists attempting to subvert our internal stability

Roles for PRC Forces:

The People's Liberation Army (PLA) will continue to be engaged in protecting our sovereign rights and defending our country from the aggression of foreign imperialists. Over the next 10-15 years they may be used in deterrence and presence missions; in countering internal subversion; and in regional, extra-regional, and global contingencies. They also must remain prepared to execute nuclear war plans.

Resources:

This planning period will be marked by extensive fiscal expansion and accelerated transformational change. The continued growth of China as a world economic power brings with it a concomitant requirement for China to assume its rightful role in influencing world events. Consequently, our military forces can expect to benefit from more than a doubling in annual defense expenditures. These funds will make it possible to leap ahead of our adversaries and dominate the new warfare regime by the middle of the next decade.

Strategic Drivers:

PRC force planners must take into account:

- The problem of U.S. alliances surrounding China, attempting to contain her as was done to the former Soviet Union
- The broadening of warfare to include the space, information, and the microbial dimensions
- The ability of transformed military forces to achieve decisive effects with fewer forces than had been the case in the prior century

Regional Guidance:

- **The Americas:** Seek new arms control measures that limit, delay, or prevent U.S. weaponization of space, development of advanced biological weapons, and weaponization of the sea floor. Develop military ties to Central and South American countries to enhance visibility of, and appreciation for, trade flows (military and commercial) with China.
- **Europe:** Leverage ties with European technology development efforts. Quietly encourage Europe to focus on the North African Islamic threat to divert their attention from larger world events. Encourage NATO discussion on the Baltics to divert Russia's attention from increasing Chinese interests in Siberia and to place a wedge between European and Russian relations.
- **Asia:** Seek to create an Asian common market which we can control. Attempt to draw Korea further into the Chinese orbit, concluding with a formal treaty of alliance, if possible. Focus intelligence efforts on Japan and India. Continue to develop ties among southeastern Asian nations to constrain India's imperialistic aspirations. Encourage development and expansion of Central Asian energy resources in a manner most favorable to China. Continue to seek removal of U.S. forces from the region and dismantlement of their bases.
- **Southwest Asia:** Continue expand our ties to Saudi Arabia, Iran, Iraq, Kuwait, and selected Gulf states. Develop closer military-military ties, including helping them to develop military capabilities that place U.S. "presence" forces at increased risk. Solidify commercial ties for Chinese products and technology in return for secure access to energy supplies.
- **Russia:** Monitor nuclear forces and materials. Attempt to develop cooperative programs to counter American and European capabilities. Discourage, but prepare for, Russian integration into NATO.

Force Planning Guidance:

Posture forces to fight and win two major wars and a number of proxy wars. Illustrative planning scenarios include but are not limited to:

- Seizure of Chinese territory in Siberia stripped away by unfair treaties
- Indian attack, including the threat of nuclear use, on China or one of its allies
- Political coercion of Japan
- Interdiction of Chinese energy supplies from either Central or Southwest Asia or the South China Sea (e.g., by India, Russia, or the U.S.)
- Large-scale peace enforcement operations in Indonesia
- Covert support for North American insurgent groups
- Covert economic warfare against the U.S. and India

Special Problems:

Planners should *explicitly consider* how to overcome the following challenges:

- Creating a robust anti-access barrier to imperialist power projection forces
- Delivering a surprise blow to U.S. military space capabilities with *enduring* effects
- Degrading the C4ISR network on which adversaries depend
- Rapidly gaining control of mass urban areas with relatively few close combat forces
- Reducing the vulnerability of friendly forces to enemy long-range precision strikes

Exploiting the Military Revolution:

- Conduct extensive operational experimentation to identify the most promising leap ahead systems and forces, and weed out likely "false starts"
- Make critical choices as to which systems and forces must be procured in operationally useful numbers and which capabilities must be divested in order to transform PRC military capabilities by 2025

PLA Base Force Summary

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PLA Base Force (1998-2010)

General Trends

- Beginning with an annual military budget of $25 billion that is expected to rise to about $90 billion by 2010, the PLA plans to invest heavily in the following areas: ballistic and cruise missile technologies, airborne and space-based C4ISR systems, counter-stealth sensors, anti-ship and anti-air defenses, submarines, and precision-guided munitions.

- To "jump start" the PLA's transformation, the Central Military Commission (CMC) plans to take full advantage of technology transfer opportunities available in the near-term. A vigorous effort will be made to acquire advanced anti-air missile technology (e.g., SA-10/S-300 air defense systems from Russia), advanced combat aircraft technology (e.g., Russian Su-27/Su-30 and Israeli cooperation on the development of the J-10), submarines and related technologies (e.g. Russian *Kilos*), C3I technologies (e.g., Israeli *Phalcon* and the Russian *Mainstay*), and precision munitions (e.g., AA-11 *Archer* and Kh-17 *Krypton* from Russia) from abroad.

- The top modernization priority over the next ten years will be China's missile force.

Conventional Missile Forces

Missile Type	Type	Range (km)	Payload (kg)	1998	Comments
DF-3A	Ballistic (liquid)	2,800	2,000	44msl / 44 launchers	Poor CEP (>1000 meters), land-mobile
DF-11 (M-11)	Ballistic (solid)	300	500	24 msl / 12 TELs	Land-mobile
DF-15 (M-9)	Ballistic (solid)	600	500	24 msl / 12 TELs	Land-mobile, current CEP of about 300 meters to be improved to <45
DF-21	Ballistic (solid)	1,800	600	10 msl / 10 TELs	
DF-25B	Ballistic (solid)	1,700	2,000	N/A	Fielding planned for 2002
C-802 Land-attack	Cruise	150		N/A	50 msl planned by 2004 (TERCOM + GPS/GLONASS-assisted guidance)
TOTAL CONVENTIONAL MISSILES				**102**	

- Missile-related R&D will focus on developing more advanced solid propellants, more efficient turbofan/turbojet engines, and more accurate guidance systems.

- The PLA may opt to produce a conventional variant of land-mobile DF-31 (8,000km range) which is expected to enter into service at the turn of the century.

- Current plans also call for investment in new manufacturing techniques and automation technologies in order to expand the PLA's missile production capacity over the next decade.

AIR FORCES

Platform Type	1998	Comment
Manned Fighter / Ground Attack Aircraft	~40 FWE (3,000+ aircraft, mostly 1950-1960s era designs, but also 48 modern Su-27s purchased from Russia)	Planned co-production with Russia of up to 300 additional Su-27s. Indigenously-designed J-10 (based in large part on Israeli Lavi) to enter serial production in 2005.
Non-Stealthy Theater Bombers	300+ (H-5 / H-6 armed with C-601 AShMs, 110 km range)	
Manned C4ISR Aircraft	290	
ISR UAVs	3	*Chang Hong* recce UAV, NPU D-4 recce/EW UAV, and ASN 104/105 UAV
Air Mobility Aircraft	405 transports / 5 primitive refuelers	Includes 10 IL-76 heavy transports purchased from Russia. Current plan is to convert up to 20 H-6 bombers to air-to-air refueling role.
Surface-to-Air Missile Units	124 (mostly HQ-2 launchers w/ 18 nm range & RF-61s w/ 4 nm range)	24 SA-10 missile firing units (220 missiles) with 80+ km engagement range were recently acquired from Russia. They are deployed in six launch battalions (each with 4 launchers).

- Key goal of PLAAF is to create an integrated air defense network that links fighter aircraft, surface-based SAMs, and C4I elements.
- Given finite resources, the PLAAF plans to transition toward a significantly smaller, but much more capable air force with modern equipment.
- In addition, the PLAAF leadership has emphasized the development of unmanned aerial vehicles (UAVs) for intelligence, surveillance, and reconnaissance (ISR) missions over the next decade.

GROUND FORCES

Unit Type	1998 (Active)	Comments
Army Tank Divisions	15	Total of about 8,500 tanks; but that includes about 6,000 aging Type-59s. Only about 1,000 modern tanks such as the Type 80/85 are currently fielded.
Army Airborne Divisions	3 (manned by AF)	
Army Infantry Divisions	78 (including 2 mechanized)	These divisions are organized into 24 Group Armies.
Army Artillery Divisions	14 (mostly towed arty)	Large fraction of towed artillery, but increasing amount of self-propelled artillery (122 & 155mm) and MRLs.
Army Rapid Reaction Divisions	12	3 divisions in "rapid reaction" role and 9 "ready to mobilize" in 24-48 hours.
Army Helicopter Regiments	7	
Marine Infantry Divisions	1 bde (5000 men)	

- The PLA leadership plans to transform the Army into a much lighter, more mobile, information-intensive force during the upcoming decade. The long-term goal is to equal or surpass the capabilities of America's "Army 21" by about 2015.

- The PLA plans to cut 500,000 troops over the next three years. 2-3 of PLA's Group Armies (corps equivalent) will be deactivated and absorbed into the People's Armed Police (PAP).

NAVAL FORCES

Vessel Type	1998	Comments
Anti-shipping Missile Units (Coastal)	80	Mostly HY-2 (85 km) , HY-3 (80 km), and HY-4 (135 km) anti-shipping missiles (AShM)
Attack Submarines	61 (36 aging *Romeo*-class subs but also 5 *Han*-class SSNs, 2 Song-class subs, and 3 *Kilos* SSKs)	Obsolete *Romeos* scheduled to be replaced by Type 039 *Song*-class diesel-electric subs.
Principal Surface Combatants	54 (including 18 destroyers and 36 frigates, mostly of 1970s vintage)	Includes 2 Russian-built *Sovremenny*-class guided missile destroyers.
Amphibious Assault Ships	71 (including 25 LSTs)	Amphibious assault ships to be modernized with *Zhousan* class LST and *Qiongsha* class assault ships in coming years as earlier generation landing transports are decommissioned. PLAN also plans to build high-speed air-cushion landing craft.
Missile and Torpedo Craft	335 (most equipped w/ C-801 AShMs, 40 km range)	
Mine Countermeasure Ships	120	

- Given the modest size of the current navy and the importance of maritime security concerns (e.g., securing SLOCs, protecting our territorial claims in the South China Sea) to the political leadership in Beijing, the PLA has made naval modernization and expansion a priority for the coming decade.

- Obsolete submarines (e.g. aging Romeos) will be retired from the fleet and replaced by more capable boats over the next decade. In addition to the indigenous *Han*- and *Song*-class programs, the Navy expects to work out a licensing arrangement with Russia for producing *Kilo*-class submarines in China.

- Naval-related R&D over the next decade will focus on developing more sophisticated anti-shipping missile technology (possibly with assistance from France or Russia), quieter submarines, ASW technologies, and sea-launched cruise missiles

SPACE & INFORMATION WARFARE FORCES

Satellite System	1998	Comments
Civilian Communication Satellites (worldwide)	150	Expected to grow to over 1500 satellites on orbit by 2010.
Civilian ISR Satellite Systems (worldwide)	15	
Military Reconnaissance Satellites	Jianbing-1B photo-reconnaissance satellite series	First launch in 1992, each satellites orbits for 15 or 16 days.
Military Communication Satellites	3	1 DFH-3 series (indigenous) and 2 foreign-built satellites
Space Launch Sites	4	

- The PLA plans to rely on the burgeoning commercial space industry for most of its space-based C4ISR needs over this period.
- Assuming the technical obstacles can be overcome, the PLA plans to launch several types of military satellites (e.g., ELINT, electro-optical, synthetic aperture radar, missile early warning, navigational, and weather) over the coming decade.
- China is a share-holder in the Iridium consortium which will provide global cellular service via a 66 LEO-based, satellite constellation.
- China's space shuttle project was officially launched in 1992. The goal is to conduct a manned trial in space by 2005. Current designs specify a shuttle with a payload of 3-3.5 tons.
- China operates an extensive, ground-based space and missile tracking network.
- The PLA plans to initiate a comprehensive IW program focused on developing information protection technologies (to detect, track, and prevent incursions into friendly computer networks) as well as to develop the means to fight and win information confrontations in the future.

STRATEGIC NUCLEAR FORCES

Delivery Systems

Platform Type	Range (km)	1998	Comments
SSBNs/SSB	N/A	1 *Xia*-class SSBN armed with 12 JL-2 SLBMs and 1 modified *Golf*-class SSB equipped with 12 J-2 SLBMs	The JL-2 SLBM is a two-stage solid fuel missile with 8,000 km range. The J-2 is equipped with a MIRVed warhead configured with 3, 100 kt warheads and 1 PENAID package.
Non-stealthy Theater Bombers (nuclear capable)		<160	
DF-4 / CSS-3	4,750	12 msl / 12 TELs	Liquid propellant, slated to be decommissioned in 2001.
DF-5A / CSS-4	13,000	7 msl in hardened underground silos	
DF-21 / CSS-5	1,800	10 msl / 10 TELs	Slated for decommission or conversion to conventional role by 2010.
DF-31	8,000	N/A	24 planned for deployment beginning in 2001 (land-mobile, MIRVed, PENAIDs).
DF-41	12,000	N/A	12 planned for deployment beginning in 2008 (road-, rail- and river-mobile; MIRVed warhead).

Nuclear Stockpile

Nuclear Warhead Inventory		**450**	

- Nuclear-related R&D during this period will focus on developing smaller warheads, more accurate missile guidance & navigation systems, MIRV technology, and penetration aids.
- Benefiting from Russian technical assistance, a clandestine research project aimed at optimizing warheads for EMP effects is also underway.

OTHER MILITARY UNITS

- Military Reserve – 1.2 million
- Central Military Commission – 530,000
- People's Armed Police – 700,000

PRC Defense Program Adjustment Worksheets

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Program Adjustments Move 1

(FY 1999-FY 2011)

Budget Overview

Budget expected to rise from $25 billion in FY 1999 to about $90 billion in FY 2011. Total defense budget over period is approximately $750 billion

Baseline defense program consumes $400 billion

Growing personnel cost plus inflation consumes $100 billion

Remaining budget surplus for new spending is $250 billion ($250 billion)

R&D

Expanded R&D Option 1	+ $25 billion
Expanded R&D Option 2	+ $50 billion
Expanded R&D Option 3	+ $100 billion

Procurement

DF-11 and DF-15 Ballistic Missiles (300 – 600 km range)

Procure 500 additional missiles	+$.5 billion
Procure 1000 additional missiles	+$1 billion

DF-21 and DF-25 Ballistic Missiles (1800 km range)

Procure 500 additional missiles	+$.5 billion

DF-35 and DF-45 Ballistic Missiles (2,500 – 5,000 km range)

Procure 250 missiles	+$.5 billion
Procure 500 missiles	+$1 billion

DF-31 and DF-41 Ballistic Missiles (8,000 – 12,000 km range)

Procure 100 missiles (conventional variant)	+$.5 billion

C-802 / Land Attack Cruise Missiles (150 – 300 km range)

Procure mix of 1000 additional missiles	+$1 billion

Low-Observable Land Attack Cruise Missile (750 km range)

Procure 200 missiles	+$.5 billion
Procure 400 missiles	+$1 billion

Procure Theater Missile Defense (PAC –2/3) Equivalent

Procure 24 TMD Batteries	+$3.5 billion
Procure 48 TMD Batteries	+$7 billion

Advanced Surface-to-Air Missiles (e.g., SA-10C/D)

Purchase 300 firing units from abroad	+$1 billion

J-10 Indigenous Fighter

Procure 200 additional aircraft	+$6 billion

Su-27 / J-11 Fourth Generation Fighter

Co-produce 200 aircraft	+$7 billion
Co-produce 400 aircraft (100 indigenously)	+$15 billion
Co-produce 600 aircraft (300 indigenously)	+$33 billion

Modern Ground Attack Aircraft (e.g. Su-30/34s)

Purchase 200 aircraft from abroad	+$10 billion
Purchase 400 aircraft from abroad	+$20 billion
Purchase 600 aircraft from abroad	+$30 billion

Indigenous Ground Attack Aircraft (variant of Su-24)

Procure 200 aircraft	+$8 billion
Procure 400 aircraft	+$16 billion

Modern Ground Attack Aircraft (reverse-engineered Su-30/34)

Procure 100 aircraft	+$6 billion

Purchase 6 Early Warning / Battle Management Aircraft +$2.5 billion

Second Generation ISR UAVs

Procure 100 UAVs	+$.5 billion)

Procure 24 Air Refuelers +$2 billion

Procure 24 Heavy Air Transports +$2 billion

Land-based Anti-Ship Missile Units

Procure 300 additional firing units	+$.5 billion

Aircraft carrier (45,000 ton class)

Purchase 1 carrier from abroad	+$4 billion
Purchase 2 carriers from abroad	+$8 billion

Small-Deck Carrier (Indigenous, 30,000 ton class)

Procure 1 carrier	+$2.5 billion

Attack submarines (*Kilo*-class / Type 212)

Purchase 4 additional subs from abroad	+$1 billion
Purchase 8 additional subs from abroad	+$2 billion
Co-produce 20 additional subs	+$6 billion

Attack submarines (Indigenous, Song-class)

Procure 8 additional subs	+$1.5 billion

Modern Destroyers (*Sovremenny*-class)

Purchase 4 destroyers from abroad	+$2 billion
Purchase 8 destroyers from abroad	+$3.5 billion
Co-produce 20 modern destroyers	+$9 billion

Procure 8 *Luhu*-class Destroyers +$2 billion

Frigates (*Jiangwei*-class)

Procure 8 additional frigates	+$1 billion
Procure 16 additional frigates	+$2 billion

Fast-attack Missile & Torpedo Craft

Procure 24 additional craft	+$1 billion

Upgrade All Surface Combatants with C-802 or SS-N-22 Anti-Ship Cruise Missiles +$.5 billion

Modern Amphibious Assault Ships

Purchase 2 ships from abroad	+$1.5 billion
Purchase 4 ships from abroad	+$3 billion

Semi-modern Amphibious Assault Ships

Procure 5 ships indigenously	+1 billion

Advanced Main Battle Tanks (T-90II)

Procure 600 additional tanks	+$2.5 billion
Procure 1200 additional tanks	+$6 billion
Procure 2400 additional tanks	+$12 billion

Infantry Fighting Vehicles / Armored Personnel Carriers (Type 95)

Procure 600 IFV/APCs	+$1.5 billion
Procure 1200 IFV/APCs	+$4 billion
Procure 2400 IFV/APCs	+$8 billion

Modern MLRS (e.g. Russian SMERCH)

Procure 500 firing units with reloads	+$1 billion

Procure 100 E-FOGM equivalent Firing Units +$1 billion

Advanced, All-weather Attack Helos (e.g., Ka-50/52)

Purchase 100 helos from abroad	+$3 billion
Purchase 200 helos from abroad	+$6 billion
Purchase 300 helos from abroad	+$9 billion

Procure 3 Military Communication Satellites	+$1 billion
Procure 2 E-O and 2 SAR Satellites	+$3 billion
Procure 2 SIGINT Satellites	+$1 billion

Force Structure

PLAF Fighter Wings	
Cut 5 FW	($3 billion)
Cut 10 FW	($6 billion)
Cut 15 FW	($9 billion)
Surface Combatants	
Cut 15 ships	($.5 billion)
Cut 30 ships	($1 billion)
PLA Infantry Divisions	
Cut 6 divisions (2 Group Armies)	($10 billion)
Cut 12 divisions (4 Group Armies)	($20 billion)
Cut 18 divisions (6 Group Armies)	($30 billion)

Readiness

Increase Readiness & Training	
$25 billion plus up over the period	
$50 billion plus up over the period	
$75 billion plus up over the period	

GRAND TOTAL:

China Program Adjustments
Move 1 Carry Forwards

Procurement

DF-11 and DF-15 Ballistic Missiles (300 – 600 km range)

500 additional missiles	+$1.5 billion
1000 additional missiles	+$3 billion

DF-21 and DF-25 Ballistic Missiles (1800 km range)

500 additional missiles	+$1.5 billion

DF-35 and DF-45 Ballistic Missiles (2,500 – 5,000 km range)

250 missiles	+$2 billion
500 missiles	+$3.5 billion

DF-31 and DF-41 Ballistic Missiles (8,000 – 12,000 km range)

100 missiles (conventional variant)	+$1.5 billion

C-802 / Land Attack Cruise Missiles (150 – 300 km range)

1000 additional missiles	+$3 billion

Low-Observable Land Attack Cruise Missile (750 km range)

200 missiles	+$1.5 billion
400 missiles	+$3 billion

Procure Theater Missile Defense (PAC –2/3) Equivalent

24 TMD Batteries	+$1.5 billion
48 TMD Batteries	+$3 billion

J-10 Indigenous Fighter

Procure 200 additional aircraft	+$3 billion

Su-27 / J-11 Fourth Generation Fighter

200 aircraft	+$6 billion
400 aircraft	+$12 billion
600 aircraft	+$18 billion

Modern Ground Attack Aircraft (e.g. Su-30/34s)

Purchase 200 aircraft from abroad	+$6 billion
Purchase 400 aircraft from abroad	+$12 billion
Purchase 600 aircraft from abroad	+$18 billion

Indigenous Ground Attack Aircraft (variant of Su-24)

Procure 200 aircraft	+$4 billion
Procure 400 aircraft	+$8 billion

Modern Ground Attack Aircraft (reverse-engineered Su-30/34)

Procure 100 aircraft	+$3 billion

Purchase 6 Early Warning / Battle Management Aircraft +$1.5 billion

Second Generation ISR UAVs

Procure 100 UAVs	+$1.5 billion)

Procure 24 Air Refuelers +$1.5 billion

Procure 24 Heavy Air Transports +$1.5 billion

Aircraft carrier (45,000 ton class)

1 carrier from abroad	+$4 billion
2 carriers from abroad	+$8 billion

Small-Deck Carrier (Indigenous, 30,000 ton class)

1 carrier	+$2 billion

Attack submarines (*Kilo*-class / Type 212)

4 additional subs from abroad	+$.5 billion
8 additional subs from abroad	+$1 billion
20 additional subs	+$3 billion

Modern Destroyers (*Sovremenny*-class)

Co-produce 20 modern destroyers	+$2 billion

Advanced Main Battle Tanks (T-90II)

600 additional tanks	+$4 billion
1200 additional tanks	+$8 billion
2400 additional tanks	+$17 billion

Infantry Fighting Vehicles / Armored Personnel Carriers (Type 95)

600 IFV/APCs	+$4 billion
1200 IFV/APCs	+$8 billion
2400 IFV/APCs	+$17 billion

Advanced, All-weather Attack Helos (e.g., Ka-50/52)

Purchase 100 helos from abroad	+$3 billion
Purchase 200 helos from abroad	+$6 billion
Purchase 300 helos from abroad	+$9 billion

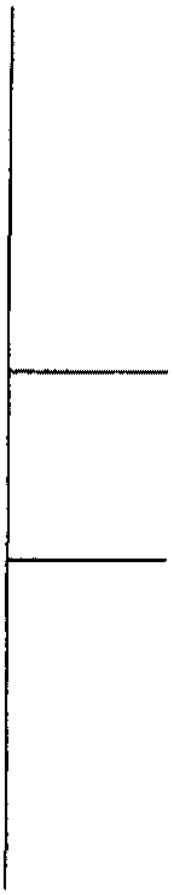
Force Structure

PLAF Fighter Wings

Cut 5 FW	($3.5 billion)
Cut 10 FW	($7 billion)
Cut 15 FW	($10 billion)

PLA Infantry Divisions

Cut 6 divisions (2 Group Armies)	($25 billion)
Cut 12 divisions (4 Group Armies)	($50 billion)
Cut 18 divisions (6 Group Armies)	($75 billion)



Program Adjustments Move 3

(FY 2012-FY 2025)

Budget Overview

Budget expected to rise from $90 billion in FY 1999 to about $200 billion in FY 2025. Total defense budget over period is approximately $2 trillion

Baseline defense program consumes $1 trillion between cost growth and inflation

Growing personnel cost consumes $350 billion

Remaining budget surplus for new spending is $650 billion — ($650 billion)

Carry Forward from Move 1

R&D

Expanded R&D Option 1	+ $50 billion
Expanded R&D Option 2	+ $100 billion
Expanded R&D Option 3	+ $150 billion

Procurement

DF-35 and DF-45 Ballistic Missiles (2,500 – 5,000 km range)

Procure 500 missiles	+$2 billion
Procure 1000 missiles	+$4.5 billion

DF-55 (5,000 km range)

Procure 500 missiles	+$2.5 billion
Procure 1000 missiles	+$5 billion

DF-65 (10,000 km range)

Procure 250 missiles	+$2 billion

Low-Observable Land Attack Cruise Missile (750 km range)

Procure 1000 missiles	+$3.5 billion
Procure 2000 missiles	+$8 billion

VLO, Land Attack Cruise Missiles (1500 km range)

Procure 1000 missiles	+$6 billion
Procure 2000 missiles	+$13 billion

VLO, Extended-Range Cruise Missiles (4000 km range)	
Procure 500 missiles	+$4 billion
Procure 1000 missiles	+$9 billion
Procure Advanced Theater Missile Defense (THAAD-Equivalent)	
Procure 7 TMD Batteries	+$10 billion
Procure 14 TMD Batteries	+$20 billion
Advanced Surface-to-Air Missiles (e.g., SA-X)	
Procure 300 firing units	+$6.5 billion
J-12 Multirole Aircraft (JSF equivalent)	
Procure 400 aircraft	+$26 billion
Procure 800 aircraft	+$60 billion
Procure 1200 aircraft	+$90 billion
Nonstealthy Intercontinental Bombers	
Procure 12	+$4 billion
Procure 24	+$7 billion
Wide-body ALCM Trucks (each with 40 ALCMs & reloads)	
Procure 12	+$4 billion
Procure 24	+$8 billion
Procure 48	+16 billion
Stealthy Intercontinental Bombers	
Procure 6	+$8 billion
Procure 12	+$13 billion
Airborne Lasers	
Procure 6	+$5.5 billion
Procure 12	+$9 billion
Advanced ISR UAVs	
Procure 100 ISR UAVs	+$2 billion
Procure 200 ISR UAVs	+$4.5
IW UAVs	
Procure 12 IW UAVS	+$1 billion
Procure 24 IW UAVS	+$2 billion
Weaponized UAVs	
Procure 100 UAVs	+$3 billion
Procure 200 UAVs	+$5.5 billion
Procure 100 Modern Air Refuelers	+$10 billion
Procure 100 Modern Airlifters (C-17)	+$23 billion

Advanced Land-based Anti-Ship Missile Units	
Procure 300 additional firing units	+$1 billion
Anti-Ship / ASW UAVs	
Procure 100	+$4.5 billion
Procure 300	+$12 billion
Wide-Area, Underwater Sensor Nets	
Procure 2	+$6.5 billion
Nimitz-Class Carrier plus Air Wing	
Procure 1	+$14 billion
Procure 2	+$25 billion
Missile Barges (each with 500 S/R ballistic missiles)	
Procure 2	+$1 billion
Procure 4	+$2 billion
Procure 6	+$3 billion
Advanced Nuclear Attack Submarines (improved NSSN-equivalent)	
Procure 8	+$13.5 billion
Procure 16	+$25 billion
Procure 32	+$46 billion
Attack Submarines (advanced AIP diesel)	
Procure 8	+$4.5 billion
Procure 16	+$8 billion
Procure 32	+$15 billion
Advanced ASW Frigates	
Procure 10	+$3.5 billion
Procure 20	+$7 billion
Battle Dominance Ships (DD-21 equivalent)	
Procure 8	+$5.5 billion
Procure 16	+$10 billion
Procure 24	+$15 billion
Advanced Amphibious Assault Ships	
Procure 8	+$4 billion
Procure 16	+$8 billion
Stealthy Armed Reconnaissance Helicopters	
Procure 100	+$3.5 billion
Procure 200	+$7 billion
Procure 400	+$14 billion

Advanced Main Battle Tanks ((M1A4 equivalent)

Procure 600 additional tanks	+$5.5 billion
Procure 1200 additional tanks	+$10 billion
Procure 2400 additional tanks	+$19 billion

Infantry Fighting Vehicles / Armored Personnel Carriers (Type 95)

Procure 600 IFV/APCs	+$3.5 billion
Procure 1200 IFV/APCs	+$7 billion
Procure 2400 IFV/APCs	+$14 billion

Advanced Field Artillery Systems (Crusader-equivalent)

Procure 100	+$1 billion
Procure 200	+$2 billion
Procure 400	+$4 billion

Procure 100 Enhanced E-FOGM equivalent Firing Units

Procure 200	+$3 billion
Procure 400	+$6 billion

Space-Based Laser Conatellation

Procure partial constellation (12 sats)	+$13 billion
Procure full constellation (24 sats)	+$35 billion

Space-to-Ground Attack Satellites (100 rods each)

Procure 4	+$4.5 billion

Ground-Based, DE ASATs

Procure 6	+$25 billion
Procure 12	+$45 billion

Direct-Ascent, Kinetic Kill ASATs

Procure 48	+$.5 billion

Trans-Atmospheric Vehicles (Space Planes)

Procure 8	+$10 billion
Procure 16	+$20 billion

Rapid Launch, Light Satellites

Procure 40	+$5 billion
Procure 80	+$9 billion

Advanced Military Communication Satellites

Procure 6	+$8 billion
Procure 12	+$15 billion

Advanced ISR Satellites (E-O, SAR, IR, ELINT)

Procure 6	+$10 billion
Procure 12	+$20 billion

Sea Control Satellites	
Procure constellation of 12 satellites	+20 billion

Force Structure

PLAF Fighter Wings	
Cut 5 FW	($7 billion)
Cut 10 FW	($14 billion)
Sea Control Brigades	
Create 2	+$8 billion
Create 4	+$16 billion
Create 6	+$30 billion
PLA Tank / Mach Divisions	
Cut 5 divisions	($35 billion)
Cut 10 divisions	($70 billion)
Cut 15 divisions	($100 billion)
PLA Infantry Divisions	
Cut 12 divisions (4 Group Armies)	($50 billion)
Cut 24 divisions (8 Group Armies)	($100 billion)
Cut 36 divisions (12 Group Armies)	($150 billion)
Advanced Airborne Divisions	
Create 1	+$25 billion
Create 2	+$50 billion
Mobile Strike Brigades	
Create 3	$11 billion
Create 6	$20 billion
Create 9	$30 billion
Aerial Strike Force Divisions	
Create 1	+$28 billion
Create 2	+$54 billion
Create 4	+$106 billion
Mobile Strike Force Divisions	
Create 1	+$11 billion
Create 2	+$20 billion
Create 4	+$40 billion
Specialized IW Brigades	
Create 2	+$2 billion
Create 4	+$4 billion
Create 6	+$6 billion

Readiness

Increase Readiness, Training, and PME
$50 billion plus up over the period
$75 billion plus up over the period
$100 billion plus up over the period

GRAND TOTAL:

PRC R&D Options

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Move 1 PRC R&D Options

R&D is funded in the base program during the period FY 1999-2011 at approximately $4 billion per annum. This R&D level funds preliminary research, and in some cases, model R&D consistent with the **863 Program** (e.g. space, lasers, automation, biotechnology, information systems, energy, and new materials) as well as upgrades to current generation systems in the base force (*e.g.*, DF-11/15 ballistic missiles, J-10 fighters, Type-80/85 main battle tanks, *Luhu*-class destroyers, and *Song*-class attack submarines).

R&D can be increased during this move by **50%** ($25 billion plus-up over the period), **100%** ($50 billion plus-up over the period), or **200%** ($100 billion) in order to finance **expanded/alternative** programs.

System groupings under the three R&D options listed below are based on the projected level of resources required, the degree of technological discontinuity involved and commonality with other systems under development. Accordingly, systems can not be readily shifted among options.

Option 1: $25 Billion Increase. This level of increase would extend and accelerate *existing* technology development programs as well as enable significant progress in missile propulsion technologies (including scramjets), advanced missile navigation and guidance systems (e.g., FOG-based inertial guidance, terrain matching, digital scene matching, and IR imaging), sensor technologies (including automated target recognition), and a range of stealth technologies (e.g., low-observable design, radar-absorbing materials, and active signature reduction techniques).

This R&D expansion would make it possible for the Ministry of Defense to procure several new systems during the FY 2012-2025 period. Systems than could be procured in operationally meaningful numbers by 2025 with this level of R&D include:

- Advanced battlefield rockets equivalent to American ATACMS-ER
- "Smart" sea mines capable of distinguishing "enemy" naval vessels from friendly maritime traffic
- Long-range, low observable, highly precise cruise missiles
- Extremely accurate ballistic missiles equipped with PENAIDs
- Direct-ascent, kinetic kill anti-satellite weapons

- Trans-atmospheric vehicles capable of rapid, global precision strike and limited space operations (outgrowth of space shuttle project initiated in 1992)
- Stealthy, long-endurance unmanned aerial vehicles (UAVs) for both ISR and strike missions
- Stealthy manned fighter aircraft and bombers
- Semi-stealthy missile & torpedo craft

Option 2: $50 Billion Increase. This level of increase positions the Ministry of Defense to procure all of the systems described under Option 1 *plus* several additional advanced platforms made possible by significant technological progress in robotics, MEMs, sensor miniaturization, high speed computing, artificial intelligence, and high density energy storage. Future procurement options for the FY 2012-2025 period enabled by this R&D funding level could include:

- A family of battlefield support robots including robotic porters, scouts, sappers, and sentries
- Multipurpose, rapid launch, light satellites
- A family of electronic warfare tools including conventional EMP and high-power microwave weapons, directional infrared and GPS jamming systems, and sophisticated, broadband radio frequency jammers
- Advanced multispectral decoys and other advanced electronic countermeasures (ECMs)
- Electric-drive missile launchers and semi-stealthy advanced combat vehicles (ACVs)
- Electromagnetic guns capable of shooting 500 to 1000 kms

Option 3: $100 Billion Increase. This level of increase positions the Ministry of Defense to procure all of the systems described under Options 1 and 2 *plus* several additional systems made possible by significant technological progress in directed energy, adaptive optics, space-based remote-sensing, and other space-related technologies. Future procurement options for the FY 2012-2025 period enabled by this R&D funding level could include:

- Airborne lasers (air control and BPI of ballistic missiles)
- Space-based laser constellation (space control and ABM)
- Neutral particle beam, ground-based ASAT
- Ground-based lasers for "dazzling" an opponent's satellites
- Space-to-ground, direct attack satellites (150 kinetic energy projectiles per satellite)

Move 3 PRC R&D Options

R&D can be increased during this move by $50 billion, $100 billion, or $150 billion over the course of this period, 2011-2025, in order to finance **expanded/alternative** programs.

System groupings under the three R&D options listed below are based on the projected level of resources required, the degree of technological discontinuity involved and commonality with other systems under development. Accordingly, systems cannot be readily shifted among options.

Option 1: $50 Billion Increase. This level of increase would extend and accelerate *existing* technology development programs as well as enable significant technological progress in human genome sciences, biochemistry and advanced biotechnologies.

This R&D expansion would make it possible for the Ministry of Defense to procure several new capabilities in the period *beyond* 2025 such as the following:

- Novel biotoxins and bioregulator weapons;
- Genetically-specific biological weapons;
- Bio-reactive or "chameleon" materials which automatically adapt to their surroundings;
- Rugged, light weight, highly-sensitive biosensors capable of detecting and identifying a wide-range of chemical and biological agents;
- "Breathable" personal protective gear composed of durable biomaterials; and
- A biotech-based decontamination/remediation capability.

Option 2: $100 Billion Increase. This level of increase positions the Ministry of Defense to procure all of the systems described under Option 1 *plus* several additional advanced platforms made possible by significant technological progress in the following technology areas: fuel cell / electric drive, PGM miniaturization, and the application of signature management technologies (active and passive) to wide-bodied aircraft. This R&D expansion could make it possible for the Ministry of Defense to field in the period *beyond* 2025 several advanced air, ground, and sea systems such as:

- Stealthy, 10 ton, electric propulsion, electromagnetic gun-equipped (10 kilometer maximum effective range) advanced combat vehicles *and* stealthy, electric drive, multipurpose, 100 kilometer range, advanced missile artillery systems.

- Stealthy airlifters, aerial refueling aircraft, and battlespace control aircraft (*i.e.*, low observable airborne laser platform).

- Stealthy, air-to-air and air-to-ground UAVs which can be launched and recovered from a stealthy, wide-bodied, extended range aircraft (up to 12 short range UAVs per aircraft).

- Large-scale, precision, air delivery utilizing INS/GPS-guided parafoils dropped from stealthy air transports.

Option 3: $150 Billion Increase. This level of increase positions the Ministry of Defense to procure all of the systems described under Options 1 and 2 *plus* a few additional systems made possible by advances in artificial intelligence, MEMS, and high-density energy storage. For instance, with this level of R&D, the following weapon systems could be procured in operationally meaningful numbers in the period *beyond* 2025:

- Exoskeleton-equipped infantry (integrated personal operational mobility/combat system).

- Autonomous micro-robots capable of reconnaissance and surveillance within closed structures, attacking electronic equipment, and killing humans which match their pre-programmed attack profile.

PRC System Descriptions

V

PRC Systems Descriptions

PLA Missile Systems (Second Artillery)

CONVENTIONAL MISSILE FORCES

Missile Name	Type	Range (km)	Payload (kg)	Comments
DF-3A	Ballistic (liquid)	2,800	2,000	Poor CEP (>1000 meters), land-mobile
DF-11 (M-11)	Ballistic (solid)	300	500	Land-mobile
DF-15 (M-9)	Ballistic (solid)	600	500	Land-mobile, current CEP of about 300 meters to be improved to <45
DF-21	Ballistic (solid)	1,800	600	
DF-25B	Ballistic (solid)	1,700	2,000	Fielding planned for 2002
DF-35	Ballistic (solid)	2,500	2,000	Early R&D
DF-45	Ballistic (solid)	5,000	1,000	Early R&D
C-802 Land-attack	Cruise	150		50 msl planned by 2004 (TERCOM + GPS/GLONASS-assisted guidance)

STRATEGIC NUCLEAR MISSILE FORCES

Missile Name	Type	Range (km)	Payload (kg)	Comments
JL-2	Ballistic (solid)	8,000	700	1 *Xia*-class SSBN armed with 12 JL-2 SLBMs and 1 modified *Golf*-class SSB equipped with 12 J-2 SLBMs
DF-4 / CSS-3	Ballistic (liquid)	4,750	2,200	land-mobile, poor CEP
DF-5A / CSS-4	Ballistic (liquid)	13,000	3,200	CEP < 500 m
DF-21 / CSS-5	Ballistic (solid)	1,800	600	Mobile TEL
DF-31	Ballistic (solid)	8,000	700	Land-mobile, In development, To be fielded in 2000
DF-41	Ballistic (solid)	12,000	800	Land-mobile, In development, To be fielded by 2010

PLAF Systems

Fighters

J-11 (Su-27) Heavy Air Superiority Fighter

- Max speed of Mach 2.7, unrefueled range of 1,560 km, capable of carrying a payload of 9,300 kg.
  - ➢ Comparable to the F-15C.
  - ➢ Loaded with 4 x AA-10c and 6 x AA-11 Air-to-Air Missiles (AAM) with a range from 55-110 km.
  - ➢ Equipped with variant of the *Zhuk*-27 radar able to fire anti-aircraft missiles at four different targets.

J-10 Multi-Role Fighter.

- Same performance class as the Russian MiG-29, US F-16, Euro-fighter 2000, and Dassault Rafale.
  - ➢ Argued to be more maneuverable than the F/A-18E/F
  - ➢ It can carry a variety of AAMs

Bombers / Fighter Bombers

Su-30MK Ruaalan Fighter Ground Attack Aircraft.

- Max speed = Mach 2, unrefueled range = 2,997 km, and payload = 8,008 kg.
  - ➢ Approaches capability of the F-15E.
  - ➢ Ten hardpoints for missiles or gravity bombs
  - ➢ Carries precision weapons like the *Zvezda* Kh-31 ramjet-powered anti-ship and anti-radiation missile (range = 70 km).

Su-34 Theater Bomber

- 3,200 km unrefueled range
- Can carry 17,640 lbs ordnance

JH-7 Tandem Seat-Fighter Bomber

- Max speed = Mach 2, unrefueled range = 1,500 km, and payload = 5,000kg.
  - ➢ Equipped with a terrain following radar
  - ➢ Can carry two C-801 Air-to-Surface Missiles (ASM) (range = 65km).
  - ➢ Comparable to the British Tornado and the Russian Su-24.

H-6D Bomber

- Max speed = Mach 2, Range = 48,000 km, and it is outfitted to carry ALCMs

AIR REFUELERS/ TRANSPORT

IL-78 Air-Refueler

• Range = 2,997 km with 53,320 lbs. of fuel. Can refuel a total of five to eight combat aircraft.

IL-76 Transport Aircraft

• Range = 4,625 km., Payload = 114,640 lb

EARLY WARNING AIRCRAFT

Search Watcher

• This airborne radar has an endurance of 11 hr and airborne surveillance and tracking capability over a 400 mile wide circle.

A-50 Mainstay

• The A-50 has an endurance of 10 hr and airborne surveillance and tracking capability over a 500 mile wide circle.

UAVS

Chang Hong reconnaissance UAV

• Endurance = 3 hrs., Altitude = 17,500 ft

➢ Sensor payload: photographic camera (PC)

NPU D4 reconnaissance and electronic warfare UAV

• Operating radius = 100 km, Endurance = 2 hrs, Altitude = 3,000 feet.

➢ Sensor payload: PC, Video (RT), IRLS (RT)

ASN104/105 reconnaissance and electronic warfare UAV

• Operating radius = 60-100 km, Endurance = 2 hrs, Altitude = 3,200 feet.

➢ Sensor payload: PC, Video (RT), LLTV (RT)

Second-Generation UAV

• Operating radius = 300-500 km, Endurance = 12 hrs, Altitude = 40,000 feet.

➢ Sensor payload: Video (RT), LLTV (RT), Imaging IR

SURFACE-TO-AIR MISSILES (SAMS)

SAM	Range	Speed
HQ-2J	34km	Mach 4
RF-61	8km	Mach 3
SA-10C	90km	nk
SA-10D	195km	nk

PLA Systems

TANKS

T-90 II(Indigenous)

- Diesel powered tank with explosive reactive armor
  - ➢ Main armament = 125 mm smoothbore gun
  - ➢ Max road speed = 60+ km/hr
  - ➢ Computerized fire control = control panel, laser range-finder, crosswind sensor and angular velocity sensor.
  - ➢ Infrared reflecting paint

T-85 (Indigenous)

- A diesel powered tank with NBC protection, fire/explosion/suppression system and smoke grenade launcher.
  - ➢ Speed = 65 km/hr
  - ➢ Computerized fire control system,
  - ➢ Armament = 125 mm gun fed by automatic loader.

BMD-3 Airborne Combat Vehicle

- An Infantry Fighting Vehicle (IFV) able to cope with a full range of combat missions assigned to infantry sub-units.
  - ➢ Speed = 70 km/hr, Range = 600-800 km
  - ➢ Equipped with an automatic fire control system.
  - ➢ Armament = 30 mm automatic gun and 100 mm cannon/ guided missile launcher.

HELICOPTERS

Ka-50 Multi-Role All Weather Helicopter.

- One seater, co-axial attack helicopter with an on-board integrated electronic flight navigation and weapon control system.
  - ➢ Comparable to the AN-64A Apache
  - ➢ Speed = 310 km/hr Range = 1,160 km
  - ➢ Armament = 12 antitank *Vihr* missiles (range = 11.5 km), Igla-V air-to-air missiles (range = 1- 5.2km), 30mm canon

Ka-52 Two Seater Multi-Role All Weather Helicopter.

- Co-axial attack helo.
  - ➢ Speed = 350km/hr, Range = 455 km
  - ➢ Armament = antitank *Vihr* missiles (range = 11.5 km), Igla-V AAM (range = 1-5.2km), 30 mm canon

ARTILLERY / ROCKET LAUNCHERS

Smerch Mobile Multiple Launch Rocker System (MLRS)

- Can carry up to five Bazalt parachute-retarded munitions which us sensors to find and fire at a target a 1kg penetrator.
  - Armament = 12 tubes x 300mm missiles.
  - Missile range = 20–70 km

EFOG-M-Equivalent

- An eight missile launcher with antitank and anti-helicopter roles.
  - Missile range = 15km

PLAN Systems

AIRCRAFT CARRIERS

Russian Aircraft Carrier
- A 44,500 ton angled deck aircraft carrier.
- Typically carries 36 Su-33s (*Flanker*) and 2 Anti-Submarine Warfare (ASW) helicopters.
  - ➢ Speed = Mach 2.3 , ordinance = 14,000lb.

Indigenous Aircraft Carrier (first generation)
- A 30,000 ton short deck aircraft carrier.
- Typically carries up to 30 Yak-38 V/STOL aircraft and 1 ASW helicopter.
  - ➢ Speed of = Mach 1, Ordinance = 3,000 lb, Armed = AA-11 (range = 30km)

SURFACE COMBATANTS

- **Modern Destroyer** (e.g. *Sovremenny* Russian guided missile destroyer)
  - ➢ Armament = 8 SS-N-22 Anti-Ship Missile (AshM), SA-N-7 SAMs, 1 KA-27 ASW helicopter.
  - ➢ The SS-N-22 travels at Mach 2.5 to a range of 90-120 km

- ***Luhu*** indigenously built destroyer.
  - ➢ Armament = 8 AshM C-801 (range = 65 km), FM-80(N) SAMs (range = 7km), 2 Harbin Z9A helicopters.

- ***Jiangwei*** indigenously built guided missile frigate.
  - ➢ Armament = 6 AshM C-801 (range = 65km), HQ-61 SAM (range = 8km), 1 Harbin Z9A helicopter.

- **Indigenous Amphibious Assault Ship** (e.g. *Qiongsha* Class)
  - ➢ Military lift = 400 troops, 350 tons of cargo.
  - ➢ Speed = 16 knots
  - ➢ Armament = 8 China 14.5 mm guns.

SUBMARINES

- **Russian Kilo Attack Submarines.**
  - ➢ Armament = 6 x 533 mm torpedo tubes, wake-homing torpedoes.
  - ➢ Each sub can hold 18 type 53 dual purpose torpedoes or 24 mines.
  - ➢ Equipped with SA-14 and SA-16 SAMs

- **Song SS Diesel-Electric Submarine.**
  - ➢ Armament = 6 x 533 mm torpedo tubes
  - ➢ Each can hold 18 Yu-4 or Yu-1 torpedoes
  - ➢ It is capable of firing C802 (range = 180 km) anti-ship cruise missiles while submerged.

- **Han Nuclear Attack Submarine**
  - ➢ Armament = 6 x 533 mm torpedo tubes
  - ➢ It is capable of firing C802 (range = 180 km) anti-ship cruise missiles while submerged.

ANTI-SHIP MISSILES (ASHM)

AshM	Range (km)	Payload (kg)	Comment
C-101 (HY-2) *Silkworm*	83	400	Active radar
C-201 (HY-2A) *Seersucker*	102	500	Active radar / IR Homing
C-301 (HY-3) *Sawhorse*	180	500	Active Radar / Mach 2
HY-4	135	500	Active Radar
C-802 *Saccade*	120	165	Active Radar
XW-41	300	400	Improved HY-4
SS-N-22 *Sunburn*	160	300	Active/passive radar homing. Mach 2.5

Strategic Developments

STRATEGIC DEVELOPMENTS, 1998-2008

MILITARY TRENDS

Despite multinational export control efforts such as the Missile Technology Control Regime (MTCR), ballistic and cruise missile technology continues to spread. Regional competitors are able to purchase ballistic missiles with greater range and accuracy and more lethal warheads than those Iraq used during the Gulf War. An increasing number of states are also acquiring cruise missiles. The spread of accurate ballistic and cruise missiles allows regional competitors not only to attack an adversary's cities, but also ports, airfields, garrisons, and logistics facilities.

In response, a growing number of states -- including the United States, China, India, Russia, Japan, Israel, Great Britain, France, and Germany -- are in the process of deploying or purchasing theater missile defense (TMD) systems. At least for the short-term, current systems should be able defeno point targets against small-scale attacks by ballistic missiles, but will likely be unable to protect large fixed targets against a concerted attack by stealthy cruise missiles or ballistic missile barrage attacks. To complicate matters, states with ballistic missile forces have responded to TMD developments by incorporating countermeasures (e.g., maneuvering warheads, decoys, etc) into their missile designs.

A growing number of states are utilizing unmanned air vehicles (UAVs) for reconnaissance and surveillance. Several advanced states have programs to deploy cruise missiles with reduced signature; others are developing such a capability.

Increasingly sophisticated mines and SAMs have proliferated widely. As a result, traditional amphibious assault has become more difficult and non-stealthy wide-body aircraft such as the JSTARS, AWACs, and ABL have become more vulnerable to attack.

Several international consortia operate commercial satellite communications architectures that provide voice and data service to customers across the globe. While most customers are civilian, several military organizations employ them as well. In addition, public-key encryption provides users - civilian and military alike - access to secure, redundant communications paths.

Both states and non-state actors have access to precision location data provided by the Global Positioning System (GPS) and its counterparts. Precision location information offers the ability to locate friendly and hostile forces to within several meters and to employ stand-off weapons with great precision against fixed targets.

Electro-optical imagery with better than one-meter resolution is commercially available from American, Russian, and European vendors. In addition, the United States,

Russia, China, Europe, Japan, India, Israel, Brazil, South Africa, and Korea possess their own imaging satellites.

GEOPOLITICAL TRENDS

UNITED STATES

The United States remains strong economically, politically, and militarily. Economic growth continues at rates above Europe, but below most of the countries in Asia. The United States continues to be dependent on both oil and natural gas imports. Strategically, America's closest allies are Europe and Japan.

Since the Mexican crisis in 2004, border security has been a recurrent theme in national politics. Concern about the vulnerability of the U.S. information infrastructure was raised in 2005, when a previously unknown Middle Eastern terrorist group with suspected ties to Iran waged a successful information warfare attack against a computer network supporting the New York Stock Exchange. The attack shut the exchange down for two days and sharply curtailed trading for several weeks thereafter. The incident raised concern about the vulnerability of the U.S. information infrastructure to information attack.

CHINA

China's economy continues to grow steadily and it is anticipated that Chinese GDP will surpass that of the United States in the next decade. Beijing is improving and expanding its infrastructure, particularly in the area of telecommunications, and has an emerging space-launch industry. Pursuing military modernization, Beijing has been importing advanced technologies from Russia, western Europe, and Israel. While China's main trading partners continue to be the United States, Japan, Europe, and Russia, the country is becoming the dominant economic force in Central and Southeast Asia.

China's energy needs are voracious. Although Beijing has expanded production in the Tarim Basin and the Bohai Sea, it continues to be a net importer of oil. In 2004, Beijing's negotiations with Moscow and Siberian regional authorities resulted in the development of a liquid natural gas pipeline (LNG) scheduled to go on-line in 2012. Beijing's negotiations with several of the Central Asian republics resulted in a 2007 agreement to build the world's largest natural gas pipeline from Turkmenistan to the Chinese coast. The pipeline is scheduled for completion in 2021.

Relations between Moscow and Beijing are on the whole positive, though China's increasing influence in Central Asia has caused some coolness between the states. Tensions have also arisen between Beijing and the Siberian regional authorities regarding the treatment of the Chinese population in the maritime provinces.

Population growth remains under control. Productivity and production continue to expand and per-capita income continues to rise. However, economic growth is concentrated in the coastal areas; one-quarter of all Chinese still live in poverty. Separatist groups continue to operate in Tibet and Xinjiang, and intermittent violence has occurred throughout the decade.

NORTH AMERICA

MEXICO

Contrary to expectations, NAFTA has not enabled the Mexican economy to overcome its weaknesses. Competition from Asia has hit several important sectors of the economy severely, causing significant economic dislocation. Continuing population growth exacerbates these problems.

Lack of confidence in the Mexican government due to extensive corruption has prevented any effective economic or social reform. Drug interests are reported to have significant influence in Mexico's northern states.

Intelligence reports reveal that several drug cartels have been channeling funds and weapons to the Zapatistas and several other anti-government factions in the south. In the early part of the decade the erosion of the legitimacy of the Mexican government, combined with escalating levels of poverty, sparked the rapid spread of unrest in rural Mexico. As the Mexican government lost control of the situation, the level of violence increased and spread to the north, causing the number of Mexicans attempting entry in the United States to grow significantly.

Violence spilled across the U.S. border as Mexican army special operations units pursued insurgents into Texas. The situation reached a crisis point in 2004 and the U.S. President decided to use military forces to restore order along the border. In the six years since the crisis, U.S. assistance to Mexico has enabled the government to reassert control over most of the countryside. The violence exacerbated Mexico's economic woes, but with American assistance the economy is rebounding.

CUBA

Fidel Castro died in 1999. Shortly thereafter, his brother and heir apparent Raul was assassinated in an internal power struggle. Havana's new leadership has liberalized the Cuban economy and opened it to foreign investment. Growing shares of Cuba's well-educated population are employed in the global information economy.

ASIA

ASEAN

The region has seen significant growth and economic development, though some states, Indonesia in particular, have lagged behind the rest. The organization is divided into pro-China (Malaysia, Singapore, Thailand) and anti-China (Vietnam, Philippines, Indonesia) camps. As a whole, the organization has focused on economic and development issues.

INDONESIA

The post-Suharto successor regime has had difficulty controlling anti-government insurgent groups on Sumatra and Timor. Violent clashes have occurred continually in the past decade. As the violence has spread, investor confidence has been shaken and economic growth has slowed.

KOREA
Korea was re-unified in 2004. Despite international economic assistance to the north, the cost of unification has been high. The difficulties of integrating the north into the south, combined with xenophobia and nationalism, have fueled resentment towards outside powers. Recent years have seen the rise of vocal anti-Japanese sentiment. Seoul's failure to provide a complete accounting of the former North Korean nuclear program has also created friction. For the time being, a token U.S. military presence remains in Korea to reassure Japan. American and Korean leaders have, however, agreed to a phased withdrawal of American forces from the peninsula by 2014.

JAPAN
Japan has been able to pull itself out of the economic doldrums of the 1990s and is once again experiencing economic growth and prosperity. Good economic and trade relations with the states in the region remain a priority for Tokyo, but the risks posed by the increasing missile threat have galvanized the government to invest in TMD. The nature and mission of Japan's self-defense forces have not been changed significantly. Instead, the Japanese government reaffirmed its security relationship with the United States.

INDIA
India's path to economic development has been bumpier than China's, but the country's economy is now growing robustly, as are its energy requirements. India has not been able to access Central Asian pipelines to its north and west because of tensions with China and Pakistan. India relies on the Middle East states, Malaysia and Indonesia for its energy imports.

The economy branched out into many high-tech industries, particularly software development and space systems. New Delhi has made significant inroads in modernizing the country's telecommunications and transportation infrastructure. Through increased defense expenditures, the Indian Ministry of Defense improved the military's power-projection capabilities, while modernizing its naval, air and ground forces. Already cool relations between New Delhi and Beijing worsened after China's navy base in Burma became operational in 2002.

PAKISTAN
Pakistan continues to lag economically behind its neighbors. The conclusion of the Afghan civil war in 2003 enabled the construction of long-awaited oil and LNG pipelines from the Central Asian states to the Pakistani coast. Islamabad has refused to approve the construction of spurs to India, linking its cooperation to the peaceful resolution of the Kashmir conflict. Tensions between the two states remain high.

EURASIA

RUSSIA
Russia has begun to get its economic house in order, but communism has bequeathed it a tremendous human and economic legacy. The process of modernizing the state's industry and infrastructure is a slow one. Relations between Moscow and the regional governments continue to be fraught with difficulties. In several regions, particularly eastern Siberia, pro-independence movements have gained momentum. The need to

rebuild Russia largely dictates Moscow's foreign policy. Moscow is concerned about the growth of Chinese power in Asia, particularly its increasing economic ties with the Central Asian states and Siberia.

Faced with severe economic constraints, the Russian military is pursuing a policy of selective modernization. Its top priority is to ensure the viability of its strategic and tactical nuclear forces. Moscow has increasingly come to rely upon nuclear weapons to offset the fact that its conventional forces are falling farther and farther behind the state of the art. The size of the Russian army and air force continues to dwindle. The navy's surface fleet has declined considerably, although the production of advanced submarines has increased.

Russia continues to develop a number of advanced technologies, including directed-energy systems, sensors, signature reduction, and advanced explosives. It seems unlikely that such weapons will be fielded in more than limited quantities anytime soon, however.

AZERBAIJAN

Post-independence oil deals and contracts with western oil producers generated the wealth necessary for significant economic and infrastructure development. The economy is strong, and Baku is becoming an important financial center for those interested in investing in Central Asia. Militarily, Azerbaijan remains weak, relying on Russian and western support to contain the Armenian rebels operating in the Nagorno-Karabakh region.

CENTRAL ASIAN REPUBLICS

With significant investments from China, the United States, Russia, and Europe, the Central Asian republics have been developing their energy infrastructures to meet growing world demand. Western expansion of this infrastructure has been constrained by the continuing conflict between Azerbaijan and Armenia. The conclusion of the Afghan civil war in 2003, however, provided a much desired eastern export route for the region's resources. China's influence in the region continues to grow.

EUROPE

Europe has been moving down the long and bumpy path towards economic integration. Trade friction has periodically strained relations with the United States, but they in general remain amicable. NATO expanded to the east when the Czech Republic, Hungary, and Poland joined the organization. Increasingly concerned by the spread of Islamist power in the Maghreb, the European members of NATO - especially France, Spain, and Italy - have emphasized planning and training for out-of-area operations in the Mediterranean littoral.

MIDDLE EAST

IRAN

Iran poses the most serious threat to U.S. interests in Southwest Asia. Tehran possesses a handful of nuclear weapons, a stockpile of chemical and biological weapons, and ballistic and cruise missiles capable of delivering them throughout the region. It has also deployed an increasingly potent anti-access capability in the form of

shore-based mobile anti-ship cruise missiles, surface-to-air missiles (SAMs), large numbers of naval mines (including sophisticated rising mines purchased from China), and diesel attack submarines. This anti-access system gives Iran the ability to greatly increase the cost of U.S. power projection operations in Southwest Asia. Gulf Cooperation Council (GCC) members have voiced doubts about the ability of the United States to fulfill its commitment to them.

IRAQ

Iraq poses a limited threat to U.S. allies in the Persian Gulf. United Nations sanctions have been lifted, but monitoring of Iraqi weapons programs continues. While Iraq possesses a large, but aging, mechanized army, the regime in Baghdad has been preoccupied with internal unrest from Shia opposition in the south and Kurdish separatism in the north.

ALGERIA

An Islamist regime swept into power in Algiers in 2001, triggering a bloody and protracted civil war. The new Algerian regime, with strong ties to Tehran, has sparked concern in Europe over the spread of militant Islam on its doorstep. Both Iran and Algeria have been linked to insurgencies in Morocco and Egypt. There are also suspicions that Algeria may be diverting materials from its nuclear power plant to develop nuclear weapons, but intelligence organizations have been unable to substantiate the charge.

SAUDI ARABIA

The kingdom remains the largest oil producer in the world. However, recent protests and demonstrations indicate that the ruling family maybe losing its firm grip of control. Several anti-American demonstrations ended in violence, and there is increasing populist sentiment for the removal of American troops from Saudi Arabian soil. It is believed that several of the most vocal anti-American groups are receiving support from Tehran.

NON-STATE ACTORS

Sub- and trans-national actors, such as terrorist groups, drug cartels, and criminal organizations, are playing an increasing role in international affairs. A number of groups have acquired advanced conventional weapons such as SAMs, precision mortars, and anti-tank guided weapons (ATGWs); several have developed the ability to manufacture and deliver chemical and biological weapons. Moreover, the diffusion of information technology is increasing the power of these organizations. The Internet and satellite communications provide cells with cheap and easy means to communicate with one another, while the combination of satellite navigation and precision weaponry allows them to launch small but highly lethal attacks. The information warfare attack upon the New York Stock Exchange in 2005 highlighted the potential of non-state actors to inflict considerable damage upon the economy of a major power.

STRATEGIC DEVELOPMENTS, 2011-2023

MILITARY TRENDS

A number of states are pursuing emerging warfare areas (see Table 1). Several have acquired or are experimenting with strategic non-nuclear precision-strike forces utilizing ballistic missiles, stealthy cruise missiles, and precision-guided munitions (PGMs) dropped by aircraft. A number of states have acquired or are developing the ability to conduct independent information warfare operations. The use of space for military purposes continues to increase, including the deployment of weapons in orbit.

Table 1: Emerging Warfare Areas, C. 2023

	Russia	Europe	Japan	India	Iran
Strategic Precision Strike	D		D	D	D
Independent Information Warfare	E	E	E	D	D
Space Warfare	E	E		D	D*
Missile Defense	D	D	D	E	
Decentralized Ground Operations		D			
Unmanned Air Operations	D	D	D	D	
Submerged Power Projection	D				
Anti-Navy			D	D	D

D = Deployed Capability · E = Experimental Capability · R = Research and Development
** Limited ASAT capability, developed with assistance from China.*

The threat posed by ballistic and cruise missiles has led a number of states to improve their theater missile defense (TMD) capability. However, these systems are easily overcome either by barrage attack or by stealth. The increasing vulnerability of massed forces to long-range precision strikes has caused states to reduce the signature of their military ground, sea, and air forces. Such efforts have included fielding smaller and more maneuverable units as well as incorporating low-observable materials into the design of individual military systems.

Decentralized ground units comprised of light armored vehicles, helicopters, and missiles have supplemented or supplanted massed armored formations in a number of armies. Advanced ground forces are also increasingly roboticized. Theater entry has become increasingly problematic. All state-of-the-art aircraft designs are stealthy, with low-observable unmanned air vehicles (UAVs) and weaponized UAVs in wide use. Stealth is also being applied to wide-body aircraft (air transport, air refueling and air control, i.e., ABL).

Naval surface combatant designs have incorporated low-observable features to reduce their vulnerability to anti-ship cruise missiles, but the vulnerability of even these platforms have caused several navies to move to submersible ship designs. In addition,

submarines feature more prominently in naval warfare given the vulnerability of surface ships and the continued importance of undersea control.

Several states have pursued an anti-navy capability by netting together precision weapons, sensors, mines, and submarines. Accordingly, high-end naval power projection, including amphibious warfare, is increasingly becoming an element of undersea warfare.

GEOPOLITICAL TRENDS

ASIA

KOREA

The last American troops left Korea in 2014, ten years after Korean unification. Nationalism and xenophobia continue to create friction with Korea's neighbors, especially Japan and Russia. Seoul continues to drift closer to China. In 2018, western intelligence organizations revealed that Seoul was developing nuclear weapons, word of which sent shock waves throughout Asia and pushed Japan towards increasing its military spending.

JAPAN

The reunification of Korea, revelations about Seoul's nascent nuclear program, and the growth of China's power have led Japan's leadership to seek closer ties to the United States. Tokyo's nervousness culminated in the 2019 decision to expand considerably its defense expenditure in a move that strained relations with China and Korea. There are fears in U.S. policy circles that Japan may abruptly tilt to a pro-China policy.

In the years that followed, the Japan Self-Defense Forces (JSDF) expanded its naval and air forces and air and missile defenses. The Japanese government publicly reiterated its pledge not to acquire nuclear weapons, but announced the creation of a non-nuclear long-range precision strike arm to serve as a strategic deterrent. Japan has developed experimental information warfare capabilities.

INDIA

Robust economic growth has enabled India to modernize its forces and make significant advances in space and information warfare capabilities. India has become an important center for software development, and its indigenous commercial space industry has become a substantial player in the global market. In the last decade, the Indian space agency launched four of its own military surveillance satellites. India has both nuclear and non-nuclear precision-strike forces and the military has deployed a significant anti-navy capability. Theater missile defenses are experimental.

On the strength of its growth in military and economic power, India has developed a correspondingly more assertive foreign policy. Relations with both Pakistan and China remain strained.

INDONESIA

The government of Indonesia continues to face internal conflict. Several insurgent groups supported by Indonesia's Chinese minority and aided by Beijing have carried out terrorist acts throughout the country, including the destruction of several airliners using hand-held surface-to-air missiles. Instability in Indonesia and the rise of China have, in turn, caused Australia to increase its defense spending and seek closer ties with the United States.

EURASIA

RUSSIA

The Russian economy has been growing slowly, though steadily, thanks to European and American investment. The modernization of Russia's domestic infrastructure has led to the expansion of both the manufacturing and information sectors of the economy. Rising expectations have led to calls for autonomy from regions that feel they have not shared in Russia's economic success.

Eastern Siberia seceded from Russia in 2012. The new Siberian Republic has attracted investment from American and Japanese firms, who have been exploiting the republic's vast natural resources. China has heightened its influence in the region as well.

Moscow's relations with western Europe and the United States are cordial, due to both shared economic interest and concern over China's growing power. Russia's reconciliation with its former Cold War adversaries culminated in its admission into the North Atlantic Treaty Organization (NATO) in 2020. The Russian government is concerned by Iran's apparent attempts to subvert the governments of the Central Asian states, as well as Beijing's increasing influence in the region.

Faced with a growing missile threat on its borders, Russia has deployed a TMD capability. While Moscow continues to rely heavily upon nuclear weapons to deter attack upon the homeland, the armed forces have also fielded several strategic non-nuclear strategic strike units. Although the navy's surface fleet remains small in comparison to that of other great powers, its submarine force has continued to expand and modernize. Russia has also developed experimental capabilities to wage strategic information warfare and the military is also developing a space warfare capability. The Russian air force is capable of limited UAV operations, but efforts to transform the army remain embryonic.

EUROPE/NATO

The Islamic threat from northern Africa has increasingly driven European defense planning. NATO has deployed a limited TMD capability in southern Europe. In addition, France, Italy, and Spain have together fielded a high-technology expeditionary division for use in the Mediterranean littoral. NATO members have developed UAV strike capabilities and are also developing capabilities in the fields of information and space warfare.

Growing ties between Russia, Europe, and the United States, and mutual concern over the growing power of China, culminated in the 2020 decision to admit Russia into a greatly expanded NATO. Most of the former Warsaw Pact as well as Ukraine, Belarus, Moldova, and the Baltic states were admitted to the organization earlier in the decade. The pact's geographic scope has expanded, and the alliance's charter has been amended to give priority to out-of-area operations.

MIDDLE EAST

IRAN

Iran continues to foment instability in the region. Tehran's relationship with the Islamic regime in Algeria remains close, and Iran figured in the overthrow of the Egyptian government in 2011. Iranian agents have also been linked to Islamist insurgencies in several Central Asian states.

Tehran's closest foreign ally is Beijing. China supplies Iran with a range of weapons, including ballistic and cruise missile systems. In addition, China gives Iran access to data from its space-based reconnaissance assets. These capabilities have bolstered Iran's ability to deny outside forces access the Persian Gulf region.

EGYPT

Popular dissatisfaction with rampant corruption and declining standards of living translated into growing support for Islamic insurgent groups in Egypt. In 2011, the Egyptian Islamic Brotherhood, with aid from Algeria, Iran, and Sudan, seized power in a revolution that triggered a bloodbath against the former regime. The new government closed the Suez Canal for two weeks to demonstrate its power, then re-opened it with sharply increased tolls.

The new Islamist regime in Cairo has begun enforcing a strict interpretation of Islamic law and has launched pogroms against Egypt's Coptic Christians. The spread of radical Islam has alarmed both moderate states (such as Jordan) and conservative regimes (such as the gulf monarchies).

ISRAEL

Israel, alarmed by the spread of radical Islam, has given renewed attention to the acquisition of both TMD and long-range precision strike systems. The Israel Defense Force (IDF) had developed sophisticated unmanned air vehicles for reconnaissance and surveillance and has experimented with their use for strike missions.

NON-STATE ACTORS

In 2021, A small group affiliated with an obscure Asian religious sect released a genetically-engineered biological warfare (BW) agent into San Francisco's Bay Area Rapid Transit (BART) subway system during rush hour. The attack led to the death of over 500 people and permanently disabled more than 1,000.

Crisis Events	**X**

CRISIS (2009)

TAIWAN

Weeks before the election in 2008, a scandal rocked the island when it was revealed that several of the highest officials in the Nationalist Party were channeling funds from Beijing to pro-unification groups on the island. When the news was made public, mass pro-independence demonstrations ensued. Advocating independence from the mainland, a Taiwanese nationalist from the Taiwan Democratic Progressive Party was elected president.

Three weeks after the election, the government held a national plebiscite on the question of independence. 58 percent of the population voted for independence. With the support of the national Assembly and the Legislative Yuan, the president declared Taiwan's independence from China, making the following statement: "The Taiwanese choose life, liberty, and the pursuit of happiness as a free and independent country."

In stunned surprise the international community is struggling to figure out an appropriate response to the Taiwanese action. European statesmen, Russian and Japanese leaders have called for Chinese restraint and a peaceful resolution to the situation. Chile has recognized Taiwan's independence.

CRISIS (2023)

SIBERIAN REPUBLIC

Since Siberian independence from Russia in 2012, the United States, China and Japan have been investing heavily to develop the country's energy infrastructure. The United States receives 15 percent of its energy supplies from Siberia, China receives 20 percent. The booming Siberian economy has drawn three million Chinese workers into the country (which represents 15 percent of the population).

The large number of resident Chinese workers became an issue of concern for the Siberian government when a series of strikes by Chinese nationals severely interrupted operations at several key natural gas refinement facilities. The Siberian government responded by restricting the flow of natural gas to China, revoking work permits, and severely restricting both the immigration of Chinese workers and cross-border traffic. These measures provoked large demonstrations in Vladivostok, Khabarovsk, and other cities (where up tc 25 percent of the population is ethnic Chinese). The situation in the Amur River Valley has escalated into Russo-Chinese ethnic conflict, which the Siberian armed forces have moved to suppress. Several thousand ethnic Chinese have been wounded or killed.

The Siberian armed forces are capable of maintaining internal order (for the time being) but would collapse quickly in the face of a Chinese invasion (see attached order of battle).

CSBA CENTER FOR STRATEGIC AND BUDGETARY ASSESSMENTS

1730 Rhode Island Avenue, NW, Suite 912
Washington, DC 20036
Tel: 202-331-7990 Fax: 202-331-8019
http://www.csbahome.com