

Statement to the Subcommittee on

Intelligence, Emerging Threats, and Capabilities

Dr. Mark Lewellyn, National Security Analysis Department Head,

The Johns Hopkins University Applied Physics Laboratory

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Chairman Thornberry, Congressman Langevin, and Members of the Subcommittee. Thank you for inviting me to provide my views on the important trends that will shape the national security environment looking out to 2030 and how they might affect the path set by the 2012 Defense Strategic Guidance. In addition, you asked for an assessment of the guidance whether there are threats or missions that are not adequately addressed and require greater attention. The opinions stated are my own and do not necessarily reflect those of The Johns Hopkins University Applied Physics Laboratory or its sponsors.

It is more than two decades since the U.S. concluded Operation Desert Storm. Since that time – and especially since 9/11 – the U.S. has been involved almost continuously in combat operations. Our involvement in these operations is now

winding down. At the same time, the economic constraints on the investments we can make in our military forces are increasing. The 2012 Defense Strategic Guidance flowed from an assessment of how this changing security environment along with changes in future threats would shape the U.S. defense strategy. The strategy is intended to transition “our Defense enterprise from an emphasis on today’s wars to preparing for future challenges, protect the broad range of U.S. national security interests, advance the Department’s efforts to rebalance and reform, and supports the national security imperative of deficit reduction through a lower level of defense spending.”

Will this strategy get the military capability we need in the near term – especially in the context of declining funding for defense? The strategy attempts to be comprehensive. However, there are some areas where we may be falling short, and we must think through an integrated response to address them.

The strategy identifies a range of missions that U.S. forces need to address with the resources that are available and the threat environment in which the missions must be executed. The resources needed to deal with the threats include the ships, aircraft, ground vehicles, sensors, weapons, communications equipment, cyber and space assets, and other materiel used by soldiers, sailors, airmen, and

marines.

A starting point for determining the resources we need is the existing force structure, which changes relatively slowly over time. Much of our technical effort focuses on improving the capabilities of the sensor, weapon, communication, cyber, and space systems that will be used to address emerging threats. Our work indicates there are gaps in the capabilities we need to defeat emerging threats identified in the strategy – particularly the anti-access and area denial threats posed by Iran and China.

For example, maintaining our access to space is a real issue, but there are few viable backups to counter attacks on our satellite communications networks close to a denied area and quickly reconstitute the capability they provide. This includes the need to identify methods to operate in environments where the Global Positioning System (GPS) is denied. Also, the kinetic weapons we are developing to counter threats launched against our forces, while capable, should be supplemented by “non-kinetic” systems to insure we can deal effectively with large, coordinated attacks. Non-kinetic means to defeat these threats include netted electronic warfare systems, integrated cyber attack capability, lasers and other directed energy systems. In addition, we should explore creative uses of existing weapons to counter threat systems. We must also continue to explore

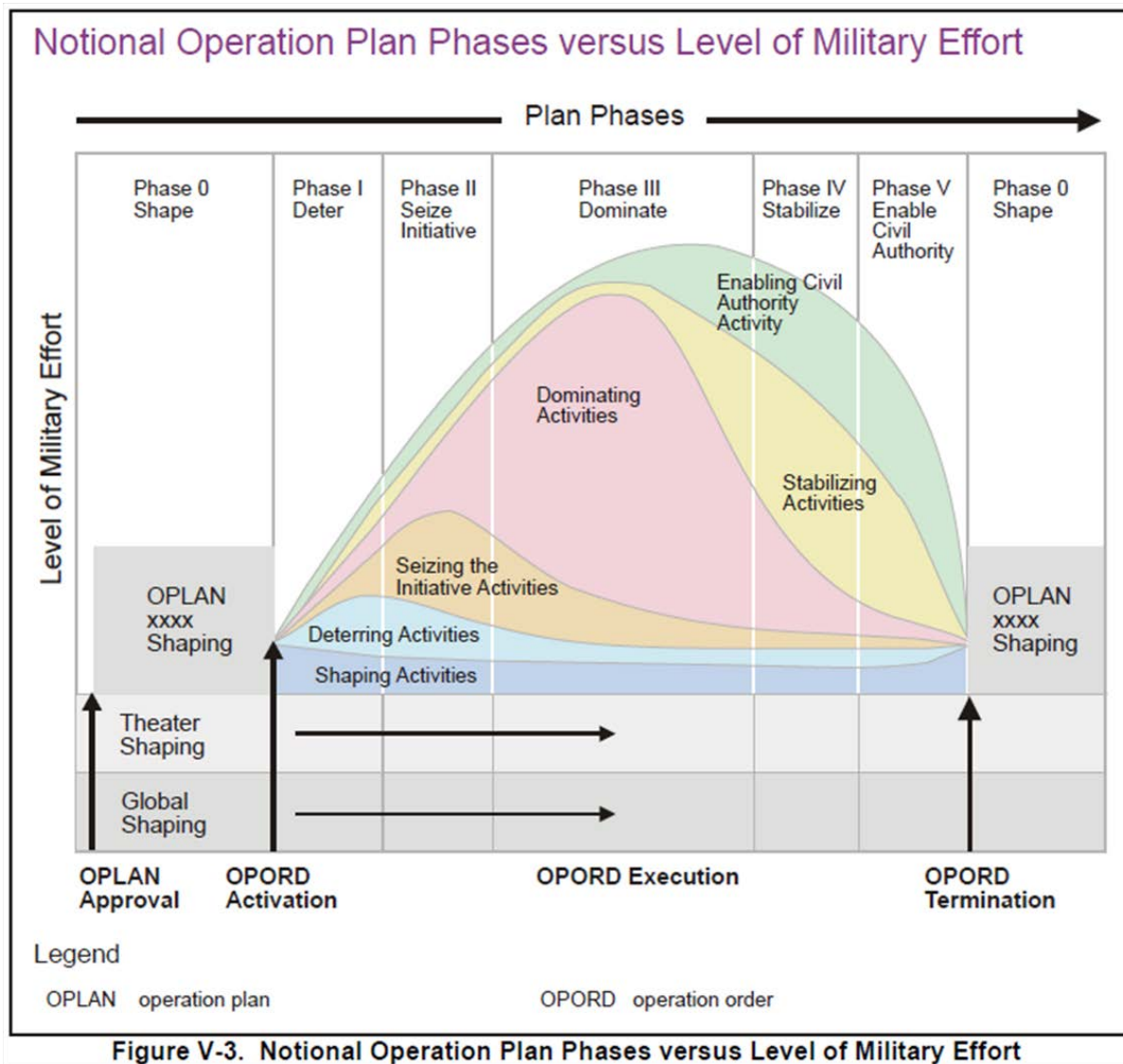
ways to use electromagnetic weapons with their promise of large magazines of relatively inexpensive “bullets” to counter threat kinetic weapons. We have an edge in the capability of our submarine force relative to potential threats, and we must work to maintain it. The ambiguity posed by the unseen presence of a capable submarine can be leveraged to our advantage. Exploring ways to operate unmanned systems autonomously will allow the proven capability of these systems to be used in new ways. Finally, we must insure that our special operations forces have the technology they need to perform their critical missions.

U.S. strategy calls for forces to deter and defeat aggression, project power despite anti-access/area denial challenges, operate effectively in cyber space and space, and provide a stabilizing presence, therefore, we must consider the capabilities we need in peacetime (to deter and provide presence) as well as in wartime (to defeat and project power). While we work to improve the ability of our systems to defeat those of the threat in war, we must also consider how we can better use these systems to deter potential threats and “win without fighting” much as we did during the cold war. (In the cold war, we did this by outspending the Soviet Union. Given our current economic environment, we do not have this luxury against today’s emerging competitors.)

The following figure shows the phases of a notional operations plan (OPLAN) and the relative level of military effort corresponding to each phase. Phase “0” corresponds to shaping, which includes developing alliances, security cooperation, and security assistance plans through diplomacy to support U.S. goals in the area of interest. Phase “1” corresponds to deterrence. Deterrence includes an element of responsiveness, and prepositioned and/or forward-deployed forces help reduce the response time. Space and cyberspace assets provide especially quick response with their persistence and speed-of-light performance, respectively. As the figure shows, shaping and deterrence in a particular theater demands a continuous, but relatively low, level of military effort.

In the event deterrence fails, subsequent phases 2 through 5 demand increasing levels of military effort to seize the initiative, dominate the threat, and provide post-conflict forces to stabilize the area and enable the return of civil authority. We saw this increase in the demand for military effort and its eventual decline clearly during Operation Iraqi Freedom.

To limit the level of military effort in a time of decreasing resources for defense, it makes sense to focus our efforts to “win” through shaping and deterrence.



Source: Joint Publication 3-0, *Joint Operations*

The defense strategy calls out two countries by name – China and Iran – for their efforts to develop asymmetric means to counter U.S. power projection capabilities indicating areas of the world where we will need to maintain

responsive forces to deter and, if needed, defeat potential threats. The defense strategy further calls for a rebalance toward the Asia-Pacific region in the context of overall contribution of U.S. forces to global security.

Because of this rebalance toward the Pacific and, in particular, a focus on China, we recently completed a small internally-funded research effort to understand better how shaping and deterrence in the Western Pacific might work for naval forces. Our interest was in figuring out ways to use the available military effort to keep potential conflict from shifting from operations in Phases 0 and 1 to Phase 2 and higher where the demand for resources might outstrip our ability to provide them.

Our work focused on the pre-conflict dimensions of the emerging competition between the U.S. and China in the Western Pacific. It was motivated by a concern that understanding the capabilities needed to defeat a potential threat, i.e., succeed in Phases 2 and 3, may not be sufficient to understand how these same capabilities can deter that threat and shape the environment in which our forces operate to support broader U.S. strategy.

In China, the United States has a competitor with a coordinated, whole-of-government strategy for achieving its national objectives in the Western Pacific

without needing to resort to war, i.e., to win in its version of Phases 0 and 1, as evidenced by its development of anti-access, area denial capabilities. In turn, to deter China effectively, the U.S. must employ an effective countervailing strategy informed by an understanding of the implications of divergent U.S. and Chinese perspectives. In short, the U.S. and China view the world through different lenses. These affect how we: view each other; view other states in the region; conduct diplomacy and commerce; develop and implement policy, strategy, and plans; and conceive of conflict and wage war. We must include an understanding of these differing views as we operate our current forces in the Pacific and as we develop, test, and employ new capabilities to insure that the “messages” we want to send to China are received as we intend. The “message” China sent by demonstrating its ability to shoot down a satellite several years ago was received clearly by us.

How can we do this? Our initial work suggests the following.

At the strategic level, we must ensure a continued whole of government strategy for the Western Pacific that: coordinates the application of all elements of national power to ensure that our peacetime policy goals are not undermined by China’s “win without fighting” strategy; minimizes the risk that misperceptions



will exacerbate crises; and balances the competing imperatives of shaping, deterrence, and war-fighting. We must also broaden our investment in learning about Chinese strategic culture, military culture, service cultures, and operational cultures (including acquisition practices). Further, we should consider the use of “cultural red teaming” to review the way our forces plan to operate in proximity to China’s and develop consistent methods to understand how our actions are perceived.

As an example the Navy is starting to deploy its new small combatant the Littoral Combat Ship (LCS) and plans to forward base the first of these ships in Singapore. The LCS will therefore be a new Phase 0 – 1 asset available for use in the Western Pacific. How will we use the LCS, and what messages do we want to send with it?

We must also ensure that our intelligence collection efforts remain strong and that as a government we encourage openness and transparency drawing on insights gained from social media and other information technologies.

Information is critical, and there is already evidence that in the cyber world operations may already be shifting from Phase 1 into more direct competition.

We must ensure that our cyber forces are equipped with the appropriate technologies and rules of engagement to win.

What does all this mean for Congress? You should support the development of capabilities that contribute to “winning” in Phase 0 – 1 including continued development of warfighting capabilities that contribute to deterrence such as the aforementioned efforts to compliment our kinetic systems by developing complimentary non-kinetic means to defeat threats. These include netted electronic warfare systems, integrated cyber attack capability, lasers and other directed energy systems, as well as electromagnetic weapons able to fire larger magazines of “bullets” to counter threat kinetic weapons. In addition, we need to maintain our edge in submarine warfare, cyber operations, and special operations capability. The latter will be critical to address continued threats from terrorism, which are not directly aligned with emerging threats like China. And because communications and intelligence are critical for operations in Phase 0 – 1, we must work to maintain our access to space and identify ways to improve resilience in our space systems.

Thank you for the opportunity to provide my comments. I am prepared to address any questions you may have.

Dr. Mark T. Lewellyn is Head of the National Security Analysis Department (NSAD) at the Johns Hopkins University Applied Physics Laboratory (JHU/APL). Dr. Lewellyn assumed leadership of NSAD in April 2011 and heads a multidisciplinary department of more than 200 staff tasked with defining emerging national security challenges; identifying future system capabilities and requirements; characterizing the operational context for future systems; and assessing the effectiveness of new technologies, operational concepts, and integrated systems on joint force effectiveness and national security policy.

Before joining APL, Dr. Lewellyn served as Vice President and Director of Advanced Technology and Systems Analysis at the Center for Naval Analyses, an operating division of CNA. During a 33-year career at CNA, he led numerous technology and acquisition studies for the Navy, Marine Corps, and Coast Guard; served as Scientific Advisor to Navy and Marine Flag and General officers charged with developing and acquiring new systems; and held middle- and senior-management positions of increasing responsibility.

In addition to his responsibilities at CNA and APL, Dr. Lewellyn served as a member of the Defense Science Board Task Force on Early Intercept Ballistic Missile Defense from May 2010 to May 2011.

Dr. Lewellyn holds a Ph.D. from the University of California (Berkeley), an M.Sc. from the University of East Anglia (as a Fulbright-Hays grant recipient), and a B.A. from Hamline University, all in the physical sciences.

Dr. Lewellyn is a recipient of the Department of the Navy Meritorious Public Service Award.