

**Statement of Dr. Michael Pillsbury**  
**To the US-China Economic and Security Review Commission**  
**Hearing on China's Military Modernization and its Impact on the U.S.**  
**and the Asia-Pacific**  
**March 30, 2007**

Let me begin by expressing my appreciation to the Chairman and the other distinguished members of the US-China Economic and Security Review Commission. It is an honor to have the opportunity to testify here today.

The "tool kit" of the Office of Net Assessment in the Pentagon offers many approaches to understanding the questions that several Commissioners posed to the witnesses during yesterday's hearing about China's long term military goals and capabilities. If we have time today, I would like to suggest how some of those tools may assist in "diagnosis" of where China is going and how to assess what our strategic interaction with China should be over the long term. Net Assessment studies not only alternative scenarios, but also the role of perceptions, the various types of shocks and surprises that can occur, and organizational theory such as the contributions that Nobel prize winners like Herbert Simon have made, extending also to psycho-cultural insights from scholars like Nathan Leites whose work on operational codes combined open sources with insights from psychoanalysis and cultural anthropology. Net Assessment used an eclectic approach to understanding the Soviet Union, with some success.

First, as I understand your questions, let me jump from the "diagnosis" that Net Assessment aims for to the Commission's interest in "prescriptions" for Congress.

I completely agree with the excellent statement of General Cartwright of STRATCOM the Senate Subcommittee on Strategic Forces two days ago. I have attached an excerpt from the transcript for the convenience of Commissioners. General Cartwright bears the responsibility for this issue within DOD. He gave a briefer version to you yesterday in his comments, so I recommend you read his full remarks which are the most complete account the DOD has provided. China's formal position on its ASAT test January 11, 2007 is clear. The Chinese Foreign Ministry spokesman has said "other countries should not be alarmed."

In my study for the Commission on January 19, I raised ten possible policy measures that the Commission may wish to consider for its annual report to the Congress:

### *1. US Countermeasures – Awareness, Assessing Damage, Forensics, Counter Strikes*

Of the thirty Chinese proposals, one set would be particularly challenging to US military vulnerabilities in a crisis. In each of their books, Chinese Colonels Li, Jia and Yuan all advocated **covert** deployment of a sophisticated antisatellite weapon system to be used against United States in a surprise manner without warning.

In my view, even a small scale antisatellite attack in a crisis against 50 US satellites [assuming a mix of targeted military reconnaissance, navigation satellites, and communication satellites] could have a catastrophic effect not only on US military forces, but of the US civilian economy. It is not clear from US open sources how rapidly--if at all--United States could launch “spare” satellites to replace a few dozen that had been incapacitated in orbit by a Chinese attack. US sources refer to many [very expensive] countermeasures such as maneuvering satellites in orbit to escape destruction, using constellations of small satellites, rapid replacement with spares, and even prompt counter strikes on the Chinese launchers.<sup>1</sup>

A second set of Chinese concepts proposed in these open source writings would also be particularly challenging. Many of the concepts recommended include both jamming and attacking ground stations, rather than the permanent destruction of US satellites. In both cases, the Chinese authors imply the United States may lack the “forensic” ability to know which nation had neutralized US space systems through covert attack, jamming or destruction of ground stations by missile or Special Forces raids. The US Defense Department currently has put before Congress various proposals for enhancing situational awareness of space attack, but the ultimate approval of multiple-year funding is unknown.

### *2. Need for Dialogue with PLA and these ASAT Authors*

It is important that the US establish with the Chinese in military exchanges the serious importance to which we assign this published, detailed advocacy of Chinese covert preparations to weaponize space. Access to ASAT specialists in China has been impossible in the DOD exchange programs in the past decade, according to some observers, because China prohibits ASAT experts from participating in the exchanges at all. The 3 PLA authors appear to experts on space, but may never have visited the US, and, if they are invited to visit us, could be made aware of both the Congressional restraints on US space programs in the past, and the likely consequences of a Chinese shock and awe attack of the kind their books advocate..

### *3. Detecting Signatures of Chinese ASAT, Intelligence Challenge for US Policy Decisions*

An implication for the US intelligence community of these Chinese proposals would be the feasibility of identifying the developmental “signatures” of the recommended covert systems through normal intelligence collection. It may be difficult and probably

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<sup>1</sup> For a Unclassified list of countermeasures, see “Space Systems Survivability,” Uri Ra’anan and Robert L Pfaltzgraff, Jr, eds., *International Security Dimensions of Space*, Hamden CT, Archon Books, 1984, pp 87-93.

impossible to detect the manufacturing and testing of many of the components that are proposed. The authors make clear in many of the recommendations that the acquisition of the systems and even their deployment are to be done covertly in a manner that cannot be detected by United States until the moment of their use by China in a crisis. Plasma attack, attacks on GPS, use of stealthy satellites, penetration and destruction of ground stations, jamming based on deceptive transmissions that imitate US signals, experimental units that can be converted in a crisis, ASATs fired from submarines -- all these concepts could potentially be concealed in advance of their use unless their signatures were anticipated. By definition, the Chinese government would deny the existence of such covert programs. Indeed, consideration must be given to the possibility that active duty colonels have been permitted to publish such proposals as an effort to influence US thinking regarding the potential vulnerabilities and lack of effectiveness of possible space based national missile defense components, thus discouraging their development and acquisition.

#### ***4. Multilateral Diplomacy with Japan, India, European Union and Russia on ASAT***

There are opportunities to pursue multilateral diplomacy with US allies. We might ask whether other nations in addition to the United States have any concerns about these proposals and recommendations. The question would be whether China in the future may be the subject of pressure from the international community in addition to the United States. We should not approach this matter unilaterally.

#### ***5. Verification and On Site Inspections in a Possible ASAT Agreement?***

With respect to US arms control policy, some advocates such as Congressman Ed Markey have proposed that we re-think the question of refusal to negotiate or discuss the Chinese proposal to the UN conference on disarmament in Geneva on a non-verifiable agreement against weaponization in outer space. If such an agreement explicitly permitted American National missile defense and was verifiable with on-site inspection, it might merit negotiation. After all, China has accepted 100 visits by the inspection organization of the chemical weapons ban, so the precedent exists of China's accepting on-site inspections for international arms control agreements. Of course, the ban will be reciprocal so the United States would be compelled to accept inspections potentially of sensitive facilities under the control the national reconnaissance organization which manufactures highly classified US satellites and space systems.

#### ***6. Inference of Chinese Determinations of US Space Weapons activities and plans***

With regard to future Sino-American exchanges and dialogue, one might ask what precisely are the catalysts or red lines that China seems to be suggesting will compel it to initiate the acquisition and deployment of space-based systems including antisatellite weapons. This issue is significant because an effort to engage China in a dialogue on space weapons would be futile and even naïve, if the decision has already been made by Chinese leaders because of their misperceptions of existing US policies and programs.

#### ***7. China's Proposed Space Weapons Ban and Current US Missile Defenses***

In terms of understanding Chinese motives for a proposal in 2002 for a space weapons ban, that is, a decade after Chinese authors first recommended ASAT development, it is useful to keep in mind the relevant chronology. The American arms-control community has actively advocated a ban on space weapons systems since at least 1999, as can be seen in the appendix [Bibliography on Space Arms Control]. It seems possible therefore that China's proposal in Geneva in 2002 may have been stimulated by three or more years of observing US arms-control community proposals for space weapons bans.

If this hypothesis is correct, it helps to explain why China permitted the publication of three rather provocative books in 2001, 2002, and 2005 by military officers' with their proposals for covert deployment of antisatellite weapons directed at US assets. The publication of these books and other explicit recommendations advocating future antisatellite programs may have been authorized as part of a larger design to influence the US policy debate in the Congress and the media. One goal would be to oppose the extensive proposal by Senator Sam Nunn for a national missile defense system of 100 interceptors. If China essentially is threatening to deploy a robust ASAT system in the decade or two ahead, it makes a powerful case against even the current modest 20 interceptor system of in the present program.

#### ***8. Space-related Export Controls and Further Restrictions on Deemed Exports***

There are substantial export control issues involved in any US decision to oppose or impede China's potential acquisition of antisatellite systems. We might ask whether more restrictive technology transfers on China could head off Chinese development of some or all of the antisatellite systems listed in the proposals identified in open sources. For example, nanotechnology laminated surfaces, miniature rocket motors; quick launch space vehicle propulsion, and directed energy technology (especially advance performance lasers), precision space guidance systems, and various bilateral technology exchanges such as the current program of the National Science Foundation for cooperation in remote sensing will become areas to examine for additional technology transfer restrictions. It would be a major project to identify and design new export controls on US technologies related to anti- satellite weapons acquisition and deployment.

#### ***9. PACOM and STRATCOM Role in Educating the PLA on Consequences of ASAT***

The US Department of Defense has extensive exchange programs in its "theater engagement plans" and may wish to play a greater role in deterring Chinese development of space weapons. Both Strategic Command and Pacific Command may wish to consider in their discussions on track one and track 1.5 whether to include information about the consequences of an attack on US military satellites in a crisis as part of their routine presentations on US defense policy and strategy to the Chinese.

#### ***10. China's Friends May Still Dismiss Chinese ASAT Ambitions For Lack of Evidence***

It is difficult to rely on Chinese open source literature as the sole source for a persuasive strategic warning that vulnerable US military command, communications and sensitive national intelligence systems may all be in jeopardy in the decade ahead

If we know little about how space warfare may unfold because it has never happened, is it wise to dismiss the probative value of Chinese open source recommendations on the grounds that no one has yet seen China start to manufacture, test, exercise, and write doctrine for real space weapons? It would seem that open source materials containing recommendations for future ASAT concepts deserve more attention than to be completely dismissed, just as they cannot be considered to be completely definitive.

At a minimum, these writings suggest the need for a more assertive US engagement effort with the authors and their organizations. At a maximum, these writings suggest a major misperception by at least the authors and possible the Chinese leadership that US efforts to “weaponize space” are decades away, if the US Congress ever permits such efforts at all.

Transcript of public hearing of Senate Armed Services Subcommittee on Strategic Forces  
Wednesday March 28, 2007

SEN. NELSON: Well, the Chinese have shown us that they can hit a less challenging target. Now that they've done an ASAT, tell us what you think about that.

GEN. CARTWRIGHT: The ASAT test by the Chinese, one, was not a surprise. This was their third attempt. What was for us impressive was that in three attempts, they made significant changes each time and were able to, in three attempts, come to a -- successful intercept, I guess is the way we would term it, on their third attempt.

It was impressive, the science and the engineering that went into that activity to get them to that level of capability.

Having said that, direct ascent ASATs, in and of themselves, are a relatively expensive and inefficient way to address a space threat. We came to that conclusion; the Russians came to that conclusion a while back. I personally believe that the Chinese will come to the same conclusion.

But they have -- they have undertaken a what we would call a very disciplined and comprehensive continuum of capability against space -- our space capabilities, okay -- all the way from temporary and reversible effects that could be -- examples would be GPS jamming, things like that, COM jamming, all the way through direct ascent ASAT. And eventually, they're probably be looking at co-orbital. And then, the one that you really worry about is introducing weapons of mass destruction into space on a missile.

But they have demonstrated the capability across that. On the lower end of the spectrum, they've not only demonstrated it, they've fielded it into their forces. And to me, that demonstrates one, that they have a very comprehensive look at what they want to be able to do as a nation in their region.

Does that require, from our standpoint, that we do in kind the same type of activity? In other words, do we need to now think about weapons in space and ASAT-type capabilities, et cetera?

We have the technical capability. My belief right now is knowing what we believe we know about this threat after the demonstrations -- that it is premature to start thinking about an arms race in space. There are, as you said earlier, many other ways to address a threat. We do not have to have a space response to that threat.

Now, having said that, I do believe it is prudent to improve our posture and situation awareness in space. Who's doing what? Why are they doing it? Where are they? Attribution -- a disciplined way to know when there is an anomaly going on in space and be able to then challenge as to why it's an anomaly and what's the intent behind the owner of that particular craft. Those are things that we have to spend some time on.

Number two -- and we have been, and I believe we're on a good path in that area. Number two is, what do we need to do about the assets that we have on orbit that are associated with national security? What kind of defensive postures do we want to have for them, mostly associated with being able to recognize when they're being threatened, to be able to take rudimentary passive-type defenses -- close shutters, open gates, turn off, whatever is appropriate?

You're not going to move a very large satellite which, as you know, sir, is the size of a bus out there. That's not going to outrun a Jaguar that's coming on a direct ascent ASAT. But it can tell what's happening, particularly in the lower end of the spectrum in jamming and RF-type activities, and in proximity.

When somebody's near it that we didn't intend to be near, it can alert us.

It can start to give us an understanding of what's going on. And our first activity ought to be: "Gee, is this something we planned to have had happen? Is this something normal in the course? Can we explain this?" And if not, can we react inside of the decision cycle of our adversary to save that satellite and engage in something other than forceful response to try to stop anything that would harm that asset.

I mean -- I want to be -- I want to get to a point where we know what's going on out there, and we have more choices than just a kinetic option.

SEN. NELSON: Well, the initial reports are that they will have the capability with enough production of these ASATs by 2010 to basically knock out most of our satellites in Low Earth orbit.

So, you as a combatant commander, you look at alternative programs -- we understand that -- but what are you advising us that you need in order that we would not go blind from Low Earth satellites?

GEN. CARTWRIGHT: Prompt global strike.

SEN. NELSON: What else?

GEN. CARTWRIGHT: I need the ability to change my sensor -- our sensor capabilities from one of cataloguing to one that is proactive -- doesn't require new sensors. It just requires thinking about how you use them differently so that you are predictive in nature and can understand threats that are emerging rather than reacting.

SEN. NELSON: And the prompt global strike would give you the -- the strike in order to do what?

GEN. CARTWRIGHT: If --

SEN. NELSON: What? Either knock out the launch vehicle that they're going to launch the anti-satellite on?

GEN. CARTWRIGHT: There's any number of nodes in the system in order for them to be able to knock out satellites. There are sensor nodes, there are command and control nodes, and there are certainly the launch nodes. And then there's the flight en route. Any of those nodes should be available, and we ought to explore to stop a conscious strike that would take out all of our Low Earth Orbit satellites.

And we ought to apply all venues of our national power to intervene on all of those nodes, rather than, you know, setting yourself up for just one silver bullet, so to speak.