



ACQUISITION,  
TECHNOLOGY  
AND LOGISTICS

THE UNDER SECRETARY OF DEFENSE  
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WASHINGTON, DC 20301-3010

MAY 15 2008

MEMORANDUM FOR CHAIRMAN, DEFENSE SCIENCE BOARD

SUBJECT: Terms of Reference – Defense Science Board (DSB) 2008 Summer Study on Capability Surprise

The United States (U.S) is in a never-ending race to maintain a capability edge against potential opponents. Despite significant U.S. science and technology prowess, numerous paths exist for adversaries to achieve “capability surprise.” Many of the alternative paths for adversary capability development do not rely on leading edge science and are sometimes achieved at a significant cost advantage over U.S. capabilities. Fortunately, capability development paths exist without using cutting edge science and technology for the U.S. and may also create opportunities for the U.S. to employ cost imposing strategies on adversaries.

There are three different scenarios in which capability surprise can occur:

1. Surprise in the laboratory. Although less likely than some other forms of surprise due to the extensive intellectual interchange and competition among laboratory scientists, surprise from a fundamental scientific breakthrough is still possible. Breakthroughs in mathematics, algorithms, cryptography, and device technology, for example, can spring from anywhere. More likely are the surprises that might result from the clever first application(s) of scientific discoveries.

2. Surprise during transition from concept to fielded product. Transition time is affected by numerous issues, including: bureaucratic process, manufacturing capability, training, and logistics. Presuming we all share the same worldwide base of science, whoever can move it into fielded weapons systems the fastest has a real advantage – and some countries have the resources, agility, and will to accomplish this. An adversary that cares less about process, cost, and potential abuse and more about speed has the potential to get capabilities to the field more rapidly than we might expect. Furthermore, the spread of manufacturing technology, service and process improvement techniques, and management knowledge make the transformation of laboratory knowledge into reliable, repeatable, deliverable, maintainable equipment more likely. Globalization accelerates market workforce training and will accelerate the development of this capability as other countries compete in the global market.



3. Surprise introduced by the unconventional or unforeseen use of an existing capability. It might be commercial (e.g., the Internet as a command and control net) or a weapons system (e.g., the B-52 in a tactical support role). Innovative development of new capability using existing force structure can be extremely rapid, prove costly in combat, and be extremely effective. Another facet of this particular surprise mechanism is the employment of old or low technology against high-end U.S. capability.

Underlying the kinds of surprise are the reasons why surprise may occur. A partial list of such reasons includes:

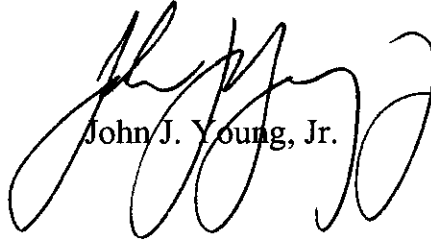
- a. Failure to respond to the introduction of a new capability
- b. Planned response proceeds at too leisurely a pace
- c. Failure to imagine a capability
- d. Underestimating an adversary's prowess to introduce a capability
- e. Assuming that an adversary would not dare to do such a thing

The study should focus on the *whats* and *whys* of capability surprise and the measures to ensure that DoD and its interested partners are best positioned to prevent, or mitigate, capability surprise against itself. It should assess the surprise mechanisms, dealing with how surprise may occur, and develop relevant recommendations in two domains: how to reduce the potential for surprise across the dimensions outlined above; and given that some surprise will always occur, how to better prepare ourselves to respond appropriately. Recommendations should also be formulated for ensuring that the Department, in coordination with the intelligence community, has both the people and processes in place not only to identify potential surprises across the dimensions outlined above but also, on an annual basis, to formally assess both risks and opportunities in dealing with them.

Finally, the study should assess cost-imposing strategies to include what adversaries may do to the U.S. and what the U.S. could do against potential adversaries, both with respect to high-end technology solutions and employment of low-end or old technology solutions. As part of this assessment, the study should also consider how the U.S. might impose surprise on its adversaries in rapid, cost effective, and unique ways.

The study will be co-sponsored by the Under Secretary of Defense for Acquisition, Technology and Logistics, the Under Secretary of Defense for Intelligence, the Vice Chairman of the Joint Chiefs of Staff, and the Commander, Joint Forces Command. Dr. Miriam John and Mr. Robert Stein will serve as Chairpersons of the Summer Study. Mr. R.C. Porter of OUSD(I) and Mr. Robert Baker of the Office of the Director of Defense Research and Engineering will serve as co-Executive Secretaries; and Lieutenant Colonel Chad Lominac, USAF, will serve as the DSB Secretariat Representative.

The Task Force will operate in accordance with the provisions of P.L. 92-463, the “Federal Advisory Committee Act,” and DoD Directive 5105.4, the “DoD Federal Advisory Committee Management Program.” It is not anticipated that this Task Force will need to go into any “particular matters” within the meaning of section 208 of title 18, U.S. Code, nor will it cause any member to be placed in the position of acting as a procurement official.



John J. Young, Jr.