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HOUSE COMMITTEE  
ON ARMED SERVICES**

**TESTIMONY OF**

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**(ACQUISITION & TECHNOLOGY)**

**BEFORE THE UNITED STATES HOUSE**

**COMMITTEE ON ARMED SERVICES**

**READINESS SUBCOMMITTEE**

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Chairman Ortiz, Congressman Forbes, distinguished members of the Subcommittee:

Thank you for the opportunity to appear before you today to discuss some of the Department of Defense's current efforts to address our energy risks and our energy governance. The past year has been quite active as the enterprise has begun to appreciate the challenges and potential opportunities related to energy.

My name is Chris DiPetto and I am here representing Deputy Under Secretary of Defense (Acquisition & Technology) (A&T), Dr. James Finley. A&T has some specific responsibilities related to examining and setting policy on DoD mobile systems energy. Specifically, we were directed by the Deputy Secretary to mature and incorporate a concept called the "Fully Burdened Cost of Fuel" (FBCF) into DoD business processes. Incorporation of this concept, we believe, will give energy, particularly the burdens of battlespace delivered fuel, proper consideration as we design, develop and acquire capabilities.

The DoD Energy Security Task Force is chaired by Under Secretary of Defense for Acquisition, Technology and Logistics, the Honorable John J. Young. This task force was chartered in May 2006 to delve into the unique energy challenges the Department faces and to develop management and technology solutions. This group has succeeded in raising the profile of energy within the Department and is positioned to provide the senior leadership with actionable recommendations this year on how to manage these energy risks in new and innovative ways. The Office of the Director, Defense Research and

Engineering provides the day-to-day leadership to the Energy Security Task Force, so I defer to them to provide the committee a broader description of its workplan and successes to date. However, A&T participates actively in this group along with other OSD, Joint Staff, Service and Defense Agency representatives.

Today I will provide you some background on energy challenges the Department faces, some work my leadership and I are doing to better understand the Department's energy risk, and some planning and business processes changes the Department is considering to better manage these risks.

### **Background**

Historically, the Department has treated energy, whether from petroleum-based fuels or electricity, as a cheap commodity, reliably supplied by our highly professional and capable logistics community, via our air tankers, our tanker trucks, our Navy oilers and our installation engineers. The quickly escalating retail price of petroleum-based fuels, the operational risks our supply lines face in our on-going operations, the growing appreciation of installations' energy savings opportunities, and the recognition of the vulnerability of grid-supplied power have all conspired to raise awareness of the energy risks we face. It is for these reasons that the Defense Science Board (DSB) Task Force, chaired by Dr. Schlesinger and General Carns, was commissioned and the DoD Energy Security Task Force was stood up by the Deputy Secretary in late 2006. An earlier Defense Science Board study in 2001 first raised this concern that the Department does

not address the energy-related variables properly in our force planning, requirements development or acquisition process. This more recent DSB Task Force was commissioned, in part, to revisit the 2001 assessment.

My role, supporting the DoD Energy Security Task Force and in response to direction from the Deputy Secretary's Advisory Working Group (DAWG), is to mature and apply an analytic construct for the "Fully Burdened Cost of Fuel" to the Department's myriad business processes affected by fuel. This is an idea quite familiar to any business with transportation assets. The idea is that strategic planning and long-term costing should include not only the price one pays for fuel at the pump, but also all of the logistics effort (equipment depreciation and replacement, personnel, force protection, etc.) it takes to deliver the fuel to the location needed. This concept can be applied meaningfully in the Department's force planning, requirements, acquisition and the science and technology investment and prioritization processes. The utility of this approach is purely analytic in nature. This will not affect DoD accounting systems. We are merely trying to have those organizations considering and building the capabilities we determine we need to be informed of the logistics consequences of their choices.

Our immediate focus on the Fully Burdened Cost of Fuel is to mature the methodology, learn from recent Service experiences and our three pilot programs, add it to relevant DoD guidance, and seek applications in earlier phases of DoD capability development processes. This concept was explained in some detail in the recent Defense

Science Board task force report and in the GAO's recent report (Defense Management: Overarching Organizational Framework Needed to Guide and Oversee Energy Reduction Efforts for Military Operations – GAO-08-426). I will explain the thesis behind the Fully Burdened Cost of Fuel construct in greater detail later in my comments.

One thing that has become clear through A&T's work on energy is that DoD processes need to reconsider our risks and opportunities related to energy. From an operational perspective, our current and future forces face serious challenges from opponents who are smart enough to try to avoid contact with our combat forces and to concentrate on our large logistics tail. Our recent experiences with irregular warfare have provided some hard-earned lessons on this front. Emerging challenges from long-range cruise and ballistic missiles also pose growing complication to our fuel logistics forces. Hence, we were directed to examine the Department's capability development process to identify how we can mitigate our forces' fuel demand and channel investments in energy efficiency, or as we say, energy productivity, more effectively.

The core principle we identified early on, as both the 2001 and 2008 Defense Science Board Energy Task Force reports stated, is that DoD force planning processes do not appreciate what the value is of investing a given dollar into raising the energy efficiency of the force. There is no clear demand signal from commanders, force planners or requirements developers as to the value of the energy our platforms and our forces burn. Its value is infinite when it is not there, but it is treated as a "public good" as

an economist would put it, when it is there. Hence, we don't have good data to understand what it may be worth to the force, in the present or in the long-term, to be more fuel efficient.

Occasionally, a request does come into the Pentagon from the field, as one did from Major General Zilmer, the former commander of US forces in Al Anbar province in Iraq in 2006 that punctuates this challenge. MajGen Zilmer issued a Joint Urgent Operational Need (JUON) statement to the Joint Staff requesting sustainable energy equipment for his forward operating bases. This request was sparked by the general's recognition of the vulnerability of the fuel convoys delivering fuel to his generators. That vulnerability was threatening his operational mission success by delaying resupply. Further, combat forces had to be taken off of offensive missions and placed in force protection roles for the fuel trucks. The Army, in particular, has done an impressive job meeting such urgent needs statements, particularly in devising energy-saving solutions to reduce demand in the field. However, this is a short-term fix that fails to address the long-term vulnerability and deep reliance of our forces on fuel resupply during and between missions, today and into the future. Based on the assessment of the Defense Science Board Task Force and other analyses, we know there is a great deal of energy risk that is not evident to our planning processes and cannot be addressed after systems are fielded.

## **DoD Energy Security Strategic Plan**

Recent DoD strategic planning guidance directed the internal Energy Security Task Force to provide the DAWG a DoD Energy Security Strategic Plan this spring. This product is intended to do three things: 1) to provide our senior leadership a deeper appreciation of the broad, cross-cutting implications of operational fuel demand and to drive to a common vision; 2) to provide recommended courses of action to reduce the Department's energy risk; and 3) to perhaps show some leadership within the Interagency to raise issues with broader relevance for discussion. Once this Strategic Plan is completed, is briefed to the DAWG, and the Deputy Secretary's guidance is handed down, we expect to have a deliberate, actionable plan to begin to address DoD's energy risk.

Department business processes, planning processes, governance and a variety of other energy-related issues will be addressed in this Strategic Plan. It is premature for me or any other Department representative to discuss any specifics at this time because it is in draft and has not been aired to any DoD senior leaders. The Strategic Plan's priorities, workplan and responsibilities are being worked out as we speak. However, I can say the Department is considering the recommendations of the Defense Science Board Task Force, the Government Accountability Office report, other recent studies and analyses, and internal assessment and lessons learned from on-going operations in formulating the Plan.

## **Fully Burdened Cost of Fuel Thesis and Methodology**

Our work on the Fully Burdened Cost of Fuel is focused on gaining two types of insights for decision-makers at all levels of DoD, as well as for the industries that supply our operational systems). First, we want to understand the magnitude of our operational risk from our huge fuel demand so we will better understand what its worth to make our operational systems more energy efficient and to reduce our resupply risk. The sustainment rate of our forces in operations is a major limiting factor in our operational tempo. Fuel, ammunition, food and water and spare parts resupply are all factors. We are focusing on fuel, though related work is going on in the logistics community all the time to ease the flow of these other assets. Gaining insights on fuel may allow some investment to move from logistics force structure (the “tail”) to combat forces (the “tooth”) in the future force as a result of reduced operational fuel demand.

Second, from a pure cost perspective, early indications from our “Fully Burdened Cost of Fuel” analyses show that the science and technology and acquisition tradespace would open up significantly if we properly valued the financial costs of delivering fuel to the operator. Technologies that are cost prohibitive (on a life cycle costing basis) at \$3.04 a gallon for JP-8 military grade fuel may suddenly look like a bargain at \$42 a gallon, which is the fully burdened price for JP-8 coming from a tanker aircraft, including the depreciation of those assets. This figure is a little old, but it was validated by the 2001 DSB Energy Task Force as well as studies performed by the Logistics Management Institute, the JASONS (an expert DoD scientific advisory body) and the Institute for



Defense Analyses. What does \$42 a gallon mean to DoD? This price tells us it is worth thinking differently about investing to reduce the energy demand of the force. In some cases, we may reconsider the mix of platform types we need and their numbers. For the most part though, we think it tells us we should invest more heavily in lighter weight materials, perhaps spend more on more efficient engines, and perhaps consider taking schedule risk to wait for technologies to mature. Even the development of more energetic fuels would be informed by such analysis. Energy demand would continue to be one of dozens of variables in the tradespace, but it would become more visible and accurately valued.

This approach is not predicated on the idea that energy factors should trump any other individual factor in making decisions in designing systems for our warfighters. To the contrary, the intent is just to raise the value of fuel up in the tradespace from its inaccurate, traditional value (only at the commodity price) to one more representative of its impact on operations and force planning.

Once the methodologies for calculating the FBCF have been vetted for land, sea and air capabilities, we anticipate working with the Joint Staff and the logistics community in using this work as the basis for setting the value and methods of the Energy Efficiency Key Performance Parameter (KPP), currently in the Chairman of the Joint Chiefs of Staff Instruction 3170. As you may know, a KPP for a given DoD program represents an operational quality that a system must maintain in its design to

allow the program to proceed to the next acquisition milestone and through to fielding. In 2007, the Joint Requirements Oversight Council (JROC) directed that energy should be considered as a KPP and the analytic work needed to employ it in the tradespace analyses is currently underway. By implementing the FBCF in a broader set of DoD business processes, and by adding fuel logistics forces into the joint DoD scenario-based force planning process in a more meaningful way, we anticipate developing an understanding of how to set targets and thresholds for this KPP.

### **Fully Burdened Cost of Fuel – Pilot Programs**

In April 2007, Under Secretary of Defense for Acquisition, Technology and Logistics issued a policy memo to examine three pilot acquisition programs for how they considered fuel within their tradespace, each at varying phases of their development. The purpose of this examination was to provide insights on how real programs consider fuel and to inform the methodology or methodologies for applying the fully burdened cost of fuel to the long-term costing of operations and sustainment (specifically for fuel) for major defense acquisition programs. The pilot programs identified were: 1) the Joint Light Tactical Vehicle (JLTV), a joint Army-Marine Corps land program; 2) the Air Force's next generation long-range strike program (Next Generation Bomber, or NGB); and 3) the Navy's CG(X), or next generation cruiser.

Each of the three pilot programs was at a different phase of acquisition when the April 2007 memorandum was released, and each has considered the impact of fuel

demand and its required logistics in different ways. One thing that has become apparent already is that a number of relevant constraints that affect fuel demand and logistics demand have typically been set for a given program well before an Analysis of Alternatives is formally conducted in the requirements (i.e. JCIDS - Joint Capability Integration and Development System) phase. This finding reinforces the need to better examine fuel supply and demand risks and alternatives in the force planning process, prior to requirements-setting.

A lessons-learned document based on our pilot program experience and discussion will be available in early summer. The recommendations will inform further policy change options for the DoD acquisition system as well as provide necessary tools to future programs to take the FBCF into account. One thing we can safely say today is that there is no one methodology that applies to all systems or capabilities. However, the core variables we should consider in assessing the fully burdened cost of fuel will not change. Fuel commodity cost, the cost of the logistics tail, and the cost of force protection will all remain. The challenge will be in writing flexible guidance to a diverse range of experts, from force planners, requirements developers, systems engineers, program managers and contracting officers that will be applicable to a wide range of materiel solutions.

### **Energy and the Force**

One does not have to think for too long to figure out that energy is one of a small number of core assets the US military absolutely requires to function. What food and

water are to our personnel, fuel and electrical power are to our equipment and installations. Energy demands must be accommodated in almost every aspect of our planning, from powering a Forward Operating Base to considering the refueling requirements of our units in the field. Despite this deep reliance we've built on energy for our military capabilities over the past ninety or more years, much of our force planning still treats fuel like oxygen, a commodity that will be available at the time and place of our choosing. Obviously, conditions in the field are seldom that cut and dry, so our operational planners and field commanders put much more of their time and attention into ensuring fuel is delivered where needed, when needed. This dichotomy between DoD force planning and operational planning is a fissure we're just beginning to come to grips with.

I will reinforce a comparison the Defense Science Board Task Force made. One major reason for the high professional quality of our warfighters compared to those from many other countries is that we invest a great deal to train like we fight. We build and maintain great ranges and urban operations training facilities, and we train jointly and globally, often with partners. Fuel logistics for those exercises are planned as key enablers and fuel costs are covered or else the training does not happen. However, when we design our future capabilities in the Pentagon or at the major Service materiel commands and elsewhere, logistics demand of our capability choices are not addressed until after we have decided on what that performance our platforms or combat units should have. Stated more simply, our force planning processes almost always plug fuel

logistics in at the back end, after the capability we want is designed. The result is that we plan capabilities and systems ignorant to the combat support “tail” we are creating. That has negative implications for the total force, as well as for the platform or unit we’ve designed for the “tooth”. Further, we make decisions on the unrefueled range and payload and loiter time of platform types, but at no point does the force development processes consider whether it’s worth it to reduce the logistics demand to gain unit or theater deployability, vulnerability or sustainability benefits. Finally, we have little to no analysis on which to determine what its worth to the larger force to invest in fuel efficiency technologies. We’re largely allocating investment based on military or technical experience, not on modeling, wargaming, trend analysis or other accepted tools.

Some of the negative results of this approach are: a shifting of mission risk to the combat support forces, which have less ability to shape (or survive) their battlespace than combat forces, a lack of focus on the costs to the enterprise from fuel and fuel logistics force growth, and a resulting opportunity cost through reduced resources for combat forces (trigger-pullers) and combat force development.

The good news is that the Department leadership, as it becomes better informed on these cross-cutting energy issues, is beginning to test and implement a number process changes that will help us better manage our energy demand and spur innovation in how we build our capabilities.

While A&T's focus is on understanding and mitigating the energy demand of mobile forces, there is also a supply and demand aspect to this challenge that other communities, like Science and Technology, Logistics, and Installations and Environment are addressing. Many other parts of the Department are doing important, interesting work to address supply-side and demand-side challenges, but those are best explained by the Components or by the Energy Security Task Force leadership.

Dr. Finley and I appreciate your attention on these critical energy management issues facing the Department. We look forward to the Committee's support of these practical management and strategic planning process changes to reduce the energy burden on our forces.