

**REPORT OF THE  
DEFENSE SCIENCE BOARD  
TASK FORCE  
ON**

**NUCLEAR DETERRENCE**

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**OFFICE OF THE UNDER SECRETARY OF DEFENSE  
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## *Cost Reduction*

- **Use of Dual-Capable cost sharing**
  - **Current dual-capable forces**
    - **Bombers**
    - **Tactical aircraft**
    - **TLAM/N capable attack submarines**
  - **Possible long-term future**
    - **Next SSBN**
- **Life extension of SSBNs, ICBMs**
- **Reduced, dedicated strategic C3**
- **Common component development**
  - **Commercial rocket engine technology for ballistic missiles**
  - **Reentry Systems Applications Program**
  - **Guidance Applications Program**
- **Right-sizing the weapons stockpile planning factor**

A number of efficiencies are already in place or well underway to reduce the cost of maintaining a reliable, robust deterrent. A significant part of the force is dual capable, sharing the cost with conventional force capabilities.

In the long-term future, the SLBM leg could also reside on a variant of the new attack submarine. However, given the 42 year life of the Ohio class, that is not a near term prospect.

There is little prospect for dual-capable ICBMs. At the same time, the ICBM force is of continually increasing deterrent value as the nuclear force becomes smaller. This subject is discussed later in the report.

Still to be done is right-sizing the weapons stockpile. However, this is a cost avoidance issue rather than cost reduction since the budget consequences of the current hedge are not included in either the DOD or the DOE budget.

## *The Triad Issue*

- Diversity is important
  - Triad is stabilizing
  - Provides a hedge against technological failure
  - Insures against a disabling attack on nuclear forces generation
- SLBMs
  - 2/3 of the strategic nuclear warheads
  - Most survivable when on patrol
  - Large capability on small number of platforms
- ICBMs
  - Single-warhead ICBMs of increasing value with declining numbers
  - Removes temptation for limited or piecemeal strategic attack
- Bombers
  - Low incremental costs for nuclear mission
  - Little opposition
  - Stabilizing when on alert

While the benefits of diversity in the nuclear deterrent force and the President's 1997 statement clearly support the need for a robust Triad of nuclear forces, there are continuing challenges to supporting that policy declaration with capabilities as the nation looks towards lower numbers of deliverable nuclear weapons.

The Task Force concluded that even at the lowest level contemplated for the next step beyond START II (START III?) a triad is essential to a stabilizing and effective deterrent. Each leg of the Triad is of increasing importance as the numbers are reduced.

The SLBM leg remains the most survivable leg in the day-to-day posture. Still, the small number of platforms makes it unwise to vest an ever larger percent of the declining force in this leg of the Triad. Doing so could lead an adversary to seek an advantage by focusing intently on means to attrit this force over time, particularly since it might be done without attribution and would take years for the US to recover with new production.

The Task Force believes that the change in the relative value of the ICBM force is important and not adequately understood. This is the leg whose value increases the most with declining forces. As the total numbers on both sides moves the situation from warhead rich to target rich, the single warhead silo-based ICBM becomes highly stabilizing. It requires more than a 1:1 ratio for the attacker to attrit this force and that changes the correlation of forces against the attacker without commensurate impact on the broader target set.

Further, significant numbers of ICBMs denies any adversary the benefit of a limited attack. Without the ICBMs, surprise attacks against a handful of bomber bases and SSBN facilities, with plausibly deniability, could drastically alter the correlation of forces.

The Triad remains highly stabilizing and is well worth the price.

## *The De-Alerting Issue*

- **Perceived reasons for de-alerting**
  - Danger of response to false warning
  - Danger of unauthorized use
  - Minimize temptation to launch under attack
- **Realities**
  - US strategic systems are the least susceptible to the stated concerns. The real concern is about the security of others' forces
  - De-alerting is no cure for a lack of trust in the National Command Authorities and associated safeguards — implied by concern about an ill-considered launch.
  - START II had as a high priority goal increasing stability by reducing the vulnerability of strategic nuclear forces
  - Schemes for de-alerting advanced to date increase the vulnerability of forces. Some could be highly destabilizing
- **If the concern is reliability of the Russian System, then need to engage Russia in ensuring operability of its warning and C<sup>2</sup> systems**
- **Before any additional dealerting, need a carefully defined set of objectives that improves stability and negotiations for agreed mutual actions — unilateral US actions counterproductive**

The on-going de-alerting discussion needs to be in far more depth before decisions are made.

The Task Force found the current set of arguments for further US de-alerting difficult to understand. The arguments stress potential weaknesses in the Russian command and control system as a source of danger of unauthorized or accidental use. A frequently suggested fix is for the US, with a very secure and reliable command and control system, to take the initiative to de-alert weapons without addressing core negotiation and verification issues.

The central issue must be stability. This was the central issue guiding US START II goals and the principal driver of the outcome. Hence, to do violence to the stability of the force over a perceived danger not addressed by de-alerting US systems seems unwise in the extreme.

A more rational approach to addressing concerns about the quality of the warning system available to the Russians would be to explicitly address that issue.

If, after considering the full implications, US leaders are convinced there are ways to increase stability through mutual de-alerting, then we should undertake a serious effort to define a negotiating position and then enter into such negotiations with the Russians. The Task Force was unable to find any such defined positions or plans for negotiations.

## *Future Threats*

- **Uncertain and potentially dangerous future threat environment**
  - Russian nuclear forces remain large and capable
  - Increase in others' strategic nuclear capability – i.e., China
  - Proliferant nations with NBC capability – what deters?
    - Question of whether US nuclear policy and forces (type and mix) provide credible deterrent against these emerging threats
- **US policy remains ambiguous on whether US nuclear deterrence extends to chemical and biological threats**
  - Declaratory policy addresses chemical and biological weapons attacks in regional war
  - Steps are needed to underwrite policy with operational steps
    - Need formal direction to plan for active counter-proliferation
    - Implications for crisis stability
    - Suggests specialized weapons/tailored effects for our nuclear deterrent in the long term

As to the future threat, there is near certainty that, wherever arms control efforts take us, Russia will continue to be a nuclear superpower and China will continue to evolve to more capable nuclear forces.

More complex is the issue of deterring the broader use of weapons of mass destruction by nations whose behavior is less predictable.

On this last point, US public declaratory policy remains more ambiguous than the Task Force believes useful. US policy statements vary from declaring that we will not use nuclear capabilities against non-nuclear nations to declarations that US nuclear forces are a deterrent to the use of other WMD. Our declaratory policy needs to be less ambiguous and backed by defined requirements and focused operational readiness.

### *Service Focus - Navy*

- **SSBNs only sea-based ready nuclear force – still well focused**
- **TLAM/N can be regenerated on attack submarines – exercised regularly**
  - Questions about long term plans for non-strategic forces
- **SSP continues to provide strong program focus**

The demands on the SSBN force and their focus have changed little since the end of the Cold War other than some reduction in patrol rates.

At the same time, the Navy is not tasked for day-to-day tactical nuclear forces. TLAM/N can be regenerated within 30 days on attack submarines. The Navy's Pacific forces command structure depends on the US Strategic Command for nuclear command and control and support coordination. Through the SACLANC in Norfolk, the US provides naval support to NATO.

As in the case of Air Force DCA, the long term rationale and support for TLAM/N capabilities is uncertain at best.

In coordination with the Navy Staff/N87, the Navy's Strategic Systems Program office continues to provide strong continuity and professional expertise to manage Navy nuclear programs.

## ***Training, Exercises, & Operations***

- **Global Guardian – USSTRATCOM’s annual exercise**
  - Exercises end-to-end nuclear capability
  - Strategic nuclear systems, plus DCA and TLAM/N
- **Global Archer exercises – USSTRATCOM**
  - Narrower in scope
  - Good training vehicle
- **Air Force and Navy regularly exercising readiness**
- **Air Force and Navy earning good inspection ratings overall**
  - Air Force Nuclear Operational Readiness Inspections
  - Navy Technical Proficiency Inspections
  - Nuclear Surety Inspections

Operational units are benefiting from a significant increase in training exercises. The annual Global Guardian series has been reinstated and is exercising most aspects of nuclear force generation.

There has also been an increase in the Global Archer series.

After a post-Cold War hiatus, the inspection programs have been revitalized and are producing positive results.

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## *Sustaining Current Systems*

### *Navy*

- **SLBM Warhead Protection Programs (SWPP) -**
  - NavyDOE effort to maintain the capability to jointly develop replacement nuclear warheads for the W76/MK4 and W88/MK5
  - One near-term, one long-term design
- **Trident D-5 Backfit Program**
  - Update 4 C-4 platforms to the D-5
  - FY2000 to FY2006

Navy sustaining hardware programs are focused on assured capability to provide warheads for the D-5 and on the D-5 backfit.



## *Reversibility*

- Helsinki Joint Statement (HJS) calls for transparency and irreversibility in a START III agreement. START III should include:
  - “Measures relating to the transparency of strategic nuclear warhead inventories and the destruction of strategic nuclear warheads and any other jointly agreed technical and organizational measures, to promote the irreversibility of deep reductions including prevention of a rapid increase in the number of warheads”
  - How does US compensate for Russian production and infrastructure capacity and modernization plans/activity?
- How does US compensate for large asymmetry between US and Russian non-strategic nuclear forces/stockpiles?
  - This asymmetry leads to a complex set of issues that needs to be explored

The issue of reversibility also has important implications for decisions on maintaining the nuclear deterrent.

Both the US and Russia have declared irreversibility as a basic goal for START III. Still, the entire concept of hedging against reconstitution assumes reversibility.

A major complication arises from the asymmetry in US and Russian reversibility. Since production capability — platforms or warheads — has not previously been a subject for arms control negotiations, introducing warhead production capacity as an element of reversibility will be difficult but essential to the concept.

Again, the set of issues associated with the combination of commitment to irreversibility and asymmetry demands intense focus to sort out the issues and to prepare to negotiate.

In the meantime, it has the direct implications for the stockpile already discussed.