Conventional Prompt Global Strike: A Fresh Perspective

National Institute for Public Policy

October 10, 2012

Basic Case for CPGS

- **Ability to strike time-sensitive, high-value targets**
  - Examples: gathering of terrorist leaders, imminent WMD or ASAT missile launch; WMD-laden ship ready to leave port; select anti-access and area denial capabilities

- **Fills possible gap in existing capabilities**
  - Conventional forces: potential of insufficient range; may not be timely enough; far-off deployment; vulnerability to defenses; wrong weapons
  - Nuclear forces: political and military disadvantages of use
Reasons for a Fresh Look at CPGS

- 2008 presidential election and 2010 congressional elections
  - Administration with new set of national security objectives relevant to CPGS
  - Altered political landscape on Capitol Hill affects support for CPGS
- Advances in CPGS technology
  - Greater variety of CPGS options now appear feasible
- Change in strategic arms control regime
  - START I expiration and New START entry into force
- New insights on Russian early warning capabilities
  - Helps clarify nuclear ambiguity issue

CPGS Supports Objectives of 2010 NPR

- “Preventing nuclear proliferation and nuclear terrorism”
- “Reducing the role of U.S. nuclear weapons in U.S. national security strategy”
- “Maintaining strategic deterrence and stability at reduced nuclear force levels”
- “Strengthening regional deterrence and reassuring allies and partners”
- “Sustaining a safe, secure, and effective nuclear arsenal”
CPGS Basing Options

### Principal Characteristics of CPGS Options

- **Basing mode:**
  - Land-based (U.S. or overseas); sea-based (SSBN, SSGN, ship)
  - Co-located with strategic forces or geographically distant

- **Launch booster:**
  - Existing land- or sea-based missile;
  - Booster with stages from retired missiles;
  - New missile

- **Payload delivery vehicle:**
  - Ballistic reentry vehicle;
  - Non-ballistic hypersonic boost-glide vehicle

Characteristics determine applicability of arms control limits and can provide observable differences from ICBMs, SLBMs.
## CPGS Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Basing Mode</th>
<th>Launch Booster</th>
<th>Payload Trajectory</th>
<th>Range (nmi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional Strike Missile</td>
<td>Land-based in U.S.</td>
<td>New design</td>
<td>Non-ballistic (HTV-2 or AHW payload)</td>
<td>10,000-12,000</td>
</tr>
<tr>
<td>Advanced Hypersonic Weapon</td>
<td>Land-based, deployable outside U.S.</td>
<td>New design</td>
<td>Non-ballistic (hypersonic boost-glide vehicle)</td>
<td>2,000-4,000</td>
</tr>
<tr>
<td>Conventional Trident Modification</td>
<td>Sea-based on SSBNs</td>
<td>Trident II SLSM</td>
<td>Near-ballistic (modified Mk-4 reentry body)</td>
<td>4,000-6,000</td>
</tr>
<tr>
<td>Sea Strike Missile</td>
<td>Sea-based on Ohio SSIGNs and Virginia SSNs</td>
<td>New design</td>
<td>Non-ballistic</td>
<td>~1,800-3,500</td>
</tr>
<tr>
<td>ArcLight Missile</td>
<td>Sea-based on surface ships and submarines</td>
<td>New design; VLS-compatible</td>
<td>Non-ballistic</td>
<td>~2,000</td>
</tr>
</tbody>
</table>

### Observable Characteristics:

“Discrimination Profiles” for CPGS Options

- **Basing & Firing Location**
  - High
  - Med.
  - Low
- **Launch Signature**
- **Midcourse Path**
- **Terminal Flight**
**Observable Characteristics:**

*“Discrimination Profiles” for CPGS Options*

<table>
<thead>
<tr>
<th>Basing &amp; Firing Location</th>
<th>Launch Signature</th>
<th>Midcourse Path</th>
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<tr>
<td><strong>High</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>CSM, AHV, SS, AL</td>
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</tr>
<tr>
<td><strong>Medium</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS, AL (sub)</td>
<td>CSM</td>
<td></td>
<td>CTM</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td></td>
<td></td>
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<td>CTM</td>
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*CSM = Conventional Strike Missile; AHV = Adv. Hypersonic Missile; CTM = Conventional Trident Modification; SS = Sea Strike; AL = ArcLight*
Arms Control Limits

- INF Treaty and New START include limits on nonnuclear as well as nuclear weapon systems

- INF Treaty
  - Bans cruise missiles and ballistic missiles with ranges of 500 - 5,500 km
  - “Ballistic missile” = “a missile that has a ballistic trajectory over most of its flight path”

- New START
  - Limits of:
    - 700 deployed ICBMs, SLBMs, nuclear heavy bombers;
    - 800 deployed and nondeployed missile launchers and bombers;
    - 1,550 deployed warheads
  - “Ballistic missile” definition same as in INF Treaty
  - “ICBM” = >5,500 km; “SLBM” = >600 km

- Of CPGS options examined, only CTM is treaty limited (by New START)
  - Missiles with hypersonic boost-glide vehicles are not “ballistic missiles”

Applicability of INF Treaty and New START to CPGS Options

<table>
<thead>
<tr>
<th>CPGS Option</th>
<th>INF Treaty</th>
<th>New START</th>
</tr>
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<tbody>
<tr>
<td>Conventional Strike</td>
<td>Not applicable</td>
<td>Accountable toward treaty limits only if it meets definition of “ballistic missile” or has a booster that is accountable as an ICBM or SLBM</td>
</tr>
<tr>
<td>Hypersonic Weapon</td>
<td>Not applicable if range is greater than 5,500 km</td>
<td>Not applicable if range is less than 5,500 km.</td>
</tr>
<tr>
<td></td>
<td>For range of 500-5,500 km, no restrictions if definitions of “ballistic missile” or “cruise missile” are not met</td>
<td>If range is over 5,500 km, not accountable as long as “ballistic missile” definition is not met</td>
</tr>
<tr>
<td>Conventional Trident</td>
<td>Not applicable</td>
<td>Accountable toward treaty limits</td>
</tr>
<tr>
<td>Modification</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sea Strike</td>
<td>Not applicable</td>
<td>Would not meet definition of “ballistic missile,” therefore not accountable</td>
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<tr>
<td>ArcLight</td>
<td>Not applicable</td>
<td>Would not meet definition of “ballistic missile,” therefore not accountable</td>
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CPGS and Nuclear Ambiguity

- Frequently expressed concern that inability to distinguish CPGS from a nuclear strike would lead to a reflexive nuclear response
- The 2008 National Academy of Sciences study on CPGS concluded:
  - Nuclear ambiguity was an understandable concern, but
  - The risk of a CPGS attack being misinterpreted could be mitigated and managed
- New information sheds addition insight on this issue
  - Many CPGS weapon options are discernibly different from nuclear-armed ballistic missiles
  - Early warning and attack assessment capabilities can detect differences
  - Past experience suggests reflexive nuclear response unlikely

Russian Early Warning and Attack Assessment Capabilities

- Soviet-era
  - Characterized by large, expensive radars and defenses
  - Never fully complete
- Post-Soviet decade (1990s)
  - Many important capabilities lost to former Soviet republics
  - Atrophy of many capabilities retained
- Rebuilding and current capabilities
  - Begun during Yeltsin era
  - Modern, efficient systems replace Soviet designs, lost facilities
- Plans for future
  - Comprehensive, integrated early warning and air/ballistic missile defense
Nuclear Ambiguity: Russian Early Warning and Attack Assessment Capabilities

- Currently, Russia has a system of early warning satellites and over-the-horizon radars for launch detection, and above-the-horizon radars for attack assessment and tracking
  - Russian Space Troops deputy commander reports the system:
    - Detects missile launches from U.S., China, Iran, other countries
    - Covers all “strategic aerospace axes” and SSBN “combat areas”
    - Determines all “needed [missile] flight parameters”
    - Calculates “impact points”

For countries without early warning systems, the issue of nuclear ambiguity is moot.

Nuclear Ambiguity: Past Examples of Soviet/Russian Prudence

- Taking time to resolve ambiguity carries less risk than a reflexive response guaranteeing nuclear conflict

- Historical cases
  - False alarm from early warning satellite (1983)
  - Sounding rocket from SLBM azimuth (1995)
  - Both cases showed deliberate assessment of situation and prudent reaction

- Russian objections are means of impeding U.S. CPGS acquisition
Summary

- Political, arms control, and fiscal developments warrant fresh look at CPGS
- CPGS would fill gap between existing conventional capabilities and nuclear forces
- CPGS capabilities would support 2010 NPR objectives
- Technical advances and elimination of many treaty-related constraints make numerous options possible
  - CPGS options examined include CSM, AHW, CTM, Sea Strike, ArcLight
- New arms control regime poses few restrictions on CPGS options
  - Of concepts examined, only CTM would be constrained by existing arms control treaties
- Problem of nuclear ambiguity less a concern: CPGS systems are observably different;
  - Differences can be detected by Russia;
  - Reflexive nuclear reaction is unlikely

Questions?