Assessing the Arsenals: Past, Present, and Future Capabilities

May 2019

CSBA
Center for Strategic and Budgetary Assessments
Why this study, why now?

- Nuclear competition in the Second Nuclear Age is vastly different than that of the first
  - While global arsenals have decreased for decades, the **number of nuclear powers is increasing**
  - The Cold War nuclear competition centered on the United States and the Soviet Union, but now the **competition is multipolar**
  - Nuclear arms control that restrained the U.S. and the Soviet Union does not apply to other nuclear powers and the **existing restrictions may be on their last legs**
  - **New technologies** may challenge conventional assumptions about survivability and may effect strategic stability
- With such change, the time is right for a comprehensive open source net assessment of the global nuclear balance
What did we set out to do?

• To understand the potential implications of the changing nuclear competition, need a baseline of the current and likely future status of national nuclear arsenals
• Build snapshots and timelines to depict the current state of the nuclear balance
• Identify key asymmetries that may shape the future nuclear balance
• Identify potential linkages with trends in conventional competitions that may shape the future nuclear balance
• Create a living document that can be updated as more information comes to light
## Illustrative Snapshot of Current and Future Russian Nuclear Forces

### Platforms and Delivery Systems

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<tr>
<th>Delivery Systems and Warheads</th>
<th>Strategic</th>
<th>Non-Strategic</th>
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*Example-class = System in Service; Example-class = System in Development*
Illustrative Timeline of Current and Future Russian Nuclear Forces

---|---|---|---|---|---|---|---
SS-N-3 SHADDOCK ASCM | SS-N-5 SARK SLBM | FRAS-1 ASCROC | SS-N-7 STARFISH ASROC | SS-N-15 STARFISH ASROC | SS-N-6 M3 SERR SLBM | SS-N-8 M3 SAWFY SLBM | SS-N-18 M1 STIRNGAY SLBM
SS-N-16 STALLION ASROC | SS-N-17 SNIFE SLBM | SS-N-19 SHIPWRECK ASCM | SS-N-20 STURGEON SLBM | SS-N-25 SKIFF SLBM | SS-N-27 SAMPSON SLCM | SS-N-23 M1 SINTVA SLBM | SS-N-26 STORKILE ASCM
SS-N-26 KALIB LACM | SS-N-28 BULAVA SLBM | POSEIDON TORPEDO | SS-4 SANDAL MRBM | FROG 3/5/7 CRBM | SSC-1B SEPAL GLCM | SS-11 M2/M3 SEGO ICBM | SS-13 M2 SAVAGE ICBM | SS-20 SABER IRBM
SS-27 M2 YARIS ICBM | POSEIDON TORPEDO | SS-N-3 SHADDOCK ASCM | SS-N-5 SARK SLBM | FRAS-1 ASCROC | SS-N-7 STARFISH ASROC | SS-N-15 STARFISH ASROC | SS-N-6 M3 SERR SLBM | SS-N-8 M3 SAWFY SLBM
1991: Collapse of the Soviet Union

Estimated entry/retirement dates

Theater Range Hypersonic Weapons
SS-X-5 SIOURICIC ICBM
SS-X-11 FOKISIC ICBM
SS-27 SAVAGEIC ICBM
LIFTOFF
SS-R-1 KONDOICIC ICBM
SS-R-2 KOSHERIC ICBM
SS-R-3 SAVAGEIC ICBM
SS-R-4 KOPICIC ICBM
SS-R-5 KISTIIC ICBM
SS-R-6 KOPICIC ICBM
SS-R-7 KISTIIC ICBM
SS-R-8 KOPICIC ICBM
SS-R-9 KISTIIC ICBM
SS-RE-10 KOPICIC ICBM
SS-RE-11 KISTIIC ICBM
SS-RE-12 KOPICIC ICBM
KU-1, M1 KOSHERIC ICBM
SS-1B, 2B KOSHERIC ICBM
ABM: 18 GALAH INTERCEPTOR
ABM: 60 GALAH INTERCEPTOR
ABM: 64 GALAH INTERCEPTOR
ABM: 66 GALAH INTERCEPTOR
ABM: 68 GALAH INTERCEPTOR
2A: 100-150 GALAH INTERCEPTOR
2A: 200-250 GALAH INTERCEPTOR
FUTURE: GALAH INTERCEPTOR
Estimated entry/retirement dates

1990: Collapse of the Soviet Union

1991: Collapse of the Soviet Union
What did we learn?

• Almost thirty-years into the Second Nuclear Age, nuclear weapons are still critical components of national defense and global competition
• All nuclear powers are modernizing, but only some are growing
• Limited scope of U.S., UK, and French modernization programs raise concerns that nuclear intellectual and industrial capital to develop new weapons is at risk of atrophying
• Asymmetries of basing-mode, non-strategic nuclear weapons, and dual-capable systems may challenge nuclear deterrence
Asymmetries: Basing-Mode

United States

*Includes both deployed and non-deployed strategic warheads

Russia

*Includes both deployed and non-deployed strategic warheads

China

*An estimated 20 warheads exist for air delivery, but the composition of these warheads among gravity bombs and/or ALCMs is unknown.
Non-Strategic Deliver Systems (Post-1989)

1991: Collapse of the USSR

1991: Collapse of the USSR

US

Russia

SS-N-2 SHAMROCK ASCM
FRAS-1 ASROC
SS-N-7 STARGRIFF ASCM
SS-N-15 STARBRIGHT ASCM
SS-N-16 STALLION ASROC
SS-N-19 SHIPWEIGHT ASCM
TLAM-N SLCM
SS-N-21 SAMPSON SLCM
SS-N-26 STROBELE SLCM
SS-N-30 KALIBER LACM
SLCM

W33/8-inch AFAP
SS-4 SANDAL MRBM
SS-1c (SCUD-B) SRBM
PERSHING I/A SRBM
W48/155mm AFAP
FROG 3/5/7 CRBM
MGM-52 LANCE CRBM
SSC-4 SEPAL GLCM
SS-20 SAVER IRBM
SS-23 Oka SRBM
W79/8-inch AFAP
PERSHING II MRBM
BGM-109 GLCM
SS-21 TOCHKA-U CRBM
SS-26 ISKANDER SRBM
SSC-5 STOoge ASCM
SSC-8 GLCM
KALIBER GLCM
THALER RANGE HYPERSONIC WEAPON
AS-4 KITCHEN ALCM
B29/40MB

SS-N-3 SHAMROCK ASCM
FRAS-1 ASROC
SS-N-7 STARGRIFF ASCM
SS-N-15 STARBRIGHT ASCM
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AS-4 KITCHEN ALCM
B29/40MB

1970
1980
1990
2000
2010
2020
2030

1970
1980
1990
2000
2010
2020
2030
Dual-Capable Delivery Systems (Post-1989)
Final Thoughts

• Between the return of great power competition and the modernization/expansion of nuclear arsenals, the time is right to reassess the shifting nuclear balance

• Future of bilateral arms control and arms control in general looks bleak

• China, long known for having a minimal deterrent posture, is developing a larger and more advanced nuclear posture

• Regional rivals, like India and Pakistan, as well as North Korea are expanding their arsenals and increasing the range of their delivery systems

• With this baseline in place, future studies will explore the strategic interactions between nuclear powers as well as the possible effects of emerging technologies on the survivability of current and planned nuclear arsenals
Thank you.