Nuclear Weapons In A Nutshell

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Accomplishments, Global Arsenal

More than 125,000 warheads produced since 1945
Peak of 64,500 stockpiled warheads in 1986
(70,300 if including retired warheads)

- US stockpile peaked early (1967)
- Russian stockpile peaked late (1986)

Enormous reductions since 1986 peak:
- ~54,000 warhead stockpile reduction
- ~47,000+ warheads dismantled

~10,000 warheads in stocks (16,300 if counting retired warheads awaiting dismantlement)

US and Russia possess 90% of global inventory (94% if counting retired warheads); each has more than 4 times more warheads than the rest of the world combined; 15 times more than the third-largest stockpile (France)

Decreasing: US, Russia, Britain, France
Increasing: China, Pakistan, India
Israel relatively steady; North Korea trying
US-Russian Arsenals

With more than 90% of world inventory, US and Russia have special responsibility to reduce

Reduction of deployed strategic warheads from some 23,000 in 1989 to 3,500 in 2014 (New START counts 3,285)

Readiness level of remaining strategic forces is high: about 1,800 warheads on prompt alert

No official de-alerting, but significant reduction of overall alert level: heavy bombers de-alerted, US ICBMs and SLBMs downloaded, non-strategic forces de-alerted

Trend: pace of reduction is slowing

US cut only 309 warheads in 2009-2013, compared with 3,287 warheads cut in 2004-2008

Russia cut an estimated 1,000 warheads in 2009-2013, compared with 2,500 in 2004-2008

Instead of continuing pace or increasing reductions, US and Russian stockpiles appear to be leveling out for the long haul; new emphasis on modernization

New initiatives needed to continue reductions

Note: retired, but still intact, warheads awaiting dismantlement are not shown
• U.S. and Russian combined stockpiles of non-strategic nuclear warheads reduced by roughly 90 percent since 1991. Neither side has disclosed actual numbers

• Russia: two public declarations:
  2005: Russian “non-strategic nuclear forces” have been reduced “by four times” since 1991.
  2010: “the Russian arsenal of non-strategic nuclear weapons is reduced four times [75%]* in comparison with the USSR arsenal.”

  * Note: PNI declarations do not add up to 75%

• United States: two public declarations:
  2014: “The number of U.S. non-strategic nuclear weapons has declined by approximately 90 percent since September 30, 1991.

• Some 2,500 warheads remain assigned to non-strategic forces (Russia ~2,000; United States ~500)

• Several thousands additional retired, but still relatively intact, warheads in storage are awaiting dismantlement

• Stockpiles will likely continue to decline in next decade with or without arms control agreements
Non-Strategic Weapons: Russia

- Widely dispersed forces in four Services: tactical air force, navy, defense, and army (see map)
- Warheads not on bases but in central storage
- Yet some upgrades of nuclear-storage sites at bases (Shaykovka Tu-22 base, bottom left; Kaliningrad bottom right)
Non-Strategic Weapons: NATO

- 180 U.S. B61 bombs scattered in 87 underground vaults underneath 87 aircraft shelters at six bases in five European countries:

<table>
<thead>
<tr>
<th>Country</th>
<th>Base</th>
<th>Vaults</th>
<th>B61s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belgium</td>
<td>Kleine Brogel</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>Germany</td>
<td>Büchel</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>Italy</td>
<td>Aviano</td>
<td>18</td>
<td>50</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Volkel</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>Turkey</td>
<td>Incirlik</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>87</td>
<td>180</td>
</tr>
</tbody>
</table>

- Additional bombs in the United States for extended deterrence missions elsewhere

- 50 French ASMPA cruise missiles at three bases for 3 squadrons (2 air and 1 naval)
Because they are dual-capable, non-strategic nuclear are quickly drawn into conflicts: Russian deployment of S-300 air-defense and Su-24 bombers in Crimea (above); German personnel loading U.S. B61 on German Tornado (top right); U.S. F-16 from Aviano Air Base on rotational deployment to Lask Air Base in Poland (top right); Russian Tu-22 bomber intercepted over Baltic Sea by French Mirage fighter (bottom right).
Modernization: Russia

ICBM
- SS-27 Mod 1 (silo) completed (Tatishchevo: 60) completed
- SS-27 Mod 1 (mobile) completed (Teykovo: 18) completed
- SS-27 Mod 2 (mobile: Teykovo (18); Novosibirsk; Irkutsk; Tagil, Yoshkar-Ola) underway
- SS-27 Mod 2 (silo: Kozelsk) underway
- New ICBMs (Sarmat “heavy”; modified SS-27 (RS-26)) development

SSBN / SLBM
- Delta IV SSBN deployed
- SS-N-23 SLBM life-extension (Sineva/Layner) deployed
- Borei SSBN deploying (8 announced)
- SS-N-32 (Bulava) development

Bombers
- Tu-160 (Blackjack) upgrade underway
- Tu-95 (Bear) upgrade underway
- New bomber (PAK PA) development
- ALCM (Kh-102) deploying?

Tactical
- Tu-22M (Backfire) upgrade underway
- Su-34 (Fullback) deploying
- Yasen (Sverodvinsk) SSGN development
- SLCM (SS-N-30, Kaliber) development
- SSM (SS-26, Iskander) deploying
- SAM (S-400/SA-21) deploying (nuclear ?)
- ABM (A-135) development
Modernization: United States

ICBM
- Minuteman III life-extension deployed
- GBSD replacement ICBM development
- W78 warhead life-extension/upgrade development

SSBN / SLBM
- Ohio SSBN life-extension deployed
- Trident II SLBM life-extension development
- New SSBN development (12 planned)
- W76-1 warhead life-extension deploying
- W88-1 warhead life-extension development

Bombers
- B-2 upgrade underway
- B-52 upgrade underway
- LRS-B next-generation bomber development
- B61 bomb life-extension/upgrade development
- LRSO (ALCM) replacement development

Tactical
- F-35 nuclear capability development
- B61 life-extension/upgrade development

Infrastructure
- Uranium Processing Facility (secondaries) development
- Plutonium production facility (primaries) development
- National Ignition Facility deployed/development
Modernization: France

SSBN / SLBM
- M51.1 SLBM (TN75) deployed
- M51.2 SLBM (TNO) deployed from 2015
- M51.3 SLBM development

Bombers
- Mirage 2000NK3 deployed at Istres Air Base
- Rafale K3 deployed at Saint-Dizier Air Base
- Rafale MK3 deployed on Charles de Gaulle
- ALCM (ASMPA/TNA) deployed
- Next-generation ALCM development

Infrastructure
- Megajoule at CESTA development
- Airix/Epure hydrodynamic test center at Valduc development (partly Joint French-UK warhead surveillance testing center)
Modernization: Britain

SSBN / SLBM
- SSBN (Vanguard replacement) development (3-4 planned)
- SLBM (Trident II D5LE) development
- Mk4A/W76-1 type warhead deploying

Infrastructure
- Joint UK-French warhead surveillance testing technology center development
Modernization: China

ICBM / MRBM
- DF-31 (CSS-10 Mod 1) mobile ICBM deployed
- DF-31A (CSS-10 Mod 2) mobile ICBM deploying
- DF-21 (CSS-5 Mod 1/2) mobile MRBM deployed
- DF-41 mobile ICBM development (MIRV)?

SSBN / SLBM
- Jin (Type-094) SSBN deploying (3+ expected)
- Type-096 SSBN development
- JL-2 (CSS-N-14) SLBM development

Cruise Missiles:
- ALCM (CJ-20 on H-6 bomber) development*
- GLCM (DH-10/CJ-10) deployed**

Note: China is the only of the P-5 (NPT declared) nuclear-armed states that is increasing its nuclear arsenal

* Listed in 2013 AFGSC briefing but not in 2013 NASIC report.
** Listed by NASIC as “conventional or nuclear,” the same designation as the Russian nuclear-capable AS-4 Kitchen ALCM.
Modernization: Pakistan

MRBM / SRBM
- Shaheen II MRBM (Hatf-6) development
- NASR SRBM (Hatf-9) development
- Abdali SRBM (Hatf-2) development*

Cruise Missiles
- GLCM (Babur/Hatf-7) development
- ALCM (Ra’ad/Hatf-8 on Mirage) development
- SLCM (naval version of Babur) development?

Infrastructure
- Khushab-IV reactor development

* Listed by Pakistani ISPR but not by 2013 NASIC report.
Modernization: India

ICBM / IRBM / MRBM
- Agni VI ICBM development (MIRV)?
- Agni V ICBM development
- Agni IV IRBM development
- Agni III IRBM development
- Agni II MRBM deploying

SSBN / SLBM
- Arihant SSBN development (3+ expected)
- K-15/K-4 SLBM development
- Dhanush SLBM development

Cruise Missiles
- GLCM (Nirbhay) development*

Infrastructure
- Two plutonium production reactors developing

* Reported by news media but not listed in 2013 NASIC report.
Modernization: Israel

IRBM
  • Jericho III IRBM development?

SSG / SLBM
  • Dolphin SSG deploying
  • SLCM (Popeye Turbo/Harpoon) deploying?

Bomber
  • F-35 development

* Reported by news media but denied by officials. US public intelligence reports omit references to Israeli nuclear forces.
ICBM / IRBM / MRBM
- No Dong MRBM development?
- Musudan IRBM development?
- Hwasong-13 (KN-08) ICBM development?
- Taepo Dong 2 SLV/ICBM development?

Cruise Missiles
- KN-09 coastal defense cruise missile development?*

Infrastructure
- Yongbyon plutonium production reactor re-start development
- Uranium enrichment production development

* Listed by 2013 AFGSC briefing but not in 2013 NASIC report. 2014 update of AFGSC does not list KN-09.
Modernization: NATO

• Major nuclear facelift underway of NATO non-strategic nuclear forces
  • Modification of B61 bomb from “dumb” bomb to guided, standoff weapon with guided tail kit assembly that will increase targeting accuracy and efficiency
    ◆ Integration on F-15E in 2013-2018
    ◆ Integration on F-16 in 2015-2018
    ◆ Integration on PA-200 in 2015-2017
• B61-12 First Production Unit in 2020
• Addition of nuclear-capability to F-35A II Lightning fighter-bomber
  ◆ Integration of B61-12 in 2015-2021
  ◆ Delivery to Italy, the Netherlands, and Turkey (and Israel)
• B61-12 will also be integrated onto strategic bombers (B-2 and new LRS-B)
• Upgrade of storage sites and handling
• Cost: more than a decade worth of European Reassurance Initiatives
• Mission: deterrence, (fake) reassurance, tradition
Conclusions

- Considerable reductions of nuclear forces have been accomplished since the Cold War, yet large and widespread inventories remain.
- Many missions and scenarios fell away with end of Cold War, yet the core mission of nuclear weapons has remained largely intact and even broadened in some cases.
- United States, Russia, Britain, and France continue to reduce, although pace of reduction is slowing.
- China, Pakistan, and India are increasing arsenals, both in numbers and diversity.
- All nuclear-armed states have significant nuclear modernization programs underway; growing emphasis on nuclear modernization rather than reductions and disarmament.
- Despite previous progress and promises to reduce and eventually eliminate nuclear weapons, none of the nuclear-armed states have presented plans to complete the process.
- All nuclear-armed states continue to attribute importance to nuclear weapons for national and international security and plan to keep them for the foreseeable future.
- Modernization of non-strategic nuclear weapons continues; dual-capable non-strategic nuclear forces are a particular concern because they quickly get drawn into conflicts (fx current east-west crisis over Ukraine).
- New initiatives are needed not only to reduce warhead numbers but to limit modernization programs and keep non-strategic nuclear forces out of crisis situations.