Modernization of the Russian Strategic Forces

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Outline

- Current status
  - New START limits
  - Strategic and non-strategic weapons

- Strategic modernization programs
  - Strategic bombers
  - Submarines
  - Ballistic missiles
  - Early-warning
Current status

- New START accountable warheads and launchers (as of 1 March 2014)
  - 1512 deployed warheads
  - 498 deployed launchers
  - 906 deployed and non-deployed launchers

- Estimated actual numbers (as of January 2014)
  - 490 deployed launchers
  - 1700 deployed warheads
## Strategic triad

<table>
<thead>
<tr>
<th></th>
<th>Launchers</th>
<th>Warheads</th>
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</thead>
<tbody>
<tr>
<td>ICBMs</td>
<td>311</td>
<td>1078</td>
</tr>
<tr>
<td>SLBMs</td>
<td>112</td>
<td>416</td>
</tr>
<tr>
<td>Bombers</td>
<td>66</td>
<td>~200</td>
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<tr>
<td><strong>TOTAL STRATEGIC</strong></td>
<td><strong>490</strong></td>
<td><strong>1700</strong></td>
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<tbody>
<tr>
<td>Non-strategic warheads (in centralized storage)</td>
<td>~2000</td>
<td></td>
</tr>
<tr>
<td>Retired warheads in dismantlement queue</td>
<td>~3500</td>
<td></td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>~8000</strong>*</td>
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* Source: Hans Kristensen, Russian Nuclear Forces, 2014
Bombers

- **Tu-95MS (Bear H)**
  - Nuclear ALCMs
  - Produced in 1984-1994
  - To stay in service until 2025-2035?

- **Tu-160 (Blackjack)**
  - Nuclear and non-nuclear ALCMs, bombs
  - Produced in 1987-2007
  - To stay in service until 2025?

- **PAK DA**
  - Under development since 2011
  - Subsonic?
  - To enter service after 2025?

Photos: russianplanes.net
Submarines and SLBMs

- **Project 667BDR (Delta III)**
  - Built in 1980-1984
  - 1 submarine (+3 being retired)
  - 16 R-29R SLBMs (3 warheads)

- **Project 667BDRM (Delta IV)**
  - Built in 1985-1991, completed overhaul
  - 6 submarines
  - 16 R-29RM SLBMs
    - Sineva: 4 warheads, 2004-2013
    - Liner: 4-10 warheads, 2014-

Photos: fleetphoto.ru, Oleg Kuleshov
New submarines and SLBMs

- **Project 955 Borey**
  - 2 submarines accepted for service
    - Yuri Dolgorukiy (Dec 2012)
    - Alexandr Nevski (Dec 2013)
  - 2 under construction
    - Vladimir Monomakh (sea trials)
    - Knyaz Vladimir (in dock)
  - Total of 8 submarines by 2020
  - 16 Bulava SLBMs (6 warheads)

- **Bulava SLBM**
  - 20 tests (2005-2013), 10 successful
  - 6 tests expected in 2014

Photos: Sevmash, militaryrussia.ru
ICBMs

- ICBM force
  - About 1100 out of 1700 warheads
  - About 750 warheads on old MIRVed ICBMs

- Old ICBMs
  - R-36M2 (SS-18)
    - Produced in 1988-1992, to stay until 2022
    - 52 silo-based missiles, 10 warheads
  - UR-100NUTTH (SS-19)
    - Produced in 1979-1984, to stay until 2019
    - ~40 silo-based missiles, 6 warheads
  - Topol (SS-25)
    - Produced in 1985-1992, being withdrawn
    - About 100 road-mobile missiles, single-warhead
New ICBMs: Topol-M (SS-27)

- Development started in late 1980s
- Single-warhead missile
- Silo- and road-mobile versions
- Deployment: 1997 (silo), 2006 (mobile)
- 2014: 60 silo, 18 mobile missiles

Photos: militaryrussia.ru, vitalykuzein.net, infoglaz.ru
New ICBMs: RS-24 Yars

- MIRVed version of Topol-M
- 4 to 6 warheads
- Deployment: 2010 (mobile), 2014 (silo)
- Deployment plans
  - 2014: 33 deployed ICBMs
  - Total of 60-100 missiles to be deployed?
- SS-18 replacement?
  - Throw-weight is 1.2 tonnes vs. 8.8 tonnes
New ICBMs: Sarmat “heavy” ICBM

- Old “heavy” missile: R-36M2/SS-18
  - Launch weight 211 tonnes
  - Throw-weight: 8.8 tonnes
  - 10x800 kt warheads
    - 38 warheads considered at some point in the 1970s
    - Guided warhead tested in 1990
  - Hardened silos

- New “heavy” missile: Sarmat
  - Liquid fuel
  - Launch weight “considerably more than 100 tonnes”
  - Throw-weight more than 4.5 tonnes?
  - Deployment expected in 2018-2020
New ICBMs: Boost-glide system?

- Early development
  - Albatross system in 1987-1991
  - Flight tests in 1990, 2001?
- “Hypersonic warhead” test in Feb 2004
  - SS-19 from Baykonur to Kamchatka
  - Partially successful?
- “Hypersonic vehicle” test in Sep 2013
  - SS-19 from Dombarovskiy?
  - Failure
- Project 4202
  - Major construction in Dombarovskiy
- Production to begin in 2015?
New ICBMs: Rail-mobile missile

- **Old rail-mobile missile: RT-23UTTH/SS-24**
  - Launch weight 104.5 tonnes
  - Length 23 m
  - 10 warheads
  - 36 missiles in 1990 (+56 in silos)

- **New rail-mobile missile**
  - Based on Bulava?
    - Launch weight 37 tonnes, length 12 m
  - Rejected earlier, but considered again in 2013
  - Decision to be made in 2014
New ICBM/IRBM: RS-26 Rubezh

- “Intercontinental range” test in May 2012
  - From Plesetsk to Kamchatka – 5,800 km
  - Needed 5,500 km to qualify as ICBM
  - Tested with one warhead

- “Intermediate-range” tests
  - From Kapustin Yar to Sary-Shagan – 2,000 km
  - With multiple (reportedly 3) warheads

- IRBM based on RS-24?
  - TEL+missile:
    - 80 tonnes vs. 120 tonnes for RS-24
  - First two stages of RS-24?
    - Similar to Temp-2S/SS-16 and Pioneer/SS-20

Photo: rcforum.ru, militaryrussia.ru
INF Treaty compliance issues

- **RS-26 Rubezh**
  - INF Treaty prohibits missiles with 500-5500 km range
  - But RS-26 will be counted as ICBM under New START

- **Ground-launched cruise missile**
  - US: Tests began in 2008, not yet deployed
    - Probably not Iskander
  - INF Treaty prohibits GLCMs with 500-5500 km range
  - No good definition of GLCM range in the treaty
  - Likely a test of SLCM from ground launcher
Modernization of the triad

- **Bombers**
  - PAK DA

- **Submarines and SLBMs**
  - Project 667BDRM subs + Sineva and Liner R-29RM missiles
  - Project 955 submarines + Bulava SLBM

- **ICBMs**
  - Topol-M/RS-24 Yars
  - Sarmat “heavy” ICBM
  - RS-26 Rubezh IRBM/ICBM
  - Project 4202?
  - Rail-mobile ICBM?
Ukrainian factor

- **Yuzhmash/Yuzhnoye DB (Dnepropetrovsk)**
  - Designed and built R-36M2/SS-18 ICBM
  - Participates in the life extension program

- **Khartron (Kharkov)**
  - Guidance systems
    - UR-100NUTTH ICBM
    - 71Kh6/US-KMO GEO early-warning satellites
    - Project 4202
Early-warning system: Radars

- Radars in Ukraine, Azerbaijan no longer used
- Radars in Belarus, Kazakhstan to be replaced
- New radars are built in Russia

Voronezh-D

Voronezh-DM
Early-warning radars: West
Early-warning radars: East
Early-warning satellites

- **Highly-elliptical orbits**
  - US-KS/Oko system, 73D6 satellites
  - Limited to the U.S. territory
  - Up to 9 satellites in the constellation
  - 2014: 2 operational satellites provide 12 hours/day coverage

- **Geostationary satellites**
  - US-KMO system, 71Kh6 satellites
  - Look-down capability
  - 2014: 1 satellite at 166 East

- **New system (EKS)**
  - Under development

Photo: novosti-kosmonavtiki.ru
Prospects for nuclear reductions

- **State Armament Program 2011-2020**
  - Total: 19 trillion RUR ($650 billion)
  - Strategic triad: ~$70 billion

- **Arms control**
  - New START ends in February 2021
  - Linkage to missile defense, multilateral disarmament, conventional precision weapons
  - Few incentives to reduce the numbers
  - But still some interest in bilateral arms control