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Alert Status of Nuclear Weapons

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Briefing to

Short Course on Nuclear Weapon and Related Security Issues
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Overview: Nuclear Alert Forces

Four nuclear-armed states deploy nuclear warheads on alert, ready to be used on relatively short notice: United States, Russia, France and Britain.

Combined, the four countries deploy an estimated 1,869 nuclear alert warheads.

Russia and the United States deploy 1,749 alert warheads combined, or 94% of all alert warheads.

Despite some debate about possible need to increase readiness of nuclear forces (China, Pakistan), the five other five nuclear-armed states (China, Pakistan, India, Israel and North Korea) are thought to store their warheads separate from launchers under normal circumstances.

The overall number of alert warheads has remained relatively stable during the past five years.

Estimated Nuclear Alert Forces, 2017

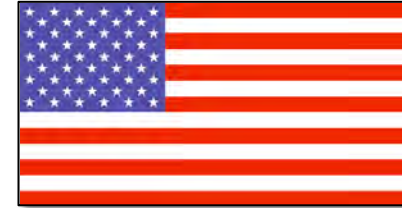
Country	Stockpiled Warheads	Alert Warheads
United States	4,000	852
Russia	4,300	897
France	300	80 ^a
Britain	215	40 ^a
China	270	0
Pakistan	140	0
India	120	0
Israel	80	0
North Korea	(10-20)	(0)
Total	9,425^b	1,869

Note: This table defines alert warheads as those mated with deployed launchers capable of launching on relatively short notice. Alert warheads make up a portion of deployed warhead that make up a portion of stockpiled warheads.

^a French and British alert forces are thought to have lower readiness than U.S. and Russian alert forces and take longer to launch.

^b In addition to stockpiled warheads, Russia and the United States have large numbers of retired, but still relatively intact, warheads awaiting dismantlement. For global overview of nuclear forces, visit: <https://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/>

US Nuclear Alert Forces



An estimated 852 warheads with 228 MT on prompt alert (ready to launch <15 min)

Alert warheads roughly 21% of total stockpile

ICBMs: 392 warheads (125 MT)
Surge: 300 warheads (upload)

SSBNs: 460 warheads (103 MT)
Surge: 1,460 warheads (deployed + uploads)

Bombers: 0 warheads
Surge: 816 warheads (deployed + uploads)

Non-Strategic: 0 warheads
Surge: 300 warheads (bombs)

Alert rate assumptions

ICBMs: Minuteman III (98%)

SSBNs: 5 on hard alert (each with 20 tubes)

Bombers: None

Non-strategic: None

US Nuclear Alert Forces: Trends

ICBM alert trends

- Overall force size declining slightly to 400 missiles
- Warhead download completed in 2014 (upload retained for Mk12A/W78 equipped missiles)
- Next ICBM (GBSD) MIRV

SSBN alert trends

- Near term: SSBN tube reduction from 24 to 20 (no overall warhead reduction)
- Long term: Next SSBN class tube reduction from 20 to 16
- SSBN fleet reduction from 14 to 12 with next SSBN (possibly sooner after last Ohio refuelings)



Mobile ICBMs are spending longer time away from garrisons during combat patrol deployments.
Image: Russian MOD

Russian Nuclear Alert Forces

An estimated 897 warheads with 516 MT on prompt alert (ready to launch <15 min)



Alert warheads roughly 21% of total stockpile

ICBMs: 686 warheads (492 MT)

Silo: 65-95% readiness

Mobile: 15-20% readiness

Surge: 391 warheads (mainly mobile)

SSBNs: 211 warheads (24 MT)

Surge: 429 warheads

Bombers: 0 warheads

Surge: 616 warheads (deployed + uploads)

Non-Strategic: 0 warheads

Surge: ~1,480 warheads (all but ABM/air-defense)

Official statements appear highly exaggerated

Of Russia's ICBMs, as many as "99 percent of missile launchers are in the state of combat readiness."

SRF Commander Col Gen Sergei Karakayev, 15 Dec 2016

Alert rate assumptions

ICBMs (silo): SS-18 (90-95%); SS-19 (65%); SS-27 Mod 1 (90%); SS-27 Mod 2 (90%)

ICBMs (mobile): SS-25 (15%); SS-27 Mod 1 (20%); SS-27 Mod 2 (20%)

SSBNs: 3 at sea; 3 at pierside (~30%)

Bombers: None

Non-strategic: None

Russian Nuclear Alert Forces: Trends

ICBM alert trends

- Overall force size declining but leveling out around 310+ launchers
- Increased emphasis on MIRV
- 10 years ago no mobile ICBMs had MIRV; by 2022 ~all will have MIRV
- Greater share of warheads on mobile (lower alert level but harder to find)
- Mobiles increase duration of combat patrol tours

SSBN alert trends

- SSBN operations increasing some (despite what you hear, not Cold War level and not as much as attack submarine operations), probably 2-4 on alert at sea plus 2-4 at pier side
- Warhead loading increasing (6 MIRV on SS-N-32; 4 on SS-N-23; 3 on SS-N-18); hedge emerging?



Mobile ICBMs are spending longer time away from garrisons during combat patrol deployments. *Image: Russian MOD*



The first two Borei-class SSBNs appear to be conducting patrols. Here Alexander Nevsky completes “combat service” in Pacific in November 2016. *Image: Russian MOD*

French Nuclear Alert Forces

An estimated 80 warheads with 8 MT on alert

Alert warheads roughly 27% of total stockpile

SSBNs: 80 warheads (8 MT)

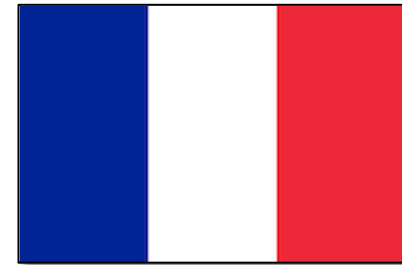
Surge: 80 warheads

Bombers: 0 warheads

Surge: 40 warheads

Non-Strategic: 0 warheads

Surge: 14 warheads



Alert rate assumptions

SSBNs: 1 at sea at all times; second boat on standby

Bombers: None

Non-strategic: None

French Nuclear Alert Forces: Trends

SSBN alert trends

- Warhead loading on some SLBMs has been reduced to allow more tailored targeting.
- M45 SLBM has recently been completely replaced by M51 SLBM with “significantly greater range and payload capacity, as well as greater accuracy”.
- 100 kt TN75 warhead is being replaced with 150 kt TNO warhead.



The M51 SLBM will receive new TNO warheads with increased yield.

Image: French MOD

British Nuclear Alert Forces

An estimated 40 warheads with 4 MT on alert

Alert warheads roughly 19% of total stockpile

SSBNs: 40 warheads (4 MT)

Surge: 80 warheads



Alert rate assumptions

SSBNs: 1 at sea at all times; second boat on standby

Bombers: None

Non-strategic: None

British Nuclear Alert Forces: Trends

SSBN alert trends

- SLBM loading has been reduced from 16 to 8
- Warhead loading has been reduced from 48 to 40
- Operationally available warheads has been reduced from 180 to 120
- Next generation SSBN will have 12 instead of 16 tubes



The new British Dreadnought-class SSBN will be equipped with 12 missile tubes instead of 16 on the Vanguard-class. *Image: UK MOD*

Partial Dealerting Steps

Since end of the Cold War, nuclear alert rates have been reduced in several ways:

- Strategic bombers were taken off alert in 1991.
- ICBM warhead loading reduced (United States); New START treaty included ICBM MIRV ban but was abandoned in favor of ballistic missile defenses against rogue states.
- SLBM warhead loading reduced (United States).
- De-targeting initiatives: ICBMs/SLBMs targeted at open ocean areas during peacetime (note: de-targeting is *not* dealerting).
- Non-strategic forces taken off alert. Most warheads destroyed but remaining placed in central storage. Some still deployed on bases near launchers (US bombs in Europe; French cruise missiles).



Promises To Dealert

US presidential candidates have repeatedly promised to rake nuclear weapons off alert.

President George W. Bush lamented that Cold War differences “were expressed in a dangerous military confrontation that resulted in thousands of nuclear weapons pointed at each other on hair-trigger alert.”

Barack Obama promised to “work with Russia to take U.S. and Russian ballistic missiles off hair-trigger alert”.

Yet, neither Bush nor Obama did so but instead retained status quo of nuclear alert postures.

Russia, France and Britain do not seem interested.

Reducing Alert Rates Seen As A Good Thing

At the end of the Cold War Russia had “12,000 [strategic] nuclear weapons, most of those on alert ... [By 1999], under START I, the Russians have about 2,000 nuclear weapons on alert [out of a total of 6,100 strategic warheads that year]. Under START II [out of 3,000–3,500 deployed strategic warheads], they’ll be down to about 1,000 nuclear weapons on alert. Under START III, if all goes [as planned, that number will] be around 700 nuclear weapons”.

Gen. Eugene Habiger, former STRATCOM Commander.

Yes – No: The Dealerting Debate

Debate is very polarized.

Proponents of reducing or even dealerting nuclear forces argue that doing so would reduce the competitive dynamic and worst-case scenario attitude in nuclear force planning and operations, as well as reducing or eliminating the risks of accidental launch of nuclear forces.

Opponents of reducing – certainly dealerting – nuclear forces argue that alert nuclear forces help maintain crisis stability and that dealerting would create significant risks of a re-alerting race in a crisis.

While there are important crisis stability and verification issues in both alerted and de-alerted postures, we find that even if all US and Russian nuclear forces were de-alerted and one side secretly re-alerted, the aggressor could not be confident in carrying out a disarming first strike because a sufficient number of highly capable forces would survive to provide a devastating retaliation.

Realerting In Existing Alert Postures



During the Constant Vigilance alert exercise at Minot AFB in May 2015, a dozen B-52 bombers were loaded with unarmed nuclear air-launched cruise missiles.

Despite concern about realerting effect, both US and Russian escalation strategies rely on significant realerting to signal and boost nuclear postures in a crisis.

US warhead “hedge” of non-deployed warheads explicitly provides “the option for [the] leadership to increase the number of operationally deployed forces in proportion to the severity of an evolving crisis.”

The US has more warheads in non-deployed hedge than in deployed force (56% vs 44%). Russian ratio similar but hedge is mainly (77%) non-strategic.

“The LRSO will provide a rapid and flexible hedge against changes in the strategic environment and limitations of the other two legs of the Triad. Under the New START Treaty, each strategic bomber counts as one launcher and one warhead, regardless of the number of nuclear cruise missiles and bombs in our inventory. This provides a **rapid upload capability to hedge against geopolitical or technical surprise.”**

Brian McKeon, OSD, testimony before Congress, February 26, 2015

Disparity In US And Russian Alert Postures

Significant differences in military postures can have significant implications:

- Russian ICBM force has more than twice the number of warheads of US ICBM force.
- US has 150 deployed strategic launcher more than Russia; drives Russian emphasis on MIRV.
- Future Russian ICBM force will be ~entirely MIRVed; US ICBM force is downgraded.
- Larger US ICBM force with fewer warheads can threaten smaller Russian ICBM force carrying more warheads (400 warheads on 400 ICBMs threatening 1,000 warheads on 316 ICBMs).
- Larger US SLBM force with more warheads has significant counterforce capability in addition to secure retaliation mission.

Shaping Nuclear Alert Futures

While intended to ensure crisis stability, alert forces can also have other negative effects:

- Nuclear alert postures drive worst-case and short-fused strategy, posture planning and decision making. Alert forces requires adversaries to maintain forces on alert: cyclic alert relationship.
- US-Russian nuclear alert postures might gradually inspire smaller nuclear-armed states to also increase the readiness of their nuclear forces (China, Pakistan).
- When combined with conventional offensive and defensive capabilities, nuclear alert postures might stimulate smaller nuclear-armed states to increase nuclear force loadings: MIRV (China and Pakistan).
- While there are risks with both alerted and dealerted postures, a realerting race that takes three months under a dealerted posture seems preferable to an alert race that takes less than three hours under current highly alerted posture.

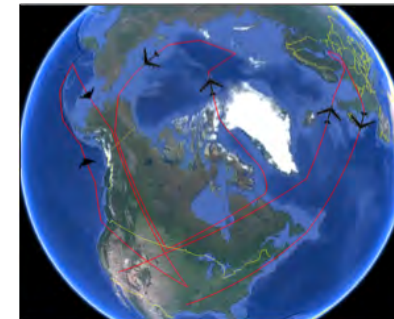


In our 2012 UNIDIR report, we discuss alert postures and issues more. Available online at: <http://www.unidir.org/files/publications/pdfs/reducing-alert-rates-of-nuclear-weapons-400.pdf>

Crises Shaping Alert Postures

Recent East-West crisis shows signs of effecting nuclear readiness postures and strategies:

- Russian vocal nuclear threats and putting nuclear forces on alert.
- Escalate-deescalate strategies entertaining limited and early use.
- Talk of increasing escalation planning and readiness of dual-capable aircraft.
- OPLAN in effect for EUCOM with increased nuclear bomber support.
- Signaling with alert forces: bomber strike exercises and and forward deployments and SSBN port visits.



Conclusions

Four countries (United States, Russia, France, Britain) have nearly 1,900 nuclear warheads (94% are Russian/US warheads) on alert on ballistic missiles, capable of launching in relatively short time.

Some smaller nuclear-armed states (China and Pakistan) are debating whether to increase the readiness of their nuclear forces.

Overall alert level have been relatively stable past five years but some force structures are changing (Russian mobile ICBM MIRV; US warhead kill effectiveness).

Signaling is increasing with nuclear alert forces and forces that would be re-alerted in a crisis.

US presidential candidates promised try to take nuclear weapons off “hair-trigger” alert but have not done so.

Alert-countries oppose reducing alert levels, certainly de-alerting, arguing alert forces create stability and de-alerting would create risks for a re-alerting race in a crisis.

Opponents of nuclear alert argue the posture is dangerous, that considerable partial de-alerting has been done without incidents, and that fear of re-alerting race is exaggerated.