

Russian Security State

GOVT-5519 / IPOL-3519 / REES-5519

Lecture 19. Nuclear Weapons and Strategy

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Today's objectives

1. *Define:* the core elements of nuclear strategy:
 - a) second strike capabilities
 - b) nuclear triad
 - c) counterforce vs. countervalue targeting
 - d) missile defense
 - e) non-strategic nuclear weapons
2. *Consider:* the concept of limited nuclear war, and its place in Soviet/Russian planning

Nuclear Time Machine!

As the captain of a U.S. navy cargo ship carrying 100 nuclear warheads and delivery systems, you accidentally sail into a time warp and are transported back in time to 1933. You have four options:

1. **Sink the ship**, preventing anyone in 1933 from getting the weapons,
2. **Return the weapons** to the U.S. government,
3. Distribute the nuclear arsenal asymmetrically to **2-3 great powers**, so that each has a reliable “second-strike” capability,
4. Distribute the arsenal evenly to **as many states as possible** (second-strike capability not guaranteed for all recipients).

Which option would you choose?

Origins of Nuclear Strategy

I am become Death. Destroyer of worlds

1. Trinity test, 16 July 1945
 - a) first test of nuclear device
 - b) New Mexico, USA
 - c) 20 kiloton TNT equivalent
2. Soviet reaction
 - a) Truman tells Stalin about test at Potsdam Conference
 - b) Stalin already knows
 - c) first Soviet test in 1949

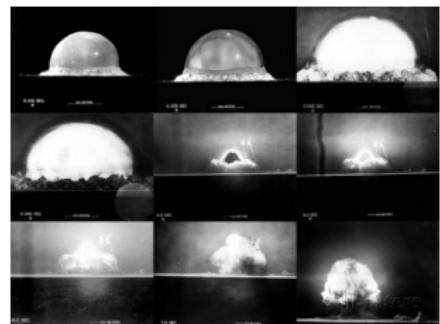


Figure 1: Trinity Test



Figure 2: Ne boltay

What's Different About Nukes?

A new kind of weapon?

1. Tokyo firebombing (9-10 Mar 1945)
 - a) 16km² destroyed, 100K killed
 - b) 334 bombers
 - c) 1,665 tons explosive
2. Hiroshima (6 Aug 1945)
 - a) 4mi² destroyed, 80K killed
 - b) 1 bomber
 - c) 15,000 tons TNT equivalent
3. Nagasaki (9 Aug 1945)
 - a) 13mi² destroyed, 75K killed
 - b) 1 bomber
 - c) 21,000 tons TNT equivalent



Figure 3: Tokyo or Hiroshima



Figure 4: Tokyo or Hiroshima

Could you survive a nuclear strike?

1. Trinity Test (20kt)
 - a) first nuclear bomb tested
 - b) same yield as Nagasaki bomb
 - c) .1 mi radius: fireball
 - d) .5 mi: complete destruction to buildings, 100% fatalities
 - e) 1.4 mi: major damage to buildings, 50-90% fatalities, 3rd degree burns
 - f) 77mi: fallout cloud
 - g) estimated casualties: 38,070 killed, 71,440 injured

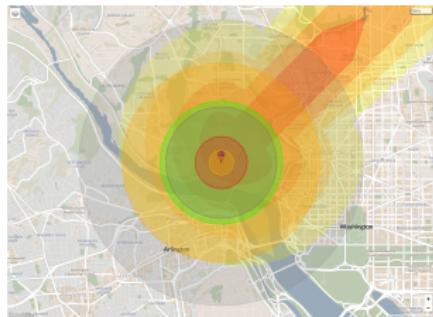


Figure 5: Blast site, 20kt

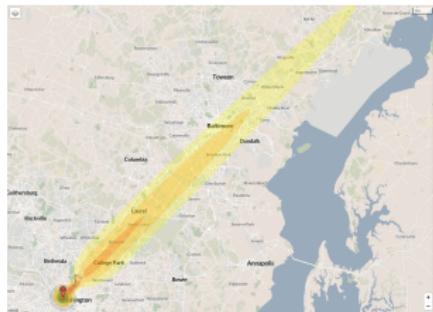


Figure 6: Fallout cloud

Could you survive a nuclear strike?

2. Ivy Mike (10Mt)
 - a) first H-bomb tested
(Nov 1952, USA)
 - b) 2 mi radius: fireball
 - c) 3 mi: complete destruction to buildings, 100% fatalities
 - d) 18 mi: major damage to buildings, 50-90% fatalities, 3rd degree burns
 - e) 526mi: fallout cloud
 - f) 1,127,930 killed, 135,550 injured

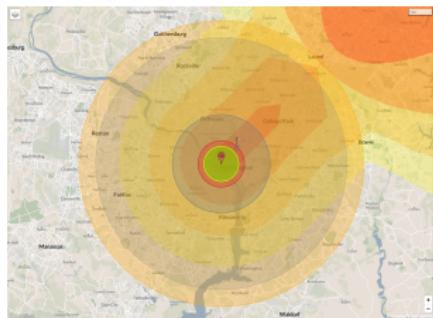


Figure 7: Blast site, 10Mt

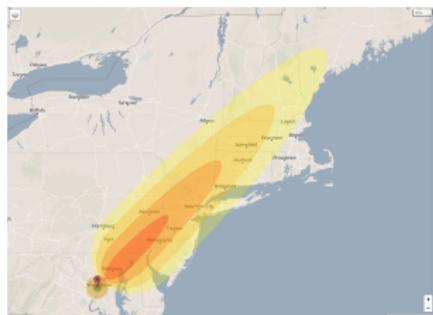


Figure 8: Fallout cloud

Could you survive a nuclear strike?

3. Tsar Bomba (100Mt)
 - a) largest nuclear device tested
(Oct 1961, USSR)
 - b) 3.8 mi radius: fireball
 - c) 23 mi: complete destruction to buildings, 100% fatalities
 - d) 46 mi: major damage to buildings, 50-90% fatalities, 3rd degree burns
 - e) 1000mi: fallout cloud
 - f) 2,233,100 killed, 2,337,650 injured

if in NYC: 7.6M killed, 7M injured



Figure 9: Blast site, 100Mt

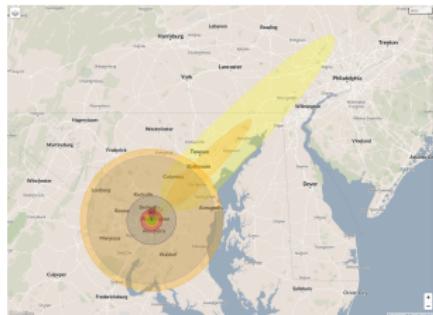


Figure 10: Fallout cloud

The puzzle

1. Why so many nukes?
 - a) fewer than 300 U.S. cities with > 100K population
 - b) fewer than 200 Soviet cities with > 100K population
 - c) not enough targets!
 - d) U.S. plans called for launching entire arsenal simultaneously
 - e) even attacking non-aligned countries

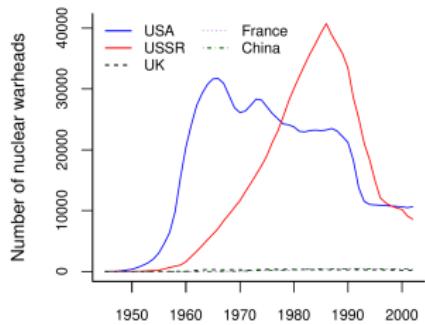


Figure 11: Nuclear balance

Legacy of WWI and WWII

1. Avoiding strategic stalemate
 - a) technological solutions
 - tanks
 - aircraft
 - long-range bombers
 - ballistic missiles (e.g. V2)
 - b) new strategic concepts
 - strategic use of air power
(independent of ground ops)
 - expanded target set
(military and civilian)
 - target will & capacity to fight



Figure 12: How to avoid this



Figure 13: This is how

Nukes: different in degree or kind?

Logic of Deterrence

Early deterrence theory

1. Bernard Brodie (*Absolute Weapon*, 1946)
 - a) if 2 sides have nuclear weapons,
nukes become useless in attack
 - b) costs of nuclear attack too high if
enemy can retaliate
 - c) only purpose: *deterrence*
(increasing costs of attack)
2. New chapter in history of war
 - a) nukes not like other weapons
 - b) only effective when *not* used

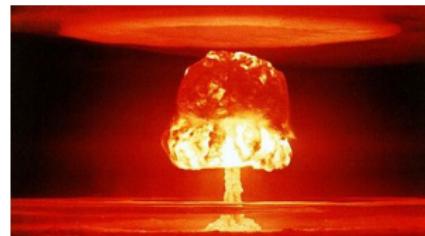
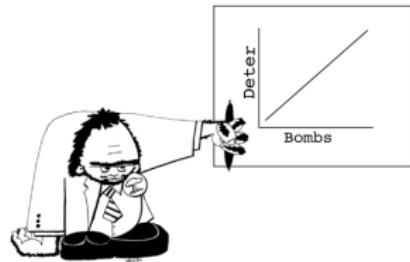


Figure 14: New era begins

Is more better?

1. How many nukes are enough?
 - a) enough = more than we got
 - b) enough to survive enemy's 1st strike
 - c) enough to retaliate, cause unacceptable damage in 2nd strike
2. How ensure 2nd strike capability?
 - a) quantity: more nukes better
 - retaliation requires surplus of nuclear weapons
 - as enemy acquires more nukes, fewer of our nukes will survive first strike
 - b) deployment: nuclear triad
 - (1) air
 - (2) land
 - (3) sea



More Bombs Deter More. Next Slide Please.

Figure 15: A new science

The Triad (1 of 3)

1. Air

(long-range bombers)

- a) oldest delivery vehicle
- b) advantages
 - flexible range
 - large payloads
 - precise delivery
 - can recall at short notice
 - reusable
- c) disadvantages
 - vulnerable on ground and air
 - difficult to sustain high alert for long periods
 - slow



Figure 16: B2 bomber

The Triad (2 of 3)

2. Land

(intercontinental ballistic missiles)

- a) 2nd-oldest delivery vehicle
- b) advantages
 - short flight time
 - high defense penetration
 - high accuracy
 - easy retargetability
 - flexible crisis management
 - low vulnerability to 1st strike
- c) disadvantages
 - not recallable
 - relatively small payloads



Figure 17: Topol ICBM

The Triad (3 of 3)

3. Sea

(submarine-launched ballistic missiles)

- a) newest delivery vehicle
- b) advantages
 - extremely low vulnerability to 1st strike
 - short flight time
- c) disadvantages
 - worse accuracy than ICBM
 - difficult communications
 - inflexible crisis management
 - not recallable
 - relatively small payloads



Figure 18: Trident SLBM

Defensive systems

1. Appeal of ballistic missile defense
 - a) reduce number of enemy weapons that reach targets
 - b) minimize damage caused by enemy weapons
2. Can defense be destabilizing?
 - a) “yes”
 - investment in defense provokes enemy investment in offense
 - enemy ability to retaliate is necessary for deterrence
 - investment in defense signals 1st strike intention (insulate self from retaliation)
 - b) “no”
 - U.S., Russia both capable of penetrating other’s BMD
 - BMD has only a marginal effect on strategic stability

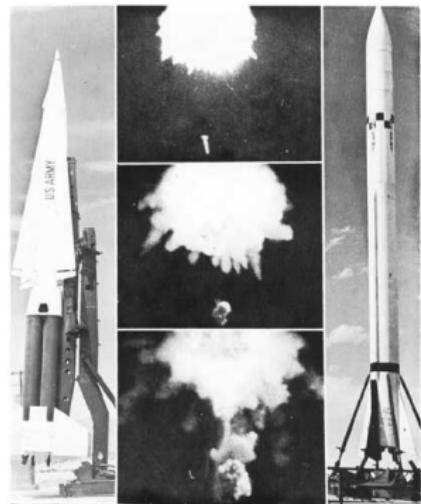


Figure 19: Nike Hercules

Counterforce vs. countervalue

1. Target enemy's nukes?
(counterforce targeting)
 - a) reduce number of weapons enemy can launch
 - b) reduce civilian casualties
 - c) but signals 1st strike intention
(missiles will be gone by 2nd strike)

2. Target enemy's population centers?
(countervalue targeting)
 - a) high civilian casualties
 - b) signals 2nd strike intention
(does not prevent retaliation)
 - c) considered more stabilizing



Figure 20: Where to strike

How to Win a Nuclear War

Discussion

1. Can you “win” a nuclear war? What would victory look like?
2. What level of damage is unacceptable?
(percent of population, physical infrastructure, vegetation)

Deterring vs. winning conventional war

1. Strategic nuclear weapons
 - a) *purpose*: win war with nukes alone
 - b) original intent: threaten nuclear retaliation for Soviet ground offensive in Europe
 - c) but more complicated if Soviets also have nukes
 - d) threat of mass retaliation less credible with Soviet 2nd strike
2. Non-strategic/tactical nuclear weapons
 - a) *purpose*: use nukes for support of (conventional) combat operations
 - b) but is it possible to keep nuclear exchange limited?



Figure 21: Nuclear artillery

Soviet Approach to Deterrence

Soviet nuclear strategy

1. Did Soviets buy U.S. deterrence theory?
 - a) yes, but not completely
 - b) concern that MAD is more fragile than U.S. thinks
 - technical advances to offensive, defense systems will undermine strategic stability
 - c) belief that nuclear effects make war costly, but still winnable
2. Evidence
 - a) emphasis on civil defense
 - b) Moscow missile defense
 - c) deep underground command centers
 - d) writings of Soviet military theorists
3. Official stance
 - a) “no first use” policy (1982)
 - b) but mismatch between declared policy and doctrine



Figure 22: Just for show?

What Soviet political leaders thought

1. Stalin's thinking on nukes
 - a) just another weapon
 - b) strategic balance unchanged
 - c) orders military to develop battlefield tactics for nukes
2. Khrushchev's thinking
 - a) nuclear war unwinnable
 - b) but can be effective deterrent
 - c) and good cost-savings
 - d) permanent nuclear standoff
3. Brezhnev's thinking
 - a) avoid nuclear war if possible
 - b) but keep capability to win



Figure 23: Kuzka's mother

What Soviet military leaders thought

1. Pre-Cuban Missile Crisis

(Sokolovskiy, Military Strategy, 1962)

- a) nukes shift objectives from front (enemy forces) to rear (economy, population)
- b) Soviets are upstart nuclear power, lack 2nd strike capability
- c) surprise, 1st strike is decisive

2. Post-Cuban Missile Crisis

- a) all-out exchange impossible
- b) use of nukes will stay restricted to theater level
- c) regionally limited nuclear war
 - short-range rockets
 - nuclear-capable artillery
 - employment plans for use at theater, lower levels



Figure 24: Sokolovskiy

Nukes in Soviet military doctrine

1. Ground force doctrine
 - a) primacy of offensive
 - b) use nuclear artillery to tear gaps in enemy defenses
 - c) disperse forces to limit damage from nuclear strikes
 - d) rely on armor protection from blast, heat, radiation
2. Naval doctrine
 - a) coastal defense is primary mission
 - b) limited blue water operations
 - c) ballistic missile submarines (SSBNs) kept in “bastions” in Barents Sea, Sea of Japan
 - d) emphasis on sea denial to keep US subs, carriers away from SSBNs



Figure 25: To the front



Figure 26: To the bastion

Russian Nuclear Strategy, Post-1991

Nukes in Russia's national security strategy

1. № first use
 - a) abandons “no first use” in 1993
 - b) reliance on nuclear weapons to offset conventional weaknesses
 - c) policy allows for nuclear retaliation in case of conventional attack (if “existence of state” is threatened)
2. Different approaches for different wars
 - a) local war (vs small states)
 - nuclear use mainly demonstrative
 - b) regional war (vs coalition of states)
 - nuclear use mainly demonstrative
 - c) large-scale war (multiple theaters)
 - strategic use of nukes expected
3. Escalate to de-escalate?
 - a) compel war termination through early use of nuclear arms
 - b) but declaratory policy is ambiguous

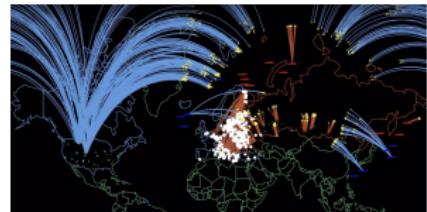


Figure 27: Duck and cover

NEXT MEETING

Russian Military Strategy After the Soviet Collapse (Tu, Nov. 12)

- How has Russia adapted to loss of empire, superpower status?
- What has been the focus of Russia's military reforms? How successful have these reforms been?
- What kind of force is Russia building now?