

UNDERESTIMATED: OUR NOT SO PEACEFUL NUCLEAR FUTURE

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QUESTIONS AND BRIEF ANSWERS

1. Where have we been, where are we now, and where are we going with regard to nuclear weapons proliferation?

The first nuclear arms race was between two super powers. The next one will be between more contestants with highly destructive capabilities far more closely matched and capable of being quickly enlarged than in any other previous period in history. This could make it more difficult to know how dangerous our enemies are and how much we can rely on our friends

2. How do we think about nuclear weapons and their proliferation?

Three schools of thought dominate — we should go to zero (arms control), maintain a robust nuclear deterrent (hawks), stop worrying about deterrence so much (academic). All have good points. None are entirely practical

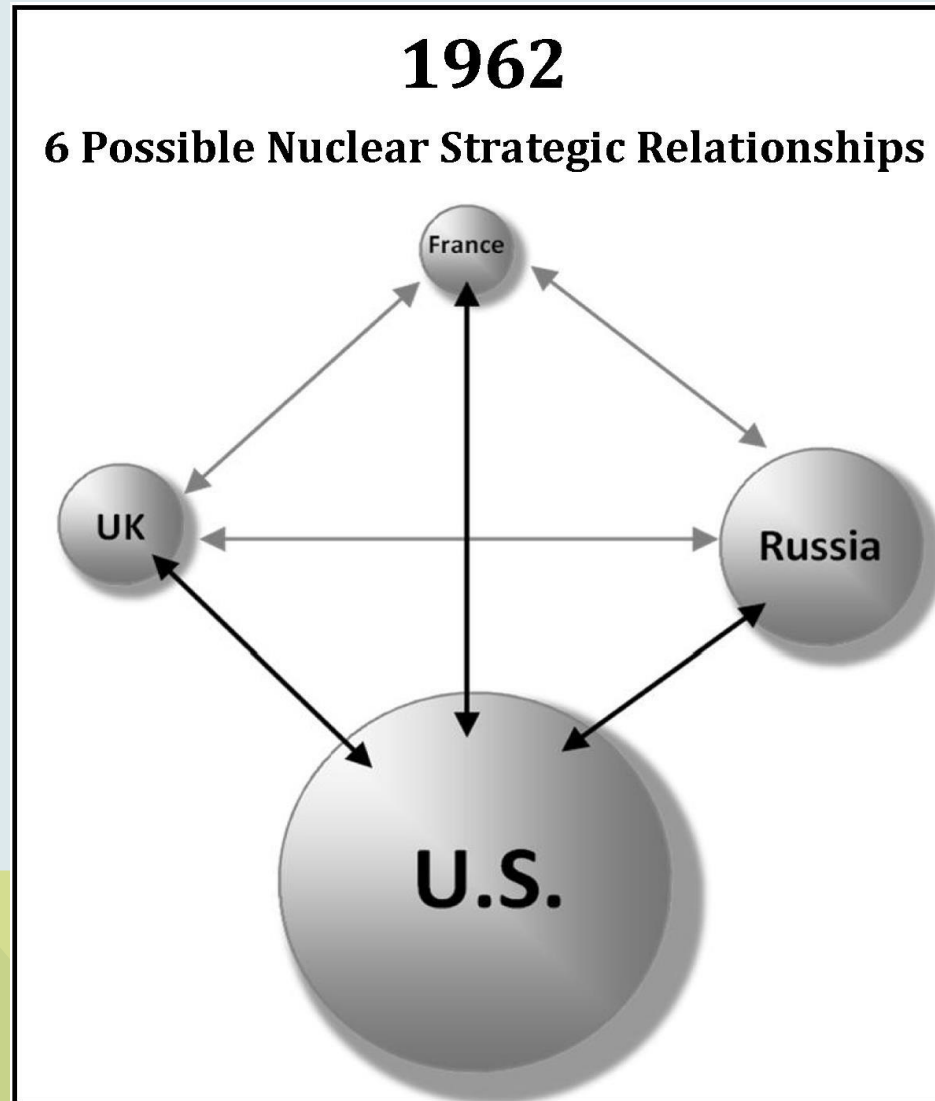
3. Is there a happy ending?

Maybe, but only if nonproliferation and nonuse hold long enough for new generation warfare to push nuclear weapons further into the background.

THE NUCLEAR STATE OF PLAY IN 1962



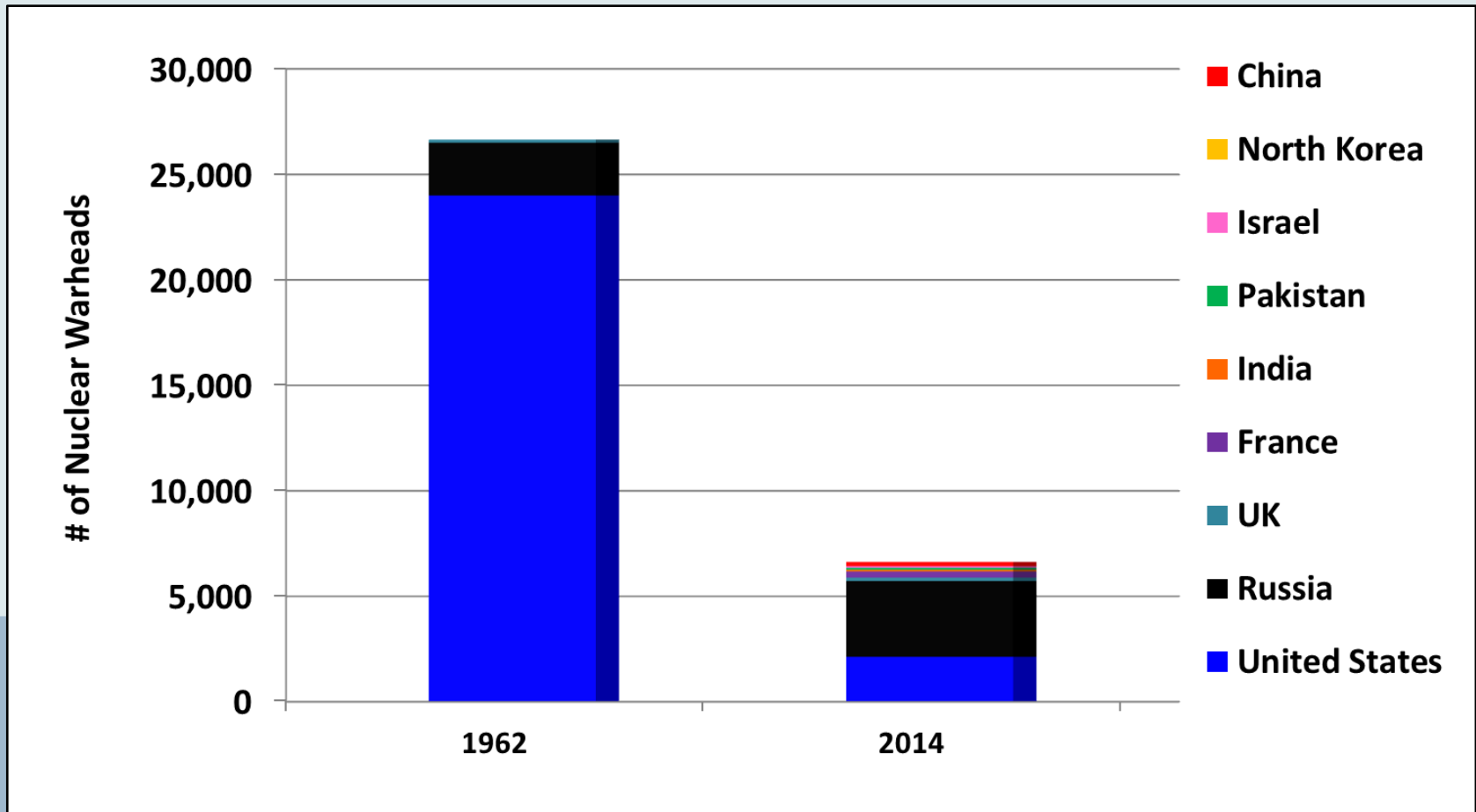
FOUR NUCLEAR WEAPONS STATES IN 1962



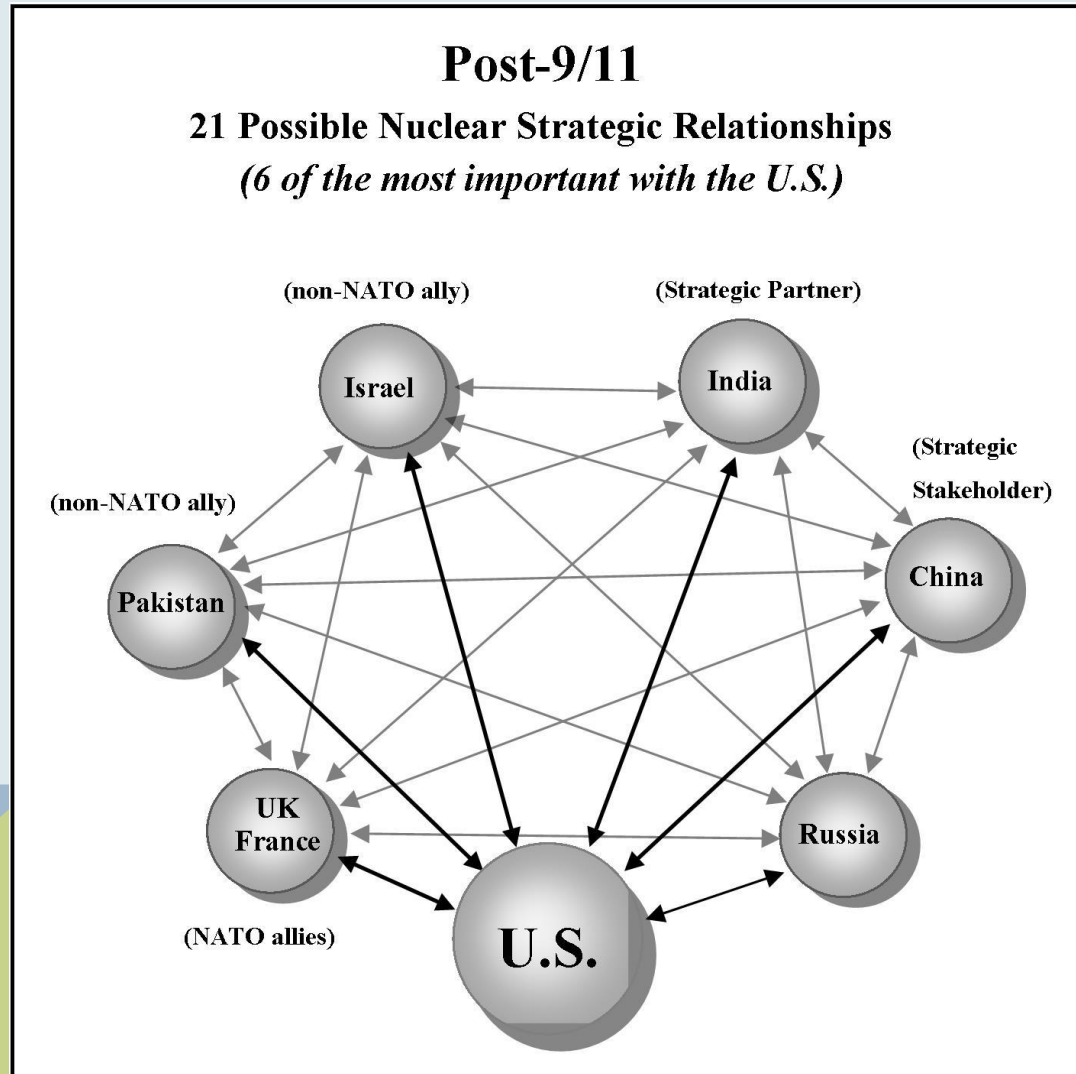
THE CURRENT NUCLEAR STATE OF PLAY



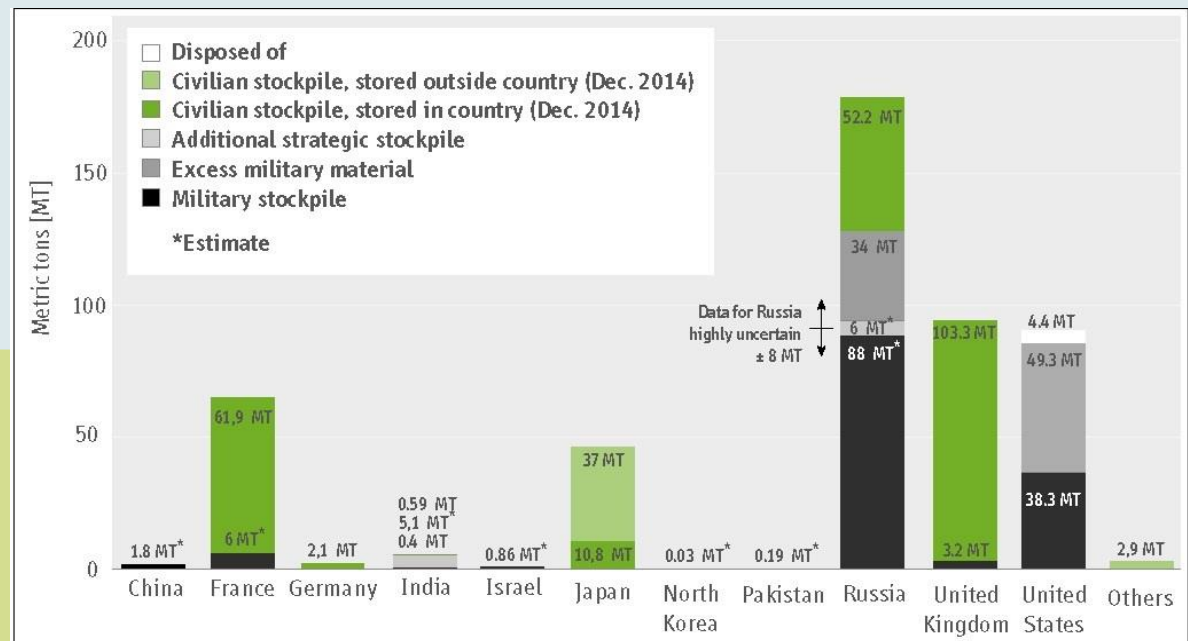
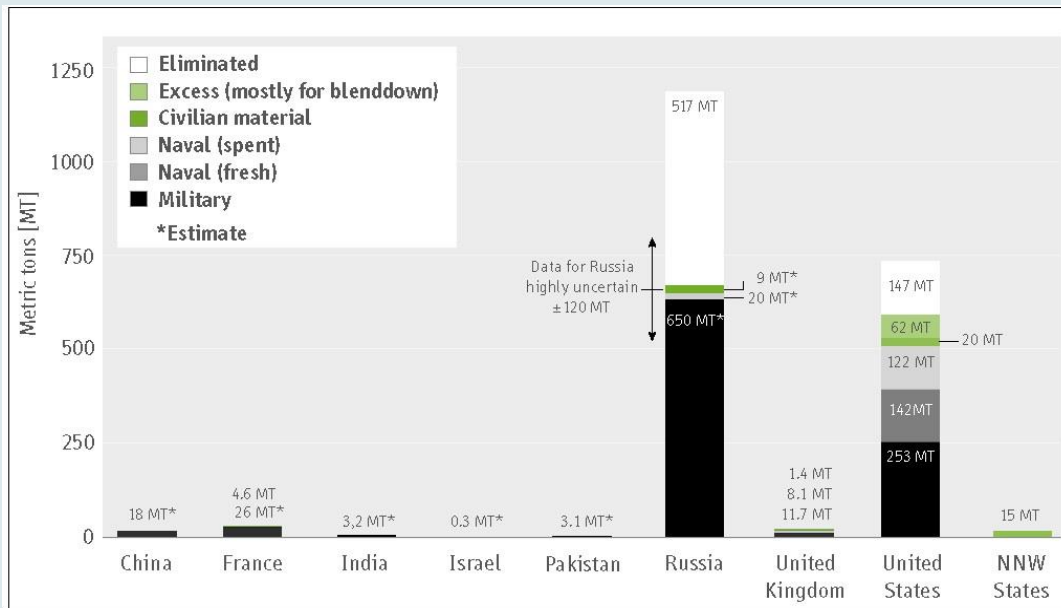
FROM U.S. STRATEGIC DOMINANCE TO A COMPRESSED NUCLEAR CROWD



PROLIFERATION PRESENT: AN OFFICIAL VIEW



EXISTING FISSILE STOCKPILES: GRIST FOR NUCLEAR RAMP-UPS AND BREAKOUTS



National Stockpiles of Separated Plutonium

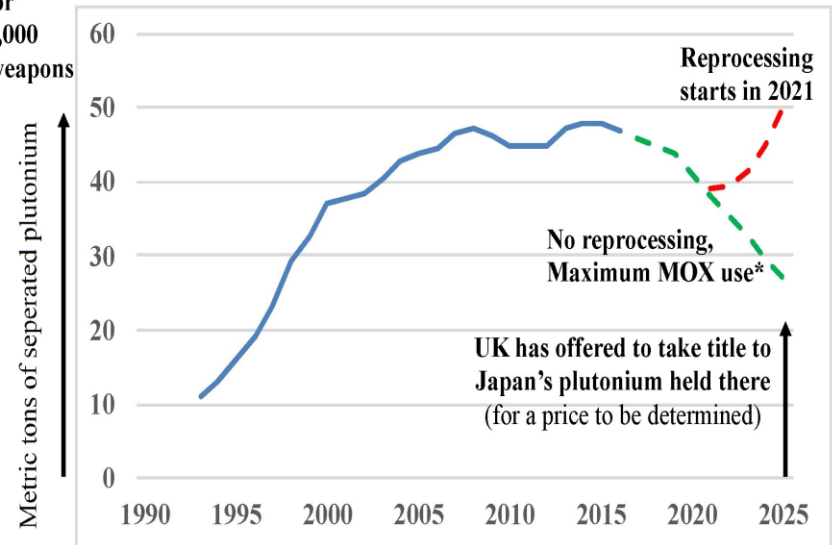
JAPAN: SITTING ON AN ARSENAL'S WORTH OF PLUTONIUM



Rokkasho

**Japan's stock of separated plutonium could decline slowly
– or climb rapidly if Rokkasho Reprocessing Plant operates**

Enough for
6,000 -12,000
nuclear weapons



ENRICHING URANIUM FOR WHAT?



Rokkasho Uranium Enrichment Plant

232 SWU required to make 1 kg HEU

Conservatively, in 2020, over 2,500 weapons
worth for PRC, over 300 for Japan

PROJECTED PRC ENRICHMENT SURPLUSES BEYOND POWER REQUIREMENTS ~ THOUSANDS OF BOMBS PER YEAR



Hanzhong and Lanzhou



Plant 814

232 SWU required to
make 1 kg HEU

120,000 SWU required
to refuel 1-GWe reactor
with LEU annually

KNOWN CHINESE REPROCESSING PLANTS



200 tHM/year plant is now under construction: ~400 bombs worth of pu/yr

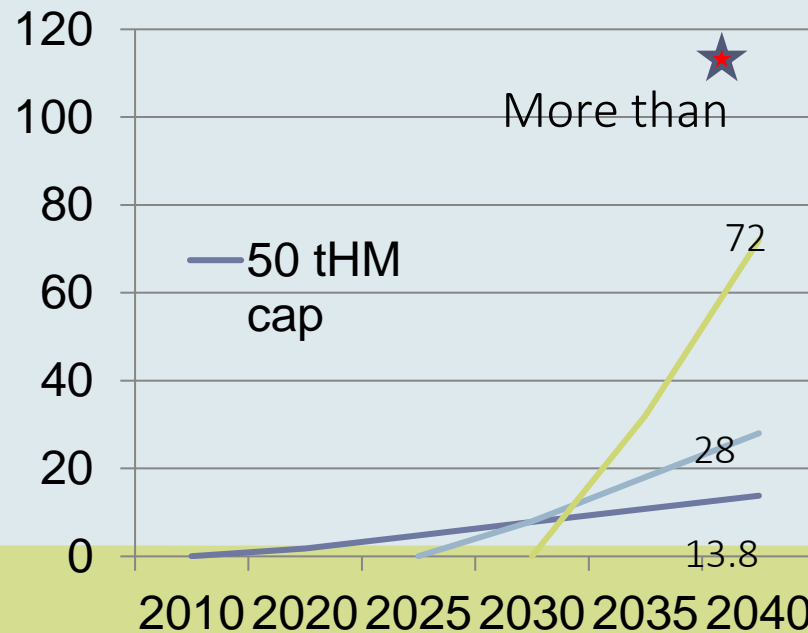


50 tHM/yr Pilot plant: ~100 bombs worth of plutonium/yr



Planned 800 tHM/yr EDF plant: ~1600 bombs worth of pu/yr

“PEACEFUL” PLUTONIUM WILL PILE UP



NOTIONAL CHINESE WEAPONS MATERIALS PRODUCTION OPTIONS — TO 2025 AND 2030

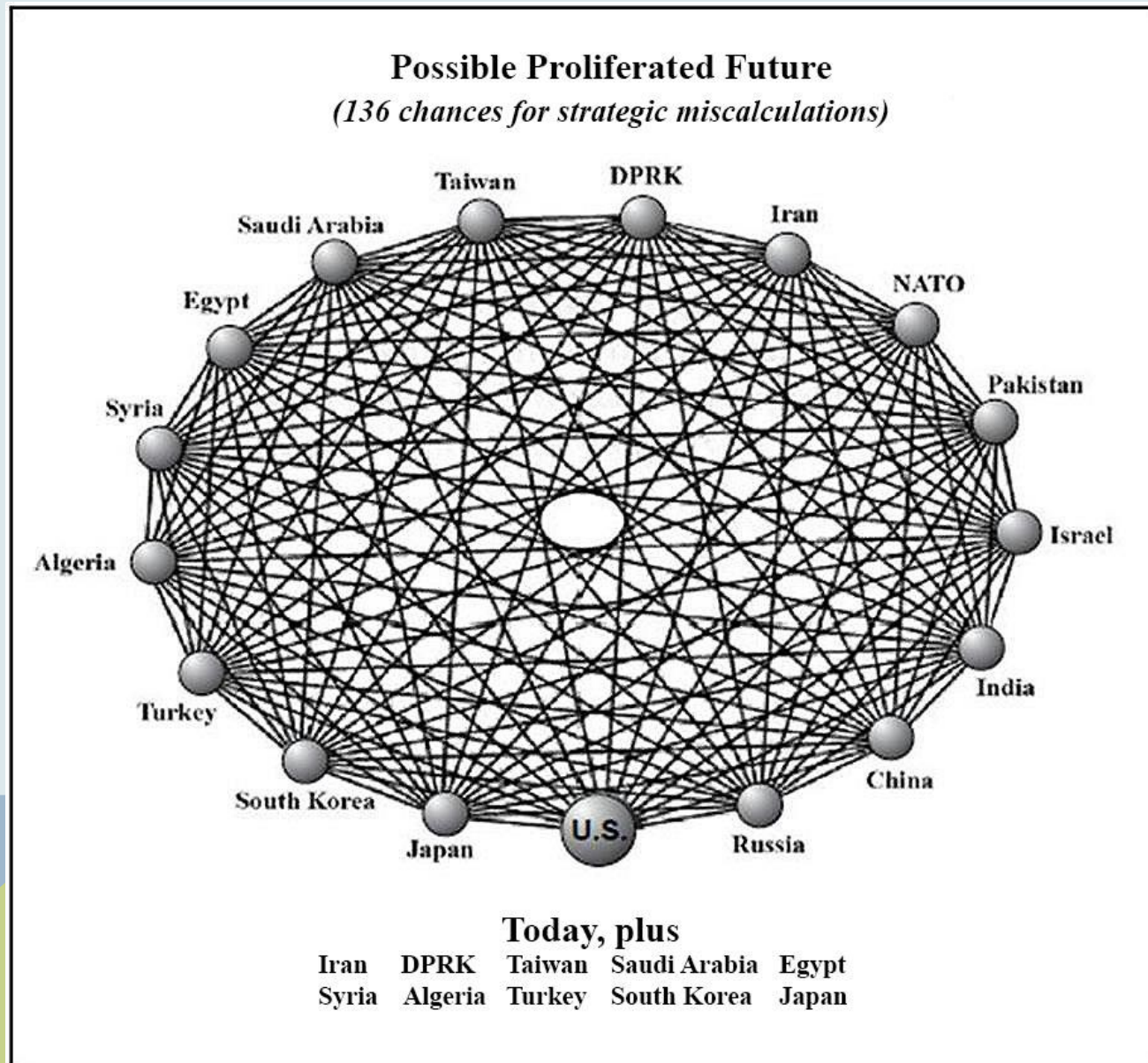
PLUTONIUM

Existing 2 HWRs,	650 kgs./year of WgPu	2025 3,250 kgs	2030 6,500 kgs
Planned 2 AHWRs	650 kgs/year of WgPu		2030 3,250 kgs
2 1-Gwe LWRs	300 kgs./year of WgPu	2025 1,500 kgs	2030 3,000 kgs
600 Mwe CFR.	200 kgs/year of WgPu.		2030 800 kgs
		2025 4,750 kgs	2030 10,050 kgs

URANIUM

Medium case running Plant 814	2025 30,000 kgs	2030 60,000 kgs.
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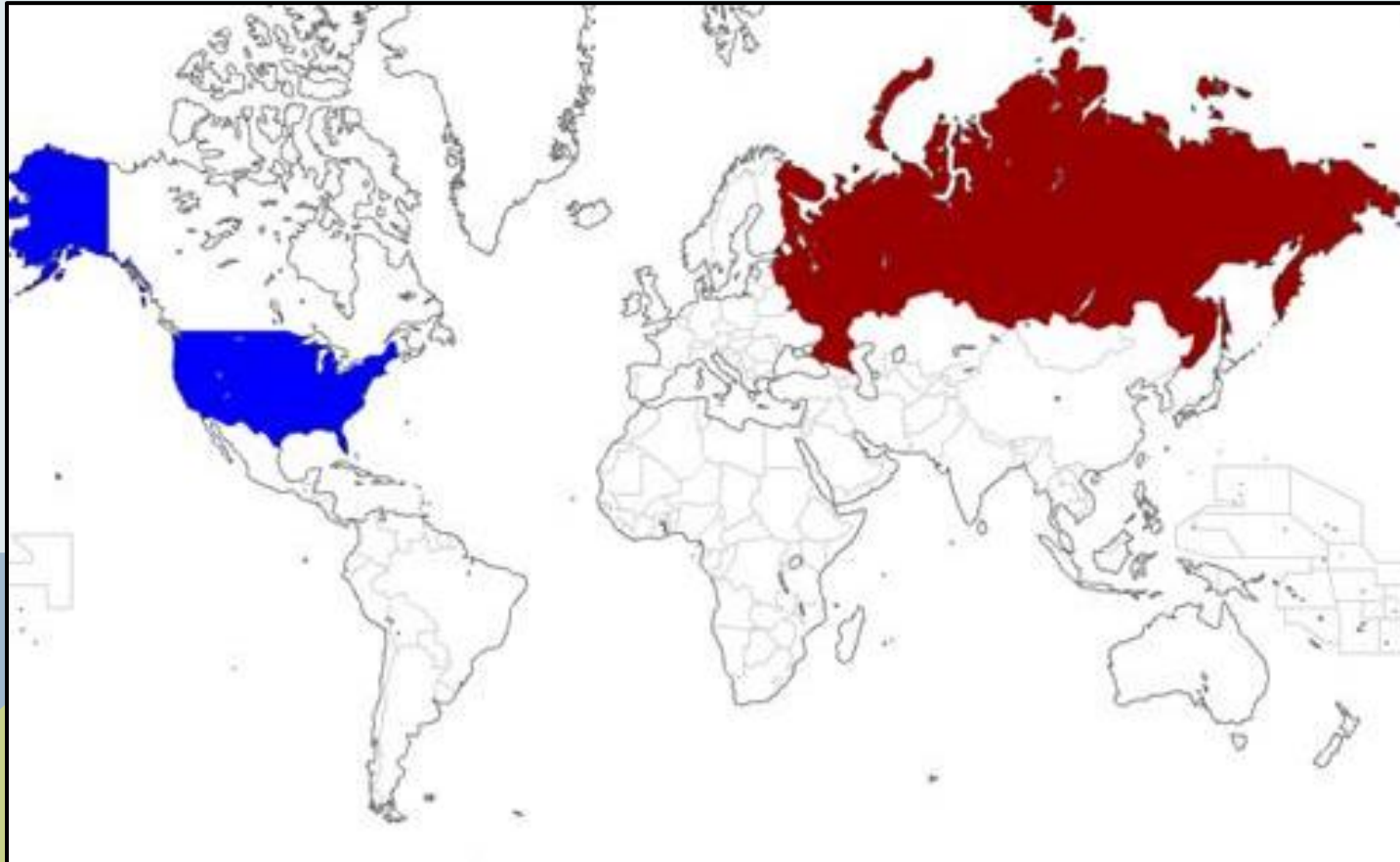
OUR PROLIFERATION FUTURE?



FROM 2 NUCLEAR CAPABLE MISSILE STATES TO AT LEAST 26

1962

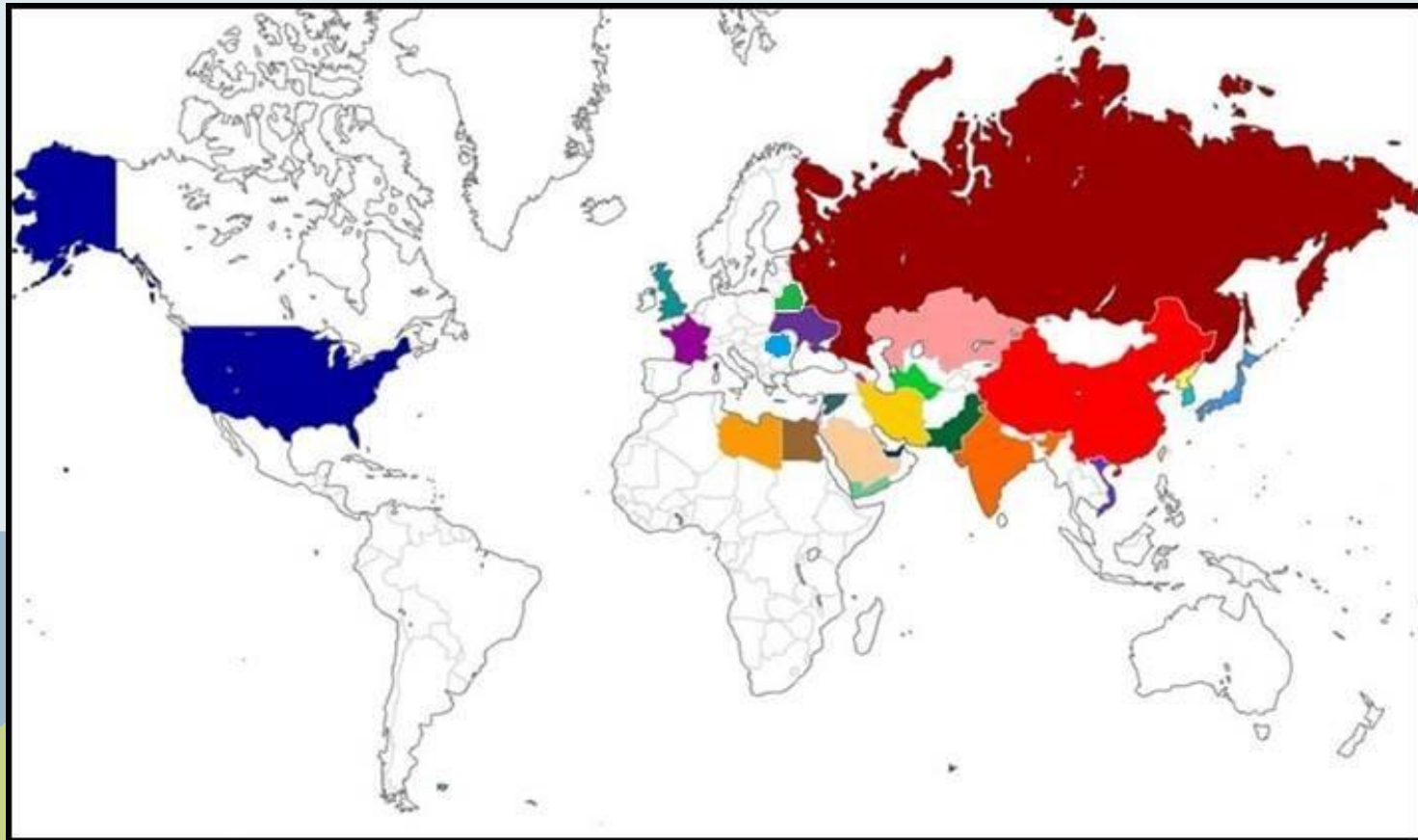
2 missile states



FROM 2 NUCLEAR CAPABLE MISSILE STATES TO AT LEAST 32

2020

32 missile states



WHERE OVERLAPPING MISSILE RANGE ARCS CONCENTRATE



NEXT ADVANCED MISSILE THREAT: ACCURATE MASS DESTRUCTION?

- Abqaiq
- Beirut blast
- Azerbaijan/ Armenia
- Houthis and Hezbollah



Fateh 110



Burkan-2H

WHAT WE THINK: THREE SCHOOLS

1. Arms Control Perspective

2. Hawkish Supporters of Nuclear Weapons

3. Academic Skeptics

- Finite Deterrence Enthusiasts
- Finite Deterrence Critics

ADDITIONAL SLIDES

WHAT MIGHT HELP

War gaming as we did in early 1980s

Work backward from futures we want and those we wish to avoid to create country-specific nonproliferation strategies

Make nonproliferation and deterrence two sides of a single strategic coin

Announce a policy not to target cities with nuclear weapons

Deter further NPT withdrawals and violations

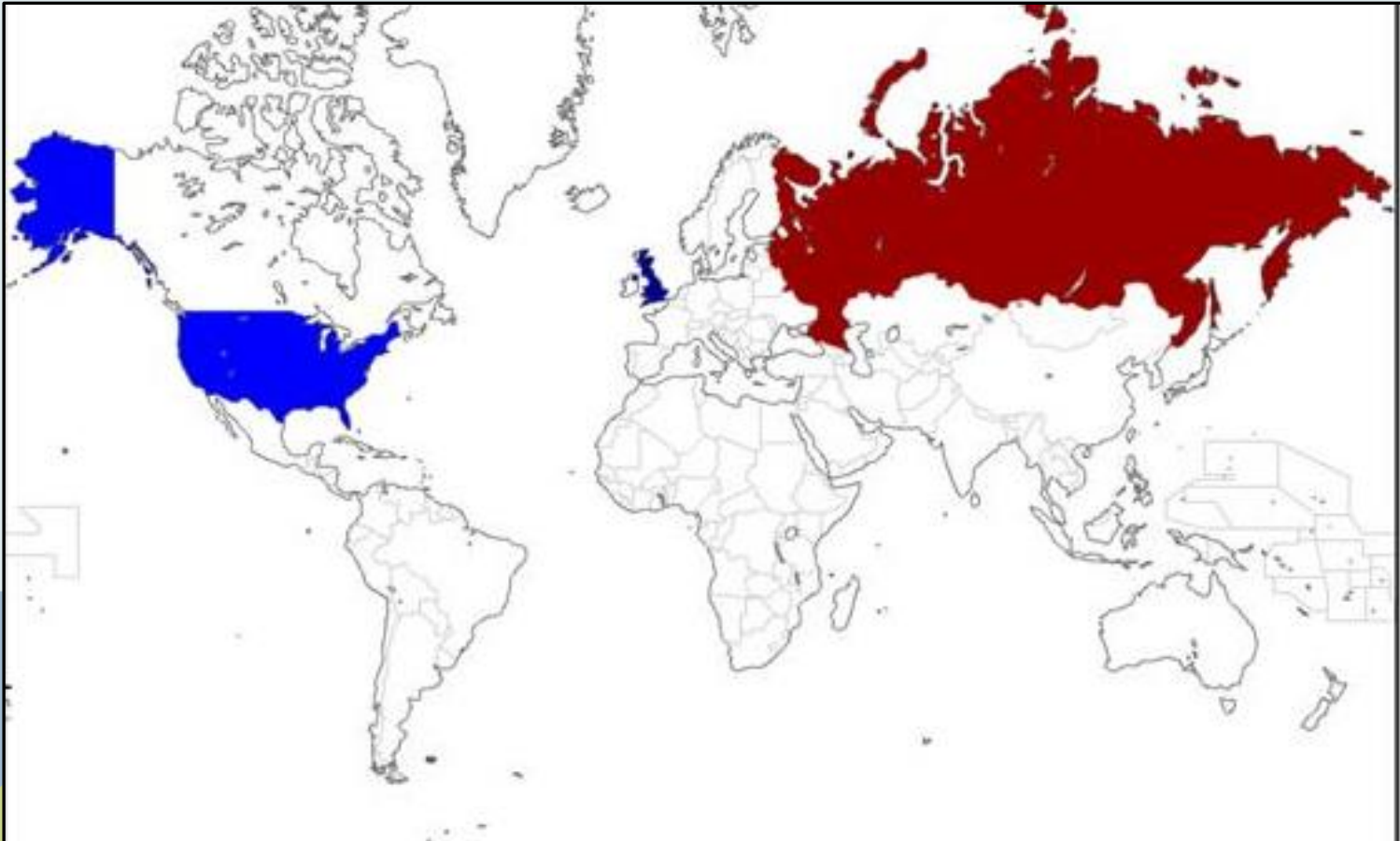
Push for a timeout, on recycling spent fuel and on further expansion of enrichment capacities, starting with the pacific rim and the middle east

Renounce nuclear targeting of cities

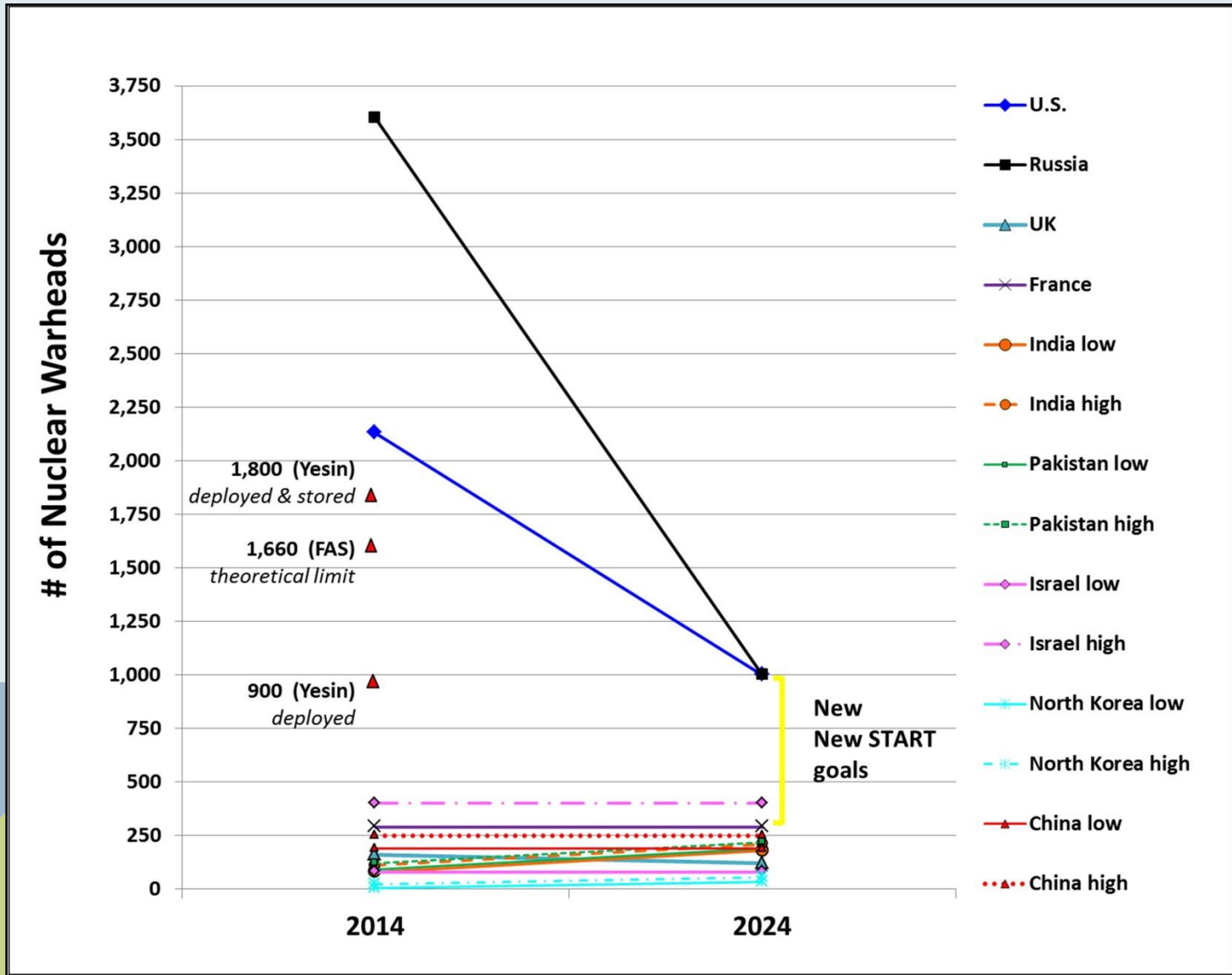
Synchronize our space force and missile modernization efforts with new harder headed controlled diplomacy

ESTABLISHED NUCLEAR POWER PROGRAMS

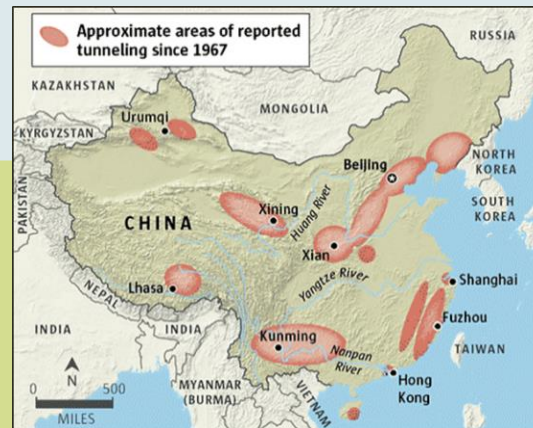
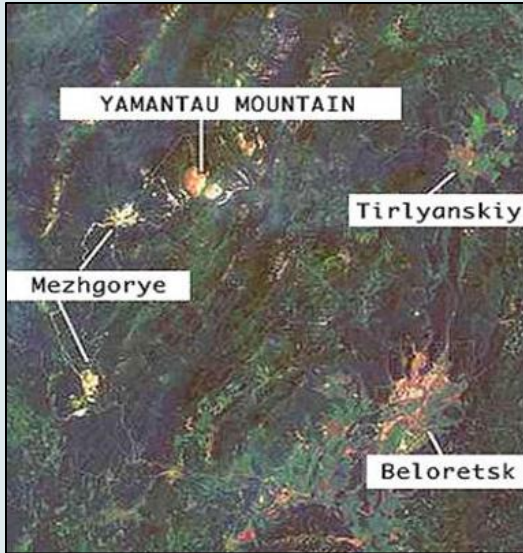
1962 – 3 countries



FURTHER NUCLEAR WEAPONS COMPRESSION?

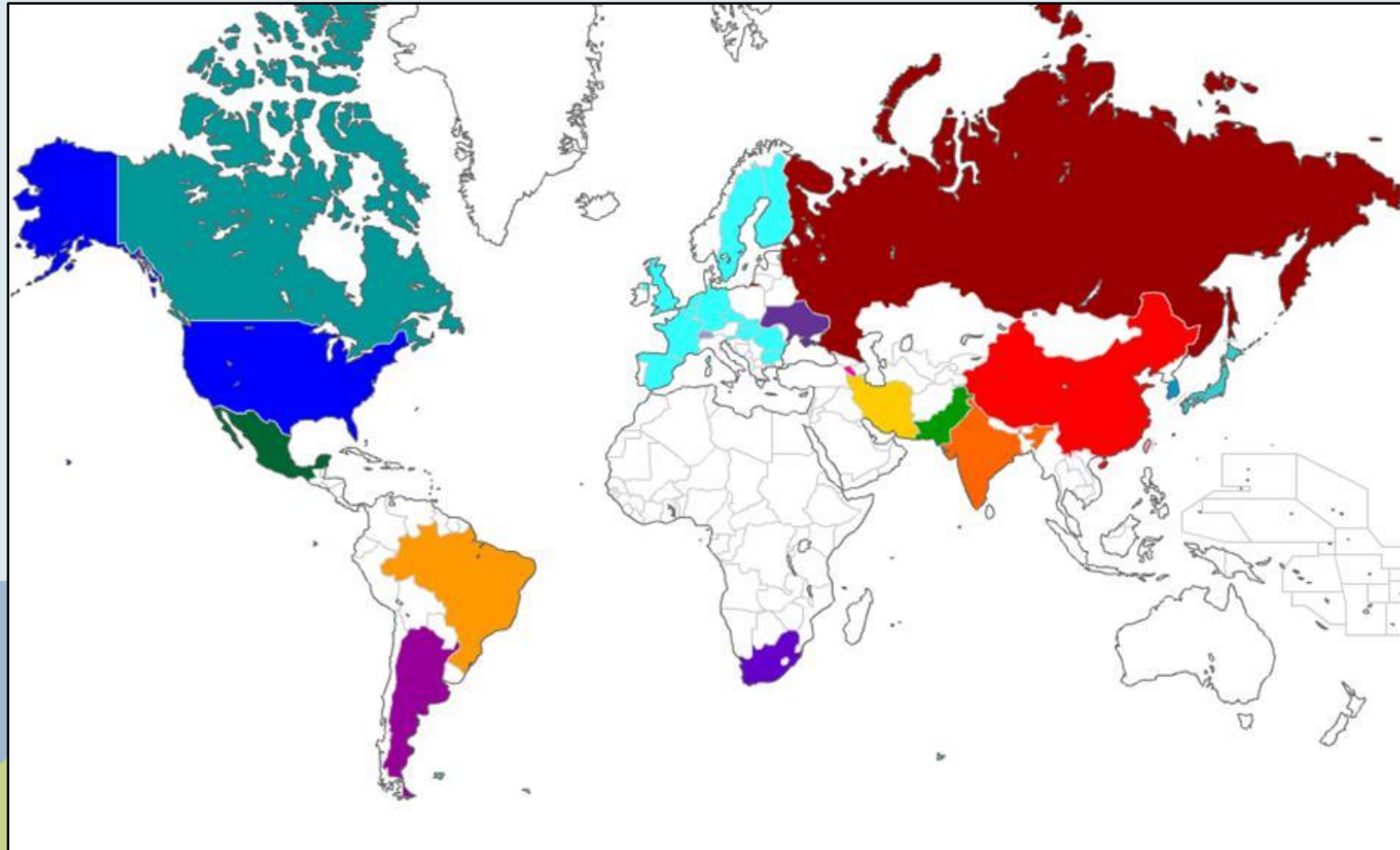


YAMANTAU, UNDERGROUND GREAT WALL, DPRK TUNNELS & IRAN



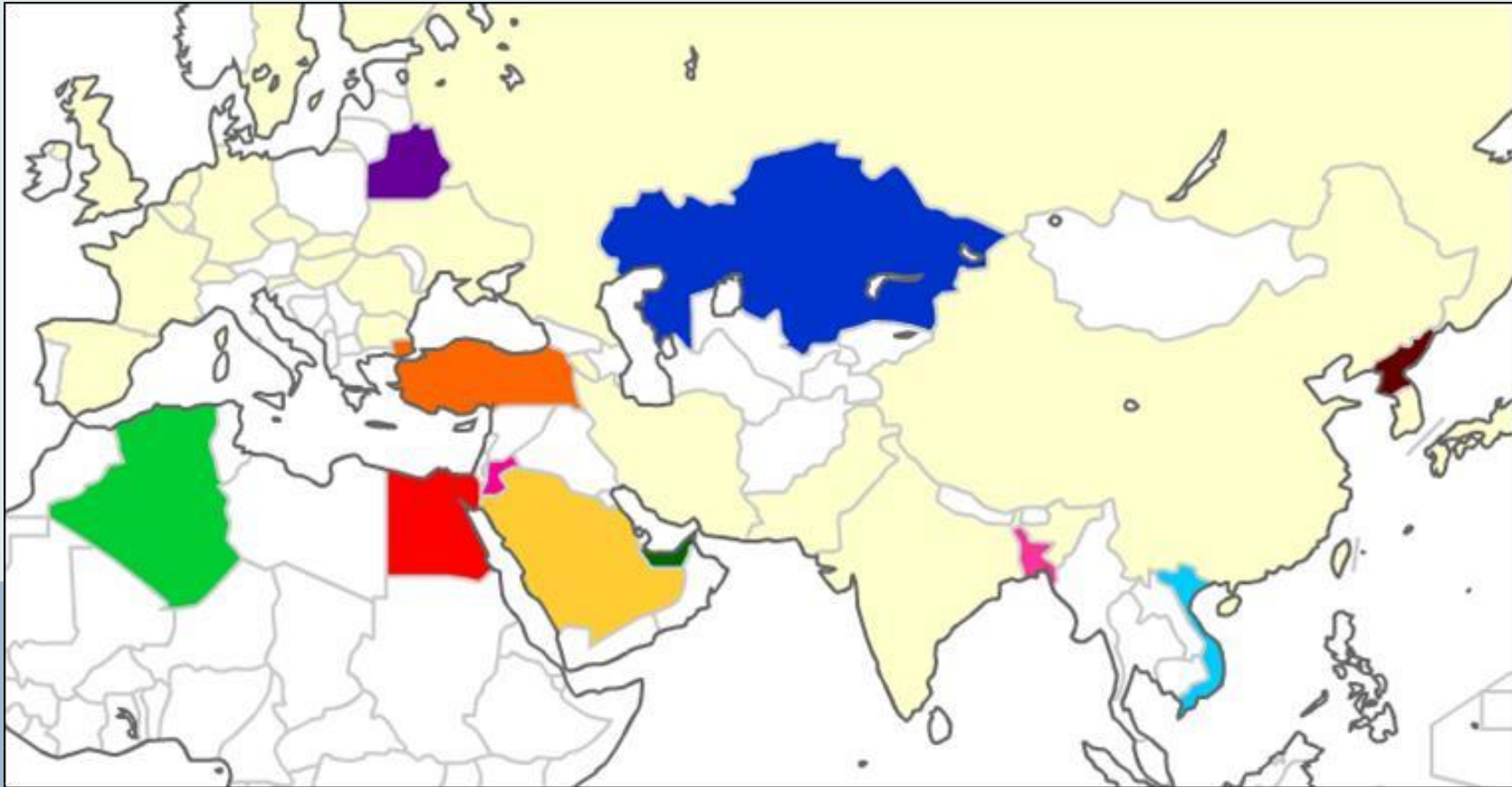
ESTABLISHED NUCLEAR POWER PROGRAMS

2017 – 31 countries



WHAT'S NEXT: MORE NUCLEAR POWERED STATES, MOSTLY IN SCARY PLACES

States Planning to Have Their First Nuclear Power Reactor by 2032



Countries shown in beige already have established nuclear power programs

THE NEXT ARMS RACE

WHAT'S DRIVING GLOBAL STRATEGIC COMPETITIONS:
IT ISN'T NUCLEAR WEAPONS

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