

Nuclear Proliferation

When each state had the nuclear bomb (or almost so)

- 1945: USA had the bomb
- 1949: USSR had the bomb
- 1952: UK
- 1960: France
- 1964: China
- 1967: Israel
- 1974: India
- 1982: South Africa
- 2006: North Korea

United Kingdom

- The UK was a participant in the Manhattan Project during WW2 and had sent over a dozen scientists to the USA
- After the Atomic Energy Act of 1947 forbids US from exchanging secrets with any nation even allies
- UK govt decides it needs a bomb
- Motivation: security (USSR) but also prestige - wants to repair US-UK relationship
- British program done steadily and cheaply takes about 4-5 years
- First test - operation hurricane held in Monte Bello Islands, Australia 1952
- H-bomb: 1957

France

- After WWII, France pursued a nuclear program, but only reactors
- In 1954: french government decides it needs an independent deterrent does not want to be dependent on the US, NATO, or anyone else for security
- Also desires prestige: france wants to be seen again as a great world power, even as its empire is waning
- Effort is initially small but in 1958 accelerates due to political instability with the territory in Algeria
- First test: gerboise bleue detonated in Algeria in 1960 and h-bomb 1968

China

- 1949: communist won and the nationalist went to Taiwan
- Mao Tse-tung asks for Stalin's help in developing a Chinese nuclear weapon in the 1950s
- Motivated by confrontations with the US over Taiwan and Korea (nuclear blackmail)
- USSR gave China substantial assistance in developing reactors and gaseous diffusion plants up until **Sino-Soviet Split** in the early 1960s
- Had to relearn how to rebuild these plans from scratch
- 1964 develops first bomb by 1964 and catches US intelligence off-guard, detonates a uranium-core implosion bomb when the US expected them to not have any HEU
- H bomb by 1967 shortest period between fission and fusion bombs

The USA and nuclear proliferation

- US attempts to help allies with bilateral agreements on nuclear technology - focused on peaceful technology and dependence
- Encourages dependence on the USA so that we are all up in their business
- By 1960, proliferation in a serious way: Israel, Egypt, Brazil, Japan, etc.

Nuclear Non-Proliferation Treaty

- In 1959: UN suggested that we should not aid other states in becoming nuclear weapons
- Over the course of 1960s, turning this into a formal treaty was negotiated with the UN
- Final NPT (nuclear non proliferation treaty) comes into existence esp. After China gets the bomb

The NPT

- Balance grand bargain
- Needs to appeal to existing nuclear states as well as non-nuclear states
- Guarantees that all states which have tested nuclear weapons before 1967 are the official nuclear club
- Vague promises by nuclear states to eventually pursue disarmament
- Non-nuclear states guaranteed access to peaceful nuclear technology
- International Atomic Energy agency becomes the watchdog for NPT reports violations to the UN
- Five sanctioned nuclear weapons states: US, USSR, UK, France, China
- If you have nukes, you won't help others get nukes
- Article IV: Each NNWS has "inalienable right" to peaceful nuclear tech

The non-signers

- Many nations sign NPT but not all various reasons for both nuclear and non nuclear
- France did not sign it and will not sign it that infringes on their sovereignty
- France signs it in 1992
- China denounced NPT as conspiracy concocted by the USSR and the US to maintain their nuclear monopoly (signs 1992)
- Argentina, Brazil, South Africa did not sign until 1990s
- India, Israel and Pakistan never sign

Israel

- France had deep ties to Israeli nuclear program starting in 1956 not clear if top-level gov't knew about it in 1960s
- France wanted a nuclear Israel primarily because it would distract Arab nations
- France a willing proliferator because they were not a world-power and thus could benefit from localized arms races
- Israel nuclear facility set up at Dimona -- nuclear reactor with 6 stories of secret labs underneath
- May have stolen American HEU in 1965 (NUMEC AFFAIR)
- US initially tries to discourage Israel from going nuclear but fails
- Has nukes ready to use by 1967 may have secretly tested in 1970s
- Under Nixon, US works out a bargain with Israel -- US will look the other way if Israel agrees not to introduce nuclear weapons to Middle East
- Israel interprets don't introduce = don't threaten, don't test, don't use
- Israeli policy known in West as nuclear opacity: don't acknowledge, don't deny - but everyone knows
- Publicly disclosed by whistleblower Mordechai Vanunu in 1986
- Mordechai Vanunu story -- whistleblower

India

- Under Nehru, India pursued peaceful/dual-use nuclear program as part of post-colonial modernization
- 1960: India rejects NPT because it wants to maintain military flexibility and because it opposes the discrimination against non weapons states (nuclear apartheid)
- India develops with French and some Canadian tech a peaceful nuclear device
- Detonated in 1974: smiling buddha
- India claims that they have not made it into a bomb, could not be used in war - not weaponized
- Indian detonation surprises US: heavy secrecy, very small program, from a very poor state
- Tests a weaponized bomb in 1998

Nuclear Modernity

- Many third world nations pursue nuclear technology as a form of nuclear modernity: atomic age seen as the ticket out of being a backward nation
- Nuclear modernity is about being advanced as well as self sufficient even though usually dependent on superpower assistance
- Most nations pursue peaceful technology but overtones of potential weapons usually present - doors left open
- USA successful at discouraging many allied nations from going nuclear - harder to do with non-allied nations

Taiwan

- Unsuccessful case of nuclear proliferation
- Had peaceful nuclear program
- After PR China tested the bomb, set up a secret exploratory program for the bomb - independent deterrent desirable?
- When US and PRC got friendlier in 1970s, even more worried
- Bought reactor from Canada with intent to generate plutonium; US intervened and got them to shut down some facilities in 1978
- 1988: US threatens to abandon their defense and Taiwan agrees to shut down reactor

South Africa

- South Africa also doesn't sign NPT originally - wants to keep its options open
- South Africa was a pariah state - apartheid policies mean it has few strong allies, very hostile relations with nearby African states
- Cooperates with Israel for mutual nuclear benefit, may have helped Israel test a nuclear weapon in 1979 = Vela incident
- Assembled six HEU bombs in 1980s, and planned for more but disassembled them in the early 1990s before the apartheid regime ended and before signing the NPT

Pakistan

- Pakistan another non-signatory to the NPT - if India no sign, they won't
- Begins long nuclear program in 1972
- Steals centrifuge technology from the Netherlands in 1970s received assistance from China in 1980s, attempts to purchase equipment from Canada, France, Germany, and others over period
- Khan

Libya

- Signed NPT in 1968
- Gaddafi seized power the next year, ratified NPT in 1975
- Gaddafi sought nuclear weapons from 1970 onward as a counter to the threat it felt from Israel
- Attempted to secure help from Soviet Union, China, Pakistan, and India, not super successful
- 2003: Gaddafi agrees to disarm ships nuclear tech to USA
- Received old centrifuges from Pakistan
- Gaddafi was sodomized with a knife

North Korea

- Signed NPT in 1985
- Got help building a plutonium reactor from Soviet Union then build own indigenous reactor some safeguards, but not fully compliant
- Withdrew from NPT in 2003
- Tested first bomb in 2006 and H-bomb in 2017
- Has tested IRBMs, ICBMs, SLBMs
- Nuclear program initially seen as a form of diplomacy - a card to be played; now seen as more serious military effort
- The North Korea economy makes knockoff things and sells them. They made counterfeit US money and sold it to other countries wow

Factors in proliferation

- Producing fissile material
- Zippe-style gas centrifuges in particular very influential on later proliferation because of relative ease of concealment
- Many aspects of nuclear programs are dual-use
- Every state who ever got the bomb did so with some international assistance: major proliferators have been France, China, and Pakistan
- “Security” - fear of existential risk to the state (nuclear or not), nukes as a hedge
- “Prestige” or “modernity” nukes as a ticket to being perceived as important
- Civilian nuclear tech - unclear
- Certain sensitive technologies - highly correlated
- Help from others? - unclear (can sometimes slow down!)
- Certain types of organizational arrangements - highly correlated with success / failure of effort

Judging the NPT

- How successful? Hard to know either way: relies on untestable assumptions
- Some clear failures: proliferation, non-disarmament, non-signers
- Potential successes: since 1967, only 4-5 new nuclear nations, not a dozen.. Could it be worse?
- Most signatories totally compliant