PAK. AFFAIRS (NUCLEAR)

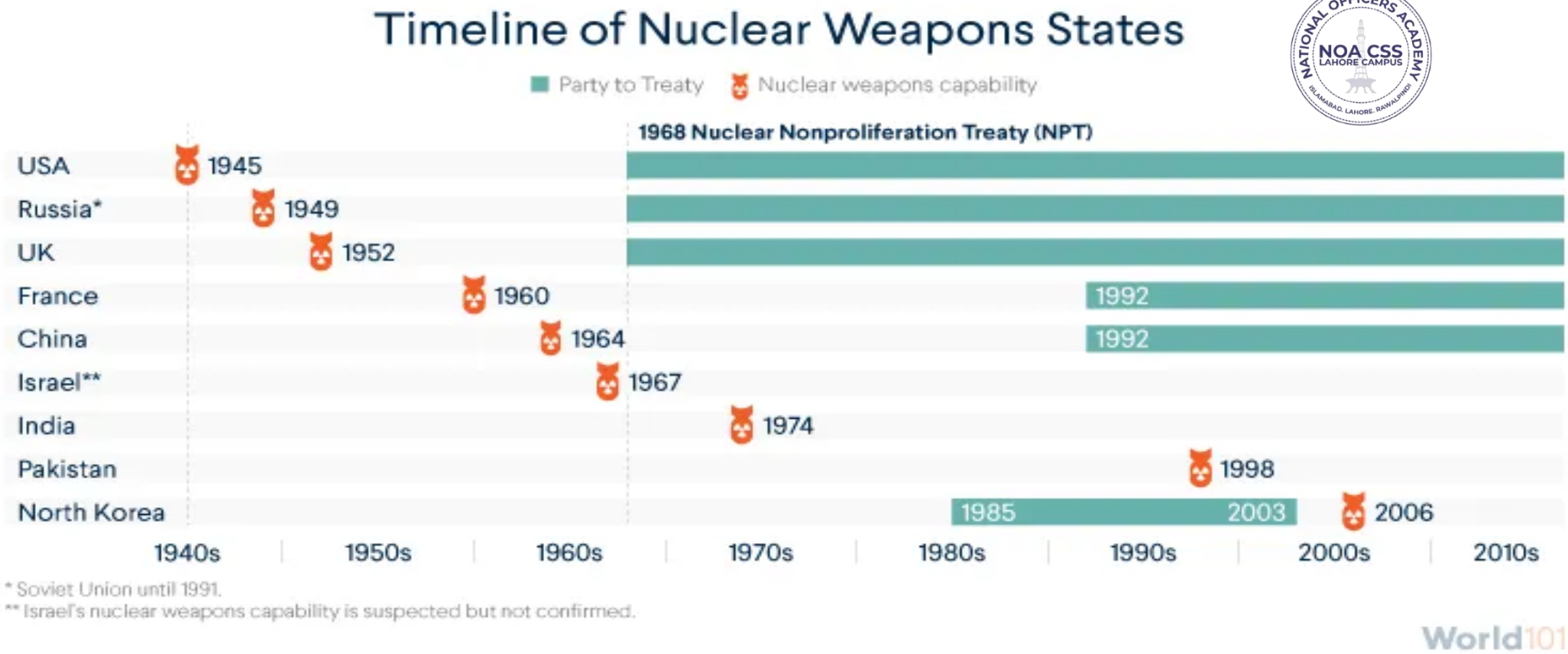
BY: MISS PAKEEZA

NOA LAHORE CAMPUS

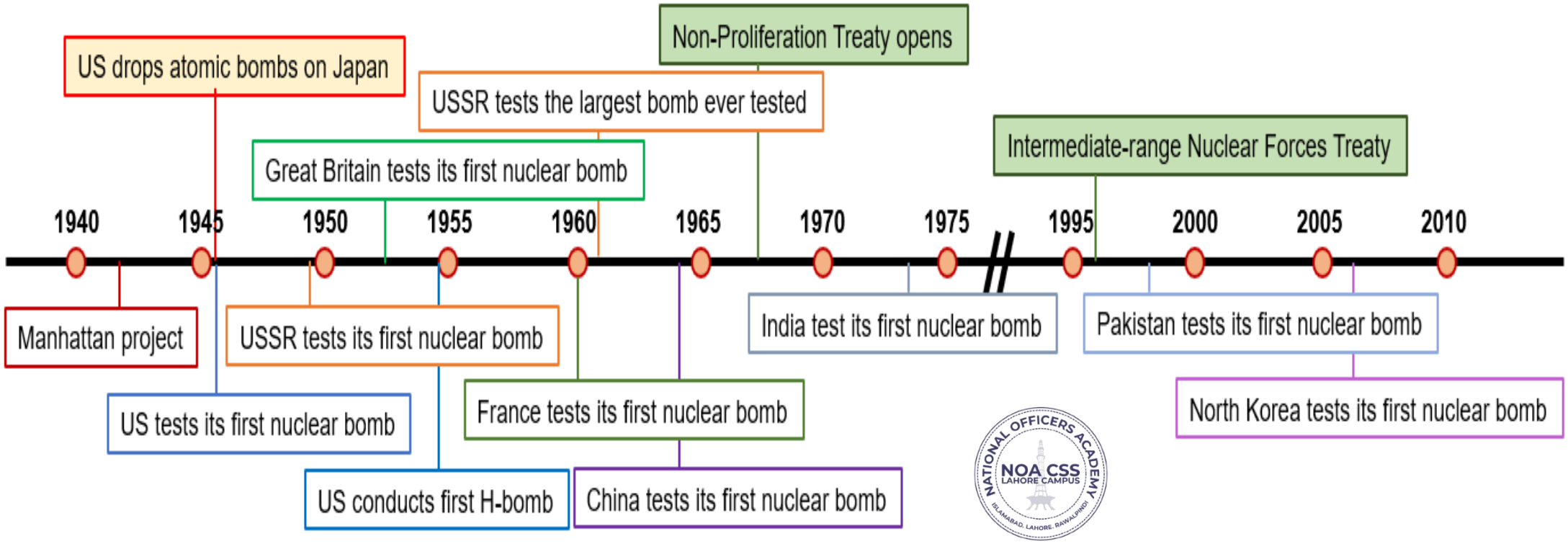
LECTURE 01- NUCLEAR ISSUES

- BRIEF HISTORY OF NUCLEAR WEAPONS
- NUCLEAR DOCTRINE OF PAKISTAN AND INDIA
- NUCLEAR PROGRAM OF PAKISTAN
- SAFETY AND SECURITY
- NUCLEAR POWER GENERATION IN PAKISTAN

BRIEF HISTORY OF NUCLEAR WEAPONS



BRIEF HISTORY OF NUCLEAR WEAPONS



2025 ESTIMATED GLOBAL NUCLEAR WARHEAD INVENTORIES

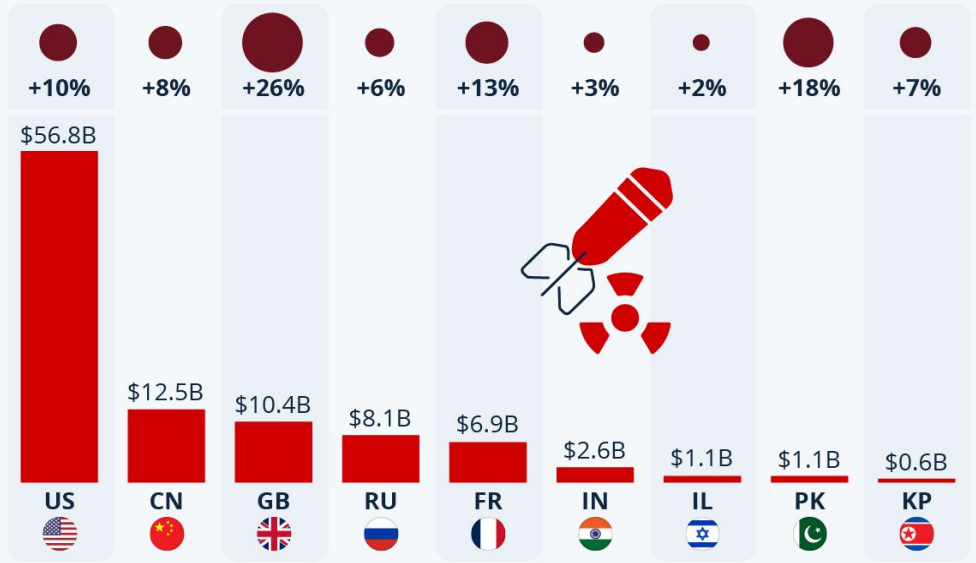
The world's nuclear-armed states possess a combined total of over 12,400 nuclear warheads; nearly 90% belong to Russia and the United States. Approximately 9,700 warheads are in military service, with the rest awaiting dismantlement.

Source: Federation of American Scientists, U.S. Department of State, U.S. Department of Energy, U.S. Department of Defense, and the Stockholm International Peace Research Institute. Updated: January 2025

Arms Control Association

Nuclear Weapons Spending on the Rise

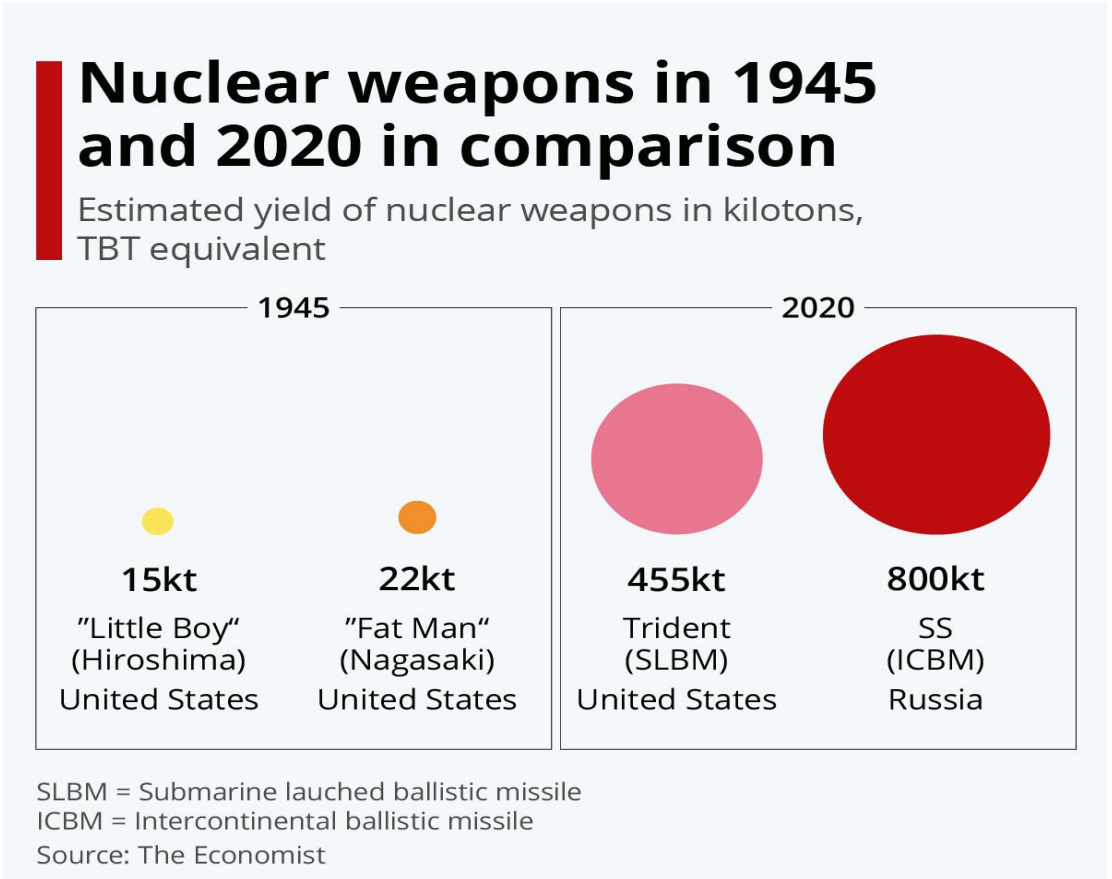
Annual total spending on nuclear weapons in 2024 and change from previous year

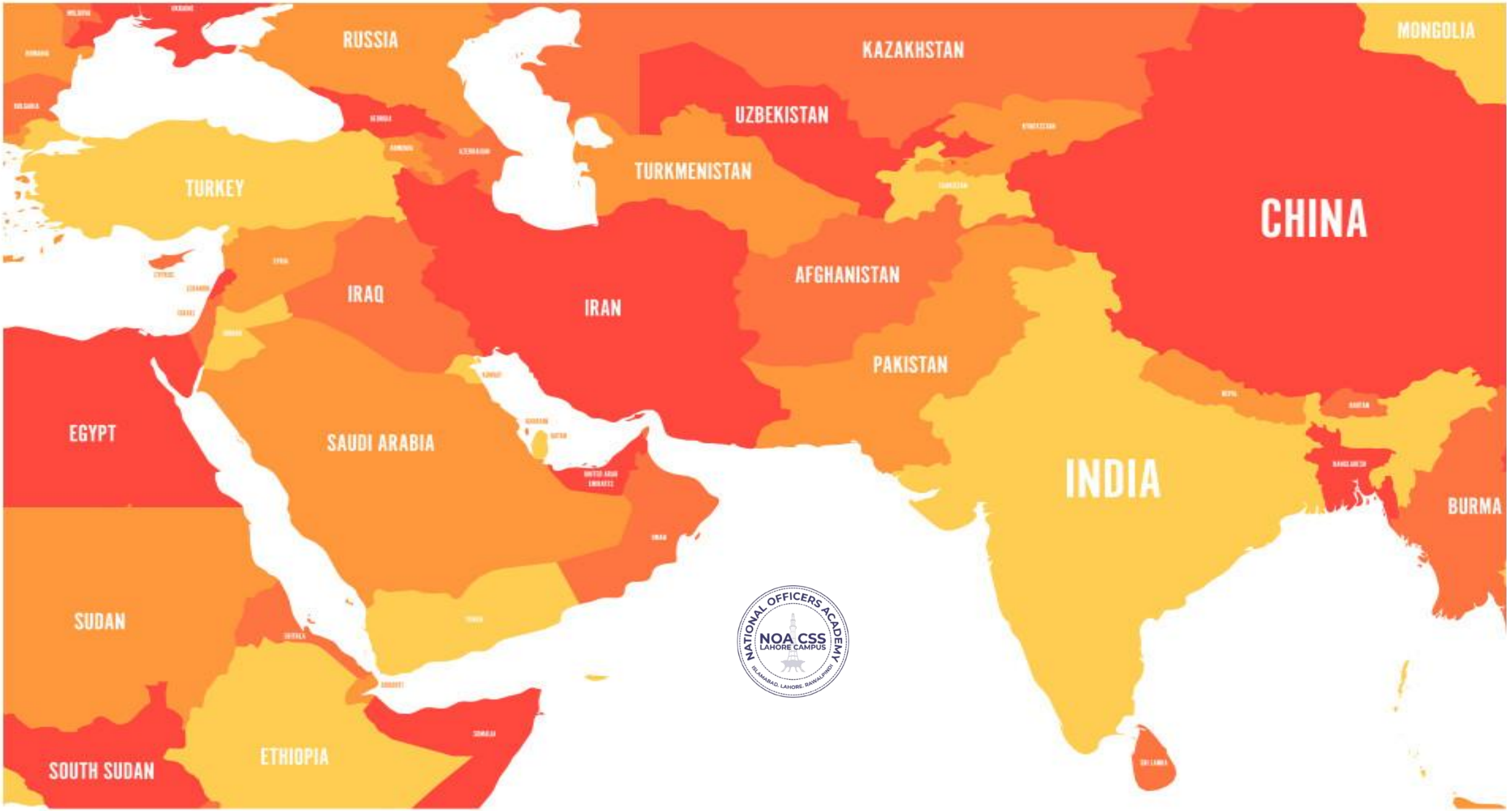


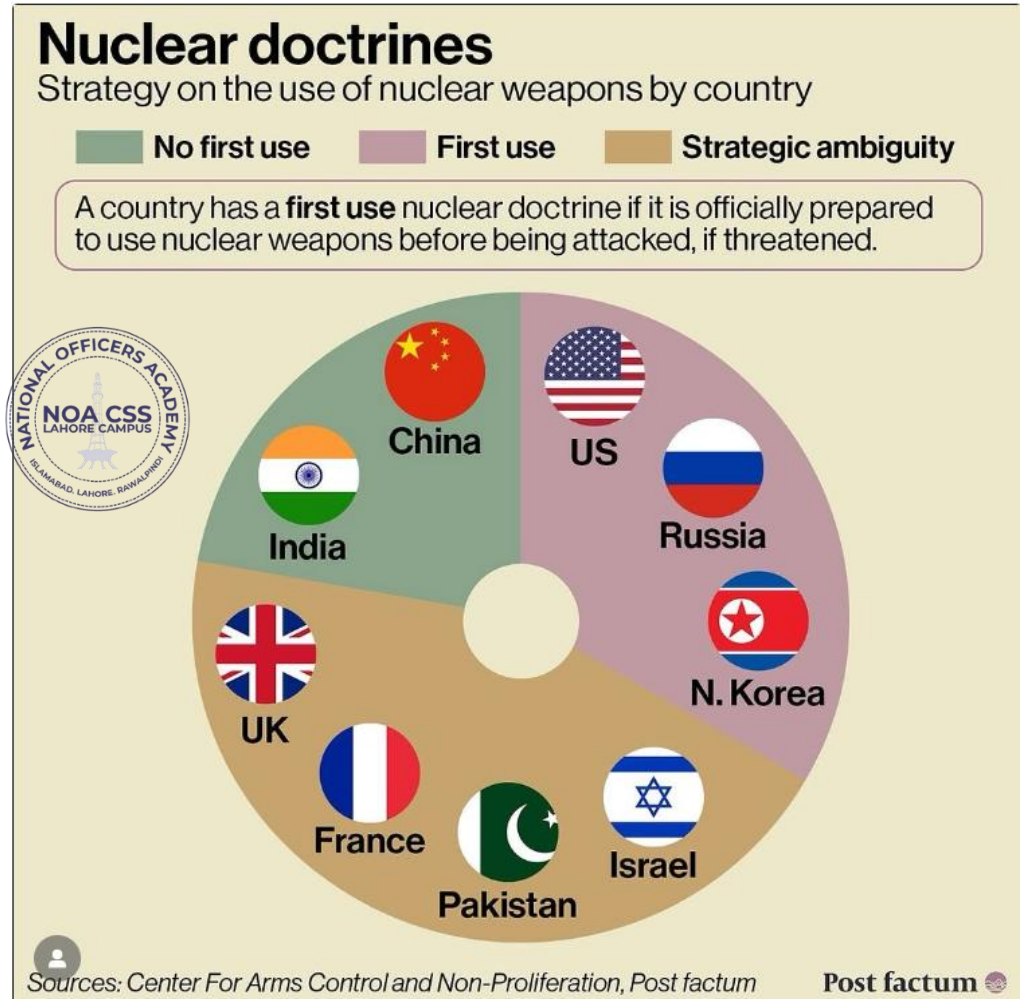
Source: International Campaign to Abolish Nuclear Weapons

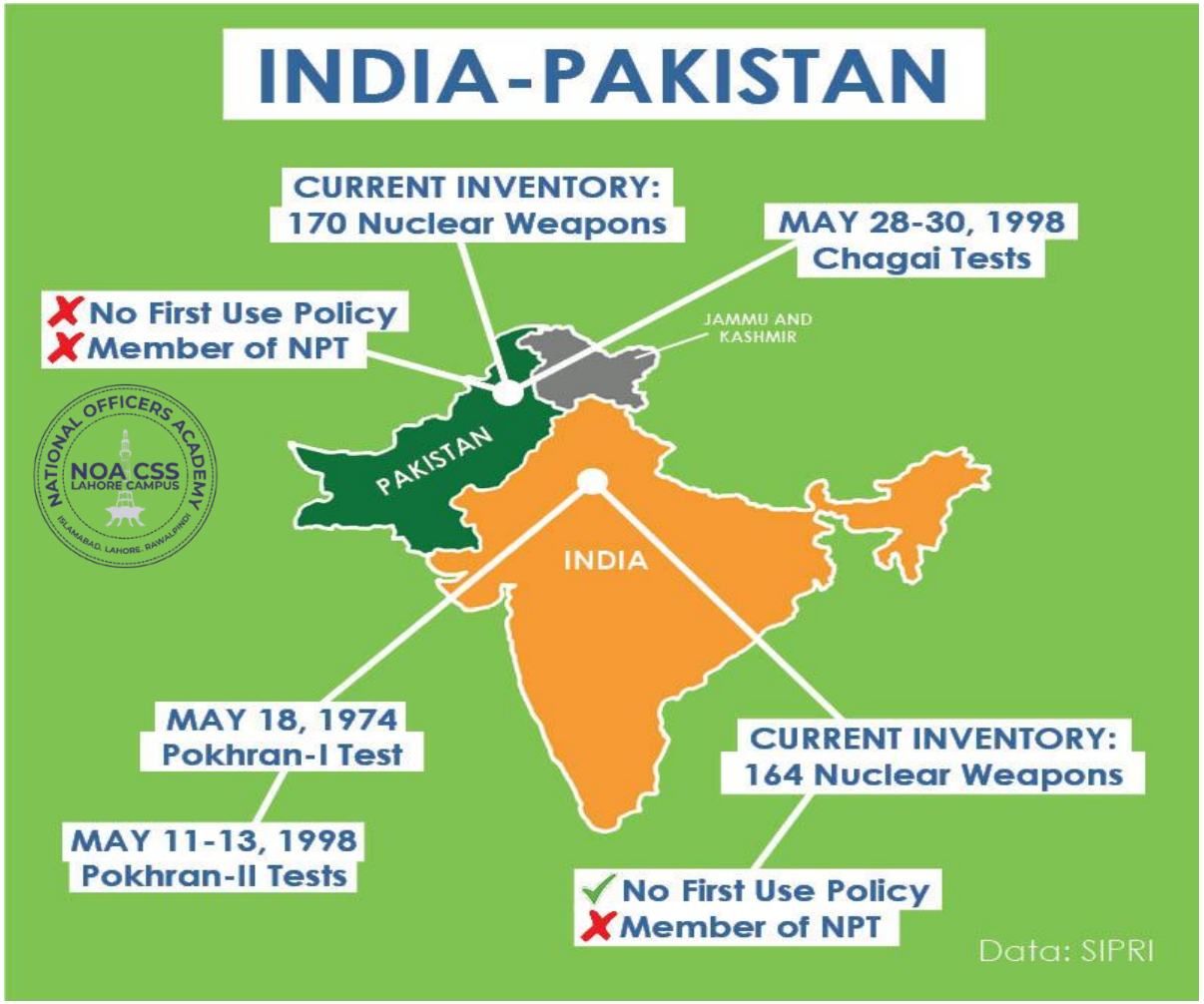
statista

EVOLUTION OF NUCLEAR WEAPONS

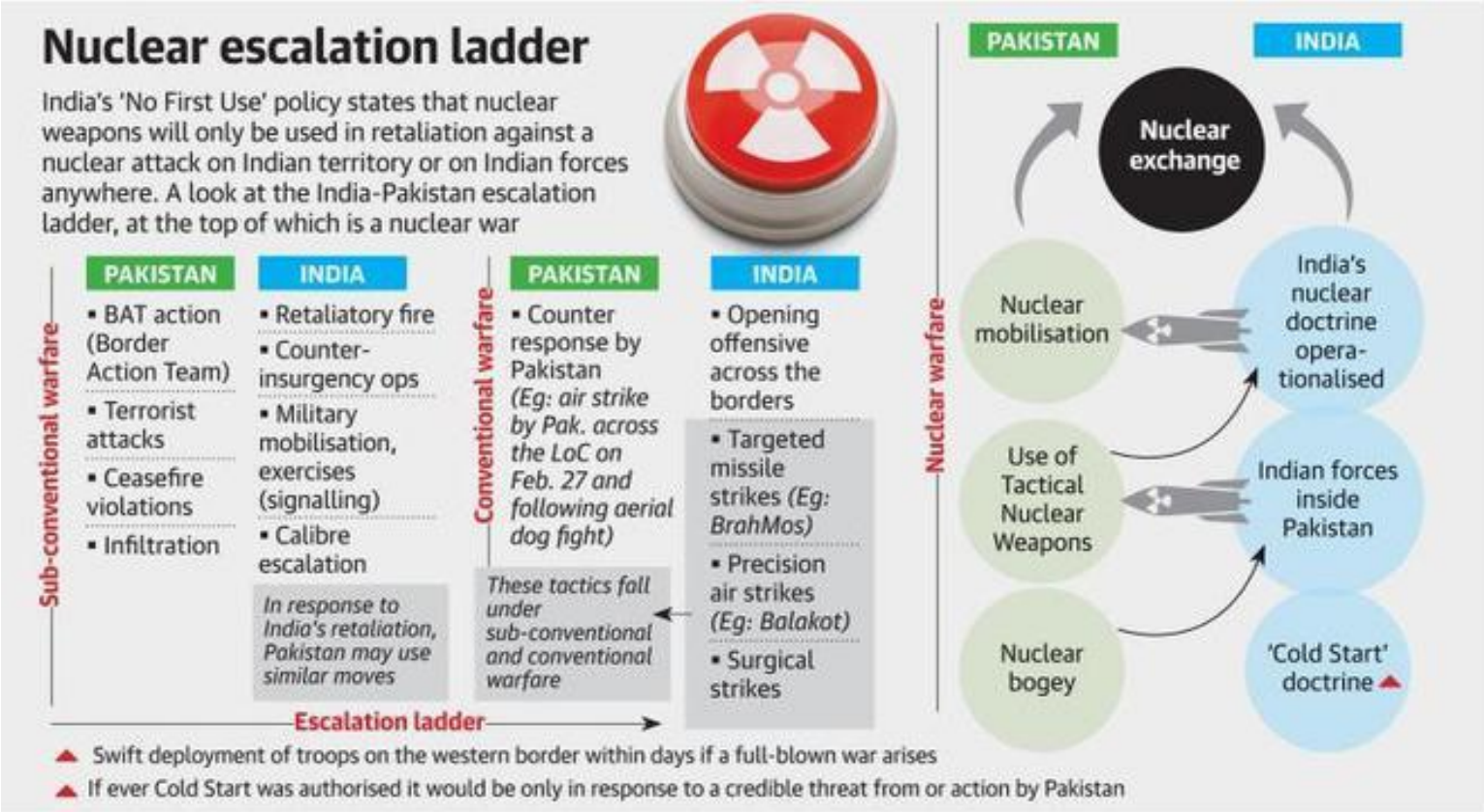



RUSSIA
KAZAKHSTAN
MONGOLIA
UZBEKISTAN
TURKMENISTAN
TURKEY
CHINA
AFGHANISTAN
IRAQ
IRAN
PAKISTAN
EGYPT
SAUDI ARABIA
INDIA
BURMA
SUDAN
ETHIOPIA
SOUTH SUDAN
NATIONAL OFFICERS ACADEMY
NOA CSS
LAHORE CAMPUS
ISLAMABAD, LAHORE, RAWALPINDI


Nuclear doctrines
Strategy on the use of nuclear weapons by country
No first use
First use
Strategic ambiguity
A country has a first use nuclear doctrine if it is officially prepared to use nuclear weapons before being attacked, if threatened.
China
US
India
Russia
N. Korea
UK
France
Pakistan
Israel
Sources: Center For Arms Control and Non-Proliferation, Post factum
Post factum


INDIA-PAKISTAN
CURRENT INVENTORY:
170 Nuclear Weapons
MAY 28-30, 1998
Chagai Tests
No First Use Policy
Member of NPT
JAMMU AND KASHMIR
PAKISTAN
INDIA
MAY 18, 1974
Pokhran-I Test
MAY 11-13, 1998
Pokhran-II Tests
CURRENT INVENTORY:
164 Nuclear Weapons
No First Use Policy
Member of NPT
Data: SIPRI

NUCLEAR DOCTRINE OF INDIA AND PAKISTAN



https://www.aljazeera.com/news/2025/5/10/could-india-pakistan-use-nuclear-weapons-heres-what-their-doctrines-say

INDIA-PAKISTAN

Nuclear neighbours

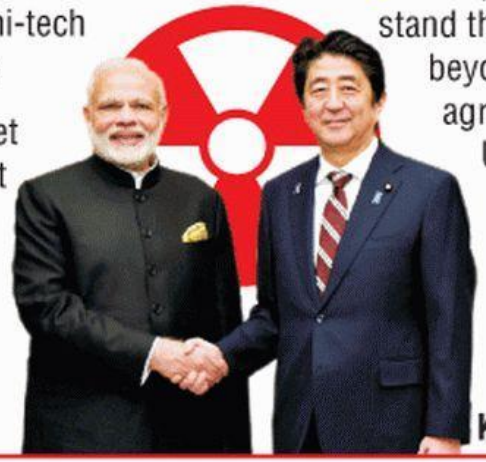
India and Pakistan officially became nuclear powers in 1998, when both countries conducted underground nuclear tests just weeks apart. Their nuclear rivalry is considered one of the most intense and volatile globally.

INDO-JAPAN CIVIL NUCLEAR DEAL

India and Japan sign historic civil nuclear cooperation deal

Key Points

- Japan can now supply nuclear reactors, fuel and technology to India
- India can purchase new generation of nuclear reactors with over 1,000 MW capacity with hi-tech safety features
- India will get state-of-the-art nuclear fuel fabrication and breeder technology from Japan
- Tokyo had earlier asked for further commitments from New Delhi on nuclear non-proliferation, but later gave up on the conditions
- India persisted on its stand that it cannot go beyond what it had agreed to with the US on a similar nuclear deal and eventually convinced Japan on the terms



KBK Infographics

India's Unique Position in India-U.S. Civil Nuclear Agreement

Nuclear Tests

- No explicit termination clauses for nuclear tests, preserving India's strategic autonomy

Fuel Reprocessing

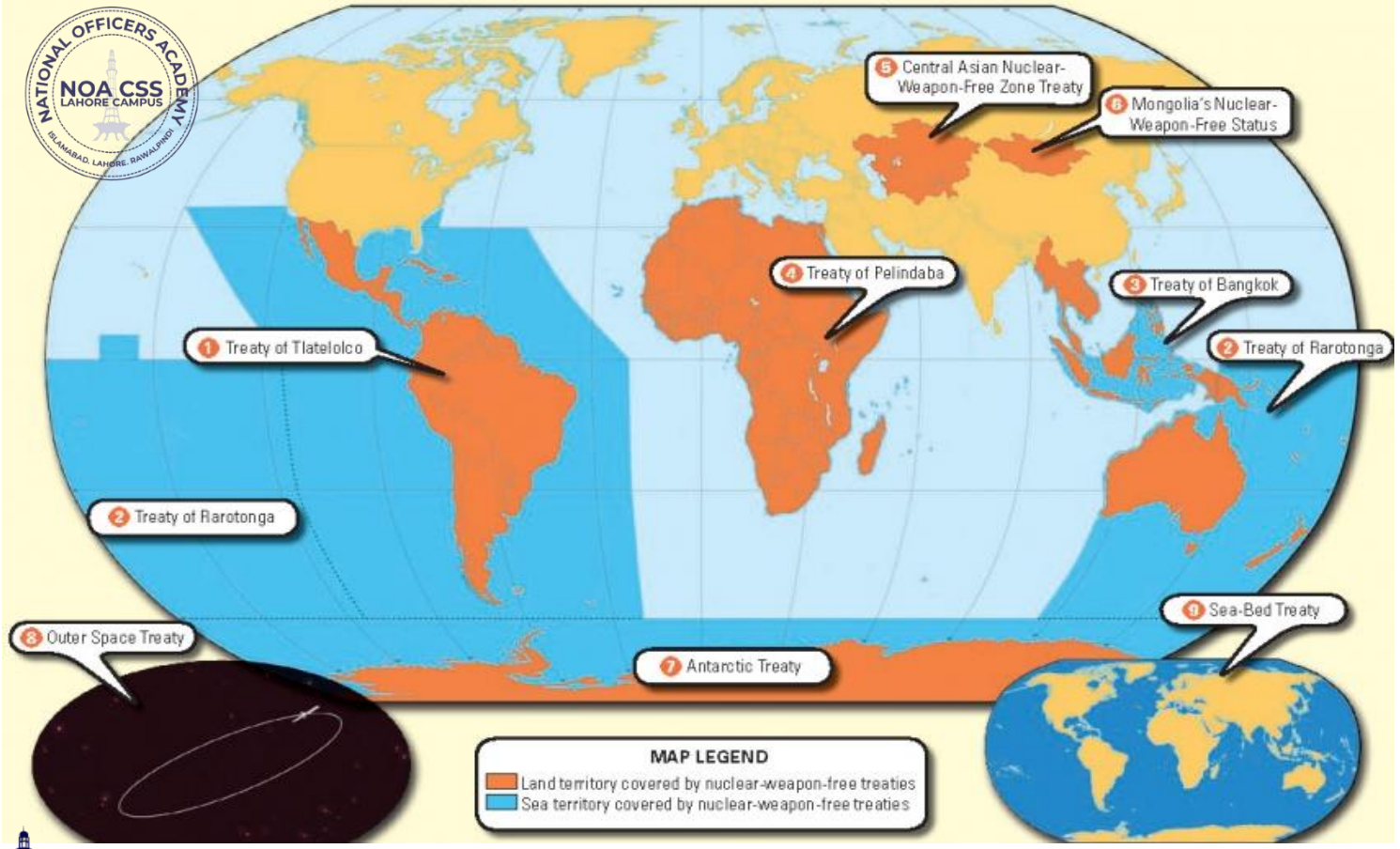
- Consent for reprocessing of US origin spent fuel has been secured;
  rare for non-NPT countries

Fuel Supply

- Unprecedented fuel supply assurances with U.S. commitment for continuous availability

NUCLEAR-WEAPON-FREE AREAS

Demarcation of nuclear-weapon-free zones, nuclear-weapon-free status and nuclear-weapon-free geographical regions



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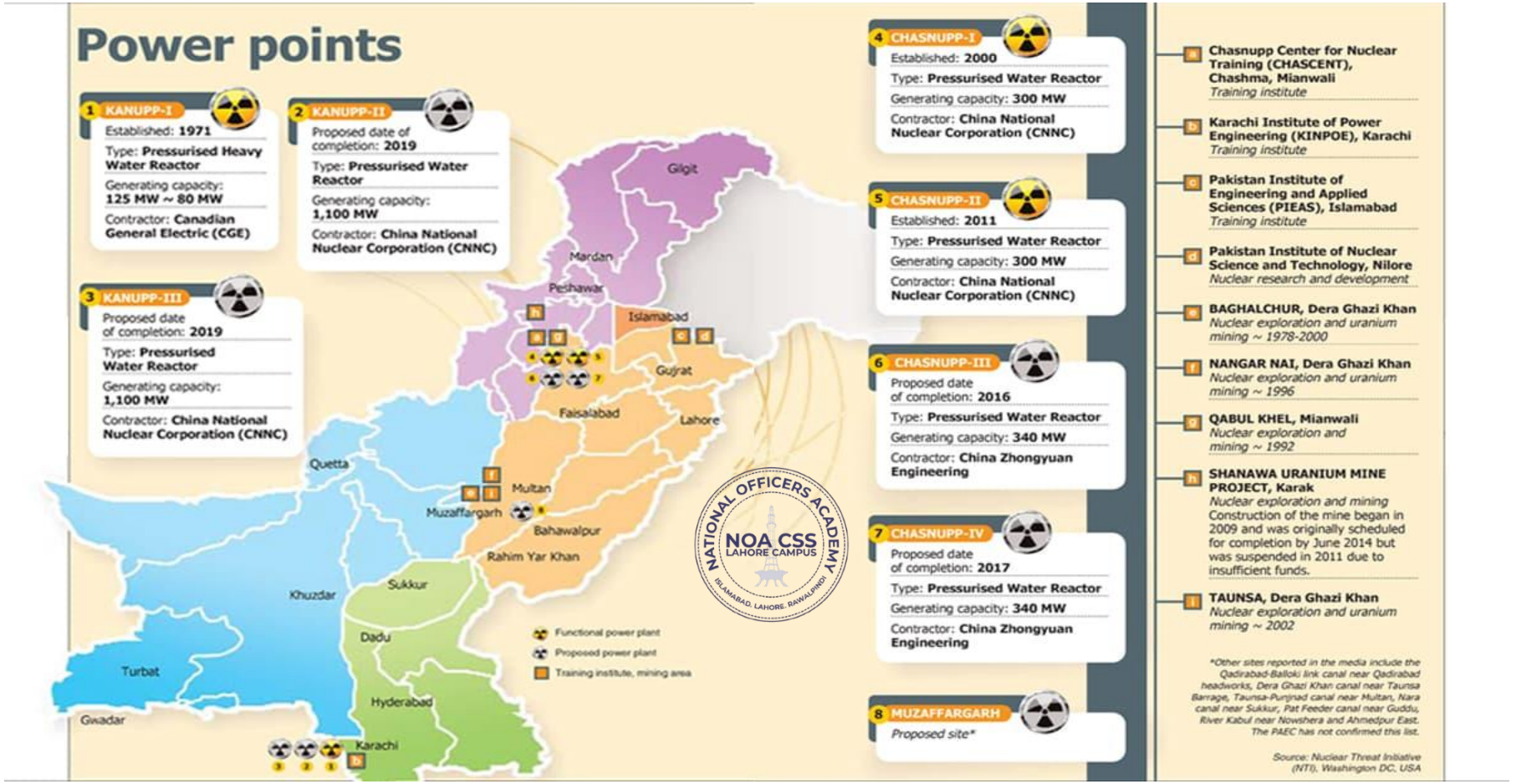
LECTURE 02- NUCLEAR ISSUES

- PAK NUCLEAR RECORD
- NUCLEAR COMMAND AND CONTROL STRUCTURE OF PAKISTAN
- NUCLEAR DETERRENCE AND IT'S RELEVANCE
- INTERNATIONAL CONCERNS VIS-A-VIS PAKISTAN NUCLEAR WEAPONS

NUCLEAR POWER GENERATION IN PAKISTAN



PAKISTAN'S NUCLEAR RECORD

The NCA is the apex decision-making body. Its structure is defined by law (**NCA Act of 2010**).

Chairmanship: The **Prime Minister** is the Chair. This ensures civilian political supremacy over nuclear weapons.

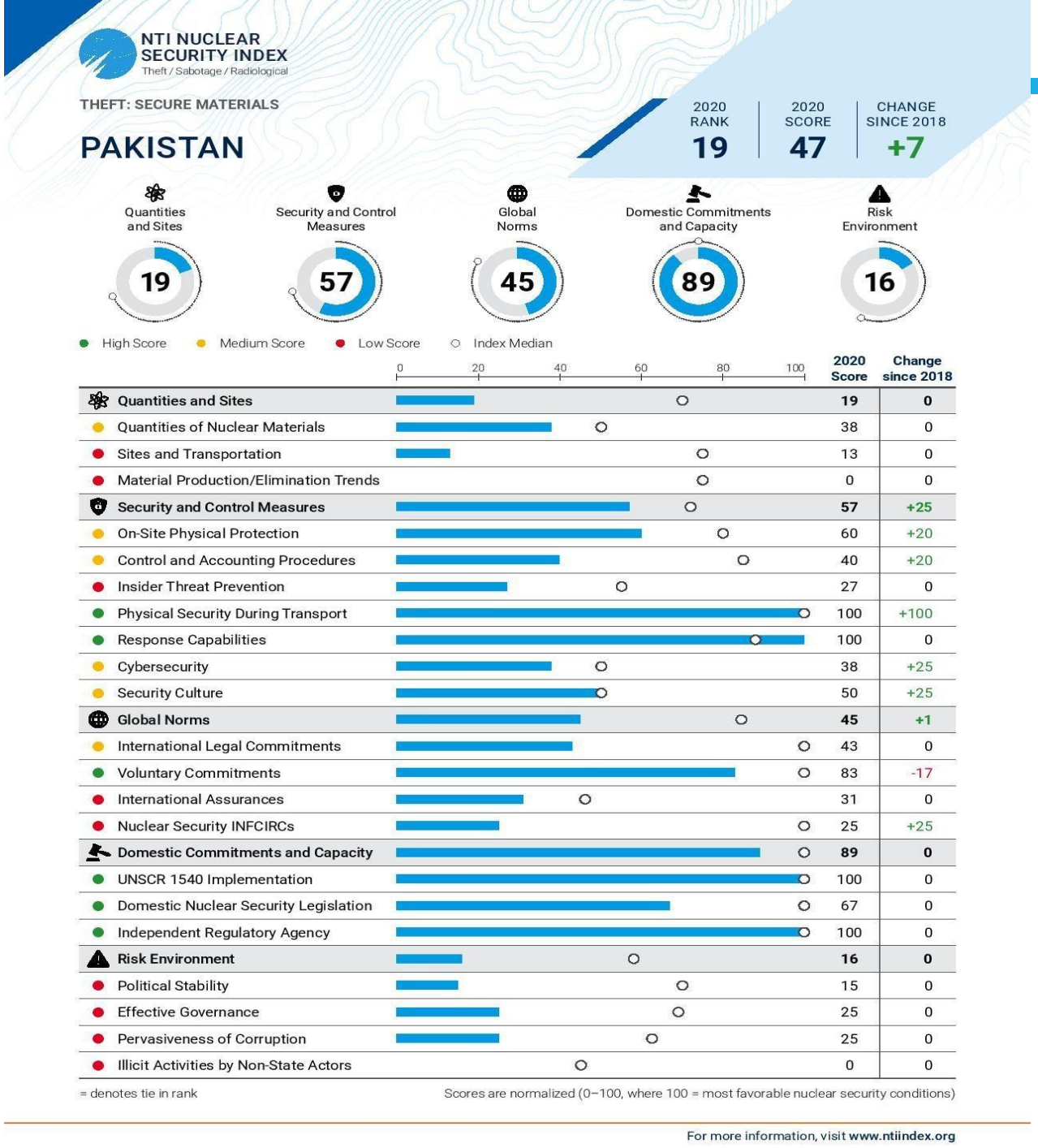
Members:

Federal Ministers of Defence, Foreign Affairs, Interior, and Finance.

Chairman of the Joint Chiefs of Staff Committee (CJCSC).

Services Chiefs (Army, Navy, Air Force).

The Director-General of the **Strategic Plans Division (SPD)** serves as its secretary.



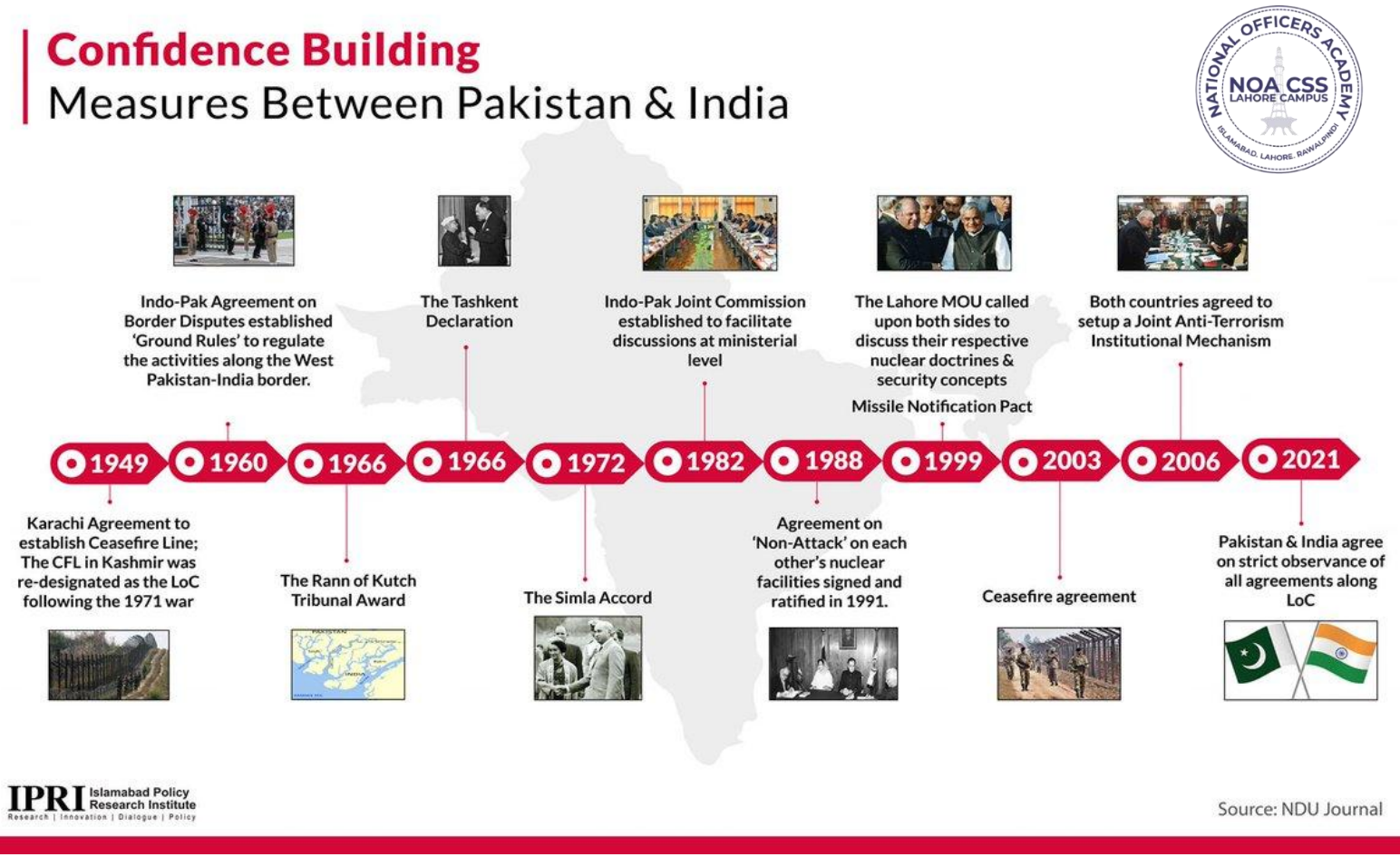
Key Committees:

- **Employment Control Committee (ECC):** The political body chaired by the PM. It is the sole authority for authorizing nuclear weapon use.
- **Development Control Committee (DCC):** Chaired by the Foreign Minister, it oversees nuclear weapons development, testing, and safety certification.
- **Strategic Forces Command (SFC):** The military body (headed by a 3-star general from a rotating service) responsible for the operational deployment, training, and, if authorized, **launch of nuclear weapons**.

CHALLENGES FOR PAKISTAN'S NUCLEAR SYSTEM

- Economic Constraints
- International Sanctions
- Regional Security Dynamics
- Technological Advancement by Rivals
- Strategic Stability and Arms Race
- Security of nuclear assets
- Dependence on external support
- Global Non Proliferation Regime
- Internal political instability
- Environmental concerns

Confidence Building
Measures Between Pakistan & India

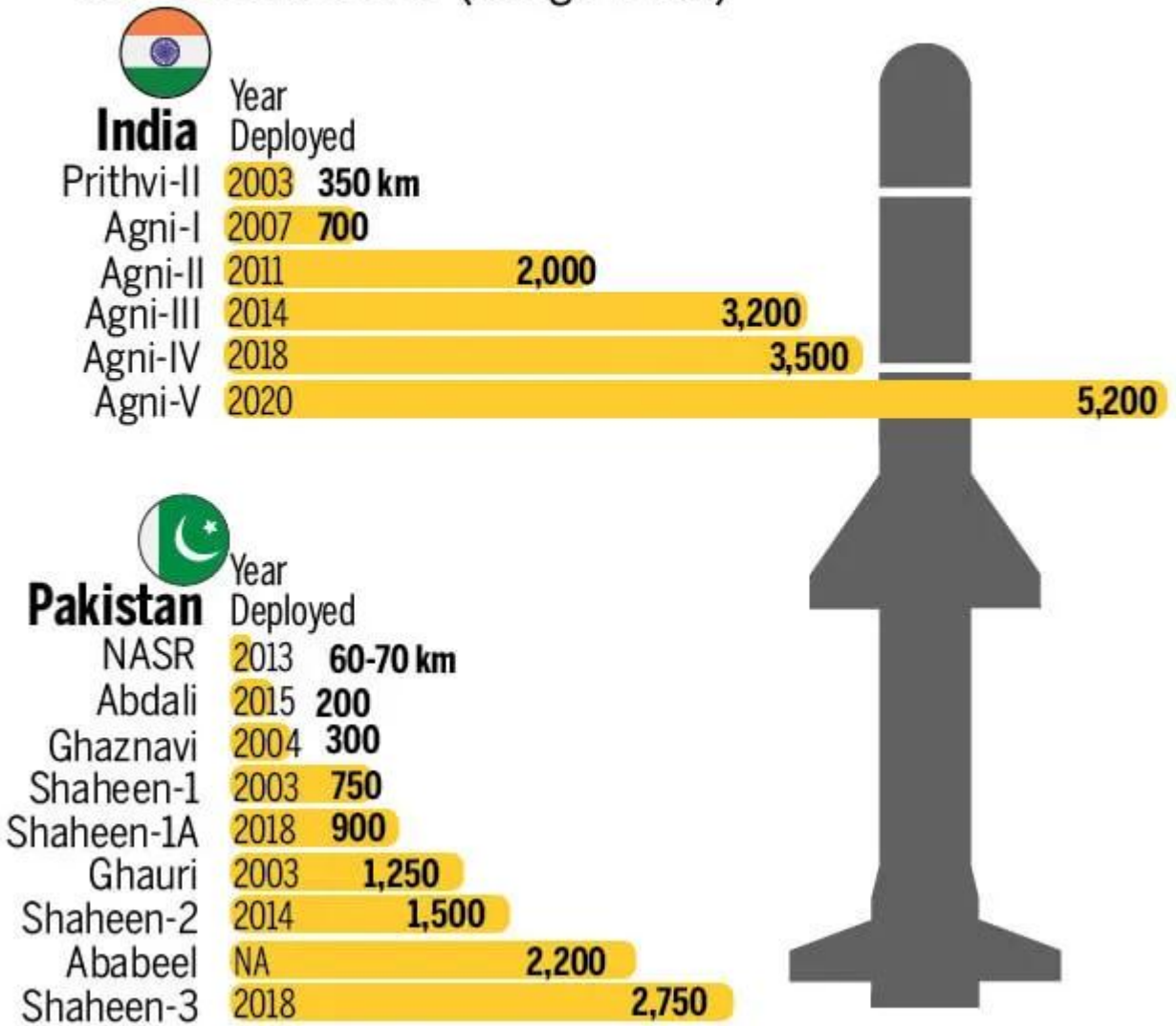


IPRI Islamabad Policy Research Institute
Research | Innovation | Dialogue | Policy

Source: NDU Journal

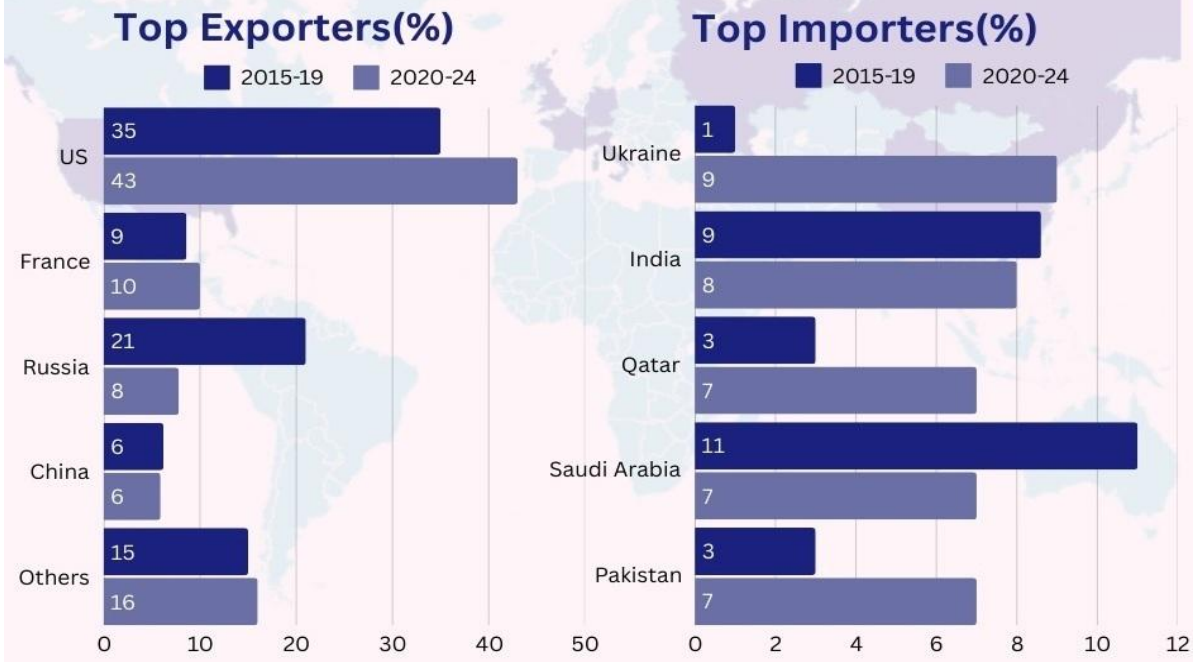
3. Key Confidence Building Measures (CBMs) Between India and Pakistan:

Type of CBM	Description	Year Established	Current Status/Effectiveness
Military	Hotline between Director Generals of Military Operations (DGMOs)	1971	Weekly use agreed after 1990 crisis
Military	Agreement on Prohibition of Attack against Nuclear Installations and Facilities	1988 (Ratified 1991)	Implemented, annual exchange of lists
Military	Pre-notification of Ballistic Missile Tests	1999 (Lahore MoU)	Exists, but implementation can be inconsistent
Political	Simla Agreement	1972	Cornerstone of bilateral relations, but threatened recently
Political	Lahore Declaration and Memorandum of Understanding	1999	Provided framework for nuclear dialogue, but progress limited
People-to-People	Cross-border trade and transportation initiatives	Varies	Often disrupted during periods of high tension
People-to-People	Cultural and educational exchanges	Varies	Limited and often affected by political climate



Global Arms Transfers 2020–2024

- The U.S. saw a significant 21% increase in arms exports compared to 2015–19.
- Ukraine became the world's largest importer, with nearly 100 times increase in imports compared to previous period.



Source: Stockholm International Peace Research Institute (SIPRI)

IRIA (www.ir-ia.com)

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LECTURE 03- NUCLEAR TREATIES

- NPT (1970)
- CTBT (1996)
- PTBT (1963)
- FMCT (PROPOSED 2006)
- JCPOA (2015)
- IAEA (1956)
- NSG (1975)
- NST

THE NUCLEAR NON-PROLIFERATION TREATY (NPT) - EXPLAINED

- The **Nuclear Non-Proliferation Treaty** (NPT) is a landmark international treaty whose objective is to prevent the spread of nuclear weapons and weapons technology, to promote cooperation in the peaceful uses of nuclear energy, and to further the goal of achieving nuclear disarmament.
- It entered into force in **1970** and is the most widely adhered to arms control agreement in history, with **191 states** as parties. Only four countries are not members: **India, Pakistan, Israel, and South Sudan**. North Korea announced its withdrawal in 2003.

The "Grand Bargain": Three Pillars

The treaty is built on a foundational compromise, often called a "grand bargain," between nuclear and non-nuclear weapon states, structured around three pillars:

1.Non-Proliferation

1. **Nuclear-Weapon States (NWS):** The five states that tested a nuclear device before January 1, 1967 (**United States, Russia (successor to the USSR), United Kingdom, France, China**) agree **not to transfer** nuclear weapons or technology to others.
2. **Non-Nuclear-Weapon States (NNWS):** All other parties agree **never to acquire** nuclear weapons.

2.Disarmament

1. All parties, especially the NWS, commit to pursuing negotiations in good faith on measures for **nuclear disarmament**. This is articulated in **Article VI** of the treaty. This pillar is a constant source of debate, as non-nuclear states argue the original five have not done enough to reduce their arsenals.

3.Peaceful Use of Nuclear Energy

1. All parties have the **inalienable right** to develop nuclear energy for peaceful purposes (like energy, medicine, agriculture) and to benefit from international cooperation in this field.

Key Mechanisms & Safeguards

•**International Atomic Energy Agency (IAEA) Safeguards:** Non-nuclear weapon states must sign agreements with the IAEA, which verifies that their nuclear programs are not being diverted from peaceful to military use. This is a mandatory condition of the treaty.

•**Review Conferences:** Held every five years to assess the treaty's implementation and address challenges.

Criticisms

•**Permanent Division:** Critics call it discriminatory, as it legally enshrines a two-tier system of five "legitimate" nuclear haves and all others as have-nots.

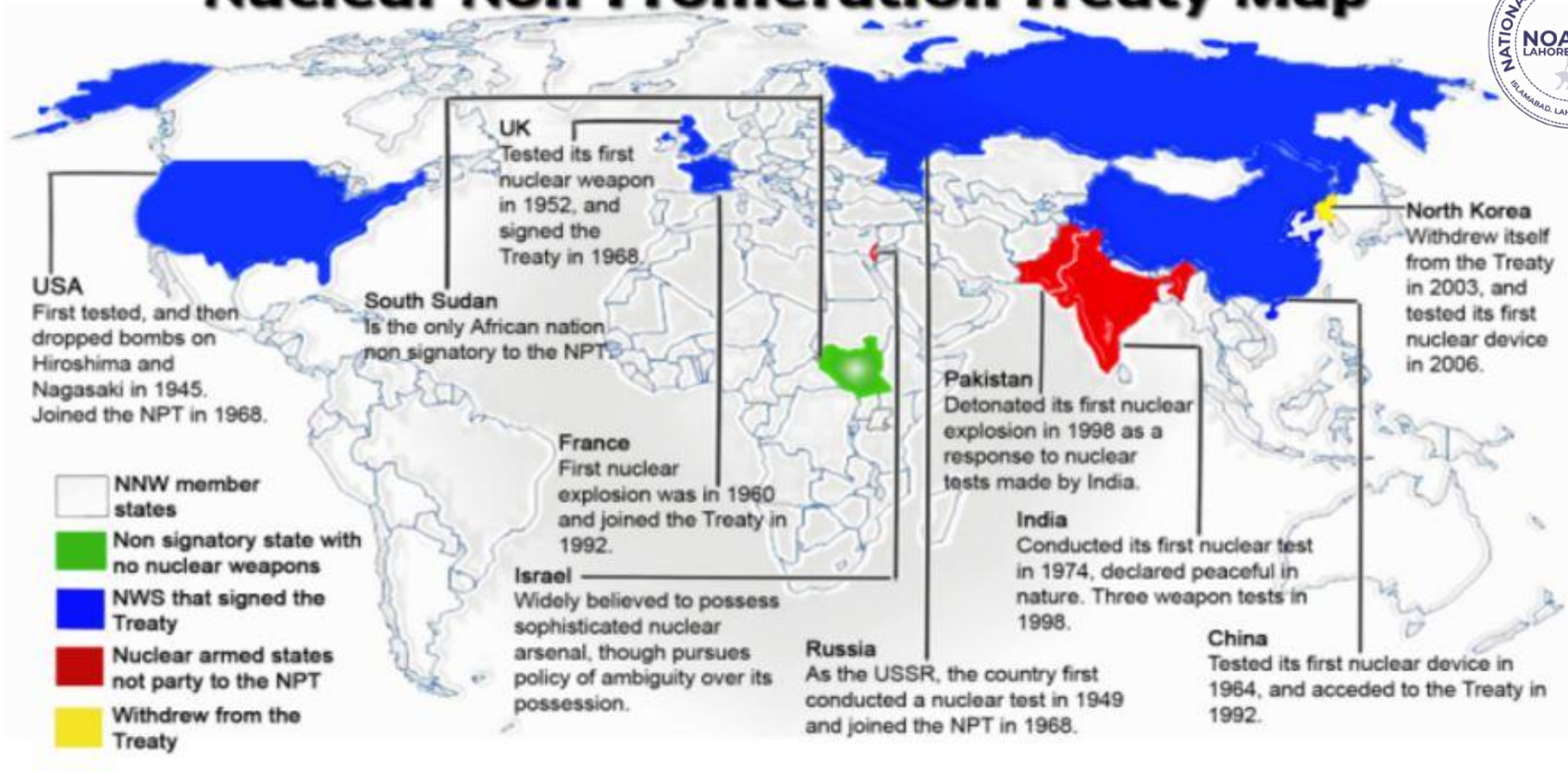
•**Slow Disarmament:** Non-nuclear states are frustrated by the perceived slow pace of disarmament by the NWS, arguing the "bargain" is unbalanced.

•**Non-Parties:** The nuclear programs of **India, Pakistan, and Israel** (all outside the NPT) remain major regional and global security concerns.

•**Withdrawal: North Korea's** withdrawal and subsequent nuclear tests exposed a loophole in the treaty's enforcement mechanisms.

•**Dual-Use Technology:** The line between peaceful nuclear energy and weapons development is thin, as seen in past cases like **Iran's** program, leading to complex diplomatic disputes.

Nuclear Non-Proliferation Treaty Map



World map showing nuclear weapons states (Image by British American Security Information Council)

THE COMPREHENSIVE NUCLEAR-TEST-BAN TREATY (CTBT)

- bans all nuclear test explosions, whether for military or civilian purposes
- opened for signature in 1996
- to stop the development of new nuclear weapons and
- prevent upgrades to existing ones, supporting global efforts in non-proliferation and disarmament.
- Signed by 156 countries to-date; not ratified by China and the US.

Another key document is the resolution adopted by the States Signatories on 19 November 1996, which established the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO).

CONTENTS

- The Treaty consists of a preamble, 17 articles, two annexes, and a Protocol with two further annexes.
- **The preamble** outlines the significance of the Treaty as an important nuclear non-proliferation and disarmament measure.
- **Article I** stipulates the basic obligations under the Treaty. It states that each State Party agrees not to carry out, encourage, or support any nuclear weapon test explosion or other nuclear explosion, and undertakes to prohibit and prevent such activities at any place under its jurisdiction or control.
- **Article II** provides for the establishment of the Comprehensive Nuclear-Test-Ban Treaty Organization in Vienna to oversee the implementation of the Treaty and to serve as a forum for consultation and cooperation among States Parties.
- **Article III** focuses on national implementation measures, requiring each State Party to take the necessary legal and administrative steps to give effect to its Treaty obligations.
- **Article IV** elaborates on the global verification regime to monitor compliance with Treaty provisions. The regime is to comprise a global network of monitoring stations (the International Monitoring System), an International Data Centre in Vienna, a consultation and clarification process, On-site Inspections and confidence-building measures . **Article V** outlines measures to redress a situation which contravenes the CTBT provisions and to ensure compliance with the Treaty.

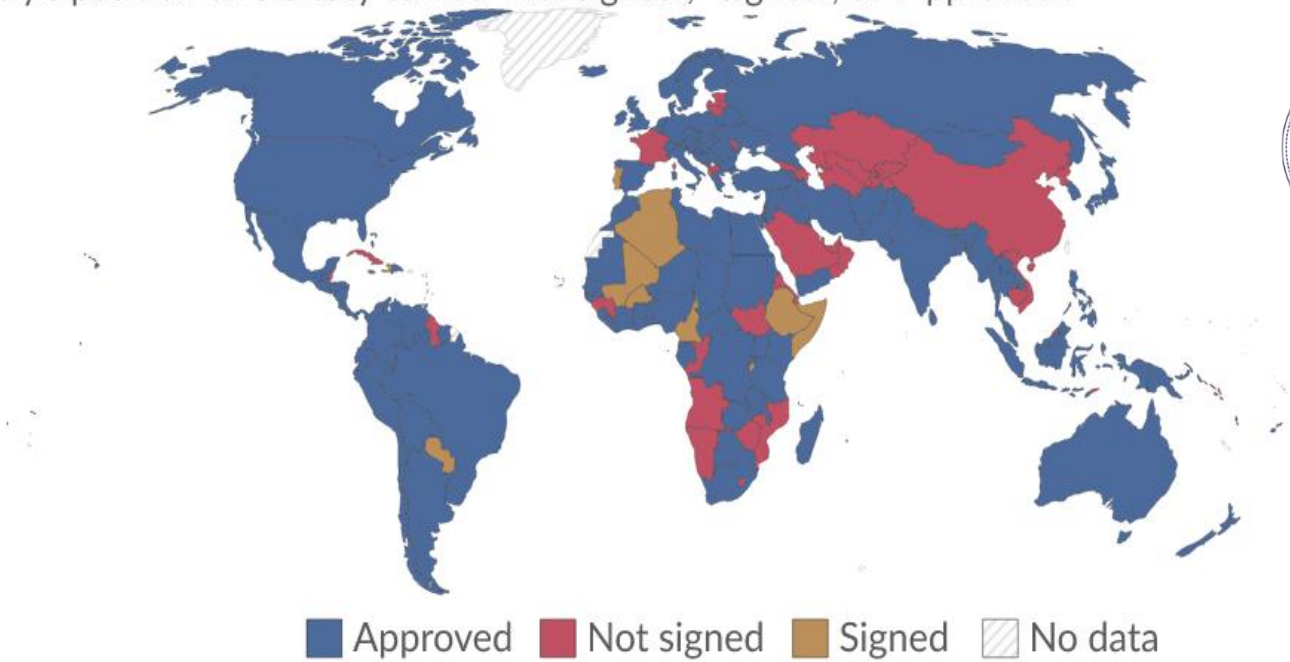
PARTIAL TEST BAN TREATY

- The Test Ban Treaty of 1963 prohibits nuclear weapons tests "or any other nuclear explosion" in the atmosphere, in outer space, and under water. While not banning tests underground, the Treaty does prohibit nuclear explosions in this environment if they cause "radioactive debris to be present outside the territorial limits of the State under whose jurisdiction or control" the explosions were conducted. In accepting limitations on testing, the nuclear powers accepted as a common goal "an end to the contamination of man's environment by radioactive substances."
- Each of the Parties to this Treaty undertakes to prohibit, to prevent, and not to carry out any nuclear weapon test explosion, or any other nuclear explosion, at any place under its jurisdiction or control
- Each of the Parties to this Treaty undertakes furthermore to refrain from causing, encouraging, or in any way participating in, the carrying out of any nuclear weapon test explosion, or any other nuclear explosion, anywhere which would take place in any of the environments described.
- This Treaty shall be of unlimited duration.
- Each Party shall in exercising its national sovereignty have the right to withdraw from the Treaty

Country position on the Partial Nuclear-Test-Ban Treaty, 2024

Our World in Data

The treaty's objective is to stop nuclear weapons tests in the atmosphere, in outer space, and under water. A country's position on a treaty can be "Not signed", "Signed", or "Approved".



Data source: United Nations Office for Disarmament Affairs (2025)

FISSILE MATERIAL CUT-OFF TREATY (FMCT)

- To prohibit the production of: highly-enriched uranium (HEU) and plutonium.
- UN Conference on Disarmament (CD), a body of 65 member nations established as the sole multilateral negotiating forum on disarmament. The CD operates by consensus and is often stagnant,
- Those nations that joined the nuclear Nonproliferation Treaty (NPT) as non-weapon states are already prohibited from producing or acquiring fissile material for weapons.
- An FMCT would provide new restrictions for the five recognized nuclear weapon states (NWS—United States, Russia, United Kingdom, France, and China), and for the four nations that are not NPT members (Israel, India, Pakistan, and North Korea).
- The United States, the United Kingdom, France, China and Russia have all declared that they have stopped producing fissile material for nuclear weapons.
- According to the International Panel on Fissile Material's (IPFM) 2015 ~~Global Fissile Material Report~~, the global stockpile of HEU in 2015 consisted of roughly 1,340 ± 125 tons, enough material to create 76,000 first simple, first generation nuclear weapons. Roughly 99% of the HEU stock is owned by nuclear weapon states. Russia and the United States have the largest stocks. India, Pakistan, and North Korea are believed to have ongoing production operations for HEU.
- IPFM estimates the global stockpile of separated plutonium at 520 ± 10 tons, of which, less than half was produced for use in weapons. About 88% of plutonium is held by states with nuclear weapons that are NPT signatories, and most of the remaining 12% is held by Japan, which has over 47 tons of plutonium. Though the five NWS no longer produce weapons-grade plutonium, production continues in India, Israel, North Korea and Pakistan(wants inclusion of current FM Stockpiles.

Increasing the security of fissile materials

Category	existing, nonexisting (and partly existing) voluntary measures	internationally binding commitments
Military: Inside weapons, military purpose, naval fuel, considered excess, declared excess, already disposed of, under IAEA safeguards	• halt production: NWS have stopped Ind,Pak,Isr ongoing • create transparency: publish inventories & future policy plans US, UK published Pu inventories • dispose of materials: HEU disposition started Pu disposition attempt failed so far • verify disposition and non-military use: negotiations on trilateral initiative • improve MPC&A: CTR intensify international efforts • convert naval reactors	• Fissile Material Cutoff Treaty • International Fissile Materials Register with the UN • International Nuclear Weapons Register with the UN • U.S.-Russian agreement on the disposition of excess weapons Pu implementation pending financing • Internationally agreed standards for MPC&A • Convention on the Physical Protection of Nuclear Material (only international transports) • Internationally agreed standards for export controls
Civilian	• phase out Pu use, diminuish stocks of existing separated Pu • stop HEU production and civilian use	• NPT • Euratom Treaty • INFCIRC/153 • Additional Protocol (I/540) • Guidelines of Pu management (I/549)

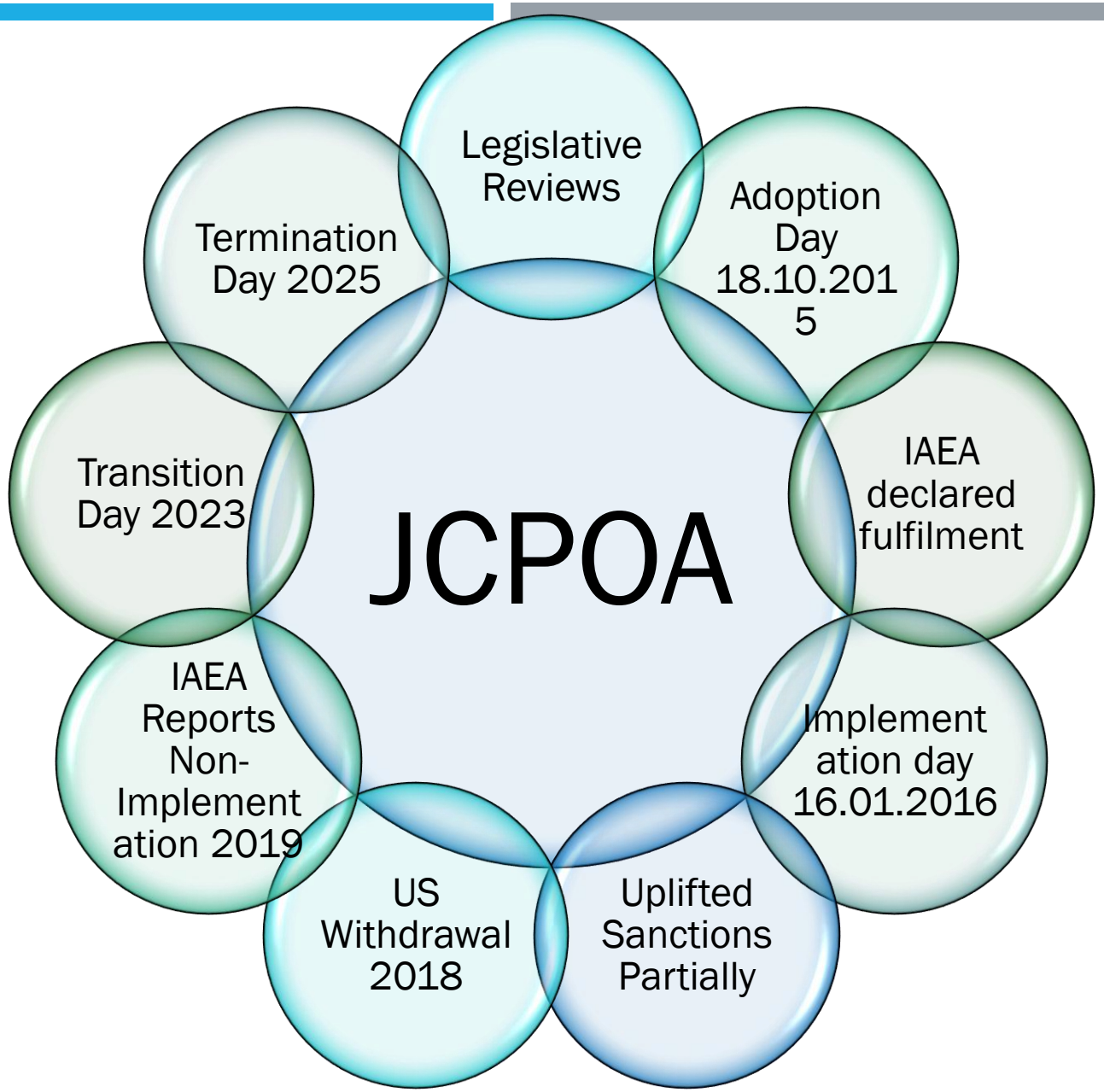
Joint Comprehensive Plan of Action (JCPOA)

The **Joint Comprehensive Plan of Action** (**JCPOA**) known commonly as the **Iran nuclear deal** or **Iran deal**, is an agreement on the Iranian nuclear program reached in Vienna on 14 July 2015, between Iran and the P5+1 (the five permanent members of the United Nations Security Council—China, France, Russia, United Kingdom, United States—plus Germany) together with the European Union.

Formal negotiations toward JCPOA began with the adoption of the Joint Plan of Action, an interim agreement signed between Iran and the P5+1 countries in November 2013. Iran and the P5+1 countries engaged in negotiations for the next 20 months and in April 2015 agreed on a framework for the final agreement. In July 2015 Iran and the P5+1 confirmed agreement on the plan along with the "Roadmap Agreement" between Iran and the IAEA

JCPOA

- On 20 July 2015, the UN Security Council adopted Resolution 2231(2015) regarding the Joint Comprehensive Plan of Action (JCPOA), agreed by Iran and the E3/EU+3. This resolution endorses the JCPOA, allowed for certain exemptions to existing restrictive measures and defines the schedule and commitments to be undertaken by all parties to lead to the termination of restrictive measures against Iran.
- On 8 May 2018, the President of the United States announced the withdrawal of the United States from the Joint Comprehensive Plan of Action (JCPOA).
- **Sanctions** imposed by the EU in view of the **human rights situation in Iran, support for terrorism and other grounds** are not part of the JCPOA, and remain in place.



IAEA

- Autonomous intergovernmental organization dedicated to increasing the contribution of atomic energy to the world's peace and well-being and ensuring that agency assistance is not used for military purposes. In 2005 the IAEA and its director general (1997–2009), Mohamed ElBaradei, won the Nobel Prize for Peace.
- The agency was established by over 80 countries in October 1956, nearly three years after Eisenhower's "Atoms for Peace" speech to the United Nations General Assembly.
- The IAEA's statute officially came into force on July 29, 1957. Its activities include research on the applications of atomic energy to medicine, agriculture, water resources, and industry; the operation of conferences, training programs, fellowships, and publications to promote the exchange of technical information and skills; the provision of technical assistance, especially to less-developed countries; and the establishment and administration of radiation safeguards.
- As part of the Treaty on the Non-Proliferation of Nuclear Weapons (1968), all non-nuclear powers are required to negotiate a safeguards agreement with the IAEA; as part of that agreement, the IAEA is given authority to monitor nuclear programs and to inspect nuclear facilities.
- The General Conference:
- meets annually to approve the budget and programs and
- to debate the IAEA's general policies
- approving the appointment of a director general and admitting new members.
- The day-to-day affairs of the IAEA are run by the Secretariat, which is headed by the director general, who is assisted by six deputies; the Secretariat's departments include nuclear energy, nuclear safety, nuclear sciences and application, safeguards, and technical cooperation.
- Headquarters are in Vienna.

OVERVIEW OF THE IAEA SAFETY STANDARDS

THE SAFETY STANDARDS COVER SAFETY IN FIVE AREAS

- Safety of nuclear facilities
- Radiation protection and safety of radiation
- Safe management of radioactive waste
- Safe transport of radioactive material
- General safety (cross-cutting themes)

Thematic areas

- Legal and governmental infrastructure
- Emergency preparedness and response
- Management systems
- Assessment and verification
- Site evaluation
- Radiation protection
- Radioactive waste management
- Decommissioning
- Rehabilitation of contaminated areas

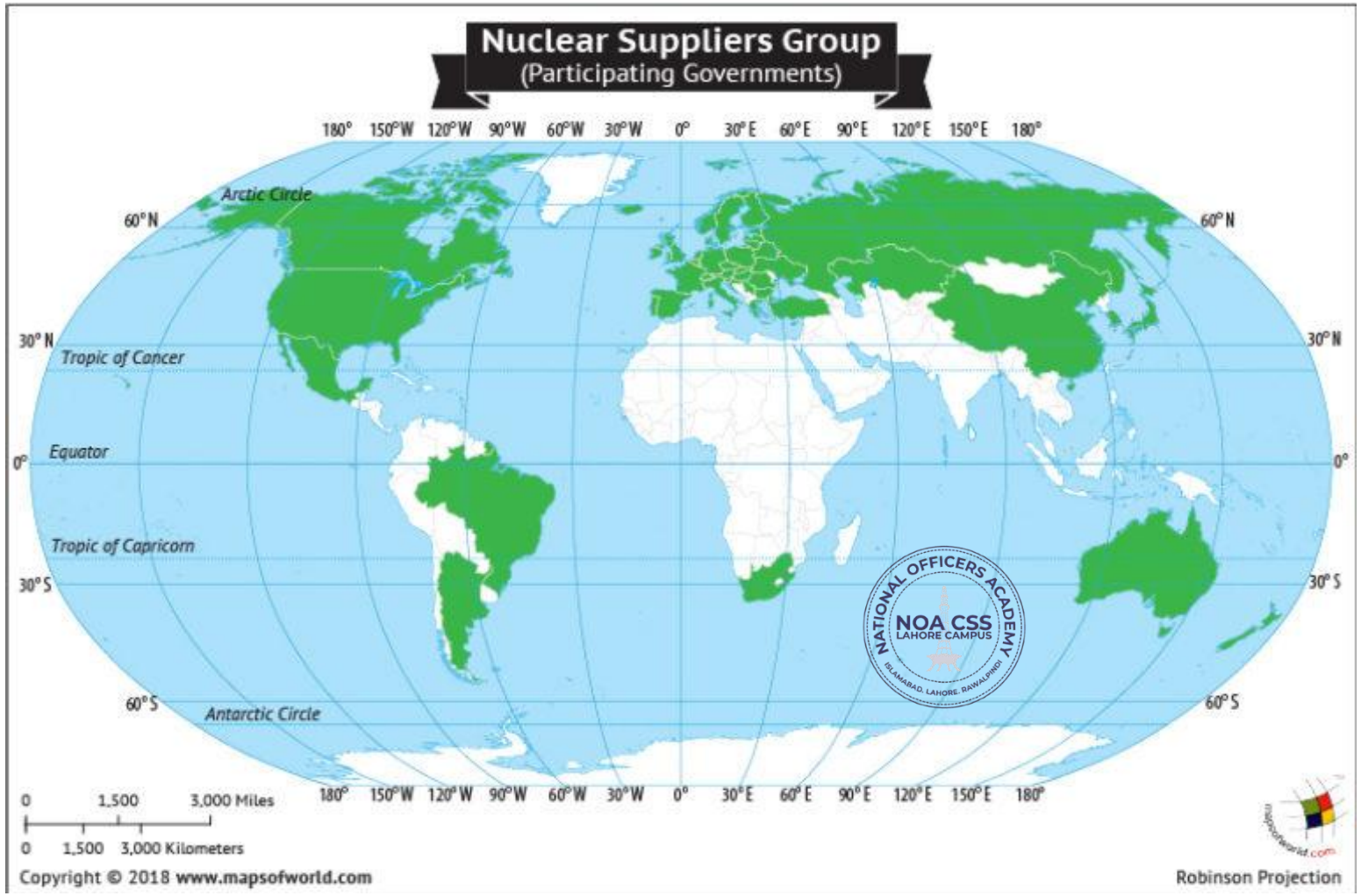
Facilities and activities

- Nuclear power plants
- Research reactors
- Fuel cycle facilities
- Radiation related facilities and activities
- Waste treatment and disposal facilities
- Transport of radioactive material

IAEA Safety Standards are available on: **www.iaea.org**

NUCLEAR SUPPLIERS GROUP (1975)

- Established in 1975, the Nuclear Suppliers Group (NSG) is comprised of 48 states
- The NSG governs the transfers of civilian nuclear material and nuclear-related equipment and technology.
- The NSG aims to prevent nuclear exports for commercial and peaceful purposes from being used to make nuclear weapons.
- In 1971, Zangger Committee required states outside the NPT to institute International Atomic Energy Agency (IAEA) safeguards before importing certain items that could be used to pursue nuclear weapons—referred to as the "Trigger List."
- The NSG Guidelines require that importing states provide assurances to NSG members that proposed deals will not contribute to the creation of nuclear weapons. Potential recipients are also expected to have physical security measures in place to prevent theft or unauthorized use of their imports and to promise that nuclear materials and information will not be transferred to a third party without the explicit permission of the original exporter. In addition, final destinations for any transfer must have IAEA safeguards in place. The IAEA is charged with verifying that non-nuclear-weapon states are not illicitly pursuing nuclear weapons. To prevent nuclear material or technology from being stolen or misappropriated for weapons, IAEA safeguards include inspections, remote monitoring, seals, and other measures.
- Members are supposed to report their export denials to each other so potential proliferators cannot approach several suppliers with the same request and receive different responses.
- In 2008, the NSG agreed to exempt India from its requirement that recipient countries must have comprehensive IAEA safeguards covering all nuclear activities. The United States pressed for a three-year exemption to allow nuclear trade with India.
- All NSG decisions are made by consensus. The Permanent Mission of Japan to the International Organisations in Vienna serves as the NSG point of contact. It receives and distributes NSG documents, schedules meetings, and assists with other administrative work.


Nuclear Suppliers Group
(Participating Governments)
180° 150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E 180°
Arctic Circle
60°N
30°N
Tropic of Cancer
0°
Equator
Tropic of Capricorn
30°S
60°S
Antarctic Circle
NATIONAL OFFICERS ACADEMY
NOA CSS
LAHORE CAMPUS
ISLAMABAD, LAHORE, RAWALPINDI
0 1,500 3,000 Miles
0 1,500 3,000 Kilometers
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Robinson Projection

PERSPECTIVE

Relevant CSS Subjects and Topics:

- Pakistan Affairs: Nuclear policy, Indo-Pak relations, Strategic autonomy
- International Relations: Deterrence theory, diplomacy under pressure, hybrid warfare
- Current Affairs: Regional security dynamics, strategic balance in South Asia
- Strategic Studies: Nuclear deterrence, security doctrines, conventional vs. non-conventional warfare

Facts and Figures:

- Pakistan's nuclear program began after India's 1974 nuclear test.
- It took over 25 years to achieve strategic capability and operational deterrence.
- In the latest crisis, Pakistan used drones, missiles, and air strikes to counter India's aggression.
- A ceasefire was brokered by the US after Pakistan's retaliatory strikes.
- Books like Eating Grass and The Security Imperative offer detailed insights into Pakistan's nuclear path.

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