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- MQ-9 Reaper
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- The mainland serow
- Currency swap arrangement
- EU ON CRITICAL RARE EARTHS
- Mains

By saurabh Pandey

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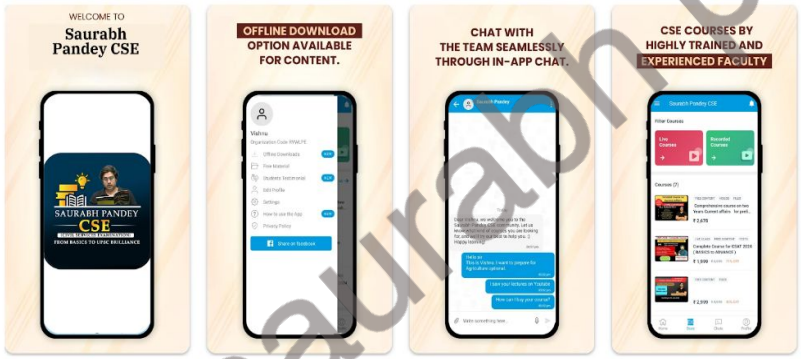

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India and U.S. in talks for Stryker infantry vehicles

Deals for MQ-9B unmanned aerial vehicles and GE-414 jet engines are making progress along with defence industrial collaborations under the initiative on Critical and Emerging Technology

Dinakar Peri
NEW DELHI

India has expressed interest in co-producing the Stryker infantry vehicles and it is in "relatively" early stages of talks with the U.S. on the Stryker and the Javelin anti-tank guided missiles (ATGM), says the U.S. Deputy Secretary of State Kurt M. Campbell.

At the same time, deals for MQ-9B unmanned aerial vehicles and GE-414 jet engines are making progress along with defence industrial collaborations under the initiative on Critical and Emerging Technology (iCET) framework.

Discussions on Stryker have been going on for several months now, and officials said the deal could potentially see local manufacture of several hundred variants of the vehicle under licence with some customisations for the Indian Army, including one with Javelin mounted on them.

However, several defence officials expressed reservations on going for Stryker given that several such vehicles have been developed and demonstrated by Indian companies in recent years.

The deal on Stryker could potentially see local manufacture of variants under licence with some customisations for the Army. AP

Early stages

"India has expressed an interest in the co-production of Stryker, and I think we're still in relatively early stages and the U.S. Army plans to demonstrate the capabilities of the Stryker to the Indian Army at an early opportunity," Mr. Campbell stated.

"We've had some discussions around the co-production of Javelin and Stryker. We're exploring a number of avenues for both co-production and engagement around technological areas where we could collaborate together on development more generally in R&D."

Mr. Campbell was speaking in a virtual briefing on Wednesday on the second India-U.S. iCET dialogue that was chaired by the two National Security Advisers last week.

The U.S. has in the past demonstrated both Stryker as well as Javelin for the Indian Army during bilateral exercises. Javelin was extensively evaluated by the Indian Army, though the deal did not go through.

On the MQ-9B deal, Mr. Campbell noted that the letter of offer and acceptance was delivered to India in early March, and they are awaiting signature to move forward.

"General Atomics is negotiating details of the sale with the Ministry of Defence and we are prepared, obviously, to work with them in addressing any outstanding questions," he stated.

The deal is in advanced stages and expected to go for approval by the Cabinet Committee on Security (CCS) in the next few months. Similarly, the deal for licence manufacture of the GE-414 engines by Hindustan Aeronautics Ltd. (HAL) to power the Light Combat Aircraft (LCA)-MkIA is also in advanced stages.

Stryker

- **The Stryker is a family of eight-wheeled armored fighting vehicles derived from the Canadian LAV III, itself derived from the Swiss Mowag Piranha.**

- The **General Atomics MQ-9 Reaper** (sometimes called **Predator B**) **is an unmanned aerial vehicle (UAV, one component of an unmanned aircraft system (UAS)) capable of remotely controlled or autonomous flight operations, developed by General Atomics Aeronautical Systems (GA-ASI) primarily for the United States Air Force (USAF).**
- **The MQ-9 and other UAVs are referred to as Remotely Piloted Vehicles/Aircraft (RPV/RPA) by the USAF to indicate ground control by humans.**
- **The MQ-9 is a larger, heavier, more capable aircraft**

MQ-9B

Predator Drones

Max Gross Takeoff Weight: 5,670 kg
Fuel Capacity: 2,721 kg
Payload Capacity: 2,177 kg across 9 hardpoints (8 wing, 1 centerline)

Crew:

Two pilots in ground control stations

Weapons

Laser guided missiles
Anti-tank missiles
Anti-ship missiles

Missions

- Humanitarian Assistance/Disaster Relief
- Search and Rescue
- Law Enforcement
- Border Enforcement
- Defensive Counter Air
- Airborne Early Warning

Missions

- Electronic Warfare
- Anti-Surface Warfare
- Anti-Submarine Warfare
- Airborne Mine Counter Measures
- Long-Range Strategic ISR
- Over-the-Horizon Targeting

GE-414 jet

General Electric (GE) Aerospace announced on that it has signed a Memorandum of Understanding (MOU) with Hindustan Aeronautics Limited (HAL) to co-produce “F414 engines” in India,

- **The General Electric F414 is an American afterburning turbofan engine in the 22,000-pound thrust class produced by GE Aerospace. The F414 originated from GE's widely used F404 turbofan, enlarged and improved for use in the Boeing F/A-18E/F Super Hornet**
- **GE's F414 engines utilise advanced technologies to enhance engine performance, durability, and reduce Life Cycle Cost (LCC) for next-generation combat aircraft.**
- **The F414 provides unrestricted engine performance with rapid throttle response and no throttle restrictions, ensuring power is readily available when needed.**

INSIDE THE F414 MILITARY AIRCRAFT ENGINE

FAN

- New high-flow design
- Stage 2/3 blisk

COMBUSTOR

- New annular combustor with multi-hole cooling design

HIGH PRESSURE TURBINE (HPT)

- Single crystal HPT blades
- Boltless retainers
- Thermally matched rotor/stator

LOW PRESSURE TURBINE (LPT)

- Single crystal HPT blades
- Boltless retainers
- Thermally matched rotor/stator

ENGINE SPECIFICATIONS

Maximum diameter **35 in**

Length	154 in
Thrust Class	22,000 lb
Airflow	170 lb/sec
Pressure Ratio	30:1

HIGH PRESSURE COMPRESSOR (HPC)

- Stage 1/2 blisk
- Stage 3 blisk

ADVANCED CONTROLS

- Dual channel. Full Authority Digital Engine Control (FADEC)
- Advanced engine analytics capability

AFTERBURNER & NOZZLE

- Air-cooled flame holder system
- Ceramic Matrix Composite (CMC) seals

- The engine offers good afterburner light and stability, enabling additional thrust to be quickly accessed when required.
  - The F414 is designed to maximize time-on-wing, simplify maintenance, and keep Life Cycle Costs low.
- The engine's six-module design makes it reliable, easy to maintain, and allows for interchangeability and with no scheduled overhauls and on-condition maintenance, the F414 maximizes engine availability

Antelope-like mammal from Bhutan recorded at lowest elevation in western Assam

The Hindu Bureau
GUWAHATI

Lone ranger: A mainland serow at the Raimona National Park in western Assam. SPECIAL ARRANGEMENT

The mainland serow, a mammal that looks like a cross between a goat and an antelope, has been recorded at the lowest elevation beyond Bhutan, its natural home, in Assam.

A team of scientists recorded a lone mainland serow (*Capricornis sumatraensis thar*) at 96 metres above the mean sea level at the Raimona National Park in western Assam. Also, the elusive animal has been found for the first time within a radius of 1 km from a human habitation.

The finding with photographic proof was published as a scientific paper in the latest issue of the *Journal of Threatened Taxa*. The paper was authored by M. Firoz Ahmed, senior scientist at biodiversity conservation group Aaranyak; senior conservation biologist Dipankar Lahkar; Nibir Medhi; Nitul Kalita; Bhanu Sinha, Divisional Forest Officer, Kachugaon; forest officials Pranjal Talukdar, Biswajit Basumatary, and Tunu Basumatary; Ramie H. Begum, Associate Professor, Assam University; and Abhishek Harihar, the director of Tiger programme, Panthera.

According to the International Union for Conservation of Nature, the mainland serow inhabits areas at altitudes of 200 metres to 3,000 metres. Its habitat is across the border in the Phibsoo Wildlife Sanctuary and the Royal Manas National Park in Bhutan.

The mainland serow

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saurabh pandey

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RBI rejigs SAARC currency swap plan

The Hindu Bureau
MUMBAI

The Reserve Bank of India (RBI) has decided to put in place a revised framework for currency swap arrangement for SAARC countries for 2024 to 2027.

"Under the Framework, a separate INR swap window has been introduced with various concessions for swap support in Indian rupee," the RBI said. "The total corpus of the rupee support is ₹250 billion." The RBI will continue to offer swap arrangement in U.S. dollar and euro under a separate U.S. Dollar/ Euro Swap Window with an overall corpus of $2 billion."

Currency swap arrangement

- **The Reserve Bank of India has put in place a revised framework on currency swap arrangements for countries within the South Asian Association of Regional Cooperation (SAARC) grouping for the time period 2024 to 2027.**
- **Under the Framework for 2024-27, a separate INR Swap Window has been introduced with various concessions for swap support in Indian Rupee.**
- **The total corpus of the Rupee support is ₹250 billion (Rs 25,000 crore),” the RBI Said**
- **The central bank will continue offering swap arrangements in US dollars and euros under a separate dollar/euro swap window with an overall corpus of $2 billion.**

- **Under the currency swap framework, the RBI would strike bilateral swap agreements with central banks of SAARC countries.**
- **The SAARC currency swap facility, which was first operationalised in November 2012, is intended to provide a backstop line of funding for short-term foreign exchange liquidity requirements or balance of payments crises suffered by SAARC countries till longer-term arrangements are made**

Recycling to kick in as long-term solution to EU rare-earths challenge

Reuters
LONDON

EU firms are gearing up to take advantage of the huge potential for recycling to supply critical rare earths for the bloc's green transition, but it will take time before there is enough supply of old EVs and wind turbines to process.

The EU will struggle to meet ambitious goals for rare earths in a new legislation designed to boost domestic output of critical minerals and reduce dependence on China.

Under the Critical Raw Materials Act that entered into force last month, the bloc has set a target that recycling should meet 25% of EU demand for critical minerals by 2030, including rare earths. Today, less than 1% of rare earths consumed in EU are recycled.

Boosting supply: A rare earth processing plant owned by Belgian chemicals group Solvay in France. SOLVAY/HANDOUT VIA REUTERS.

The 25% target is not due to be met according to a Reuters analysis, but in the longer term, the outlook is strong for the bloc to furnish a large portion of the rare earths needed for electric vehicles and wind turbines from salvaging and re-processing them.

"Today you have magnets leaving Europe every day because there is no possibility to recycle them here," said Frederic Carencotte, the founder of French start-up Carester.

The firm is collecting old magnets to be ready when its plant is due to go into production in 2026. Initially, it plans to process 2,000 tonne a year of old, permanent magnets and make rare earth oxides. It will also process mine concentrate until enough old EVs and wind turbines are scrapped to boost supply of old magnets.

Another key input will be 'swarfs', leftovers when blocks of new permanent magnets are cut into specific shapes, which can total up to a fifth of magnet production.

EU ON CRITICAL RARE EARTHS

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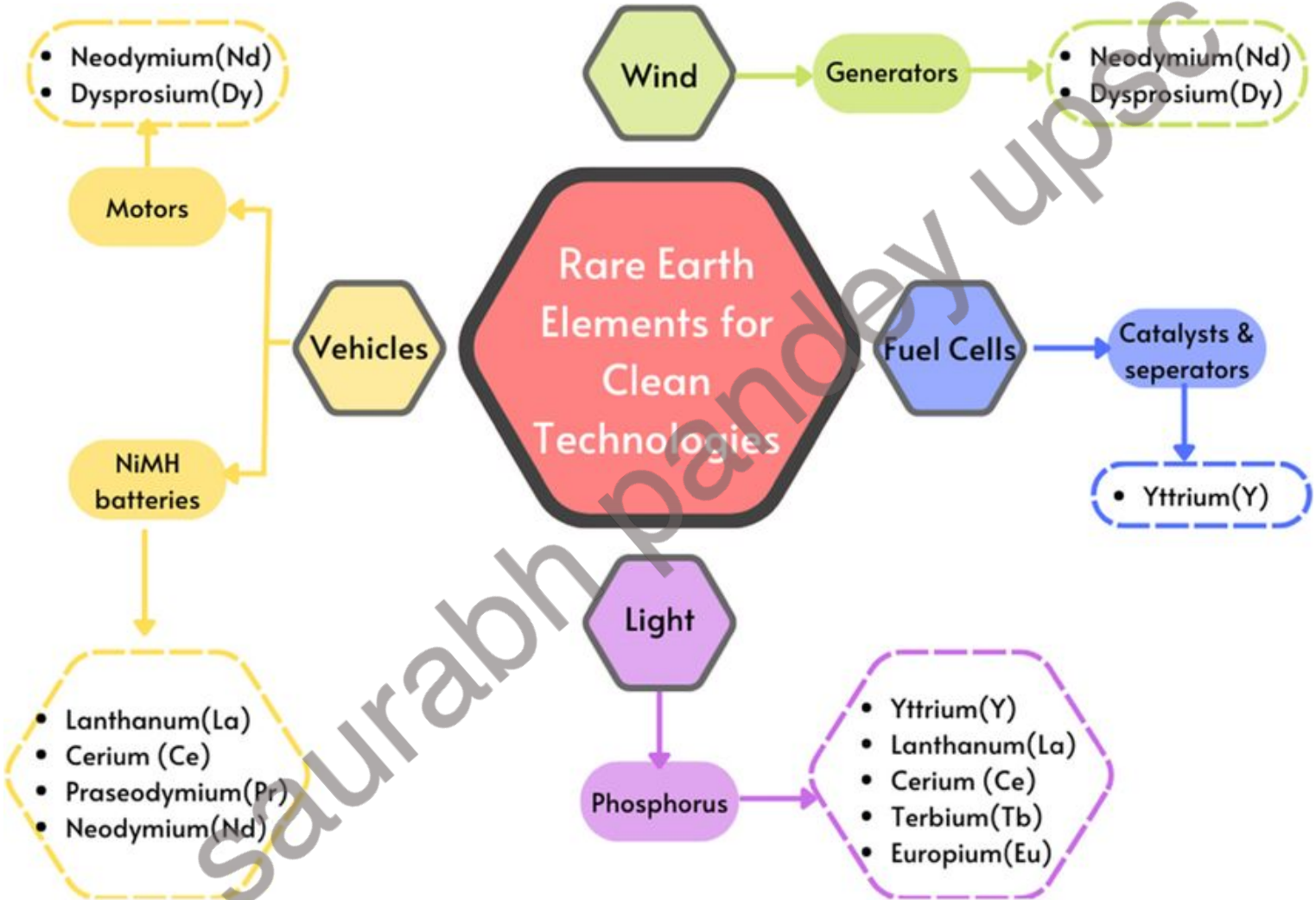
SWARF

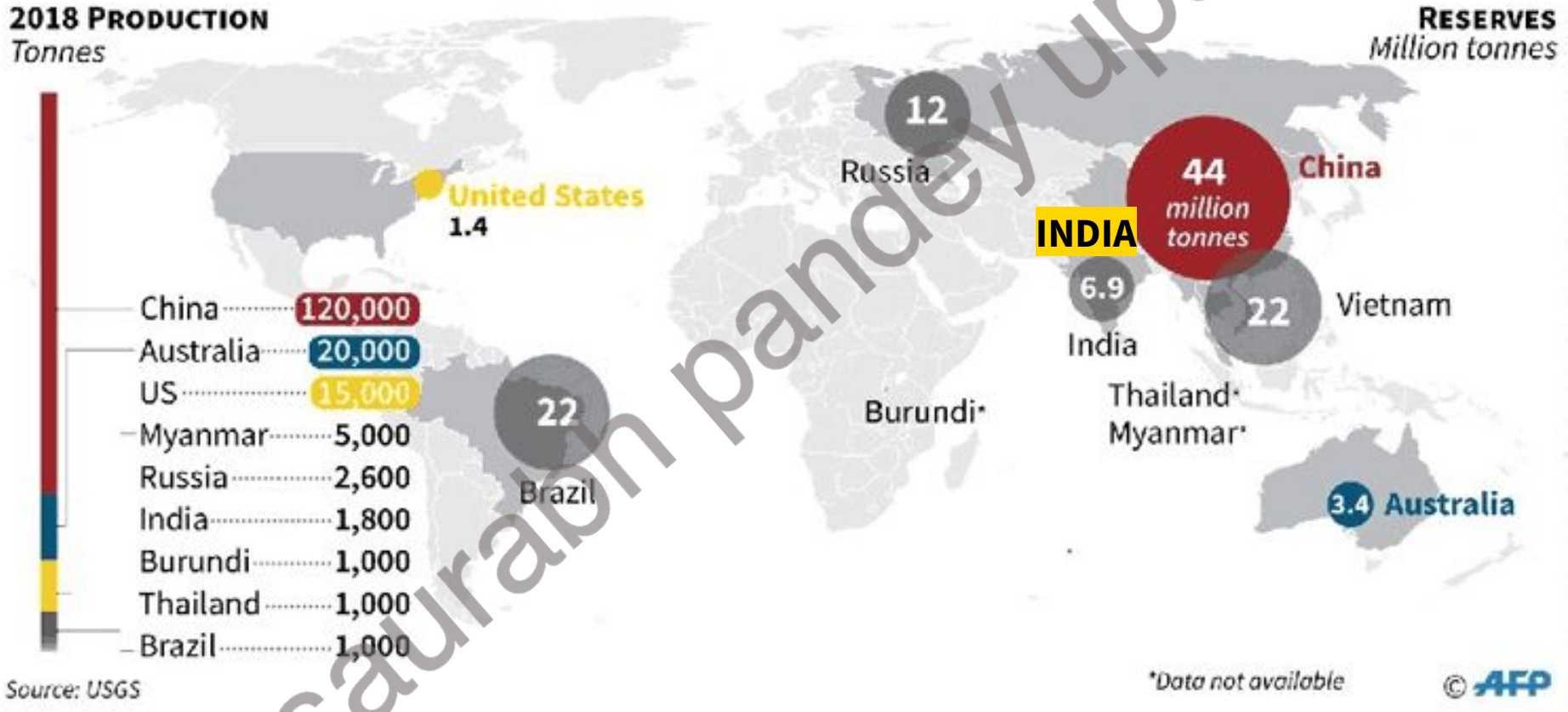
- Swarf, also known as chips or by other process-specific names, are pieces of metal, wood, or plastic that are the debris or waste resulting from machining, woodworking, or similar subtractive manufacturing processes.
- Swarf can be small particles; long, stringy tendrils; slag-like waste; or stone fragments and dust

- **Critical minerals**

- **Critical minerals such as copper, lithium, nickel, cobalt and rare earth elements are essential components in many of today's rapidly growing clean energy technologies – from wind turbines and electricity networks to electric vehicles.**



Rare earth metals production and reserves



Source: USGS

Multiple-warhead missile test success, says N. Korea

Agence France-Presse
SEOUL

North Korea successfully tested its multiple-warhead missile capability, state media said on Thursday, while dozens more trash-laden balloons sent by Pyongyang landed in the South.

Relations between the two Koreas are at one of their lowest points in years, with Pyongyang ramping up weapons testing while bombarding the South with balloons full of trash it says are in retaliation to similar missives sent northwards by activists in the South.

North Korea claimed it had "successfully conducted the separation and guidance control test of individual mobile warheads", the state-run Korean Central News Agency (KCNA) said.

A missile takes off during an individual mobile combat separation and guidance control test in North Korea on Wednesday. REUTERS

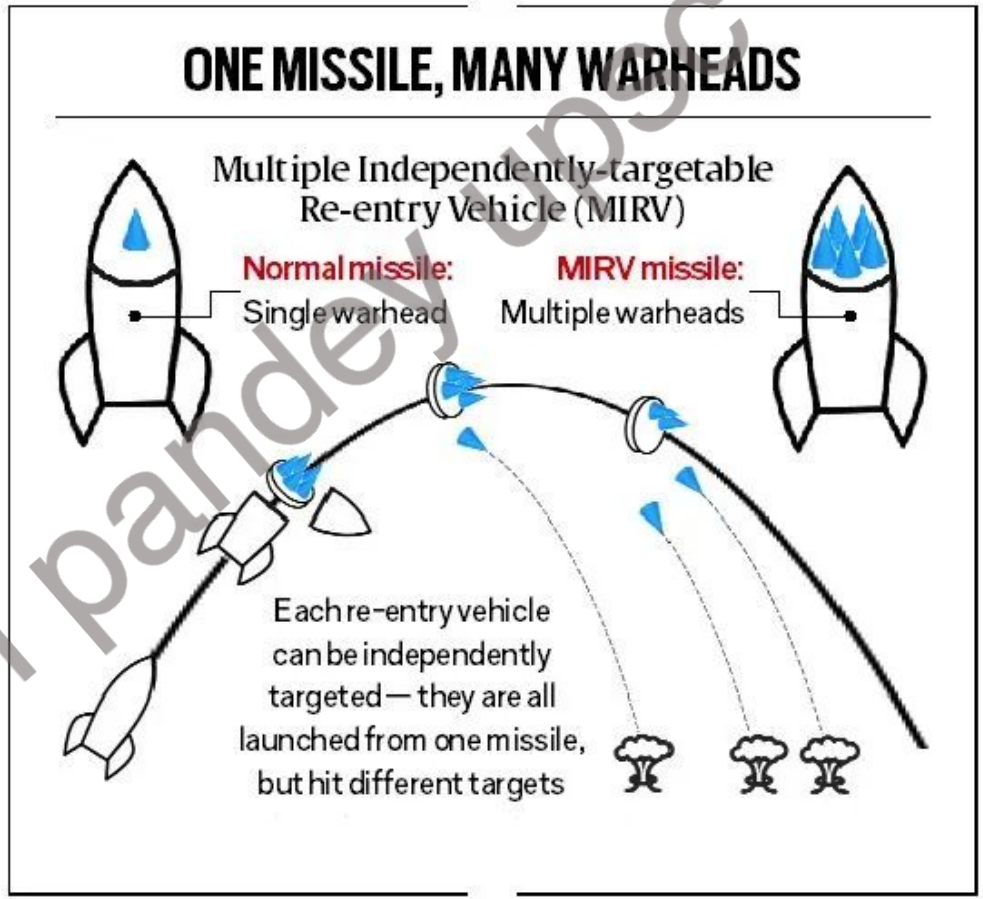
The "separated mobile warheads were guided correctly to the three coordinate targets" during the test carried out on Wednesday, it said.

"The test is aimed at securing the MIRV capability," KCNA added, referring to multiple independently targetable reentry vehicle technology – the ability to fire multiple warheads on a single ballistic missile.

South Korea's military had said the North's test on Wednesday appeared to be of a hypersonic missile, but that the launch ended in a mid-air explosion.

More smoke than usual appeared to emanate from the missile, raising the possibility of combustion issues, a South Korean military official said.

MIRV CAPABILITIES



India's MIRV punch

India has joined select group of nations that have Multiple Independently Targeted Re-entry Vehicle (MIRV) technology

Agni-5 missile uses a three-stage solid fuelled engine

5,000km range

USING MULTIPLE WARHEADS

- MIRVs can cause more destruction than missiles that carry single warhead.
- It will allow Agni-V to deliver multiple nuclear warheads against different targets across hundreds of kilometres

India completed its nuclear trial in 2018 when nuclear-powered ballistic missile submarine, INS Arihant, completed its first deterrence patrol

India's nuclear doctrine, promulgated in 2003, commits to a 'no first use' posture, with weapons to be used only in retaliation against a nuclear attack

Proud of our DRDO scientists for Mission Divyastra, the first flight test of indigenously developed Agni-5 missile with Multiple Independently Targetable Re-entry Vehicle (MIRV) technology."

—NARENDRA MODI, Prime Minister

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Target Mains -2024/25 -

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