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HAL asks civil operators to ground Dhruv helicopters

Jagriti Chandra
NEW DELHI

Hindustan Aeronautics Ltd. has advised civilian operators to ground the indigenous Dhruv advanced light helicopter Mark-III until the cause of a crash in Porbandar last week is identified.

The armed forces have already temporarily grounded all their 330 Dhruvs following the January 5 crash of an Indian Coast Guard helicopter during a training sortie that killed all three crew members onboard.

‘Renaming Kolkata’s Star Theatre is historic, yet futile’



A view of the Binodini Theatre, formerly called Star Theatre.
DEBASHISH BHADURI

Movurie Som KOLKATA

The iconic century-old Star Theatre, at the crossing of Aurobindo Sarani and Bidhan Sarani in North Kolkata, now carries a different name plaque – Binodini Theatre.

A few days after CM Mamata Banerjee’s renaming announcement in December, all banners and plaques at the auditorium were promptly replaced. While this change might seem innocuous to some, it is considered by many as historically significant – a long overdue reparation to the 19th century theatre performer Binodini Dasi.

According to author, theatre researcher and practitioner Suddhasatya Ghosh, the original Star Theatre, established in 1883 at 68, Beadon Street, and demolished and relocated by 1930, was supposed to be named after Binodini.

“Theatre veterans like Girish Ghosh, Amritalal Basu, Ardhendu Shekhar Mustafi approached Binodini to court Punjabi businessman Gurmukh Rai and help fund a commercial theatre space,” he said.

Supported by patrons

He added that female theatre practitioners at the time were primarily sex workers, and would be supported as thespians by their wealthy patrons. Between the 1870s and 1880s, Binodini became a celebrated and widely popular thespian. “Binodini had a paramour she wanted to

marry, but the likes of Girish Ghosh convinced her to court Rai instead, who they believed could help establish an autonomous theatre space,” Mr. Ghosh said. “The promise made to Binodini was that the auditorium would be named after her – B Theatre or Binodini Theatre.”

The same sentiment was echoed by Abanti Chakraborty, who co-wrote and directed the contemporary Bengali play *Binodini Opera*, a tribute and retelling of Binodini’s life story.

‘Felt betrayed’

When the auditorium was finally registered in March 1883, it was named Star Theatre. “She was told that the audience would not want to watch theatre at a space named after a sex worker. Binodini felt betrayed and humiliated,” said Mr. Ghosh.

Star Theatre slowly declined in operations and was eventually sold off before 1888.

After that, Mr. Ghosh said, the auditorium was renamed and restarted multiple times, but was finally razed. Meanwhile, the brand ‘Star Theatre’ started afresh in 1888 as a new auditorium, where it now stands.

However, both agree that renaming the theatre after Binodini accomplishes little in paying tributes to her theatre legacy. “This was not the Star Theatre established by Binodini, and others. That no longer exists. Moreover, it is a movie hall, not a theatre space.”

From Page One

Himachal CM points out troubling trend of synthetic drugs

Sukhu addresses conference on drug trafficking by the NCB; Punjab CM seeks Centre's financial support to set up special court for drug menace

Vikas Vasudeva
CHANDIGARH

Himachal Pradesh Chief Minister Sukhwinder Singh Sukhu on Saturday underscored a troubling trend towards synthetic drugs, even as his Punjab counterpart, Bhagwant Mann, sought the Union government's intervention to provide financial assistance to Punjab for setting up special Narcotic Drugs and Psychotropic Substances (NDPS) courts to check the drug menace, pointing to the problem impacting the socio-economic balance in Punjab.

Both Chief Ministers were virtually addressing the regional conference on "Drug trafficking and national security", organised by the Narcotics Control Bureau (NCB) and chaired by Union Home Minister Amit Shah in New Delhi. The conference focused on addressing the nexus between drug trafficking and national security, with particular attention to eight northern States and Union Territories.

Mr. Sukhu said the NDPS cases had risen by 340% over the past decade, escalating from approximately 500 cases in



Enduring fight: Sukhwinder Singh Sukhu during the virtual meeting on 'Drug trafficking and national security' on Saturday. ANI

2012 to 2,200 in 2023. "Additionally, the percentage of cases involving heroin has doubled, rising from 29% in 2020 to 50% in 2024.

Pointing out a troubling trend towards synthetic drugs, which are not only more potent and addictive but also harder to control owing to their chemical composition, Mr. Sukhu emphasised the necessity of a comprehensive approach to tackle drug trafficking, particularly in inter-State border areas, which have become hotspots for illicit activities.

Mr. Mann urged the Union government to give a one-time financial assistance of ₹600 crore to the State to create special

NDPS courts and recruit public prosecutors and support staff.

He said 35,000 NDPS cases had been pending for sessions trial as on January 1, 2025, adding that at the present rate of disposal, on average a sessions court takes seven years to complete the trial of pending case leaving aside all newly added cases.

Mr. Mann said that the drug problem in Punjab was impacting the socio-economic balance.

He added that the narco-terror drug trade business in Punjab had links with the international cartels that smuggle drugs from Pakistan, Afghanistan and other countries into the State.

Health professionals urged to communicate proactively to allay concerns on HMPV

The Hindu Bureau
CHENNAI

The need for public health professionals to proactively reach out to people with the right information rather than waiting for them to become concerned about information circulating on social media was emphasised during a webinar that sought to put out facts about Human Metapneumovirus (HMPV).

The webinar, "HMPV: differentiating fact from fiction", was organised by *The Hindu* and Naruvi Hospitals, Vellore, as part of their 'Healthy India, Happy India' initiative on Saturday. Soumya Swaminathan, chairperson, M.S. Swaminathan Research Foundation, and former chief scientist at World



Health Organization (WHO), emphasised the need to create more scientific literacy and scientific

awareness to avoid the kind of panic that was seen when news of HMPV came out.

Bernhard Schwartländer, epidemiologist and former WHO official, observed that not much thought has gone into developing new ways of communicating more proactively.

"It is no good to wait for the public to be concerned about information circulating on social media platforms when it is very difficult to then actually overcome it. As public health workers, we have to be much more proactive to reach out to people to explain what is going on. It is not good enough to have scientific statements hidden on websites of the national centre for disease

control because that is not where people will look every day. We have to learn to do better to avoid such concerns," he said.

On the HMPV situation in China, he said that the country has a strong surveillance system and what they have seen so far is an expected increase in respiratory infections, which until now is somewhat lower when compared to the same time in the previous years. The distribution of the viruses was also not dissimilar to previous outbreaks with the influenza virus being clearly in the lead, and a whole range of other viruses coming behind.

'Not a new virus'

"We have been exposed to HMPV for a long time. It is

not a new virus, and so, we have immunity, and most children are exposed to it. It is a part of the common respiratory infections that children get," Dr. Soumya Swaminathan said. She added that HMPV is considered a mild infection causing upper respiratory illnesses.

She stressed the need to take the 'One Health' approach considering the increasing risk of viruses and pathogens jumping from one species to another. It is important to understand the interconnections between various species and human beings, she added.

The webinar, moderated by Ramya Kannan, Health Editor, *The Hindu*, featured an exclusive question and answer session for subscribers.

'West Bank a cauldron that can explode any moment'

The Israeli Indologist says a third Palestinian *intifada* is likely at any moment, adding that Israel has a dysfunctional political system; he emphasises the worsening settler violence in the West Bank and suggests a confederation as a potential path to peace between Israelis and Palestinians; the conversation also goes into the systemic changes in 16th century southern India in major arenas

INTERVIEW

David Shulman

Stanly Johny

David Shulman, Israeli Indologist, poet and peace activist, says the West Bank has witnessed enhanced settler violence ever since the latest war between Israel and Hamas broke out. Today's Israel looks like the South Africa at the height of Apartheid, "just a few years before the system collapsed", he says. Mr. Shulman speaks about his works on southern India, the crisis in West Asia and the prospects for peace. Edited excerpts:

You have written about 'systemic change' in 16th century South India. The 16th century was also a period where you saw, in Europe, the Reformation, the Thirty Years' War, and the rise of the Westphalian system. Do you see any parallels between the southern India of the 16th century and Europe?

I think in both cases, there was a systemic change, a civilisational change, you

could say. In Europe, that was the great watershed when the Catholic Church split into Protestants and Catholics and they went to war with one another, and that was also the time of the emerging imperial autocracies like the Habsburgs in Vienna and Spain, and also the French. That eventually produced the modern revolutions in France and in America, and later in Russia. It happened here, in India, in a very different way, in an indigenous way that had nothing to do with the influence of what was happening in Europe.

Systemic change means that in all of the major arenas, there are substantial structural changes – in the social realm, in the economic sphere, in the political domain, for example. We had a new kind of South Indian States, with a new mode of political thinking, and new kinds of political legitimisation. And in the expressive domains, that is, literature, music, graphic arts, sculpture, architecture, theatre, you can see that there is a whole new world.

A new conceptual world, a new understanding of how the mind works, a new understanding of what it means to be a human being. You begin to see these

new themes emerging and crystallising.

You have also written about 'newness'. Can you explain that?

Many people, for example Sheldon Pollock, actually have written about *navata* or newness. In early modern times, before the massive intrusion of the European powers, there was a palpable sense of novelty. Suddenly, people are talking about something being and feeling really new. This is also true of music, literature, and painting. There is an amazing sense of new discoveries. So, in music for example, in Carnatic music, which was formalised – you could say 'grammaticalised' – in 16th century Thanjavur, we begin to see an emerging corpus of Carnatic compositions, with strong introspective elements. In literature, we have what we call *prabandha* texts. This is something quite new. A *prabandha* text is a self-contained book, usually not too long, that can be recited over a period of maybe a week or two. It's meant to be read from the beginning via the middle to the end. That's a rather new thing in South India. The new *prabandha* forms demand sequential reading, that comes with



an acquired newness of taste and themes.

How do you look at the developments in West Asia in light of Hamas's October 7, 2023 attack and Israel's subsequent war on Gaza?

Well, we are in a very deep crisis. And that includes the humanitarian catastrophe in Gaza. The Hamas atrocities of October 7 were unparalleled in Israel's history. Now the war has gone on for some 15 months and shows no sign of stopping.

On the West Bank, we have Israeli colonisation that has been going on for several decades. All of the Israeli settlements, without exception, sit upon stolen Palestinian land, and the

settler population has grown to several lakhs planted in the midst of a Palestinian population on the West Bank of some two-and-a-half million. The extremist settlers... are driving the Palestinians on the West Bank into a situation of horrible precariousness.

There is a system in place that supports this. That means the Army, the police, the military courts, the Israeli media, public and social media, and the government, which funds and supports the settlements.

The goal is to take as much Palestinian land as they possibly can with as few Palestinian people living on it as possible. That is been true for a long time. But since October 7, this sit-

uation has exacerbated enormously.

In addition to settler violence, there are military operations in Jenin and Nablus. The West Bank has become a cauldron that could explode at any moment. I think it is extremely likely that there will be a third *intifada* [uprising], worse than the first two. And it could happen at any time, because the Palestinian people are not going anywhere, and their life is no longer bearable.

States generally are violent. Still, you might see internal and external constraints on states. Do you think it doesn't work in the case of Israel?

I think it works to some extent. There are still some constraints, including on the Army operations in Gaza. But the figures of killed and wounded are shocking. In the northern part of Gaza, there are no buildings left standing, and the population has been displaced into tent cities farther south.

We have some two million people living in tents. There is not enough food, although there are attempts to bring in food. There is no clean water to drink. Obviously, no elec-

tricity. It's cold. And the shooting and the bombing continue. In the north, to make it even worse, now that they have cleared out most of the population, the Army is paving roads and putting up military camps. It looks like the government wants to stay there permanently, to annex it, either by some act of the Knesset or just de facto.

What is the way out, for Israel and Palestine?

I can tell you the way-out – that is constant, eternal war. The only real way out is some kind of settlement with the Palestinians who are our neighbours. The only way to make life viable for everybody, Israelis as well as Palestinians, is to reach an agreement in which the Palestinians have some form of political framework which will allow them to realise their own cultural and civilisational ambitions. For the Israelis, for the Jews, we've got that, we have a State that embodies some form of collective identities. It's not a very effective State, in many ways, but it's there. But Palestinians don't have any such framework.

We have a dysfunctional political system, which is like a crazy jigsaw puzzle. This structural situation

perpetuates the logic where the extreme right has complete control over what is happening. It's an absurd situation. [Israeli Prime Minister Benjamin] Netanyahu has devoted his life to preventing the emergence of a Palestinian State. There are two things that he really cares about. That is one, and the second is the perpetuation of his own government. And they are linked.

I think what should emerge someday, somehow, is some system that could be like a confederation, in which the Palestinians would have control over their own lives and their own security. It would have to be a demilitarised state. Israelis would have control over their lives, and there would be some overarching framework addressing security, policies, social services and everyday needs. I'm not saying it would be easy to achieve it. But people said that about Ireland. South Africa is another example. It is not a happy place, but nonetheless, the Apartheid was overturned. I think sometimes that today, we in Israel may be experiencing something like South Africa at the height of the Apartheid system. Just a few years before the system collapsed.

Civil operators told to ground Dhruv copters after January 5 crash

Armed forces have already grounded all 330 choppers in their fleet; HAL has issued the advisory to BSF, Jharkhand govt., Mauritian Police Force

Jagriti Chandra
NEW DELHI

Hindustan Aeronautics Ltd. has advised civilian operators to ground the indigenous Dhruv advanced light helicopter Mark-III until the cause of the crash in Porbandar last week is identified.

The armed forces have already temporarily grounded all their 330 Dhruvs following the January 5 crash of the Indian Coast Guard helicopter during a training sortie that killed all three crew members, Commandant Saurabh, Deputy Commandant S.K. Yadav and Pradhan Navik Manoj.

The HAL has informed its operators that the helicopter involved in the accident did not respond to pilot control inputs in the final three or four seconds, according to a helicopter industry source.

An HAL spokesperson neither confirmed nor declined the advisory. The Border Security Force has six of these choppers on its fleet, and the Jharkhand government has at least one Dhruv helicopter. The HAL also handed one Dhruv to the Government of Mauritius in February



Precarious ride: There have been nearly 20 crashes involving the ALH over the past two decades. FILE PHOTO

2023 to be used by the Mauritian Police Force.

The Coast Guard has constituted a Board of Inquiry into the accident, which is the third crash of a Dhruv in the past two years.

In September, one crashed during a medical evacuation off the Porbandar coast, killing all three aboard. In March 2023, a Dhruv of the Coast Guard crashed shortly after take-off in Kochi. There were no fatalities.

"There have been nearly 20 crashes involving the ALH over the past 24 years. While some of these have

been due to operational reasons because of the extreme conditions the chopper flies in such high altitudes and low visibility conditions at night, there have also been concerns over control rods, which were found to be broken. Subsequently, the rods were changed with an up-graded material.

The inquiry spearheaded by the ICG will reveal whether the cause of the crash was due to operational circumstances or a manufacturing flaw," Wing Commander Unni Pillai (Retd), former chief test pilot at HAL, told *The Hindu*.

Denotified tribes' anger growing amid a stagnating scheme, classification issues

Abhinav Lakshman
NEW DELHI

With the Centre's SEED scheme for denotified tribes only now taking off, caste certificates being denied to them in 29 States, and the Idate Commission's 2017 report in cold storage, anger among the denotified tribes (DNT), semi-nomadic tribes (SNT), and nomadic tribes (NT) is growing across States such as Uttar Pradesh, Haryana, and Gujarat. This anger is now also frustrating members of the Union government's Development and Welfare Board for DNTs, SNTs, and NTs (DWBDNC), who are making fresh attempts to push for the implementation of the Idate panel recommendations, which include a permanent commission, proper classification, and a detailed caste census.

Bharatbhai Babubhai Patni, DWBDNC member, said that the government can no longer shut out voices calling for the Idate Commission's recommendations to be implemented. "A Schedule must be put out listing out all the DNTs. Alongside the issuing of SC/ST/OBC certificates, there must be directions to issue joint certificates like SC-DNT, ST-DNT, OBC-DNT."

The government had constituted the National Commission for DNTs/NTs/SNTs in 2015 under the chairmanship of Bhiku

Fresh attempts made to push for the implementation of the Idate Commission recommendations

Ramji Idate, which had put out its final report in 2017, calling for the government to expedite the final classification of these communities, count their population by including a caste census column in the 2021 census, and provide a sub-quota for them under SC/ST/OBC quotas in public education and employment. The Idate commission had concluded there were a total of 1,526 DNT, NT, and SNT communities across the country, of which 269 were not yet categorised as SC, ST, or OBC.

Certificates sought

B.K. Lodhi, who was Member Secretary in the Idate Commission and is now part of the Vimukt, Ghumanu, and Ardh-Ghumanu Janjatiya Vikas Parishad (Akhil Bharatiya) in Uttar Pradesh, said, "We were the first to resist British rulers and branded criminal for it. How can this government not sort out these basic issues like DNT certificates across States?"

Uttar Pradesh is among the seven States that technically have begun issuing DNT community certificates. But Dr. Lodhi, who attended the national

workshop in New Delhi last week, said, "They are saying they have issued some 200-300 certificates and painting it as some huge achievement. It strikes at a core area, denying our identity. If the government cannot get States to issue DNT certificates, they might as well brand us criminal again, at least we will get our identity."

Welfare measures

The SEED scheme (Scheme for the Economic Empowerment of DNT/NT/SNT communities) was meant to be the Centre's flagship scheme for these communities. Launched in February 2022, the scheme offered assistance for livelihood, education, healthcare, and housing. But it took over two years for the scheme to take off.

In a meeting of top officials, chaired by Social Justice Minister Virendra Kumar last month, the government had resolved to urge States and UTs to start issuing DNT certification along with regular caste certificates.

"The Minister has assured us of action but there are real concerns about the lack of implementation of the Idate Commission's recommendations. So many people are not getting community certificates because of belonging to sub-castes, or spelling it differently, or having a hyphenated caste name," Mr. Patni said.

New National Museum in Delhi to display artefacts in chronological and thematic order

Sreeparna Chakrabarty
NEW DELHI

North Block and South Block in the national capital, which are set to house the new National Museum, will have artefacts arranged chronologically and thematically, according to a draft proposal under consideration of the Union Culture Ministry.

North Block, which is likely to be the first one of the buildings where retrofitting will be completed, is expected to house the artefacts in a chronological order, while South Block is likely to have theme-based sections, sources told *The Hindu*.

India signed a memorandum of understanding with France on December



Plans made: India signed an agreement with France on December 19 last year for the development of the new museum. PTI

19 last year for the development of the new museum, along the lines of the Louvre in Paris. The museum will be developed through adaptive reuse in collaboration with France, which is renowned for its expertise in such projects — exemplified by the

Louvre, the Grand Palais, and the Hotel de la Marine. This approach mirrors France's 'Grand Projects' initiative that transformed government buildings into iconic cultural spaces.

The chronological arrangement will have about 50 sections each with 5-6

rooms and thus around 250 galleries in total. The thematic section would have displays based on different subjects such as literature, architecture, and art. There would also be galleries with augmented reality, educational centres and children's corners.

2,06,000 artefacts

North Block houses the Ministries of Finance and Home Affairs, while South Block houses the Prime Minister's Office, and the Ministries of Defence and External Affairs.

Offices in both the buildings are being moved to the Common Central Secretariat (CCS) building on Janpath as part of the Central Vista plan.

The new museum,

which has been named 'Yug Yugeen Bharat' museum, will be able to house an estimated 25,000-30,000 artefacts and is expected to be the largest such museum in the world when completed.

As of now, the National Museum has 2,06,000 artefacts in total, out of which, 7,000-8,000 are on display.

"We have sought artefacts from all museums across the country for display in the upcoming new museum. While they are most welcome to send things on a permanent basis, we can also display them on a temporary basis and keep rotating them," B.R. Mani, Director General of the National Museum, told *The Hindu*.

India joins UN panel on data for official statistics

Press Trust of India
NEW DELHI

India has joined the UN Committee of Experts on Big Data and Data Science for Official Statistics, a statement by Ministry of Statistics and Programme Implementation said.

The panel was created to further investigate the challenges of Big Data, including the potential for monitoring and reporting on Sustainable Development Goals. India will contribute to shaping global standards and practices in harnessing Big Data and data science for official statistical purposes.

This membership is a strategic opportunity for India to align its domestic advancements in Big Data and data science.

INBRIEF



BHEL, ONGC to collaborate for new, renewable energy

Bharat Heavy Electricals (BHEL) and ONGC will explore collaboration in the area of new and renewable energy, including fuel cell, electrolyser and battery energy storage system projects. The State-owned entities will leverage the combined strengths for collaborating in emerging areas within the clean energy ecosystem and contribute to the country's National Green Hydrogen Mission, BHEL said in a release on signing of an MoU with ONGC.

India's economy likely to be a tad weaker in 2025: IMF MD Georgieva

Press Trust of India
WASHINGTON

The Indian economy is expected to be "a little weaker" in 2025 despite steady global growth, IMF Managing Director Kristalina Georgieva has said.

Ms. Georgieva also said she expected quite a lot of uncertainty in the world this year mainly around the trade policy of the U.S.

In her annual media roundtable with a group of reporters on Friday, she said global growth was expected to be steady in 2025, but with regional divergence.

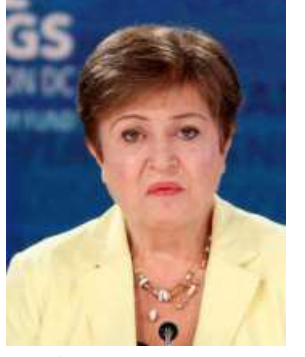
Ms. Georgieva said she expects the Indian economy to be a little weaker in 2025. However, she did not explain it any further. The World Economy Outlook update week will have more details about it.

"The U.S. is doing quite a bit better than we expected before, the EU is somewhat stalling, (and) India a little weaker," she said.

Brazil was facing somewhat higher inflation, she said. In China, the world's second-largest economy, the International Monetary Fund (IMF) was seeing deflationary pressure and ongoing challenges with domestic demand, she said.

"Low-income countries, despite all the efforts they are making, are in a position when any new shock can affect them quite negatively," Ms. Georgieva said.

"What we expect in



Kristalina Georgieva

2025 is to have quite a lot of uncertainty, especially in terms of economic policies. Not surprisingly, given the size and role of the US economy, there is keen interest globally in the policy directions of the incoming administration, in particular on tariffs, taxes, deregulation and government efficiency," Ms. Georgieva said.

"This uncertainty is particularly high around the path for trade policy going forward, adding to the headwinds facing the global economy, especially for countries and regions that are more integrated in global supply chains, medium-sized economies, (and) Asia as a region," she said.

That uncertainty is actually expressed globally through higher long-term interest rates, even though short-term interest rates have gone down, the IMF Managing Director said.

On inflation, the IMF expects global disinflation to continue, Ms. Georgieva remarked.

SCIENCE

Millions of diabetes, heart disease cases linked to sugary drinks

The Hindu Bureau

A new study estimates that in 2020, 2.2 million new cases of type 2 diabetes and 1.2 million new cases of cardiovascular disease occur each year globally due to consumption of sugar-sweetened beverages, representing 9.8% and 3.1%, respectively, of all incident cases. The study estimated sugar-sweetened beverage-attributable type 2 diabetes and cardiovascular disease burdens

across 184 countries in 1990 and 2020.

As per the study, in developing countries, the case count is particularly sobering. The highest sugar-sweetened beverage-attributable percentage burdens were in Latin America, the Caribbean and sub-Saharan Africa. In Latin America and the Caribbean, they contributed to nearly 24% of new diabetes cases and more than 11% of new cases of cardiovascular disease. In Sub-

Saharan Africa, it found that sugar-sweetened beverages contributed to more than 21% of all new diabetes cases. "From 1990 to 2020, the largest proportional increases in sugar-sweetened beverage-attributable incident type 2 diabetes and cardiovascular disease cases were in sub-Saharan Africa, 8.8% and 4.4%, respectively," the study found.

Colombia, Mexico, and South Africa are countries that have been hard

hit. While more than 48% of all new diabetes cases in Colombia were attributable to consumption of sugary drinks, nearly one-third of all new diabetes cases in Mexico were linked to sugary drink consumption. In South Africa, 27.6% of new diabetes cases and 14.6% of cardiovascular disease cases were attributable to sugary drink consumption.

Sugary beverages are rapidly digested, causing a spike in blood sugar levels

with little nutritional value. Regular consumption over time leads to weight gain, insulin resistance, and a host of metabolic issues tied to type 2 diabetes and heart disease, two of the world's leading causes of death. Men are more likely than women to suffer the consequences of sugary drink consumption, as are younger adults compared to their older counterparts, the researchers say.

They call for a multi-

pronged approach, including public health campaigns, regulation of sugary drink advertising, and taxes on sugar-sweetened beverages. Some countries have taken steps in this direction. Mexico, which has one of the highest per capita rates of sugary drink consumption in the world, introduced a tax on the beverages in 2014. Early evidence suggests that the tax has been effective, particularly among lower-income individuals.

SNAPSHOTS



Insights into coevolution of lice eggs with early bird hosts

Fossilised chewing lice eggs preserved in mid-Cretaceous Burmese amber have been discovered, marking the first direct evidence of ectoparasitic lice feeding on feathers of stem-group birds during the Mesozoic. This offers insights into the origins of lice and their early coevolution with vertebrate hosts. The discovery of the lice eggs in association with feather of enantiornithine, an extinct group, supports the hypothesis that Mesozoic bird lice were parasitic on early feathered vertebrates.

IIT Roorkee uses bacterial enzymes to degrade plasticizers

Once integrated into bacteria, the enzymes remain active for a longer time and the bacteria can be used continuously for degrading the plasticizers

R. Prasad

Besides plastics, the amount of carcinogenic plasticizers in the environment is increasing at an alarming rate. Plasticizers are chemicals added to plastics and personal care products to enhance flexibility and shine and are commonly found in items such as baby toys, shampoos, soaps, and food containers. Plasticizers can be absorbed through the skin, making them a direct threat to human health.

A team of researchers headed by Dr. Pravindra Kumar, Professor at the Department of Biosciences and Bioengineering, IIT Roorkee has successfully used an enzyme – esterase – produced by soil bacteria *Sulfobacillus acidophilus* to break down diethyl hexyl phthalate (DEHP) plasticizer. While a Chinese team had characterised this enzyme to degrade low molecular weight phthalate diester plasticizers, which can be degraded by several reported esterase enzymes, the IIT Roorkee team has identified its actual potential and used it for degrading difficult to degrade high molecular weight phthalate plasticizers. The research was funded by THDC India Limited, Rishikesh, and the results were published recently in the journal *Structure*. The group has also discovered that the esterase enzyme can bind to molecules similar to polypropylene used in plastics, making it a potential tool for extracting polypropylene from contaminated water sources.

Cleaning up using soil bacteria enzymes

Plasticizers, which are added to plastics and personal care products, can be absorbed through the skin

- The researchers have used esterase enzyme produced by soil bacteria *Sulfobacillus acidophilus* to break down diethyl hexyl phthalate (DEHP) plasticizer

- A Chinese team characterised the esterase enzyme to degrade low molecular weight phthalate diester plasticizers, while the IIT Roorkee team uses it to degrade high molecular weight phthalate plasticizers

- The esterase enzyme was structurally characterised using X-ray crystallography

- In 2017, the team isolated another soil bacteria which use three enzymes in sequence to break down phthalates into carbon-dioxide and water



Enzyme production: The esterase enzyme is produced in large-scale by cloning the enzyme genes into *E. coli* bacteria. REUTERS

- The researchers have used all five enzymes in sequence to break down DHEP plasticizer into water and carbon-dioxide

- The team is trying to insert the genes of all five enzymes into bacteria to directly convert DEHP plasticizer into water and carbon-dioxide

- Once integrated into bacteria, the enzymes remain active for a long time and the bacteria can be used continuously to degrade the plasticizer

The esterase enzyme was structurally characterised using X-ray crystallography. "This helped in identifying the active sites of the enzymes and in understanding the detailed mechanism by which this enzyme degrades the DEHP plasticizer," says Shalja Verma from IIT Roorkee and the first author of the paper. Other sophisticated biochemical and biophysical approaches were also used to understand the efficiency of the enzyme to degrade the plasticizer.

The esterase enzyme remains active for about a month and catalyzes the degradation of DEHP plasticizer with significant efficiency. For large-scale production of this enzyme, the researchers cloned the genes of the EstS1 esterase

enzyme into *E. coli* bacteria and the enzyme was produced on a large-scale through aerobic culture.

The enzyme breaks down the DEHP plasticizer into two products – mono-(2-ethylhexyl) phthalate (MEHP) and 2-ethyl hexanol. According to Prof. Kumar, this esterase enzyme, along with other enzymes identified by their group previously can convert high molecular weight phthalate plasticizers into water and carbon-dioxide. And this is where the IIT Roorkee team appears to have an edge. "The results of our research mark a significant advancement in addressing one of the most pressing environmental challenges – providing a promising path toward a plastic and plasticizer-free future," says Dr. Kumar.

Other researchers involved in the work include Shweta Choudhary, Kamble Amith Kumar, Jai Krishna Mahto, Ishani Mishra, Dr. Ashwani Kumar Sharma, Dr. Shailly Tomar, Dr. Debabrata Sircar and Dr. Jitin Singla.

In 2017, the team isolated another soil bacteria *Comamonas testosteroni* that breaks down the phthalates produced by DEHP degradation into carbon-dioxide and water. In the lab, the researchers used the enzymes in sequence to first break down DEHP to MEHP and 2-ethyl hexanol using esterase enzyme, which then was degraded to phthalate using another enzyme. The phthalate is then converted to intermediate compounds using a third enzyme (phthalate dioxygenase). The inter-

mediate compound produced after this step is converted into protocatechuate by the enzyme phthalate decarboxylase. Once protocatechuate is produced, the tricarboxylic acid cycle of the bacteria converts it to carbon-dioxide and water.

While the esterase enzyme used for breaking down DEHP into MEHP and 2-ethyl hexanol is from *Sulfobacillus acidophilus* bacteria, the three other enzymes used in sequence are from *Comamonas testosteroni* bacteria. "In the lab, we have tried using the enzymes in sequence to break down DEHP into water and carbon-dioxide," says Ms. Verma. "We are now trying to insert the genes of all the five enzymes into bacteria to directly convert the DEHP plasticizer into water and carbon-dioxide."

Putting all five enzymes into bacteria will speed up the degradation process not only because the enzymes will act sequentially but also because degradation of the enzymes becomes a non-issue once they are integrated into bacteria. Once integrated into bacteria, the enzymes remain active for a longer time and the bacteria can be used continuously for degrading the plasticizers. But when the enzymes are used without integrating into bacteria, a fresh batch of enzymes needs to be produced to continue the degradation process. "We are also undertaking enzyme engineering to speed up the degradation process inside the bacteria," says Ms. Verma.



Tumor-secreted protein may be a key to treat brain tumor

Targeting a protein called endocan and its related signaling pathway could be a new approach for treating glioblastoma, an aggressive and lethal type of brain cancer. The researchers discovered that endocan, which is produced by endothelial cells lining blood vessels in the tumour, activates PDGFRA, a receptor on glioblastoma cells that drives tumour growth and makes the cancer resistant to standard therapies such as radiation. They suggest a path toward the development of therapies that specifically inhibit this interaction.



Oldest known dinosaur in northern hemisphere

It is generally thought that dinosaurs emerged on the southern portion of Pangea called Gondwana millions of years before spreading to the northern half named Laurasia. A newly described dinosaur whose fossils were uncovered in present-day Wyoming is challenging that narrative. The creature, named *Alvayatum bahndooiveche*, is now the oldest known Laurasian dinosaur, and with fossils estimated to be around 230 million years old.

Putting the gene editing tool to use



SPEAKING OF SCIENCE

D. Balasubramanian

When you edit a letter or a document, you make specific changes in the words and phrases to make the meaning clearer. Gene editing involves changing the sequence of DNA using specific enzymes which can cut DNA at a precise location, thus permitting the removal, addition, or replacement of genetic information within a gene. The process is akin to correcting a misspelled word in a sentence or replacing it with a more appropriate word. In organisms, this modification directly alters the genetic instructions encoded in the DNA.

In earlier days, if we wanted to modify the mes-

sage in the DNA to a desired function, it involved two enzymes – one to cut the DNA at a specific site, and another to help insert the desired genetic change. While such twin-enzyme methods worked, they were laborious.

This was when Drs Jennifer Doudna of University of California, Berkeley, U.S., and Emmanuelle Charpentier of Humboldt University, Germany came out with a double action gene modification method, called CRISPR-Cas9. This is a mechanism that can edit the genomes of humans, pathogens, and plants. CRISPR stands for Clustered Regularly Interspaced Short Palindromic Repeats, and Cas9 (which stands for CRISPR-Associated Protein 9) cuts DNA strands at a specific location, creating a gap that can be filled with new DNA. Doudna and Char-



Restrictive: Researchers in India can use CRISPR-Cas9 only for academic purposes. GETTY IMAGES

pentier shared the Nobel Prize in 2012.

However, Prof. Feng Zang who was then at a Southern California University, published a paper wherein he showed genome engineering using the CRISPR-Cas9 system. But he was not included as the third scientist by the Nobel Committee. He then went ahead, obtained a patent, and moved to Boston, where he works and this patent is owned today by

the MIT-Harvard University combine, called Broad Institute, which uses the CRISPR-Cas9 system for a variety of applications such as the mouse model for cancer, identifying genes that make cancer drugs ineffective, and modification of immune cells, plus training people in the technology.

While CRISPR-Cas9 patented technology has been used for the above-mentioned diagnostic and

genetic uses, agricultural scientists and botanical researchers have been using this method to genome engineer plants. The group of Dr. Holger Puchta of the Karlsruhe Botanical Institute, Germany has published several papers, notably on how to use Cas9, Cas 12, and Cas13, for targeting plant genomes. Most recently, CRISPR-Cas9 based 'knock-out' of two genes in tomato plants increased their sweetness with no loss in weight. Similar studies on other plants and fruits will surely follow.

However, a recent report by Dr. Anurag Chaurasia, titled "How CRISPR patent issues block Indian farmers from accessing biotech benefits", points out that the IPO has granted a local patent to ERS Genomics of Dublin, which allows Indian researchers to use CRISPR-Cas9 only for

academic purposes. Our rural farmers are thus still left 'classical'.

Visually handicapped

For people afflicted with eye disorders, scientists and clinicians at LV Prasad Eye Institute, Hyderabad, in collaboration with a group in IGIB, have used one of these high precision methods to correct inherited mutations in patient-specific stem cells (*Nature Communications*, June 2024). These mutation-corrected stem cells could then make retinal cells, which showed restored expression of the missing protein.

This has opened the possibility of developing autologous cell therapies for certain inherited eye disorders. A similar approach can be adapted for other diseases affecting other tissues and cell types of the body.

Is groundwater contamination high in India?

What are the contaminants? What happens if nitrate presence is high in groundwater?

Jacob Koshy

The story so far:

An assessment of India's groundwater by the Central Ground Water Board (CGWB) found that several States are grappling with a serious problem of nitrate contamination.

Which are the sources of contamination?

The most concerning finding was that the number of districts with excessive nitrate in their groundwater rose from 359 in 2017 to 440 in 2023. This works out to nearly 56% of India's districts having excessive nitrate in ground water, defined as having more than 45 mg/l (milligram per litre). Of the 15,239 groundwater samples collected from across the country for testing, 19.8% samples had nitrates – nitrogenous compounds – above safe limits though it must be said that this proportion has not substantially changed since 2017. In the 13,028 samples analysed in 2017 for instance, 21.6% had excessive nitrate. There are two major concerns with excess nitrate content: one is methemoglobinemia, or a reduced ability of red blood cells to carry oxygen.

A bigger problem with excessive nitrates are environmental: once the nitrates in the groundwater rise to the surface and become part of lakes and ponds, algal blooms threaten the health of aquatic ecosystems.

The most common contaminant identified in groundwater is dissolved nitrogen in the form of nitrate in sub-surface waters. Since, the nitrogen content of soil is generally quite low, farmers have to look for external sources of nitrogen

The Central Ground Water Board estimates that the country's degree of groundwater extraction is 60.4%, or roughly the same as it has been through the years since 2009

by using ammonium nitrate, calcium nitrate, urea, diammonium hydrogen phosphate etc. Although nitrate is the main form in which nitrogen occurs in groundwater, dissolved nitrogen also occurs in the form of ammonium (NH₄⁺), ammonia (NH₃), nitrite (NO₂⁻), nitrogen (N₂), nitrous oxide (N₂O) and organic nitrogen.

Which places had serious contamination?

Rajasthan, Karnataka and Tamil Nadu reported the highest proportion of tested groundwater blocks with nitrate exceeding permissible levels – 49%, 48% and 37% of the tested samples respectively reported numbers beyond the limit.

Rajasthan, Madhya Pradesh and Gujarat have a long-standing nitrate problem with relative levels fairly constant since 2017, the report says. However a growing concern are blocks in central and southern India, which are reporting an increasing trend, and therefore is a reason for worry. "Maharashtra (35.74%), Telangana (27.48%), Andhra Pradesh (23.5%) and Madhya Pradesh (22.58%) also show notable levels of nitrate contamination," the report notes.

Is nitrate the only chemical contaminant?

Other major chemical contaminants affecting groundwater quality are arsenic, iron, fluoride and uranium. Just as 19.8% samples of tested groundwater had excess nitrate, 9.04% of samples had fluoride levels above the limit.

Fluoride concentrations exceeding the permissible limit were "a major concern" in Rajasthan, Haryana, Karnataka, Andhra Pradesh and Telangana. Rajasthan and Punjab reported the maximum number of samples with uranium concentration exceeding 100 ppb (parts per billion). Anything over 30 ppb is considered unsafe and several of these samples were predominant in regions of Rajasthan, Gujarat, Haryana, Punjab, Tamil Nadu, Andhra Pradesh, and Karnataka, where groundwater was over-exploited: more water was being drawn out than replenished by rains or other means.

What was the state of groundwater in 2024?

Along with its report on groundwater quality, the organisation also produced a report on the quantity of groundwater in various blocks, enumerating the availability of groundwater across India. The CGWB estimates that on the whole, the country's degree of groundwater extraction is 60.4%, or roughly the same as it has been through the years since 2009. About 73% of the blocks are in the 'safe' zone, meaning that they are replenished enough to compensate for water drawn out.

How are groundwater levels measured?

The CGWB relies on a network of about 26,000 groundwater observation wells that require technicians to manually measure the state of groundwater in a region. Since 2023, however, around 16,000-17,000 digital water level recorders were connected to piezometers in the wells. Piezometers measure groundwater levels and transmit the information digitally to a centralised location. In the next three years, the CGWB aims to increase its network from the existing 26,000 to about 40,000. When combined with similar networks possessed by other institutions, India will have about 67,000 digitally recordable units to monitor ground water dynamics.

Why is Meta shutting down fact-checkers?

Is crowd-sourced fact-checking a better way of implementing content moderation? What role did fact-checkers play during the COVID-19 pandemic? How have fact-checking communities responded to Zuckerberg's announcement? When are policy changes likely to be implemented?

John Xavier
Sahana Venugopal

The story so far:

In January 7, Meta CEO Mark Zuckerberg said the company will get rid of fact-checkers and simplify content policies by removing restrictions on topics as it is "out of touch with mainstream discourse." In a five-minute video, he said that the company will return to its roots as the fact-checkers have been "too politically biased" and "destroyed more trust than they created, especially in the U.S."

How did Meta get into fact-checking?

After the 2016 U.S. presidential election results were out, Meta, then known as Facebook, faced serious backlash for amplifying political posts that helped tilt the election in favour of U.S. President-elect Donald Trump. To build back its reputation, Facebook roped in content moderators globally and developed technology to filter harmful content.

Meta started its independent fact-checking programme in partnership with the International Fact-Checking Network (IFCN) and the European Fact-Checking Standards Network (EFCNSN). Over time, Meta became one of the largest donors to IFCN.

Meta worked with fact-checkers to address misinformation on its platforms, Facebook, Instagram and Threads. While the fact-checkers worked on finding misinformation and rating them based on the seriousness of content violation, Meta followed up with action and informed users of the measures it took. Beyond fact-checking, partner organisations worked across Meta's platforms to carry out research,

Topics including 'immigration and gender identity', a subject of frequent political discourse, will be discussed

and rate content on a qualitative scale – false, altered, partly false, missing context, satire, and true. Per IFCN's 'State of Fact-Checkers in 2023' report, income from Meta's Third-Party Fact-Checking Programme and grants remain fact-checkers' predominant revenue streams. And 68% of fact-checking organisations have 10 or fewer employees, whereas only 6.6% employ 31 or more people.

Why was there a need for fact-checkers?

Fact-checkers play a vital role in finding false and misleading content promoted on social media platforms by domestic accounts, and at times by foreign regimes. They also played a crucial role during the COVID-19 pandemic by correcting misinformation on social platforms. If the rated content on Meta is false or altered, its distribution across Meta's apps will be reduced. If key information is missing or the content is satirical, Meta might provide the needed facts. Content rated poorly by a fact-checker may not be suggested to users, and repeat offenders could be hit with penalties such as restricted reach, being unable to monetise their content or turn their content into a news page.

What other steps were taken by Meta?

Apart from relying on fact-checkers, Meta set up an Oversight Board to adjudicate cases involving serious content policy violations. The board heard serious content violation cases and made binding decisions to uphold or overturn Meta's own actions. Gradually, Meta started to move away from news content in general to keep its platform free from disinformation-prone content. The company said it will not "proactively recommend content about politics on recommendation surfaces across Instagram and Threads", noting that it wants these apps to be a "great experience" for all.

Now that is starting to change under Joel Kaplan, Meta's new chief of global affairs. Mr. Kaplan said "civic content" about elections and politics would return to the apps, and that users can choose what they want to see. He expanded on Mr. Zuckerberg's video clip, noting that the platform will also get rid of a number of restrictions "on topics like immigration and gender identity that are the subject of frequent political discourse and debate". He said, "It's not right that things can be said on TV or the floor of Congress, but not on our platforms."

What is Community Notes?

Meta will be moving towards an X platform styled content moderation system called 'Community Notes'. Under this model, instead of a centralised authority taking action against

misinformation, users work together to add additional context that will appear under false or even blatantly illegal content.

The feature itself goes beyond the Elon Musk-era Twitter. It was originally conceived as Birdwatch, where users could add context to posts they see that require more information. Initially launched in 2021, the feature gained prominence in March 2022 when misinformation on the Russia-Ukraine conflict was rife on the platform.

While crowd-sourced fact-checking is seen as a better way of implementing content moderation, Community Notes can also reflect biased majority viewpoints regarding controversial subjects. The feature can also be slow, meaning false or hateful content may go viral long before the specific context is added to clarify the post. Furthermore, under X's current style of content moderation, even posts glorifying slavery and Nazism are allowed to remain online, unchallenged.

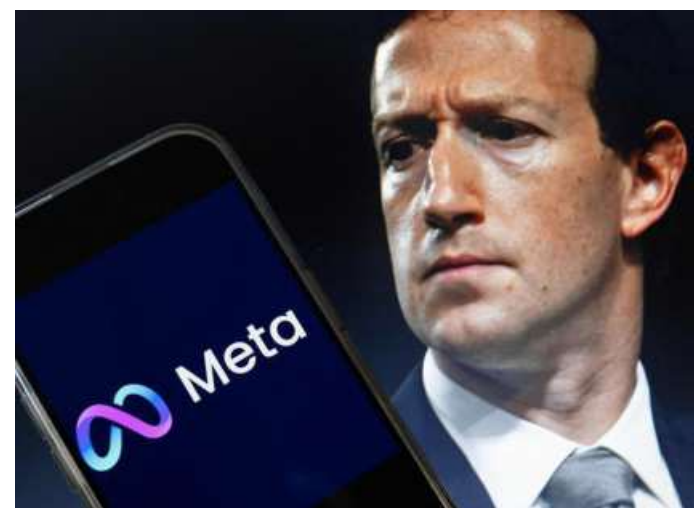
In an open letter to Mr. Zuckerberg, IFCN said, "There is no reason Community Notes couldn't co-exist with the third-party fact-checking programme; they are not mutually exclusive. A Community Notes model that works in collaboration with professional fact-checking would have strong potential as a new model for promoting accurate information."

But, Meta has decided on a hands-off approach to content moderation, by stopping its demotion of fact-checked content and removing the full-screen warnings over flagged posts. The company will focus more on illegal content and high-severity violations while adjusting content filters to make it more challenging to take down flagged content – even though this means catching "less bad stuff," as per Mr. Zuckerberg.

What is the significance of the new policy?

Mr. Zuckerberg's shift in stance comes at a time when a new Trump administration takes charge. The tech CEO dined with the President-elect at his Mar-a-Lago resort in November to repair a fraught relationship. Earlier, he publicly praised Mr. Trump's conduct after the former President survived an assassination attempt. In the video clip, Mr. Zuckerberg referenced the 2024 election as a "cultural tipping point" and committed to "restoring" free expression across Meta platforms. In essence, he was aligning his values with the new conservative government by making a clean break from the old one.

While the plan to end the fact-checking programme in 2025 applies only to the U.S., there are similar programmes Meta is running in more than 100 countries. Some of these countries are highly vulnerable to misinformation that spurs political instability, election interference, mob violence and even genocide. If Meta decides to stop the programme worldwide, it is almost certain to result in real-world harm in many places, the IFCN said in its open letter.



Policy shift: Mark Zuckerberg, the CEO of Meta. AFP

Are lithium batteries on flights dangerous?

Why has the airline pilots' body called attention to fire risks? What causes lithium-ion batteries to catch fire? What are the fire-safety equipment and protocols that need to be in place? What happened when Hurricane Helene struck the U.S. in November last year?

Vasudevan Mukunth

The story so far:

In January 2, the International Federation of Air Line Pilots' Associations (IFALPA) issued three position papers on the fire risk due to the use of lithium-ion batteries in airport and aircraft settings. The papers are motivated by air operators' increasing use of electric vehicles (EVs) and lithium-ion batteries as well as the batteries becoming more energy-dense.

What is IFALPA?

The IFALPA is a global nonprofit representing the international community of professional pilots. After the Second World War, the UN established the International Civil Aviation Organisation (ICAO) in 1947 to coordinate air transport and its principles worldwide. A year later, ICAO organised a conference in London where pilots could interact with its leaders. The IFALPA was born at this event with 13 pilots' associations. According to a source on the ICAO website, IFALPA encompassed 104 member associations representing one lakh professional pilots worldwide around 2013. Per the same source, "The belief [is] that the unique perspective of pilots operating in scheduled

Studies have found that existing fire kits have not been able to respond adequately to fires of lithium-ion batteries

flying would be of significant benefit to the creation and adaptation of ICAO Standards and Recommended Practices (SARPs) through which ICAO regulates international civil aviation." The IFALPA also provides inputs to the International Air Transport Association, the Airports Council International, and the International Federation of Air Traffic Controllers' Association.

Why are there fears about lithium batteries?

Almost every major industry in the world is mechanised to a significant degree, and the energy for these machines has traditionally been produced by burning fossil fuels. As climate mitigation has become more pressing, industries are under pressure to replace this thermal energy – the principal cause of global warming – with electric energy.

For example, EVs draw electric energy from a battery to drive an electric motor and supply kinetic energy to the wheels. In an internal combustion engine, heat energy released by burning fossil fuel moves pistons, whose motion is converted to rotary motion of the wheels.

Lithium-ion batteries have emerged as a popular solution to storing electric energy because they are energy-dense, rechargeable, and can be made in almost any shape, which is useful when there are space constraints as onboard an aircraft. But lithium-ion batteries have been known to catch fire when they are subjected to certain physical stresses.

The fire is the result of the stress creating a short-circuit inside the battery, leaving it to keep producing electric current, heat, and oxygen. The battery's internal components can become corroded while the risk of catching fire increases. The short circuit can be the result of mechanical, electric, and/or thermal abuse, which respectively deforms the internal structure, degrades its electric performance, and causes heat to accumulate.

For example, after Hurricane Helene struck the U.S. in November 2024, 48 lithium-ion batteries reportedly caught fire.

University of South Carolina mechanical engineer Xinyu Huang said they may have been the result of EV batteries rarely being rated to be waterproof when they are sitting in salt water for

more than 30 minutes. Such situations are more likely to occur during flooding, which is becoming more common due to climate change and poor urban planning.

What do the IFALPA papers say?

The three position papers are numbered POS01, POS02, and POS03. POS02 and POS03 are more general whereas POS01 is more specific.

POS02 is motivated by the different kind of fires caused by lithium-ion batteries (compared to internal combustion engines). As Mr. Xinyu wrote, "When a lithium-ion battery pack bursts into flames, it releases toxic fumes, burns violently and is extremely hard to put out. Frequently, firefighters' only option is to let it burn out by itself." The position paper thus asks "airports, rescue and fire-fighting services, operators, and ground service providers" to acquire or develop purpose-built fire-safety equipment and protocols.

POS03 extends these concerns to the flight deck – the area colloquially called the "cockpit" in civilian aircraft – where the batteries may be present in components required to operate the aircraft. It also calls attention to studies by the U.S. Federal Aviation Administration and the European Union Aviation Safety Agency finding that existing fire kits couldn't respond adequately to fires of lithium-ion batteries with an energy rating of 100 Wh or higher.

POS01 is concerned with the safe transport of lithium-ion batteries, especially UN regulations 3480 and 3481. Since the UN classifies these batteries as "miscellaneous dangerous goods", the regulations specify the packaging and labelling standards required to transport them by air. UN3480 applies to lithium-ion batteries transported in bulk and UN3481 to lithium-ion batteries fit inside some equipment that's being transported in bulk.

One difference between the two regulations is that UN3480 requires the batteries to be charged to less than 30%, also known as state of charge (SOC) 30%, whereas UN3481 doesn't. POS01 contends that UN3481 didn't adopt this restriction because it assumed manufacturers would install safeguards in the equipment to prevent a fire from one battery spreading to others. But as the energy density of batteries and the number of settings in which they are used is increasing and the size of the equipment that uses them is shrinking, IFALPA's position is that the SOC 30% limit should be extended to UN3481 as well.



New risks: A technician working on a lithium-ion battery. ISTOCKPHOTO

PROFILES

Rocket scientist

V. Narayanan

The cryogenic pioneer is taking over ISRO when the agency is working on a series of high-profile missions, from the Gaganyaan human spaceflight programme to Chandrayaan-4

Tiki Rajwi

The first big news from the Indian Space Research Organisation (ISRO) in the New Year seems to have an in-built element of surprise in it. On January 7, V. Narayanan, a rocket and spacecraft propulsion expert, who heads the ISRO's Liquid Propulsion Systems Centre (LPSC) in Thiruvananthapuram, was named successor to S. Somanath, the current chairman of the space agency.

The face of ISRO since January 2022, Mr. Somanath is highly regarded, cutting a dynamic and impressive figure, especially with the younger ISRO hands. Insider-speak is that many within the organisation were expecting his term to be extended. Comparisons with his predecessor will be par for the course when Mr. Narayanan, who joined the ISRO 40 years ago, eases into the top spot on January 14.

The change of guard is happening at a critical moment for ISRO, now guided by the Space Vision 2047. On the one hand, a series of high-profile missions are in the works; the Gaganyaan human spaceflight programme, the Chandrayaan-4 lunar mission, the development of the Bharatiya Antariksha Station – India's own space station – and landing an Indian on the moon by 2040, to name a few. On the other,



ILLUSTRATION: SREEJITH R. KUMAR

er, the Indian space sector is in a state of flux, with the Space Policy, 2023 opening it up to private players.

Ever since the first U.S.-made Nike-Apache sounding rocket lifted off from Thumba, Thiruvananthapuram, in November 1963, the Indian space programme has largely remained a jealously-guarded government concern.

To his credit, Mr. Narayanan is someone who knows the ins and outs of the ISRO, having joined the space agency's Vikram Sarabhai Space Centre (VSSC) in Thiruvananthapuram in 1984, where he worked on solid propulsion. He moved to the LPSC in 1989 to work on cryogenic propulsion, and has remained there since, initially playing his part, and in subsequent years taking the lead role, in the propulsion aspects of ISRO missions.

As LPSC Director, Mr. Narayanan was leading the development of propulsion systems for the Gaganyaan programme when he was named the next Secretary, Department of Space, and Chairman, Space Commission, for a period of two years.

Success story

In many ways, his is the quintessential hard-won success tale, the kind that parents in post-Independence India loved to inspire their children with.

Hailing from a humble background at Melakattuvilai, a village in Kanniyakumari district of Tamil Nadu, young Narayanan attended a nearby Tamil-medium school. Teachers announcing Neil Armstrong's successful 1969 moon landing is part of his childhood memories. He subsequently obtained his M.Tech. in cryogenic engineering in 1989 with a first rank from the IIT, Kharagpur. He took his Ph.D. in aerospace engineering in 2001.

At the ISRO, he has contributed to major missions and projects, including the Chandrayaan series and the successful development of the cryogenic upper stage for the Geosynchronous Satellite Launch Vehicle (GSLV).

The LPSC website describes him as "one of the few cryogenic members who have worked in this area from the beginning, carrying out fundamental research, theoretical and experimental studies and contributing to the successful development and testing of cryogenic sub systems".

One of the tried-and-tested hands of the space agency, Mr. Narayanan comes across as affable and polite. Within the ISRO community, he is viewed as hard-working and tenacious, as someone who gets things done. That his long career has largely been confined to LPSC is seen as a disadvantage, given the fast-evolving, multispeciality nature of present-day space-tech.

Many of the past chairpersons have headed multiple ISRO facilities such as the LPSC and VSSC before moving on to the Bengaluru headquarters.

To his advantage, Mr. Narayanan has experience on his side. In the changing, competition-driven global space ecosystem, ISRO has the added responsibility of hand-holding Indian space-tech startups and driving industry participation. As its next Chairman, Mr. Narayanan faces the task of steering the space agency through challenging and happening times.

The island of interest

Greenland

U.S. President-elect Donald Trump says he won't rule out use of military force or coercion to annex or buy the world's largest island

Joan Sony Cherian

On January 1, the King of Denmark unveiled a new coat of arms after more than 50 years. It features the polar bear and the ram (symbolising Greenland and the Faroe Islands, respectively) more prominently than before. Amid calls for independence in Greenland and U.S. President-elect Donald Trump's aggressive push to buy/annex the island, the Royal House seems to be underscoring the Danish realm's unity.

Greenland, the world's largest island with a population of 57,000, is an autonomous territory controlled by Denmark. This effectively means that while it has a Parliament which deals with domestic affairs such as business taxes, immigration, and mining, most of its foreign, monetary and military policy are dictated by Denmark. The Arctic island was colonised by the Danes in the 18th century and has been associated with Europe, though geographically it is part of the North American continent and closer to the U.S. than Copenhagen.

During the Second World War, the U.S. briefly occupied the region and defended it when Denmark was under siege by Nazi Germany.

Noting the region's geopolitical importance, the U.S. in 1946, after the War,



GRAPHICNEWS

Greenland, with a population of 57,000, is an autonomous territory controlled by Denmark

had offered to buy it from Denmark. Denmark rejected the offer and ever since Greenland has been a part of the Danish realm with home rule granted to the island in 1979. The U.S. runs and operates an air base on the island. However, of late, calls for complete independence from Denmark have been rising in the island. Greenland's Prime Minister Múte Egede in his New Year address talked about taking the "next step" and removing the "shackles of colonialism".

U.S. aspirations

In his first term in office, Mr. Trump had floated the idea of buying Greenland. However, this time it seems the President-elect is serious. "For purposes of National Security and Free-

dom throughout the World, the United States of America feels that the ownership and control of Greenland is an absolute necessity," he said in December. Following such a declaration, Donald Trump Jr., Mr. Trump's son, visited Greenland this year as a "private individual". Both Greenland and Danish Prime Ministers have shut down such threats and plans. Mr. Egede has categorically stated that "Greenland belongs to the Greenlanders".

Mr. Trump seems unfazed. Speaking to the press last week, Mr. Trump said he won't rule out military or economic coercion to annex/buy the island.

The island is surrounded by the Atlantic on one side and the Arctic waters on the other. Due to climate change and global warming, glaciers and ice sheets in the Arctic Sea are melting, leading to potentially new shipping routes, which could greatly enhance trade. Moreover, Russia and China have already agreed to develop new trading routes in the Arctic waters as relations with the West sour and tensions in West Asia loom large.

Last November, both countries developed a sub-committee for cooperation on the northern sea route, which spans 5,600 km from the Barents Sea near Scandinavia to the Bering

Strait near Alaska. With the threat of Russia-China cooperation in the region, annexing Greenland could give the U.S. significant control over the area, letting it decide who gets to run and operate in these strategic waters.

The island is also rich in minerals. As per a 2025 survey, 25 of 34 critical raw materials, which are used in EVs and batteries, were found in Greenland. The melting of almost 28,000 square km of Greenland's ice sheets makes drilling for oil, gas and other critical raw materials easier. Currently, China is the world's largest exporter and producer of critical minerals. Buying Greenland could make the U.S. compete with China for that status.

Mr. Trump has also issued calls to buy/annex the Panama Canal and Canada. While all of them have been touted as necessary for the U.S.'s economic and national security, the U.S. is breaking the first and fundamental rule of the UN Charter: recognising the sovereignty of nations. With respect to Greenland, the U.S. is going against the NATO agreement as well.

Similarly, the Arctic waters are a global common under the UN Convention on the Law of the Sea. The incoming U.S. President's policies are bringing to the forefront the true anarchical nature of international politics.

China, U.K. resume talks on finance after six years

Associated Press

TAIPEI

China and Britain restarted economic and financial talks on Saturday after a six-year hiatus during a visit by Britain's Treasury chief to Beijing, as the U.K.'s Labour government seeks to reset strained ties with the world's second-largest economy.

Accompanied by a delegation of British business executives and finance officials, Chancellor Rachel Reeves met with Chinese leaders, including Vice Premier He Lifeng and Vice President Han Zheng. Ms. Reeves emphasised the need for a "stable, pragmatic" U.K.-China relationship as she wrapped up talks in Beijing.

Deals inked

The two nations inked agreements on Saturday in areas such as finance "worth £600 million over the next five years for the U.K. economy," Ms. Reeves said without outlining the specifics of the deals.

China's Wang Yi visits Maldives, holds talks with President Muizzu

Press Trust of India

BEIJING/MALE

Chinese Foreign Minister Wang Yi made a surprise visit to the Maldives, during which he held talks with President Mohamed Muizzu and discussed the state of bilateral relations, amid Male's recent warming up to India.

Mr. Wang, who is also a member of the powerful Political Bureau of the Communist Party, met Mr. Muizzu during his stopover in Male on Friday while on his way back from a tour, official media reported.

First major visit

This was the first major visit by a Chinese official to the Maldives after Mr. Muizzu visited China in January last year, months after his election.

During Mr. Muizzu's visit, the two countries elevated the bilateral ties to a comprehensive strategic cooperative partnership and signed some key agreements.

In his meeting with Mr. Wang, Mr. Muizzu stressed the importance of fast-tracking key infrastructure projects outlined in the agreements and Memoranda of Understanding (MOUs) between the two countries, Maldives media reported.

He emphasised the need to prioritise social housing and road development projects, which are among the most urgent re-

Muizzu sought to expedite social housing and road development schemes

quirements for the Maldivian people, and referred to China's commitments in this regard.

Additionally, Mr. Muizzu highlighted his administration's focus on economic diversification, particularly in agriculture and fisheries, and requested China's support in advancing these crucial sectors.

Mr. Muizzu said he was glad to see Chinese people becoming the largest source of tourists for the Maldives in recent months.

Mr. Wang said that Muizzu's successful state visit to China was a highlight in China-Maldives relations.

Joint commitment

During the visit last year, Chinese President Xi Jinping and Mr. Muizzu agreed to upgrade bilateral ties to a comprehensive strategic cooperative partnership and jointly commit to building a China-Maldives community with a shared future, which has laid out broad prospects for bilateral relations, state-run Xinhua news agency reported.

Mr. Wang praised Mr. Muizzu's development vision for the Maldives and reiterated China's ongoing support for the country's sustainable development.

ISLAMABAD

Pakistan, China to further deepen ties for CPEC 2.0 development



ISTOCKPHOTO

Pakistan and China vowed to deepen their "all-weather strategic" partnership, including work on the "high-quality development" of the second phase of the China Pakistan Economic Partnership. The announcement was made at the fourth round of Pakistan-China Bilateral Political Consultations (BPC) in Beijing on Friday. PTI

Los Angeles fires expand as winds forecast to pick up



No respite: A helicopter drops water on the Palisades Fire behind a home with Christmas lights in Mandeville Canyon in Los Angeles. AP

Agence France-Presse

LOS ANGELES

The largest of the Los Angeles fires spread toward previously untouched neighborhoods on Saturday, forcing new evacuations and dimming hopes that the disaster was coming under control.

Across the city, at least 11 persons have died as multiple fires have ripped through residential areas since Tuesday, razing thousands of homes in destruction that U.S. President Joe Biden likened to a "war

scene."

Winds were forecast to pick up again on Saturday after a brief lull, posing the risk of new fires as embers are blown into dry brush.

Los Angeles residents have increasingly demanded to know who is at fault for the disaster as they grapple with the ruin.

As reports of looting grew, a sunset-to-sunrise curfew was imposed in evacuated areas.

Five separate fires have so far burned more than 37,000 acres, destroying around 12,000 buildings.



Leaving a mark: A Navy aircraft fires flares as it performs a fly-past.



Close call: Two naval skydivers collide mid-air before safely landing in the sea during a rehearsal of the operational demonstration.



In sync: Indian Navy personnel perform a continuity drill during the Eastern Naval Command's operational demonstration in Visakhapatnam.

Might over the sea

At a display in Visakhapatnam, the Indian Navy's Eastern Command demonstrates its operational excellence, resilience, and technological prowess



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The Eastern Naval Command of the Indian Navy held an operational demonstration in Visakhapatnam on January 4, showcasing a breathtaking display of maritime prowess and precision.

The grandeur unfolded with a submarine sail-past, followed by a gripping demonstration from the Marine Commando Force that featured the stealth and combat skills of the naval special forces. An oil rig demolition drill emphasised the Navy's readiness to tackle maritime emergencies, while a helicopter rescue operation illustrated their ability to execute daring lifesaving missions.

The skydiving team's performance stood out, especially after an incident during the final rehearsal two days ago, when two skydivers became entangled mid-air and had a choppy

landing in the sea. They were promptly rescued and brought back to the shore. Undeterred by the mishap, the team executed a flawless landing during the main event, earning cheers from the audience. A composite fly-past by Chetak helicopters, Hawk jets, and Dornier planes highlighted the synchronised operations of the naval air fleet.

The evening concluded with a mesmerising beating retreat ceremony. Drone formations lit up the night sky, narrating tales of naval valour and technology. Fireworks and a laser show from the deck of a ship captivated the audience, culminating in firing of flares and illumination of naval vessels, casting a glow over the coast.

The demonstration was a testament to the Indian Navy's operational excellence, resilience, and technological prowess.



Visual treat: Naval officers with their families watch as fireworks go off during the demonstration.



Red skies: Illuminated naval vessels fire flares to the sky making for a brilliant spectacle at night.



Combat ready: Marine commandos simulate a beach assault.



No glitches: Skydivers perform flawlessly during the main event, after getting over a mistake during rehearsal.



Across elements: A Navy helicopter hovers above a submarine performing a sail-past.



In control: Navy personnel simulate a blast as part of a demonstration of beach assault by marine commandos.