

March
2022

समाचार पत्रों से चयित अंश Newspapers Clippings

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खंड : 47 अंक : 48 10 मार्च 2022

Vol. : 47 Issue : 48 10 March 2022



रक्षा विज्ञान पुस्तकालय
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DRDO News

DRDO On Twitter



Defence News

Defence Strategic: National/International



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Wed, 09 Mar 2022 6:50PM

ऑस्ट्रेलिया के सेना प्रमुख 08 से 11 मार्च 2022 तक भारत के दौरे पर

ऑस्ट्रेलिया के सेना प्रमुख लेफ्टिनेंट जनरल रिचर्ड मैक्सवेल बर् एओ, डीएससी, एमवीओ चार सदस्यीय शिष्टमंडल के साथ 08 से 11 मार्च 2022 तक भारत के दौरे पर हैं।

ऑस्ट्रेलिया के सेना प्रमुख ने 09 मार्च 2022 को राष्ट्रीय युद्ध स्मारक पर माल्यार्पण किया तथा साऊथ ब्लॉक में औपचारिक सलामी गारद का निरीक्षण किया। लेफ्टिनेंट जनरल रिचर्ड मैक्सवेल बर् ने भारत के सेनाध्यक्ष, नौसेनाध्यक्ष तथा वायु सेनाध्यक्ष एवं सेना के अन्य वरिष्ठ अधिकारियों के साथ परस्पर मुलाकात की। दोनों सेनाओं के प्रमुखों के बीच परस्पर बातचीत गर्मजोशी से भरी तथा आत्मीय रही। दोनों सेनाओं के प्रमुखों ने दोनों देशों की सेनाओं के बीच रक्षा सहयोग बढ़ाने के उपायों पर चर्चा करने के अतिरिक्त वर्तमान में जारी वैश्विक स्थिति तथा भारतप्रशांत क्षेत्र की स्थिति पर विचारों का आदान प्रदान किया। जनरल ने प्रतिष्ठित नेशनल डिफेंस कॉलेज के संकाय तथा सहभागियों को भी संबोधित किया तथा बाद में उपसेनाध्यक्ष एवं नई दिल्ली स्थित भूमि युद्ध कला अध्ययन केंद्र (सीएलएडब्ल्यूएस) के निदेशक से परस्पर बातचीत की। ऑस्ट्रेलिया के आगंतुक सेना प्रमुख 10 एवं 11 मार्च 2022 को देशकी पश्चिमी सीमाओं पर तैनात भारतीय सेनाओं की संरचनाओं तथा इकाइयों का भी दौरा करेंगे।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1804629>



Press Information Bureau
Government of India

Ministry of Defence

Wed, 09 Mar 2022 6:50PM

Visit of Australian Army Chief to India from 08 to 11 March 2022

Lt Gen Richard Maxwell Burr AO, DSC, MVO, Chief of Army Australia along with four member delegation is visiting India from 08 to 11 March 2022.

On 09 March 2022, the Australian Army Chief laid a wreath at the National War Memorial and received a ceremonial Guard of Honour at the South Block. Lt Gen Richard Burr called on the Chief of Army Staff, Chief of Naval Staff, Chief of Air Staff and other senior military officers. Interaction between both the Chiefs of the Army Staff was warm and cordial. Both Chiefs exchanged views on the current global situation and the situation in Indo-Pacific in addition to discussing measures for enhancing defence cooperation between both armies.

The General also addressed the faculty and participants of the prestigious National Defence College and later interacted on regional security perspectives with the Vice Chief of Army Staff and the Director at Centre for Land Warfare Studies (CLAWS), New Delhi.

The visiting Australian Army Chief will be visiting Indian Army formations and units deployed along Western Borders on 10 and 11 March 2022.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1804481>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Wed, 09 Mar 2022 6:53PM

ऑस्ट्रेलियाई सेना अनुसंधान केंद्र (आर्क) ने भारत के सेंटर फॉर लैंड वारफेयर स्टडीज (क्लॉज़) के साथ समझौता ज्ञापन (एमओयू) पर हस्ताक्षर किए

ऑस्ट्रेलियाई सेना के प्रमुख लेफ्टिनेंट जनरल रिचर्ड बूर 08 मार्च 2022 से तीन दिवसीय भारत यात्रा पर हैं। ऑस्ट्रेलियाई सेना प्रमुख ने 09 मार्च 2022 को नई दिल्ली में भारतीय सेना के थिंक टैंक सेंटर फॉर लैंड वारफेयर स्टडीज (क्लॉज़) का दौरा किया, जहां पर उन्होंने थल सेना के वाइस चीफ लेफ्टिनेंट जनरल मनोज पांडे, अध्यक्ष, बोर्ड ऑफ गवर्नर्स, क्लॉज़ और लेफ्टिनेंट जनरल (डॉ.) रणबीर सिंह (सेवानिवृत्त), निदेशक सेंटर फॉर लैंड वारफेयर स्टडीज के साथ बातचीत की। ऑस्ट्रेलियाई जनरल को क्लॉज़ की अनुसंधान गतिविधियों और इसके आउटरीच क्रिया-कलापों के बारे में जानकारी दी गई। अकादमिक सहयोग और जुड़ाव स्थापित करने के लिए ऑस्ट्रेलियाई सेना अनुसंधान केंद्र (आर्क) और सेंटर फॉर लैंड वारफेयर स्टडीज (क्लॉज़) के बीच एक समझौता ज्ञापन (एमओयू) पर भी हस्ताक्षर किए गए।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1804556>



Press Information Bureau
Government of India

Ministry of Defence

Wed, 09 Mar 2022 6:53PM

Australian Army Research Centre (AARC) Signs Memorandum of Understanding (MoU) with Centre for Land Warfare Studies (CLAWS), India

Lt Gen Richard Burr, the Chief of the Australian Army is on a three day visit to India from 08 March 2022.

On 09 March 2022, the Australian Army Chief visited the Centre for Land Warfare Studies (CLAWS), the Indian Army think tank, New Delhi where he interacted with the Vice Chief of Army Staff, Lt Gen Manoj Pande, Chairman, Board of Governors, CLAWS and Lt Gen (Dr) Ranbir Singh (Retd), Director CLAWS. The visiting General was briefed on CLAWS research activities and its outreach initiatives. In order to establish academic cooperation and engagement, a Memorandum of Understanding (MoU) was also signed between Australian Army Research Centre (AARC) and Centre for Land Warfare Studies (CLAWS) on the side-lines of the visit.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1804480>



Wed, 09 Mar 2022 6:53PM

85% of purchases by Army is from Indian companies: COAS General MM Naravane

Recently inaugurating the Ahmedabad Design Week 3.0, Chief of Army Staff General (COAS) MM Naravane stated that 85 per cent of the purchases made by the Indian Army is “Indian”.

“As far as the Indian Army is concerned 85% of whatever we buy is from Indian Companies. The defence corridors in Chennai & Lucknow have helped in changing the entire ecosystem of the defence industry,” COAS MM Naravane asserted.

The General while addressing students at Karnavati University in Gandhinagar mentioned that the Indian Army is spearheading the process of developing a made-in-India infantry combat vehicle, an armoured personnel carrier and is finding reasonable solutions for providing water and power to the forward areas.

“Look at the combat tanks. It has essentially remained the same for the last 60-70 years. It had a hull, it had a caterpillar track and a gun on top. If you see a battle tank of World War I when it first came out, and if you see a tank today, it looks almost the same. We need a design change. Can we think of something radically different which is unique to us,” the General said.

Push to Indian defence startup ecosystem

At the inaugural ceremony, the Army Chief pointed out that the ‘Army Design Bureau’ works as a facilitator between the designers and the Indian Army under the Innovation for Defence Excellence (iDEX) and Technology Development Fund of Defence Research Development Organisation (DRDO), which provides financial support to the start-ups and MSMEs.

“We are working on 26 projects in iDEX, under which 33 start-ups are involved in it. Some of the results have borne fruit and are under trial and evaluation right now, “General MM Naravane

said. Armours, drone jammers, unmanned surface vehicles, image analytics and vital ammunition are some of the things Indian Army is presently working on with these startups. Further, the trials of these defence armours are at the final stages of evaluation.

India's first 'Robotic Lifebuoys' by Indian Navy and iDEX

In a major boost to the 'Atmanirbhar Bharat' campaign, for the first time, iDEX and Indian Navy inked a Rs. 13 crore contract to procure the country's first indigenously developed Robotic Lifebuoys under the iDEX challenge "Unmanned Surface Vehicles". The contract was secured by a Startup – Saif Seas, based in Visakhapatnam.

Further, the Indian Government has also approved a scheme with an outlay of Rs. 500 Crore (2021-22 to 2025-26) to push innovation and support startups in Defence & Aerospace sector. The move enables more than 300 startups to participate in the new design and development projects.

Defence Corridors changing entire defence ecosystem

General MM Naravne asserted the importance of defence corridors in Chennai & Lucknow, which have helped in changing the entire ecosystem of the defence industry.

Two Defence Industrial Corridors (DICs) have been established in Uttar Pradesh and Tamil Nadu to bolster the Defence manufacturing ecosystem in India. These Defence Corridors aims to attract investment of Rs. 10,000 crore in each DIC.

Giving impetus to the growth of Defence Industrial Corridors, both the DICs have been integrated with the PM's 'Gati Shakti' National Master Plan. Till date, Rs. 1401.68 crore and Rs. 2,252 crore have been invested in Uttar Pradesh & Tamil Nadu DICs respectively.

Budget 2022: Providing thrust to modernisation & defence infrastructure

The Union Budget for FY 2022-23 gave a major impetus to the modernisation of Defence Services and Defence Security Infrastructure development, including the Border Road Infrastructure and Coastal Security Infrastructure.

The Budget envisaged a total outlay of Rs 39.45 lakh crore. Out of this, the Defence Ministry allocated a total budget of Rs 5.25 lakh crore, which is 13.31% of the total budget. This includes an amount of Rs 1.19 lakh crore for Defence Pensions. The total Defence Budget represents an enhancement of Rs 46,970 crore (9.82%) over Budget Estimates 2021-22.

Notably, Defence Research & Development (R&D) will be opened up for industry, startups and academia. Further, 25 per cent of the defence R&D budget has been specifically earmarked for private investment. The first-of-its-kind initiative by the government will encourage private industry to take up the design and development of military platforms and equipment in collaboration with DRDO and other organizations through the SPV model.

<https://newsonair.com/2022/03/09/85-percentage-of-purchases-by-army-is-from-indian-companies-coas-general-mm-naravane/>

Sectoral panel pitches for \$150 billion local defence production by 2047

India should aim at raising domestic defence production to \$150 billion and bring in \$30 billion in exports per year by 2047, a key group of top bureaucrats has recommended, even as the Ukraine crisis has sparked a debate on India's huge dependency on Russia in the sector.

In a presentation made to the Union cabinet secretary in late February, a sectoral group of secretaries (SGOS) identified defence manufacturing as a key category to capitalise on India's potential and develop it as a manufacturing hub by 2047 with a 25% share in the GDP. Defence manufacturing, pharmaceuticals and biotechnology, semiconductors, capital goods, and machine tools are among the top categories identified by the SGOS for a major ramp-up over the next 25 years.

In 2020-21, 64% of India's budgetary outlay for defence went towards indigenous options. A 68% target has been identified for next year with service-wise action plans to reduce the import dependency. India also recently inked a \$375-million deal with the Philippines for export of the Brahmos missile system.

SGOS - comprising top officials from the ministries of external affairs, commerce, heavy industries, steel, textiles, MSME, labour and employment, tourism, pharmaceuticals, and chemicals and petrochemicals, besides the Department for Promotion of Industry and Internal Trade and the Central Board of Indirect Taxes & Customs - has identified 25 year targets for India's commerce and industry growth.

While it has set a target of \$150 billion for defence manufacturing by 2047, the group has proposed that pharma and biotech grow to a \$500-billion industry by then. Indian manufacturing sector's share in GDP is estimated at 13% against a global average of 16% and China's 26%. The aim is to finalise the 2047 plan by May this year.

<https://economictimes.indiatimes.com/news/defence/sectoral-panel-pitches-for-150-billion-local-defence-production-by-2047/articleshow/90109410.cms>

Thu, 10 Mar 2022

Indian Army Tests Combat Readiness in West Bengal's Siliguri Corridor



March 4, special forces carried out a rehearsal of their aerial insertion capability and rapid response near the northern border

The Indian Army conducted back-to-back exercises, ranging from airborne incursions to anti-tank firing drills, at different locations in the strategic Siliguri corridor in the past few days, which is a testament to the force's enhanced focus on the country's thinnest stretch sandwiched between Nepal and Bangladesh.

On March 4, special forces carried out a rehearsal of their aerial insertion capability and rapid response near the northern border.

Combatant free-fallers carrying logistic supply loads jumped from flying machines from an altitude of around 20,000ft and landed on precision-guided platforms.

After landing at a location in the Siliguri corridor, the free-fallers established surveillance positions to guide fire to selected enemy targets. As a follow-up, an airborne force of 400 personnel was deployed by air to capture designated objectives swiftly.

“It is an important exercise for aerial insertion of troops, equipment or supplies, directly into the tactical battle zone. The troops inserted aurally are assigned with specific tasks like the capture or the destruction of critical enemy infrastructure,” said a retired army officer.

After the Doklam standoff between the Indian and Chinese troops in 2017, the Indian defence forces beefed up vigil in the Siliguri corridor. Doklam is located at the tri-junction of India, China and Bhutan.

The corridor, also known as “Chicken’s Neck”, is the slimmest stretch of India, where the width of the country is 20 to 24 kilometres. The corridor has Nepal on north and Bangladesh on the south.

“The corridor is vital for India as it is through this stretch that every resource of manpower moves to the entire Northeast,” said an official of the state’s intelligence agency.

After the Doklam stand-off, there was a violent skirmish between Indian and Chinese troops in the Galwan Valley in Ladakh in June, 2020.

Reports emerged last year that China was developing infrastructure at Chumbi Valley, which is located between Sikkim and Bhutan.

“Such situations on the northern borders have made it imperative for the Indian Army to focus on the operational tasks of its reserve formations and give impetus to its fighting capabilities in high altitude mountainous terrains,” said a defence analyst.

After the airborne exercise, troops of the Trishakti Corps posted in high altitudes of Sikkim, the Himalayan state that sits on the India-China border, carried out anti-tank drills.

“Trishakti warriors test their mettle against metal. Indian Army remains ever vigilant on the borders. Trishakti warriors hone their anti-tank firing skills on the super high altitude plateau region of north Sikkim,” said a tweet by the Trishakti Corps which is headquartered at Sukna near Siliguri.

A source said: “ATGMs (anti-tank guided missiles or weapons), which are used to defeat armoured combat vehicles, were used in the drill. The exercise was carried out at an elevation between 16,000ft and 17,400 ft in Sikkim.”

<http://www.indiandefensenews.in/2022/03/indian-army-tests-combat-readiness-in.html>

THE ECONOMIC TIMES

Wed, 09 Mar 2022

Sanctions on Russia unlikely to create problems for India's defence sector: V K Saraswat

India's defence sector will not face any problems because of the western sanctions on Russia as Moscow has an inherent military strength and is self-sufficient in its production capabilities, Niti Aayog member V K Saraswat said on Wednesday.

Russia is one of biggest suppliers of defence products and equipment to India mostly under government-to-government contract. "Russia has got inherent military strength, they have a very good military equipment manufacturing infrastructure and by and large they are self-sufficient in their production capabilities," he told PTI.

US President Joe Biden on Tuesday announced that the US would ban the import of Russian oil and gas, targeting the main artery of Russia's economy, in response to Moscow's invasion of Ukraine.

<https://economictimes.indiatimes.com/news/defence/sanctions-on-russia-unlikely-to-create-problems-for-indias-defence-sector-v-k-saraswat/articleshow/90098207.cms>

THE ECONOMIC TIMES

Thu, 10 Mar 2022

India-China relationship must be based on 'three mutuals' - mutual respect, mutual sensitivity and mutual interest: Shringla

Development of India-China relationship has to be based on 'three mutuals' - mutual respect, mutual sensitivity and mutual interest, Foreign Secretary Harsh V Shringla suggested on Wednesday ahead of 15th round of India-China commanders talk to end the standoff in Ladakh. "We have made it clear to China that peace and tranquillity in the border areas is essential for the development of our relationship. Development of India-China relationship has to be based on 'three mutuals' - mutual respect, mutual sensitivity and mutual interest," Shringla recommended in his address at the Inaugural Session of the Training Module on India's Neighbourhood, Lal Bahadur Shastri National Academy of Administration.

India and China are set to hold the 15th round of military talks on March 11 to ease tensions in Ladakh, with the dialogue expected to focus on resolving outstanding issues at the remaining friction points along the Line of Actual Control (LAC), officials familiar with the development said on Tuesday. The last round of Corps Commander-level talks was held on January 12.

Shringla's address which focussed on India's outreach to the neighbourhood also had references to Pak-sponsored cross-border terror. "Unfortunately, we must also contend with geo-political realities and extant threats such as cross-border terrorism and crime. We will be resolute in dealing with them. We will continue to expand our capacities to do so. We will build alliances and networks through multilateral and plurilateral constructs such as the UN, the FATF, SCO and closer home through BIMSTEC and IORA and IONS, to deal with security challenges."

<https://economictimes.indiatimes.com/news/defence/india-china-relationship-must-be-based-on-three-mutuals-mutual-respect-mutual-sensitivity-and-mutual-interest-shringla/articleshow/90113527.cms>

THE ECONOMIC TIMES

Thu, 10 Mar 2022

India, Sri Lanka explore slew of maritime security agreements for Indian Ocean Region

Eyeing to secure its strategic interests in the Southern Indian Ocean region amid China's growing inroads, New Delhi is exploring with Colombo a slew maritime security agreements that

will strengthen India's interests, particularly around the eastern Trincomalee harbour. This mechanism include supply of Donier surveillance aircraft for the Sri Lanka Air Force, a ship repair dock for the Sri Lanka Navy in Trincomalee and suggestion to post a Sri Lankan Navy officer at the Intelligence Fusion Centre, a Bahrain-based intelligence sharing office which is a US Navy initiative to combat international terrorism, the narcotics trade and ensure safe maritime passage for commercial vessels in the region, ET has learnt.

India is also keen to start a renewable energy (solar power) project in and around Sampur near Trincomalee and some of the economic projects could figure on the agenda when Sri Lankan Finance Minister visits India later this month to fine tune one bn usd Line of Credit to boost the economy of the island nation.

An earlier plan by India to begin a coal power project in joint partnership with Japan has now been put on backburner as Sri Lanka announced a move away from coal plants as part of its futuristic energy policy.

The Lankan Ministers and senior Indian officials have been visiting each other's capitals often over the last six months to put the Lankan economy back on track. Colombo has identified eight sectors which they want to integrate with India for economic revival. Defence partnership is one area where Colombo is putting emphasis

Trincomalee has been of special strategic significance to India given its geographical location. India and Sri Lanka signed a deal in January to redevelop Trincomalee oil tank farms which was a result of an arduous effort undertaken by the two neighbours over the last few years.

Besides, the reopening of the Palay airport for commercial operations and several cultural projects in the Jaffna peninsula are also on the agenda of the two governments. Jaishankar is scheduled in Colombo in mid-March that is expected to be followed by the BIMSTEC Summit in Colombo on March 30 where the PM will participate either physically or virtually.

<https://economictimes.indiatimes.com/news/defence/india-sri-lanka-explore-slew-of-maritime-security-agreements-for-indian-ocean-region/articleshow/90113417.cms>

Business Standard

Thu, 10 Mar 2022

Jindal Stainless (Hisar) jumps on bagging international certification in aerospace industry

Jindal Stainless (Hisar) rose 3.77% to Rs 356.20 after the company said it received AS 9100D Certification, a quality management system for aviation, space, and defence organizations.

The certification validates Jindal Stainless (Hisar) (JSHL)'s competence to constantly meet highly stringent standards of the aerospace industry. It also enables JSHL to get listed in OASIS, the Online Aerospace Supplier Information System database, which showcases the company offerings to aerospace manufacturers.

The AS 9100D certification journey was driven by the top management and implemented by a team of around 120 people across the supply chain, within 15 months, JSHL said in a statement. JSHL managing director, Abhyuday Jindal, said: "Our ambition is to become a globally certified, end-to-end solution provider in aviation, defence, and space sectors. As an internationally recognized benchmark, AS 9100D will help us gain competitive advantage in the global and domestic aerospace marketplace, helping us expand our international footprint."

JSHL, senior vice president-manufacturing, Vijay Bindlish, added: "With aerospace emerging as a growing market, and the Government emphasis on Make in India, AS 9100D Certification is a prime requirement to gain greater access into this segment."

JSHL has been catering to the requirements of strategically significant and prestigious customers like ISRO (Indian Space Research Organisation), DRDO (Defence Research and Development Organisation) and BDL (Bharat Dynamics Ltd), VSSC (Vikram Sarabhai Space Centre) among others.

Meanwhile, on 8 March 2022, JSHL managing director, Abhyuday Jindal, said: "Among other uncertainties that the world is currently facing, we are witnessing never-seen-before spikes in prices of Nickel. As a proactive step to address volatility and contain risk, we continue to follow a prudent risk management policy to sync our sales order and raw material booking on a real time basis through increased coordination between our supply chain stakeholders."

At present the company has a healthy order book and it is also maintaining its focus on exports. Majority of the company's orders come from long term quantity contracts with its customers. The firm has a diversified mix of portfolio between high nickel as well as low or no nickel product range. JSHL production lines are capable of churning out flexible product mix in line with the market demand and raw material availability.

"The whole situation is an evolving one and we're closely monitoring it with our robust risk management practices. Russia commands about 6-8% of the refined Nickel production of the world. Our dependence on Russia for raw material sourcing is relatively very less since we source majority of our nickel from Scrap and NPI. These are majorly sourced from within India, from far-east countries such as Indonesia, and some quantities from Europe," he added.

JSHL is an integrated stainless steel plant with a melting capacity of 8,00,000 tonnes per annum. It is also the world's largest producer of stainless steel strips for razor blades and India's largest producer of coin blanks, serving the needs of Indian and international mints. Its specialty product division caters to the high-end precision and specialty stainless steel requirements of reputed Indian and international customers.

On a consolidated basis, JSHL's net profit rose 90.58% to Rs 513.68 crore on 32.63% rise in net sales to Rs 4173.43 crore in Q3 December 2021 over Q3 December 2020.

https://www.business-standard.com/article/news-cm/jindal-stainless-hisar-jumps-on-bagging-international-certification-in-aerospace-industry-122031000275_1.html

US Warns Russia May Use Biological Weapons in Ukraine

The United States on Wednesday rejected Russian claims that it supports a bioweapons program in Ukraine, saying the allegations were a sign that Moscow could soon use the weapons themselves.



Earlier, Russia had claimed that it has found biological weapons in Ukraine

"The Kremlin is intentionally spreading outright lies that the United States and Ukraine are conducting chemical and biological weapons activities in Ukraine," State Department spokesman Ned Price said in a statement.

"Russia is inventing false pretexts in an attempt to justify its own horrific actions in Ukraine."

White House Press Secretary Jen Psaki said the claims were "preposterous" and noted that "we've also seen Chinese officials echo these conspiracy theories."

"Now that Russia has made these false claims... we should all be on the lookout for Russia to possibly use chemical or biological weapons in Ukraine, or to create a false flag operation using them," she said on Twitter.

On March 6, Moscow's foreign ministry tweeted that Russian forces found evidence that Kyiv was erasing traces of the military-biological program in Ukraine, allegedly financed by the United States.

Price said "this Russian disinformation is total nonsense" and added that Russia had "a track record of accusing the West of the very crimes that Russia itself is perpetrating."

The United States said Tuesday however it was working with Ukraine to prevent invading Russian forces from seizing biological research material in the country.

<https://www.ndtv.com/world-news/russia-ukraine-war-russia-may-launch-chemical-attack-in-ukraine-us-2813999>



Scientists develop energy-efficient hydrogen production by urea electrolysis

Indian Scientists have designed an electrocatalyst system for energy-efficient hydrogen production with the help of electrolysis of urea. The urea electrolysis is helpful towards urea-based waste treatment with low-cost hydrogen production. This can be utilized for energy production towards our country's benefits.

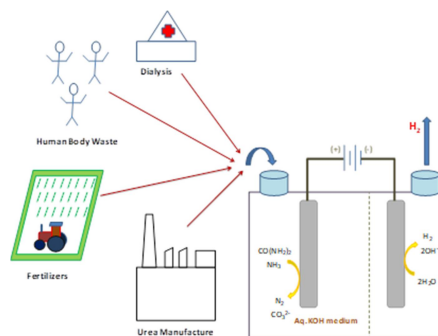
The energy requirement for production of hydrogen through water electrolysis can be reduced by 70 % through urea electrolysis. The energy-intensive counterpart of water splitting, oxygen evolution, can be replaced with urea oxidation in urea electrolysis. The low-cost, earth-abundant Ni-based catalysts are widely applied for this process. The main challenge associated with urea oxidation is retaining the prolonged activity of the catalyst as the strong adsorption of the reactive intermediate (CO_x) on the active site, referred to as catalyst poisoning, causes activity loss.

Towards this end, Mr. Alex C, Mr. Gaurav Shukla, Mr. Muhammed Safer N. K., and Dr. Neena S John from the Centre for Nano and Soft Matter Sciences (CeNS), an autonomous institute of the Department of Science & Technology, Govt. of India have developed this Nickel oxide (NiO_x) based system for producing hydrogen from electro-oxidation of urea.

In the series of research works published in the journals '*Electrochimica Acta*' and '*Journal of Materials Chemistry A*', the scientists have explored electrocatalysts and shown that surface defective NiO and Ni_2O_3 systems having more Ni^{3+} ions are more efficient electrocatalysts than conventional NiO. They have used high-energy electron beams to produce surface defective unsaturated Ni sites in NiO (e-NiO). The study reveals that e-NiO

prefers direct mechanism of urea electro-oxidation due to strong adsorption of urea molecule, whereas NiO favors indirect mechanism with low activity. Further, the prominent electrocatalyst poison CO_x could be removed by adjusting the molar ratio of KOH and Urea with improved kinetics.

The researchers, Alex and Gaurav, are of the opinion that the e-beam treatment is an effective way to produce a large number of coordinatively unsaturated active sites on electrocatalysts. It was observed that these generated sites effectively adsorb urea and favors direct urea electro-oxidation mechanism (UOR). The researcher, Safer, continued the studies on another Ni^{3+} oxide



system (Ni_2O_3), revealing that active species $\text{Ni}^{3+}\text{O}(\text{OH})$ on Ni_2O_3 possess high CO_x tolerance than NiO . The active species of high valent Ni oxide system has a profound effect on catalyst activity.

The urea electrolysis is helpful towards urea-based waste treatment with low-cost hydrogen production. India is one of the top countries by urea production, and it produced 244.55 LMT of urea during 2019-20. The nitrogenous fertilizer industries generate a high concentration of ammonia and urea as effluents. This can be utilized for energy production towards our country's benefits.

<https://dst.gov.in/scientists-develop-energy-efficient-hydrogen-production-urea-electrolysis#:~:text=by%20urea%20electrolysis-.Scientists%20develop%20energy%2Defficient%20hydrogen%20production%20by%20urea%20electrolysis,with%20low%2Dcost%20hydrogen%20production.>

