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Russia delivers more efficient nuclear fuel for Kudankulam

After the next refuelling, the reactor will start operations in an 18-month fuel cycle, according to Rosatom State Corporation

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Rosatom State Corporation of Russia has supplied the first batches of more reliable and cost-efficient nuclear fuel over the existing one, the TVS-2M nuclear fuel, to India for the Units 1 and 2 of Kudankulam Nuclear Power Plant (KNPP), the company said in a statement on Friday.

Once the new TVS-2M fuel is used in the next refuelling, the reactor will start operations with an 18-month fuel cycle. It means the reactor, which has to be stopped for every 12 months for removing

the spent fuel and inserting the fresh fuel bundles and allied maintenance, will have to be stopped for every 18 months.

"Thus, TVEL has fulfilled the agreement with Nuclear Power Corporation of India Limited (NPCIL) on implementation of a comprehensive engineering project, including introduction of TVS-2M nuclear fuel and elongation of the fuel cycle from 12 to 18 months for both VVER-1000 reactors," it stated.

Compared to the current fuel model, the TVS-2M fuel assemblies have a number of



The economic efficiency of Kudankulam nuclear project is set to increase due to the longer fuel cycles. *A. SHAIKMOHIDEEN

advantages making them more reliable and cost-efficient, according to Rosatom. Firstly, it is the rigidity of a bundle. Because of the welded frame, the fuel assemblies

in the reactor core retain their geometry. The spacer grids protect the fuel rod cladding from fretting wear and the additional spacer grid makes the fuel assem-

bles vibration-resistant.

Secondly, the new fuel has increased uranium capacity – one TVS-2M assembly contains 7.6% more fuel material as compared to the earlier fuel bundles. In addition, the special feature of the Kudankulam fuel in particular is the new generation anti-debris filter protecting bundles from debris damage, which may be caused by small-sized objects in the reactor core, the statement explained.

Operation in longer fuel cycles also enhances the economic efficiency of a plant:

As reactors have to undergo stoppage and refueling less frequently, the power units can produce more electricity. Besides, the plant needs to buy less fuel, and as the result, has to deal with smaller amounts of spent fuel.

Russia is building the KNPP under an Inter-Governmental Agreement (IGA) of 1988 and follow on agreements in 1998 and 2008. The first stage, consisting of power units No. 1 and No. 2, was commissioned in 2013 and 2017, respectively. Power units No. 3, 4 and No. 5, 6 are currently under construction.

- Total 22 commercial nuclear reactors - all operated by Nuclear Power Cooperation of India Limited.
- Across Uttar Pradesh + Rajasthan + Gujarat + Maharashtra + Karnataka + Tamil Nadu.
- Total installed capacity 6780 MW.
- India has signed Inter Governmental Agreement (IGA) for co-operation in peaceful uses of nuclear energy with 18 countries.
- The Government has accorded 'in-principle' approval of sites at Kovvada in Andhra Pradesh and ChhayaMithiVirdi in Gujarat for setting up nuclear power plants in cooperation with the United States of America.

Nuclear energy

- Nuclear power is a clean and environment friendly source of electricity generation.
- At present, India's target is to reach a nuclear power capacity of 22480 MW by 2031.

Uranium and Thorium

- The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent unit of Department of Atomic Energy (DAE), has the mandate to identify, evaluate and augment mineral resources of uranium and thorium in India.
- 44 uranium deposits in Andhra Pradesh, Telangana, Jharkhand, Meghalaya, Rajasthan, Karnataka, Chhattisgarh, Uttar Pradesh, Uttarakhand, Himachal Pradesh and Maharashtra.
- Monazite (a mineral containing thorium and rare earth elements) in the coastal beach placer sands in parts of Kerala, Tamil Nadu, Odisha, Andhra Pradesh, Maharashtra and Gujarat and in the inland alluvium in parts of Jharkhand, West Bengal and Tamil Nadu.

INDIA'S FIRST COVID-19 VACCINE FOR ANIMALS: WHY THE NEED WAS FELT

ANONNA DUTT

NEW DELHI, JUNE 10

THE AGRICULTURE Ministry on Thursday unveiled India's first Covid-19 vaccine for animals. Developed by the Hisar-based National Research Centre on Equines, the vaccine, called Ancovax, can protect animals against the Delta and Omicron variants of SARS-CoV-2.

HOW IT WORKS: Ancovax can be used in dogs, lions, leopards, mice, and rabbits. It is an inactivated vaccine developed using an infectious part of the Delta variant. In addition, it uses Alhydrogel as an adjuvant to boost the immune response.

This is the first Covid-19 vaccine for animals developed in India. There were reports from Russia last year that that country, too, had developed a vaccine against animals such as dogs, cats, minks, and foxes.

THE NEED: There have been reports of Covid-19 infection in several animals, including dogs and cats. "The vaccine can protect animals in the zoo. It can also prevent transmission from companion animals to the humans," said Dr Jyoti Misri, senior scientist, Indian Council of Agricultural Research.

The risk of animals spreading the infection to humans is considered low, according to the US Centers for Disease Control and Prevention.

The aim of the vaccine is to protect endangered animals such as lions and tigers. India reported at least nine Covid infections

in Asiatic lions in Chennai zoo last year, with one of the lioness likely to have died of it. This prompted closure of tiger reserves for tourism. Other than that, a study by the Indian Veterinary Research Institute found at least three natural Covid infections in wild Asiatic lions, and a dead leopard cub was found dead and then tested positive for Covid-19.

"There have been a few cases reported in wildlife across the world, some from the zoo, and some in pets. However, percentage-wise, it is very low. The animals develop similar symptoms to humans - cough, cold, fever, and lung lesions. However, since the disease is zoonotic [it can be transmitted from animals to humans], a vaccine would help. However, which vaccine we use has to be carefully decided," said Dr AB Shrivastav, former director, School of Wildlife Forensic and Health, Jabalpur.

WHY TYPE MATTERS: While declining to comment on this vaccine specifically, Dr Shrivastav said a killed vaccine for wild animals is always better than a live-attenuated vaccine (where a weakened live virus is used).

"We avoid live vaccine in wild animals. This is because a live vaccine might have been attenuated for one particular species, but it can still cause disease in another. Some 15 or 20 years back, a rabies vaccine developed for dogs was given to wolves in Africa and unfortunately the entire pack died. A killed virus vaccine will not harm the animals," he said.

Daily MCQ for APSC CCE

Which of the following temples is also known as the White Pagoda ?

- A. Konark Sun Temple
- B. Lingaraja Temple
- C. Jagannath Temple Dibrugarh
- D. None of the Above

Correct Answer is: **D. None of the Above.**

The Jagannath Temple at Puri is known as the White Pagoda. It is a part of Char Dham pilgrimages (Badrinath, Dwaraka, Puri, Rameswaram).

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