GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
RAJYA SABHA
UNSTARRED QUESTION NO-331
ANSWERED ON 06/02/2025

OPERATIONAL NUCLEAR POWER PLANTS

331. SHRI MAYANKBHAI JAYDEVBHAI NAYAK

Will the PRIME MINISTER be pleased to state:-

(a) the number of the Nuclear Power Plants (NPPs) constructed and operated by the Department of Atomic Energy and its units that are currently operational and the details thereof; and

(b) whether there is any progress in the related fuel cycle activities, if so, the details thereof?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (DR. JITENDRA SINGH)

(a) Presently, the installed nuclear power capacity in the country comprises of 24 reactors with a total capacity of 8180 MW. Of these, currently one reactor, RAPS-1 is under extended shutdown and three reactors, TAPS-1&2 and MAPS-1 are in project mode for refurbishment. The remaining twenty reactors are operational. The details are given in **Annexure.**

(b) India is pursuing a three-stage nuclear power programme for optimum utilisation of its limited uranium resources and exploit its vast thorium resources for long term energy security, by following nearly closed nuclear fuel cycle wherein the spent fuel from reactors is treated as resource material and not waste. India has acquired expertise in backend fuel cycle of pressurised heavy water reactors (PHWRs). Nuclear Fuel Complex (NFC) is engaged in supply of nuclear fuel for all the PHWR's operating in the country by sourcing raw material both from indigenous as well as foreign sources. NFC with its initial establishment in Hyderabad has further augmented its own production facilities for fuel and structural fabrication at Hyderabad and further established new facilities through green field projects at Zirconium Complex, Pazhayakayal for Zirconium sponge production and for fuel production at NFC, Kota. NFC in collaboration with other Units like BARC, RRCAT, NPCIL etc., had developed few systems / equipment, process improvements etc., towards reducing the dependency on import of such requirements in the field of nuclear fuel fabrication, quality control / assurance, automation / mechanization etc., thereby aiming for self- sustenance in this part of nuclear fuel cycle towards realizing Viksit Bharat.

Currently, the spent fuel from PHWRs is reprocessed to extract fissile material for use as fuel for next stage nuclear power plants. However, a small volume of radioactive liquid wastes containing minor actinides and fission products is generated during reprocessing. The high level radioactive liquid waste, generated from reprocessing of spent fuel, is subjected to a process called vitrification, wherein it is converted to glass. This vitrified solid product is subjected to natural cooling in solid storage surveillance facility. This policy is at par with international practices following the guidelines of International Atomic Energy Agency (IAEA).

For efficient management of high-level radioactive waste, BARC has developed and demonstrated partition technology for separation of long-lived actinides to facilitate increase in specific loading of waste in the vitrified solid and thereby facilitating substantial volume reduction of vitrified waste. Moreover, this partition technology can also help in recovery of useful radio-isotopes such as Caesium-137, Strontium-90, Ruthenium-106 from the liquid wastes for various societal applications.

Capacity enhancement for PHWR fuel reprocessing and waste management is under progress by construction of large capacity Integrated Nuclear Recycling Plant (INRP) deploying the partition technology.

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Annexure

Sr. No.	Reactor & Location	Capacity (MW)
1	TAPS-1, Tarapur, Maharashtra	160*
2	TAPS-2, Tarapur, Maharashtra	160*
3	TAPS-3, Tarapur, Maharashtra	540
4	TAPS-4, Tarapur, Maharashtra	540
5	RAPS-1, Rawatbhata, Rajasthan	100#
6	RAPS-2, Rawatbhata, Rajasthan	200
7	RAPS-3, Rawatbhata, Rajasthan	220
8	RAPS-4, Rawatbhata, Rajasthan	220
9	RAPS-5, Rawatbhata, Rajasthan	220
10	RAPS-6, Rawatbhata, Rajasthan	220
11	MAPS-1, Kalpakkam, Tamilnadu	220*
12	MAPS-2, Kalpakkam, Tamilnadu	220
13	NAPS-1, Narora, Uttar Pradesh	220
14	NAPS-2, Narora, Uttar Pradesh	220
15	KAPS-1, Kakrapar, Gujarat	220
16	KAPS-2, Kakrapar, Gujarat	220
17	KAPS-3, Kakrapar, Gujarat	700
18	KAPS-4, Kakrapar, Gujarat	700
19	KAIGA-1, Kaiga, Karnataka	220
20	KAIGA-2, Kaiga, Karnataka	220
21	KAIGA-3, Kaiga, Karnataka	220
22	KAIGA-4, Kaiga, Karnataka	220
23	KKNPP-1, Kudankulam, Tamilnadu	1000
24	KKNPP-2, Kudankulam, Tamilnadu	1000

* *In project mode for refurbishment*

\# *Under extended shutdown*

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