

Department of Atomic Energy



DAE Inaugurates Deuterated Compounds Production Plant and Commissions Prototype Sodium Cell at HWBF, Vadodara

Secretary, DAE & Chairman, AEC inaugurates the indigenous Versatile Deuterated compounds Production Plant (VDPP) and commissions the 24 kA Prototype Sodium Cell at HWBF, Vadodara.

VDPP strengthens indigenous production capability of specialised deuterated compounds required for advanced scientific research, strategic applications and frontier technologies.

24 kA Prototype Sodium Cell marks a major milestone towards indigenous industrial-scale production of nuclear-grade sodium for India's Fast Breeder Reactor Programme.

Facilities reinforce India's technological self-reliance and support the long-term objectives of the country's three-stage nuclear power programme.

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In a significant step towards strengthening India's indigenous technological capabilities and strategic materials programme, Dr. Ajit Kumar Mohanty, Secretary, Department of Atomic Energy & Chairman, Atomic Energy Commission, inaugurated the Versatile Deuterated compounds Production Plant (VDPP) and commissioned the 24 kA Prototype Sodium Cell at the Heavy Water Board Facilities (HWBF), Vadodara, on 21 June 2026.

Speaking on the occasion, Dr. Mohanty said, "The inauguration of the VDPP and commissioning of the 24 kA Prototype Sodium Cell reflect India's growing capabilities in developing critical materials and technologies through indigenous research and innovation. These facilities will strengthen strategic self-reliance, support advanced scientific research and contribute to the long-term objectives of India's nuclear energy programme. The development of indigenous nuclear-grade sodium

production capability is particularly important for supporting the future growth of India's Fast Breeder Reactor Programme and advancing the vision of Viksit Bharat through technological excellence."

The ceremony was held in the august presence of Shri K. N. Vyas, Homi Bhabha Chair Professor and Former Secretary, Department of Atomic Energy & Chairman, Atomic Energy Commission. Also present were Shri V. V. S. A. Prasad, Chairman & Chief Executive, Heavy Water Board; Shri K. V. Tale, Director (Operation/Technical), Heavy Water Board; Shri Nitesh Mehta, Officer on Special Duty, HWBF (Vadodara); along with senior officials of the Department of Atomic Energy, scientists, engineers and employees of the Heavy Water Board.

The Versatile Deuterated Compounds Production Plant has been established to enhance the country's indigenous capability for the production of specialised deuterated compounds required for advanced scientific research, strategic applications and frontier technological programmes. The facility is aimed to play a vital role in meeting national requirements in this critical domain through the indigenous production of high-purity deuterated solvents.

The commissioning of the 24 kA Prototype Sodium Cell marks a major technological achievement towards the indigenous industrial-scale production of nuclear-grade sodium, a critical material for India's Fast Breeder Reactor Programme. Developed through sustained research, engineering excellence and technological innovation, the facility represents a significant step towards achieving self-reliance in strategic materials required for the second stage of India's three-stage nuclear power programme, in line with the national vision of AtmaNirbhar Bharat.

These achievements underscore DAE's continued commitment to technological self-reliance, innovation and excellence in strategic sectors. The milestones further contribute to India's journey towards Viksit Bharat through indigenous technological advancement and strategic capability development.











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India Expands Nuclear Materials Capability With New Deuterated Compounds Plant And Sodium Cell

India Expands Nuclear Materials Capability With New Deuterated Compounds Plant And Sodium Cell

📁 Manufacturing • 📅 21 June, 2026



India has commissioned new facilities aimed at strengthening domestic production of specialised nuclear materials, marking a step forward in the country's long-term nuclear energy strategy. On 21 June 2026, the Department of Atomic Energy (DAE) inaugurated a versatile deuterated compounds production plant and commissioned a 24 kA prototype sodium cell at the Heavy Water Board Facility in Vadodara. According to the official government announcement, the facilities are intended to support advanced research, strategic applications and India's fast breeder reactor programme.

The initiatives reflect India's broader push to strengthen domestic capabilities in advanced technologies and strategic materials, a priority also highlighted in national innovation efforts described in India's advanced technology development agenda. By expanding indigenous production capacity, the projects aim to reduce reliance on imported materials while supporting scientific research and the country's long-term nuclear power programme.

New Facility To Produce High-Purity Deuterated Compounds



Officials inaugurate the versatile deuterated compounds production plant at the Heavy Water Board Facility in Vadodara on 21 June 2026. Image credit: Government of India Press Information Bureau

The versatile deuterated compounds production plant (VDPP) has been established at the Heavy Water Board Facility in Vadodara to enhance India's capacity to produce specialised deuterated compounds domestically. These compounds are widely used in advanced scientific research, strategic applications and a range of high-technology programmes.

The plant is designed to manufacture high-purity deuterated solvents required for research and technological applications. By producing these materials domestically, the facility is expected to support national research requirements while strengthening India's capability in strategic materials manufacturing.

Prototype Sodium Cell Supports Fast Breeder Reactor Programme

Alongside the VDPP inauguration, a 24 kA prototype sodium cell was commissioned at the facility. The prototype represents a technological milestone towards industrial-scale domestic production of nuclear-grade sodium, a critical material used in fast breeder reactors.

Fast breeder reactors form a key component of India's three-stage nuclear power programme. Developing indigenous production capacity for nuclear-grade sodium is therefore considered important for the programme's future expansion and operational sustainability.

"The inauguration of the VDPP and commissioning of the 24 kA prototype sodium cell reflect India's growing capabilities in developing critical materials and technologies through indigenous research and innovation. These facilities will strengthen strategic self-reliance, promote advanced scientific research and contribute to the long-term objectives of India's nuclear energy programme." – **Dr Ajit Kumar Mohanty, Secretary, Department of Atomic Energy and Chairman, Atomic Energy Commission**

Supporting Strategic Materials And Energy Security

The inauguration ceremony was attended by senior officials including Mr K N Vyas, Homi Bhabha Chair Professor and former Secretary of the Department of Atomic Energy; Mr V V S A Prasad, Chairman and Chief Executive Officer of the Heavy Water Board; and Mr K V Tale, Director (Operations/Technical) of the board.

Officials noted that sustained research, engineering development and technological innovation were central to the creation of the new sodium cell prototype. The facility is expected to contribute to strategic materials self-reliance required for the second stage of India's nuclear energy programme.

The expansion of indigenous capabilities in nuclear and energy technologies also aligns with wider national efforts to diversify and strengthen the country's clean energy mix, alongside initiatives such as the expansion of renewable power highlighted during India's recent focus on accelerating wind energy development.

By strengthening domestic manufacturing of critical nuclear materials, the new facilities are intended to support scientific research, energy security and the continued development of India's strategic technology ecosystem.

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એટોમિક એનર્જી કમિશનના ચેરમેન વડોદરામાં દેશના ફાસ્ટ બ્રિડ ન્યુક્લિયર રિએક્ટર પોગ્રામમાં વડોદરા મહત્વની ભૂમિકા ભજવશે

વડોદરા, રવિવાર

વીજળી પેદા કરવા માટે દેશના મહત્વકાંક્ષી ફાસ્ટ બ્રિડ ન્યુક્લિયર રિએક્ટર પોગ્રામમાં વડોદરાનો હેવી વોટર પ્લાન્ટ મહત્વની ભૂમિકા ભજવવા જઈ રહ્યો છે. ફાસ્ટ બ્રિડ ન્યુક્લિયર

રિએક્ટરમાં તાપમાનને કન્ટ્રોલમાં રાખવા માટે કૂલન્ટ તરીકે વપરાતા ૨૪ કેએ સોડિયમ મેટલનું ઉત્પાદન કરવામાં હેવી વોટર પ્લાન્ટને સફળતા મળી છે.

રિએક્ટરમાં તાપમાનને કાબૂમાં રાખવા માટે કૂલન્ટ તરીકે વપરાતા ૨૪ કેએ સોડિયમ મેટલ બનાવવામાં શહેરના હેવી વોટર પ્લાન્ટને સફળતા

આજે આ યુનિટનું ડિપાર્ટમેન્ટ ઓફ એટોમિક એનર્જીના સેક્રેટરી અને એટોમિક એનર્જી કમિશનના ચેરમેન ડૉ. અજીત કુમાર મોહંતીના હાથે ઉદઘાટન કરવામાં આવ્યું હતું. મળતી જાણકારી પ્રમાણે ફાસ્ટ બ્રિડ હેવી વોટર રિએક્ટરમાં ન્યુક્લિયર રિએક્શન થાય છે ત્યારે બહુ ઊંચા તાપમાન એનર્જી રિલિઝ થાય છે અને તેને વરાળમાં ફેરવવામાં આવે છે. જેનાથી ટર્બાઈન ચાલે છે અને ઈલેક્ટ્રિસિટી ઉત્પન્ન થાય

છે. આ પ્રક્રિયા દરમિયાન તાપમાનને કાબૂમાં રાખવા ન્યુક્લિયર ગ્રેડના ૨૪ કેએ સોડિયમ મેટલનો પ્રવાહી સ્વરૂપમાં કૂલન્ટ તરીકે ઉપયોગ થાય છે.

ભારતે તાજેતરમાં તામિલનાડુમાં કલ્પકકમ ન્યુક્લિયર પ્લાન્ટમાં પહેલું ફાસ્ટ બ્રિડ રિએક્ટર કાર્યરત કરી દીધું છે અને તેમાં જે સોડિયમ મેટલનો ઉપયોગ કર્યો છે તે વિદેશથી

મંગાવવામાં આવ્યું છે પણ ભવિષ્યમાં સ્થપાનારા ફાસ્ટ બ્રિડ રિએક્ટર માટેનું સોડિયમ મેટલ ભારતમાં અને તે પણ વડોદરામાં જ બનશે. છેલ્લા ૧૩ વર્ષથી હેવી વોટર પ્લાન્ટમાં આ માટે સંશોધન થઈ રહ્યું હતું અને તેનો પ્રોટોટાઈપ બનાવવામાં સફળતા મળી છે. આ યુનિટમાં વર્ષે ૧૮૦૦ મેટ્રિક ટન ૨૪ કેએ સોડિયમ મેટલ બનાવવાની ક્ષમતા છે.

ડ્યુરેટેડ કમ્પાઉન્ડસ પ્રોડક્શન પ્લાન્ટ પણ કાર્યરત કરાયો

હેવી વોટર પ્લાન્ટ ખાતે વર્સેટાઈલ ડ્યુરેટેડ કમ્પાઉન્ડસ પ્રોડક્શન પ્લાન્ટને પણ કાર્યરત કરાયો છે. આ પ્લાન્ટમાં બનતા કમ્પાઉન્ડનો ઉપયોગ ફાર્માસ્યુટિકલ ઉદ્યોગોમાં, પ્રોટીન, ડીએનએની પ્રક્રિયાઓ સમજવા માટેના સંશોધનમાં, શરીરમાં દવાઓ કેવી રીતે કામ કરે છે તેના રિસર્ચમાં થાય છે. આવા ઘણા ડ્યુરેટેડ કમ્પાઉન્ડસ વિદેશથી આયાત કરવા પડે છે પણ હેવી વોટર પ્લાન્ટ ખાતે પ્લાન્ટ શરૂ થયા બાદ આયાત પરની નિર્ભરતા ઘટશે અને વ્યૂહાત્મક ક્ષેત્રોમાં ભારત આત્મ નિર્ભર પણ બની શકશે.

એટોમિક એનર્જી કમિશન ચેરમેને યોગ કાર્યક્રમમાં પણ હાજરી આપી હેવી વોટર પ્લાન્ટ દ્વારા કર્મચારીઓ અને અધિકારીઓ માટે આજે યોગ દિવસે કાર્યક્રમ યોજાયો હતો. એટોમિક એનર્જી કમિશનના વર્તમાન ચેરમેન ડૉ. અજીત મોહંતની સાથે પૂર્વ ચેરમેન કે એન વ્યાસે પણ હેવી વોટર બોર્ડના ચેરમેન વી એસ એ પ્રસાદે પણ હાજરી આપી હતી.

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📅 21 June 2026

DAE inaugurates Deuterated Compounds Plant and commissions Prototype Sodium Cell at Vadodara

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Summary:

- Dr. Ajit Kumar Mohanty, Secretary DAE & Chairman AEC, inaugurated the indigenous Versatile Deuterated compounds Production Plant (VDPP) and commissioned the 24 kA Prototype Sodium Cell at Heavy Water Board Facilities (HWBF), Vadodara, on 21 June 2026
- VDPP strengthens indigenous production of high-purity deuterated solvents/compounds needed for advanced scientific research, strategic applications and frontier technologies
- The 24 kA Prototype Sodium Cell is a major step towards indigenous industrial-scale production of nuclear-grade sodium - a critical material (coolant) for India's Fast Breeder Reactor (FBR) Programme
- Both facilities support the second stage of India's three-stage nuclear power programme and reinforce technological self-reliance (Aatmanirbhar Bharat)
- Reflects DAE's push for indigenous critical-materials capability aligned with Viksit Bharat 2047

UPSC Relevance: GS3 - nuclear energy, indigenous critical materials, three-stage nuclear programme and strategic self-reliance in S&T.

Prelims Facts:

- VDPP = Versatile Deuterated compounds Production Plant; located at HWBF, Vadodara (Heavy Water Board)
- Nuclear-grade sodium is used as coolant in Fast Breeder Reactors (Stage 2 of the three-stage programme)
- DAE Secretary is also Chairman of the Atomic Energy Commission (AEC)

Key Term: Three-stage nuclear power programme - India's Bhabha-conceived plan: (1) PHWRs using natural uranium, (2) Fast Breeder Reactors using plutonium, (3) thorium-based reactors.

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