



National Workshop on Nuclear-Hydrogen Synergy 2026

PATHWAYS FOR INDIA'S CLEAN ENERGY TRANSITION

UNDER UNSECO CHAIR (RCESD) ACTIVITY

Sponsored By South Asia Foundation (MSF/SAF)

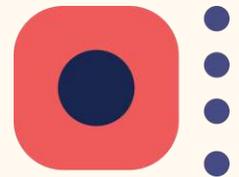
30TH JAN 2026

PONDICHERRY UNIVERSITY



IN ASSOCIATION WITH
IGCAR - KALPAKKAM

EVENT COMPENDIUM



Organized By

Department of Green Energy Technology
Madanjeet School of Green Energy Technologies
PONDICHERRY UNIVERSITY



PONDICHERRY UNIVERSITY

(A Central University established by an Act of Parliament No. 53 of 1985)
Accredited with A+ Grade by NAAC – Vth Cycle

National Workshop on Nuclear-Hydrogen Synergy 2026

UNDER UNSECO CHAIR(RCESD) ACTIVITY

Sponsored By MSF/SAF

Organized By
Department of Green Energy Technology
Madanjeet School of Green Energy Technologies
PONDICHERRY UNIVERSITY

IN ASSOCIATION WITH
IGCAR - KALPAKKAM

NWNHS
2026





புதுவைப் பல்கலைக்கழகம்

(மத்திய பல்கலைக்கழகம்)

पांडिचेरी विश्वविद्यालय

(केंद्रीय विश्वविद्यालय)

PONDICHERRY UNIVERSITY

(A Central University)

பேராசிரியர் ப. பிரகாஷ் பாபு

துணை வேந்தர்

आचार्य प. प्रकाश बाबू

कुलपति

Prof. P. PRAKASH BABU

VICE - CHANCELLOR



லாக்டர். அம்பேத்கர் நிர்வாக கட்டிடம்,
ஆர். வெங்கடராமன் நகர்,

டீ. அபேத்கர் ப்ராசானிக் ஔவன

ஆர்.வீகடராமன நகர்,

Dr. Ambedkar Administrative Building

R. Venkataraman Nagar,

காலாப்பட்டு, புதுச்சேரி,

காலாபெட் புதுச்சேரி,

Kalapet, Puducherry - 605 014.

12.01.2026

Welcome to NWNHS- 2026

I am delighted to extend a warm welcome and pen this preface for the *National Workshop on Nuclear-Hydrogen Synergy 2026: Pathways for India's Clean Energy Transition*, a timely and forward-looking forum that brings together leading nuclear experts from IGCAR, academic faculties, researchers and students to explore the nexus of atomic energy and hydrogen production. The event is highly timed in the context of India's ambitious clean energy trajectory, the synergy between nuclear power and hydrogen production offers a compelling pathway to decarbonize energy systems, create reliable baseload power, and produce very low-carbon emission for hydrogen at large scale. Such integration enhances energy security and supports transformational applications across sectors—from industrial processes to transportation—while contributing to the achievements of national climate commitments. This workshop provides an invaluable platform to examine advancement in nuclear-hydrogen technologies, policy frameworks, and collaborative strategies that can accelerate the adoption of clean energy pathways in our country.

The workshop features SIX invited lectures by IGCAR experts on nuclear–hydrogen technologies and safety in Fast Breeder Reactors, along with vibrant networking opportunities. Participants are encouraged to engage actively and build lasting collaborations for a sustainable future. I thank the faculty of the Department of Green Energy Technology for making this event possible and appreciate Prof. R. Arun Prasath, UNESCO Chair RCESD, and Convenor of this workshop, for his visionary leadership and dedicated efforts in bringing IGCAR and Pondicherry together. I am confident that this workshop will foster insightful discussions and lasting collaborations, while contributing meaningfully to India's clean energy transition and technological advancements for a sustainable future.

(Prof. P. Prakash Babu)

श्रीकुमार जी पिल्लै

उत्कृष्ट वैज्ञानिक एवं निदेशक

SREEKUMAR G PILLAI

Outstanding Scientist & DIRECTOR



सत्यमेव जयते

भारत सरकार
परमाणु ऊर्जा विभाग
इन्दिरा गाँधी परमाणु अनुसंधान केन्द्र
कल्पाक्कम 603 102, तमिलनाडु, भारत

GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
INDIRA GANDHI CENTRE FOR ATOMIC RESEARCH
KALPAKKAM 603 102, TAMIL NADU, INDIA



PREFACE

January 26, 2026

I'm truly delighted that Pondicherry University in association with Indira Gandhi Centre for Atomic Research (IGCAR) is organising the National Workshop on, "Nuclear-Hydrogen Synergy NWNHS-2026". It is exciting to see so many experts gathering to dive into this crucial topic where nuclear energy meets hydrogen production; right at the heart of tackling our world's push for sustainable energy.

Pairing nuclear power with hydrogen production is a game-changer for cutting carbon in tough areas like heavy industry, shipping, and manufacturing. Nuclear gives us steady, high-heat energy and power for making hydrogen through electrolysis or heat-based methods, delivering green hydrogen on a big scale without the ups and downs of solar or wind. This fits perfectly with India's Green Hydrogen Mission and our global drive to net-zero emissions, boosting energy independence along the way.

The workshop's six lectures cover critical facets of nuclear-hydrogen synergy, from green hydrogen production potential in Fast Breeder Reactors (FBRs) and pathways for production, storage, and transportation, to advanced hydrogen sensing for nuclear safety, steam leak scenarios in sodium-cooled systems, and sodium cleaning techniques with hydrogen safety measures. These sessions at NWNHS-2026 will deliver practical insights into safe, scalable integration of nuclear heat for hydrogen economies, equipping participants with actionable knowledge to advance India's green energy goals.

At IGCAR, we are committed to pioneering this domain through rigorous research and demonstration. Leveraging on our fast breeder reactor expertise and ongoing feasibility studies for green hydrogen production; conducted in collaboration with partners like BARC, we are advancing toward a pilot-scale demonstration plant to validate integrated nuclear-hydrogen technologies. Looking forward, our focus will be on homegrown technologies, sharing know-how, and teaming up with others to bring these ideas to life across India.

I extend my sincere gratitude to the Chancellor of Pondicherry University, Prof. P. Prakash Babu and Dr. Arun Prasath, UNESCO Chairholder and Convenor NWNHS-2026, for hosting this insightful workshop and spearheading the valuable collaboration with IGCAR. Your visionary initiative strengthens our shared pursuit of nuclear-hydrogen advancements for a sustainable future.

I extend my warmest best wishes to the organizers, speakers, and all participants. May this workshop ignite transformative ideas and forge lasting pathways to progress. Together, let's power a cleaner, hydrogen-driven future for generations to come.

(Sreekumar G Pillai)
Director



दूरभाष/Phone: +91-44-27480267/27480240 (O) फ़ैक्स/Fax: +91-44-27480060

मोबाइल/Mobile: 9498599840

ई-मेल/E-mail: director@igcar.gov.in

France Marquet
Madanjeet Singh Foundation
Principal Trustee, MSF



I'm delighted to invite you to the vibrant "National Workshop on Nuclear-Hydrogen Synergy 2026: Pathways for India's Clean Energy Transition promises" vital discussions on clean energy innovation, organized under the UNESCO Chair of Green Energy Technologies, located in the Madanjeet Singh School of Green Energy technologies, Pondicherry University. The Department is one of the SAARC Institutions of Excellence promoting regional cooperation through UNESCO Madanjeet Singh Institutions. The workshop will be held on 30th January 2026. It will bring together IGCAR experts, researchers, academics, and students and thus create a synergy of sustainability globally.

Climate change due in particular to the use of fossil fuels has to be gradually replaced so the much-needed approach is to have alternative green and clean energy technologies such as solar photovoltaic, solar thermal, bioenergy, wind energy, wave energy and nuclear energy. The National Workshop on Nuclear-Hydrogen Synergy 2026: Pathways for India's Clean Energy Transition promises is a space for discussing alternatives and raising new ideas from researchers, academics, professionals and students from all over India.

On behalf of my fellow trustees and myself I wish to express my gratitude to Pondicherry University through its Vice Chancellor Prof Prakash Babu and the entire organizing team at the Green Energy technology in partnership with the UNESCO Chair Holder Professor Ramaswamy Arun Prasath convenor of the conference and Professor Prasanth Raveendran New director of the UNESCO Madanjeet Singh School of Greene Energy. I hope you will also enjoy the beautiful scenery of the Bay of Bengal.

Best regards & Thank you,

France Marquet
46 Bd des Invalides 75007 Paris, France
madanjeetsaf@gmail.org

Foreword



I warmly thank the organizers and participants of the Nuclear – Hydrogen Synergy 2026 (NWNHS-2026): Pathways for India's Clean Energy Transition, taking place on 30 January 2026 at Pondicherry University. This event, organized under the UNESCO Chair activities by the Department of Green Energy Technology in collaboration with the Indira Gandhi Centre for Atomic Research, brings together distinguished experts to advance the dialogue on nuclear science, hydrogen technologies, and sustainability.

We are confronting a global energy crisis at the same time as climate change impacts are accelerating. Yet our societies remain deeply dependent on fossil fuels for agriculture, food security, water purification, and transport, and that will remain so for some time, whether we like it or not. Today, the world is home to approximately 8.3 billion people, a number that continues to grow, and all of them, all of us, really, need reliable energy, adequate food, and safe water. This places us in a period of energy paradox: the very systems that sustain human life rely on energy sources that undermine environmental stability, either via carbon emissions, or via the need for cooling water, and via the question of nuclear waste storage. This reality makes the transition more complex, but also more urgent.

The clean energy transition must therefore be rapid, but carefully managed. A short-term mix of fossil fuels, nuclear power, and clean energy may be a transitional necessity in some contexts, but it cannot be the end goal. Fossil fuels remain the main driver of emissions, and both fossil and nuclear systems place significant pressure on eco-hydrological resources. It is essential that the energy sector turns within a realistic timeframe toward clean energy as a clear priority, without creating new crises in water availability, energy access, or food security. In this context, the themes of NWNHS-2026, including nuclear-enabled green hydrogen production, hydrogen storage and transport, sensing technologies, sodium-heated steam generators, and hydrogen safety, are highly relevant, particularly when assessed through the lens of long-term sustainability and environmental safeguards.

UNESCO Biosphere Reserves offer an important framework for advancing these efforts. Designed as places to test, apply, and demonstrate sustainable development solutions, Biosphere Reserves function as living laboratories for living in harmony with nature. They provide appropriate settings to pilot clean energy solutions while protecting biodiversity, water resources, and local livelihoods.

In 2026, the UNESCO Regional Office in South Asia will prioritize the advancement of Biosphere Reserves, with particular attention to Bhutan and Nepal, two ecologically rich countries that currently have no Biosphere Reserves. This presents a timely opportunity to integrate clean energy innovation into conservation and development planning from the outset. Through initiatives such as the UNESCO Chair Programme, the Man and the Biosphere Programme, and the Green School Quality Standards, UNESCO supports climate and energy literacy, scientific capacity building, and dialogue between scientists and policymakers. We must not miss this opportunity to act decisively toward Sustainable Development Goal 7: Clean and Affordable Energy. Let us lead with knowledge, act with responsibility, and commit to a clean energy future that secures food, water, and energy for all while respecting ecological limits.

I commend Prof. R. Arun Prasath, UNESCO Chairholder at Pondicherry University, for his leadership and dedication, and I am confident that NWNHS-2026 will inspire meaningful collaboration toward sustainable clean energy pathways, within UNESCO Biosphere Reserves and beyond.



Dr. Benno Böer

CHIEF OF NATURAL SCIENCES
UNESCO, SOUTH ASIA
REGIONAL OFFICE, NEW DELHI

28.1.26

DR. BENNO BÖER
CHIEF, NATURAL SCIENCES, SOUTH-ASIA

PONDICHERRY UNIVERSITY
DEPARTMENT OF GREEN ENERGY TECHNOLOGY
MADANJEET SCHOOL OF GREEN ENERGY TECHNOLOGIES



Welcome Message

It gives me immense pleasure to extend a warm and cordial welcome to all the distinguished speakers, delegates, researchers, academicians, industry experts, and students to the one-day workshop on “**Nuclear–Hydrogen Synergy 2026**”, hosted at Pondicherry University.

This workshop is jointly organized by the **Department of Green Energy Technology, Pondicherry University, the South Asia Federation (SAF)**, and **IGCAR**, under the esteemed banner of the **UNESCO Chair activity**. The convergence of these institutions reflects a shared commitment toward advancing sustainable, secure, and future-ready energy systems through interdisciplinary collaboration.

As the world transitions toward low-carbon and resilient energy pathways, the synergy between nuclear energy and hydrogen production has emerged as a promising solution to address energy security, climate change mitigation, and industrial decarbonization. Nuclear-assisted hydrogen generation offers the potential for large-scale, continuous, and clean hydrogen production, positioning it as a key pillar in the global clean energy transition. This seminar aims to provide a focused platform to deliberate on recent technological advancements, policy frameworks, safety considerations, and future prospects of nuclear–hydrogen integration.

Pondicherry University, through its Department of Green Energy Technology, remains committed to fostering cutting-edge research, capacity building, and international cooperation in the field of renewable and advanced energy technologies. The association with UNESCO Chair activities further strengthens our mission to promote knowledge dissemination, sustainable development goals, and regional collaboration across South Asia.

I am confident that the technical sessions, expert lectures, and interactive discussions during this seminar will stimulate meaningful dialogue, inspire innovative ideas, and pave the way for collaborative research and policy initiatives. On behalf of the organizing committee, I once again welcome you all and wish the seminar every success.



Prof. R. Prasanth Ravindran
Head of the Department, DGET, PU
Co - Chairman of NWNHS 2026

PONDICHERRY UNIVERSITY
DEPARTMENT OF GREEN ENERGY TECHNOLOGY
MADANJEET SCHOOL OF GREEN ENERGY TECHNOLOGIES



PREFACE

I am pleased to extend my warm welcome to all the participants, distinguished IGCAR nuclear experts, researchers, and academic experts attending this important “One Day National Workshop on Nuclear Hydrogen Synergy” NWNHS-2026, hosted under the UNESCO Chair activity by the Department of Green Energy Technology, Madanjeet School of Green Energy Technologies (UMSGETS), Pondicherry University in profound collaboration with the Department of Atomic Energy, Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam. This is our second collaborative national-level workshop, underscoring nuclear hydrogen synergy as a transformative pathway for sustainable energy generation by leveraging advanced reactor technologies to produce clean hydrogen with no carbon emissions.

In alignment with global efforts to combat climate change and advance in hydrogen technology, the workshop features insightful presentations from eminent IGCAR experts on pathways for Nuclear–hydrogen Synergy. The topics to be covered in the event can be listed as (a) Nuclear-assisted electrolysis and hybrid thermal–electrochemical processes for hydrogen production, (2) Sodium-Cooled Nuclear Fast Breeder Reactors to hydrogen sensing methodologies, and (3) Nuclear safety measures—promising knowledge exchange, interdisciplinary dialogue, and support our Nation’s nuclear mission ambition. India’s Nuclear Energy Mission aims to expand from the current 8.8 GW to 100 GW of nuclear power capacity by 2047 to power Viksit Bharat. India aspires to become a developed nation by 2047 with a USD 30 trillion economy. Thus, increasing our per capita energy consumption is essential to raise living standards, support high-value industries, enhance well-being, improve education and healthcare, and improve the overall quality of life via carbon-emission-free energy. This workshop is being organized at the right time, in line with global and national efforts to fight climate change and ensure fair access to energy for all. I am sure that the outcomes of this important workshop will meaningfully shape our national policy, foster academic-institution linkages, and inspire the next generation of nuclear energy scientists, engineers, and technologists. Once again, I thank all the distinguished speakers from the IGCAR and all the participants for your commitment.

I look forward to a productive day exploring nuclear hydrogen synergy as a transformative step toward cleaner energy production for a sustainable future—have a great time!



Professor R. ARUN PRASATH
UNESCO Chairholder - RCESD
Convenor of NWNHS 2026

About NWNHS 2026



The One Day National Workshop on Nuclear-Hydrogen Synergy 2026: Pathways for India's Clean Energy Transition, hosted by the Department of Green Energy Technology, Madanjeet School of Green Energy Technologies (UMSGETS), Pondicherry University and sponsored by the South Asia Foundation (MSF/SAF) under UNESCO Chair Activity with profound collaboration with the Department of Atomic Energy, Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam – Node focuses on Nuclear hydrogen production as a transformative pathway for sustainable energy generation, leveraging advanced reactor technologies to produce clean hydrogen without carbon emissions. This synergy between nuclear power and the hydrogen economy addresses climate change while meeting growing global energy demands. As India advances its nuclear capabilities, integrating hydrogen production into existing and next-generation reactors—including Small Modular Reactors (SMRs)—offers significant potential for achieving energy security and environmental sustainability goals aligned with national green energy initiatives.

Topics

Advances in Nuclear Hydrogen Production Technology
Hydrogen from Fast Breeder Reactors (FBRs)
Controlled Hydrogen Evolution, Sensing and Safety Measures - FBRs
Sodium-heated Steam Generators
Hydrogen Storage and Transportation

About Pondicherry University

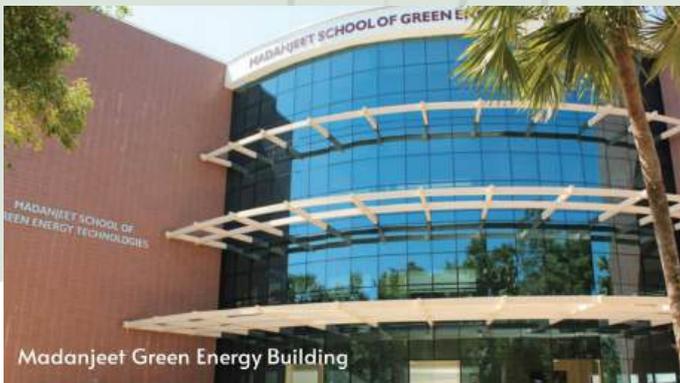


Pondicherry University, established in 1985 is an Indian Central University is one of the most sought-after campuses amongst the students from across the nation as a destination for the Higher Education and Research. Pondicherry University has 15 Schools, 38 Departments, 11 Centres and 1 Chair offering over 144 PG, PG-Diploma/ certificate & Research programmes with a student strength of 7000 including foreign students. Currently the University has more than 130 funded research projects including SAP & FIST Projects from various agencies like UGC, DST, CSIR and DBT. The University has two-off campuses, one located in Port Blair (Andamans) with two Departments viz., Ocean Studies and Marine Biology and Coastal Disaster Management and another Post-Graduate Centre at Karaikal. Fresh green sprawling campus spread over 880 acres, features great Instrumentation & Resource facility, 100% Wi-Fi connectivity with 100% power back-up, 24x7 Library facility, 22 well-furnished hostels, Round the clock medical facility, Placement Cell, Community Radio (Puduvai Vaani) and Study India Programme.



Department of Green Energy Technology

The Department of Green Energy Technology was established in 2010 under the aegis of Madanjeet School of Green Energy Technologies with a vision to promote education and research in Renewable and Green energy. DGET offers M. Tech in Green Energy Technology which is supported by South Asia Foundation and Ph.D. in the field of renewable energy & related subjects. The Ministry of New and Renewable Energy has recognized and approved the Department as a Nodal Centre in the fields of all clean energy sources. DGET has proficient faculties to teach, offer consultancy and take up research work in several core areas of energy.



DGET has several MOUs with leading academic institutions and industries specializing in energy. In 2024, under the effort of DGET, the Madanjeet School of Green Energy Technologies was recognized as UNESCO Chair on Renewable and Clean Energy for Sustainable Development. DGET is constantly evolving and excelling in various fields of energy technologies, both in research and product development.





Dr. Homi J. Bhabha
Father Of The Indian Nuclear Programme

About IGCAR

Indira Gandhi Centre for Atomic Research

Founded in **1971**, **IGCAR** plays a pivotal role in advancing **India's fast reactor technology**. The centre has achieved milestones such as the successful operation of the **Fast Breeder Test Reactor (FBTR)**. In addition to fast reactor development, IGCAR is engaged in multidisciplinary nuclear research spanning materials science, safety systems, thermal hydraulics, radiation shielding, and fuel cycle technologies. It also supports strategic programs in defence, space, and high-performance computing.

In alignment with its climate policy, India declared a **net-zero emission** target by **2070** at **COP26**, reinforcing the strategic role of nuclear energy not only in electricity generation but also in applications such as industrial process heat, seawater desalination, and hydrogen production.



Shri Sreekumar G Pillai
Current Director, IGCAR

In the global pursuit of sustainable and clean energy solutions, **nuclear energy** stands out as a **reliable and low-carbon** source of electricity, capable of delivering **large-scale, uninterrupted baseload power**. As nations intensify efforts to meet their climate commitments and achieve net-zero greenhouse gas emissions, nuclear energy is increasingly seen as an indispensable solution to mitigate climate change and meet **Sustainable Development Goals (SDGs)**, especially SDG 7 (Affordable and Clean Energy) and SDG 13 (Climate Action).

India, under the vision of **Dr. Homi J. Bhabha**, has adopted a unique and long-term strategy through its **three-stage nuclear power programme**. This roadmap is designed to maximize the utilization of domestic resources, particularly **thorium**, of which India holds around 12-18% of the world's known reserves. While thorium is fertile rather than fissile, it has the potential to play a vital role in future advanced reactors, enhancing energy security and sustainability.

Stage I focuses on **Pressurized Heavy Water Reactors (PHWRs)** fuelled by natural uranium. These reactors serve dual purposes: they generate electricity and breed plutonium-239, which becomes the input material for the next phase.

Stage II involves **Fast Breeder Reactors (FBRs)** that convert fertile uranium-238 into additional fissile material, significantly improving fuel efficiency and enabling a closed fuel cycle. A critical project in this stage is the **500 MWe Prototype Fast Breeder Reactor (PFBR) at Kalpakkam**, developed by the **Indira Gandhi Centre for Atomic Research (IGCAR)**. As of 2024, the PFBR is in the advanced stages of commissioning and is expected to become a cornerstone of India's breeder-based nuclear strategy.

Stage III, currently in the research and development phase, envisages **Advanced Heavy Water Reactors (AHWRs)** that use uranium-233 bred from thorium-232, aiming to establish a self-sustaining thorium fuel cycle. This would enable India to tap into its vast thorium reserves, minimizing dependence on imported uranium.

Supporting this national mission, under the **UNESCO Chair on Renewable and Clean Energy for Sustainable Development**, the **Department of Green Energy Technology (DGET)** at **Pondicherry University**, in collaboration with **IGCAR, Department of Atomic Energy (DAE)**, is organizing the National Workshop on **Nuclear-Hydrogen Synergy 2026 (NWNHS-2026)** on **30 Jan 2026** at the Cultural-Cum-Convention Centre, Pondicherry University, Puducherry. The workshop aims to provide a multidisciplinary forum focused on Nuclear hydrogen production as a transformative pathway for sustainable energy generation, leveraging advanced reactor technologies to produce clean hydrogen without carbon emissions. Eminent experts from IGCAR share cutting-edge insights into India's current progress and future direction in clean nuclear energy.



Nuclear Hydrogen Technology Integrated Pathways and IGCAR's Role

Overview

Nuclear energy offers a reliable, low-carbon pathway for large-scale hydrogen production by supplying both electricity and high-temperature heat. Integrating nuclear reactors with hydrogen systems improves energy efficiency, enhances grid flexibility, and supports deep decarbonization of industrial sectors. In India, IGCAR, Kalpakkam is uniquely positioned to enable nuclear-hydrogen integration through its expertise in fast-reactor and sodium technologies. Nuclear-hydrogen coupling represents a scalable, high-efficiency pathway toward net-zero energy systems. With its strengths in fast-reactor technology, sodium systems, and safety integration, IGCAR is strategically positioned to support India's transition toward a low-carbon hydrogen economy while enabling sustained industrial decarbonization.

Nuclear-to-Hydrogen Production Pathways

Low-Temperature Electrolysis (LTE)

Uses nuclear electricity in alkaline or PEM electrolyzers at near-ambient temperatures. This is the most deployment-ready option, with demonstrated efficiencies of 62–82% in operating nuclear plants.

High-Temperature Steam Electrolysis (HTSE)

Couples nuclear heat with solid-oxide electrolysis cells (SOECs) operating at 800–1000°C, reducing electrical demand by ~35% and achieving up to ~90% electricity-to-hydrogen efficiency.

Thermochemical Water-Splitting Cycles

Multi-step chemical cycles (e.g., sulfur-iodine, copper-chlorine) use high-temperature nuclear heat to split water without direct electrolysis. These systems offer theoretical efficiencies of 47–50%, requiring temperatures near 900°C.

Hybrid Cycles

Combine thermochemical and electrochemical steps to reduce electricity consumption. The hybrid-sulfur process requires only ~25% of the electricity needed for conventional electrolysis.

Grid-Coupled Flexible Electrolysis

Hydrogen production absorbs off-peak nuclear electricity, improving reactor utilization and providing grid-level load balancing.



Synergy Between Nuclear Power and Hydrogen

- **Improved Reactor Economics:** Converts surplus nuclear output into storable hydrogen instead of curtailment
- **Grid Stability:** Electrolyzers act as flexible loads supporting renewable-rich grids
- **Industrial Decarbonization:** Enables continuous hydrogen supply for steel, ammonia, refineries, and synthetic fuels
- **Higher System Efficiency:** Advanced reactors enable superior high-temperature hydrogen routes
- **Optimized Energy Systems:** Integrated modelling shows improved overall economics and asset utilization

IGCAR: Capability and Strategic Advantage

The Indira Gandhi Centre for Atomic Research (IGCAR) operates the Fast Breeder Test Reactor (FBTR) with steam outlet temperatures of approximately 510°C, supporting advanced hydrogen technologies. Key contributions include:

- Fast-reactor thermal management and high-temperature integration
- Sodium technology and hydrogen detection systems for reactor safety
- High-temperature materials development
- Joint feasibility studies with BARC on green hydrogen production

A future fast-reactor park at Kalpakkam could co-locate hydrogen plants, supplying electricity and high-temperature steam to coastal industrial corridors—aligning with global trends in integrated nuclear-hydrogen energy systems.

- **Near-term (5–10 years):** Nuclear electricity with PEM electrolysis
- **Mid-term (10–15 years):** HTSE coupled with high-temperature reactors
- **Long-term:** Generation IV fast reactors with thermochemical cycles, enabling 40–50% system-level efficiencies

Technology Readiness Outlook

UNESCO CHAIR ON

Renewable and Clean Energy for Sustainable Development

Professor R. Arun Prasath holds the established UNESCO chair on “Renewable and Clean Energy for Sustainable Development (RCESD)” in the UNESCO Madanjeet School of Green Energy Technologies (UMSGET) at Pondicherry University (2024-2028). The official inauguration of the 16th prestigious UNESCO chair in India was held on 10th December 2024 to promote green and clean energy technologies. The UNESCO chair at Pondicherry University was achieved through collaborative efforts involving the Ministry of Education - Govt of India, UNESCO - India, South Asia Foundation Madanjeet Singh Foundation (MSF) Trustee, and with endorsements from international partners (Germany, Australia, Brazil, USA, and UK), as well as national hosts and collaborators of Prof. R. Arun Prasath. Additionally, Prof. R. Arun Prasath’s extensive international experience in research and his extensive out-reach sustainable practices such as promotion of solar campus at PU campus, Invest in Our Planet Earth, Sustainable Campus Campaigns, Green Campus Auditing, Sustainability@PU, Net-zero Pondicherry University, has been instrumental in securing this chair.

This initiative is part of the broader UNITWIN/UNESCO Chairs Programme, which aims to enhance institutional capacities through international cooperation and knowledge sharing among higher education institutions. The UNESCO Chair will serve as a platform to promote research, education, and capacity-building in sustainability, renewable energy, and community development. To work with governments, schools, colleges, universities, industries, NGOs, businesses, researchers, technology developers and environmentally conscious individuals working towards the promotion of renewable energy, also It will actively engage in fostering global partnerships, advancing knowledge-sharing, and supporting innovative practices that align with UNESCO's mission to build peace through education, science, and culture. This achievement marks a new chapter for Pondicherry University in its ongoing journey toward academic excellence and sustainable development.

The official inaugural function of the UNESCO Chair on “Renewable and Clean Energy for Sustainable Development” was held on 10th December 2024. The Chair Establishment Report is attached here.

[Webpage](#)

[Inaugural Report](#)





Professor R. Arun Prasath

UNESCO – Chairholder
Department of Green Energy Technology
Madanjeet School of Green Energy Technologies
Pondicherry University

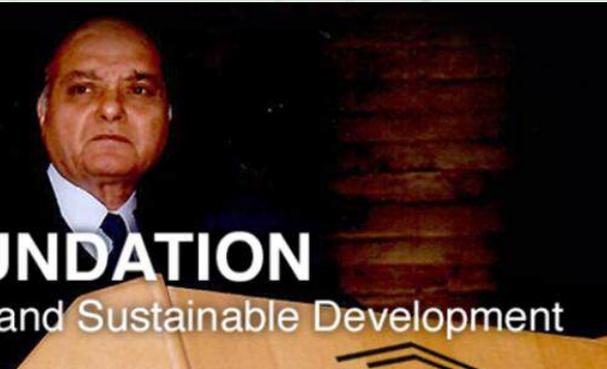


- UNESCO Chairholder to promote “Renewable and Clean Energy for Sustainable Development,” which was established with the support of UNESCO Madanjeet School of Green Energy Technologies (UMSGET) and his international partners at Pondicherry University (2024-2028).
- Active member in promoting renewable energy and sustainability at the Pondicherry University campus. “Solar Campus Master Plan” initiative for Pondicherry University, Invest in Our Planet Earth, Sustainable Campus Campaigns, Green Campus Auditing, Sustainability@PU, Net-zero Pondicherry University



R. ARUN PRASATH is a Professor in the Department of Green Energy Technology at Pondicherry University. He received the prestigious DAAD fellowship (1999-2001) for his doctoral research work at the Max-Planck Institute for Polymer Research, Mainz, GERMANY. He worked as a material researcher in several prestigious institutes, as a research associate at the Indian Institute of Science, Bangalore, INDIA (2002-2004), a postdoctoral researcher at the University of Strathclyde, Glasgow, UNITED KINGDOM (2004-2006) and at University of New South Wales, Sydney, AUSTRALIA (2006-2008), and as a senior researcher in Ghent University (2008-2010), BELGIUM with special fellowship named BOF and received the prestigious RAMAN fellowship to work at University of Wyoming, UNITED STATES OF AMERICA in the year 2014-15. Currently, he is leading a research group on energy materials and sustainability. He extensively focuses on materials synthesis, characterization, and application in solar energy, bio-energy, batteries, fuel cells, and other green and clean energy technologies. He has authored over 60 peer-reviewed journal articles, proceedings, and book chapters and is a co-inventor in 3 International patents and 2 European patent applications to his credit. He has presented more than 80 oral presentations at various conferences, seminars, courses, and invited talks, mainly on research progress and outreach on renewable energy technologies. He was involved as PI/Co-PI in projects funded by DST-SERB, MNRE, and ICSSR. He has guided several students on their PG degree projects, and some Ph.D. students have obtained their doctoral degrees under his guidance on material development for solar cells, bio-energy, battery, and fuel cells.

Prof. R. Arun is also actively involved in the outreach and promotion of renewable energy technologies and sustainable development practices at Pondicherry University. His achievements include the detailed project report for the “Solar Campus Master Plan” for the Pondicherry University Main Campus, Invest in Our Planet Earth, Sustainable Campus Campaigns, Green Campus Auditing, Sustainability@PU, and Net-zero Pondicherry University. His team’s project proposal to Pondicherry University in 2012-2013 for a “Solar Campus” has contributed to promoting Solar Energy Generation on campus, with a current installed capacity of ~3 MWp in 2021, making Pondicherry University one of the largest affordable and clean energy generators among educational institutions in India. He also served as chairman of the green audit for the Pondicherry University campus and as a member of the QS Sustainability Ranking and the Times Higher Education World University Rankings for the campus, focusing on SDG 7: “Affordable and Clean Energy.” In addition, he is a member of several university-administration initiatives that promote sustainable practices. Under his leadership, the UNESCO chair aims to promote greener and cleaner energy technologies, energy security, and sustainable development. The UNESCO chair advocates for a rapid and massive transformation toward greener and cleaner energy generation via solar, wind, hydro, ocean, wave, waste-to-energy, geothermal power, hydrogen energy, and the development of efficient technologies like fuel cells, hydrogen electrolyzers, electrical mobility, more efficient energy storage systems, carbon capture, utilization, and storage technologies, green building and, sustainable chemical technologies, etc. to address the global climate change issues for the promotion of sustainability in energy generation and use.



SOUTH ASIA FOUNDATION

Regional Cooperation Through Education and Sustainable Development

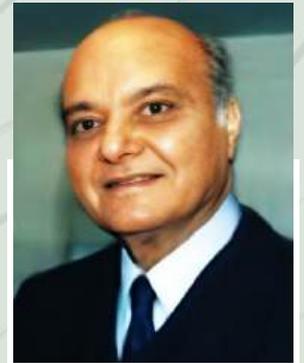


Founded by UNESCO Goodwill Ambassador Madanjeet Singh in 2000, the South Asia Foundation (SAF) is a secular, non-profit and non-political organization, comprising eight autonomous chapters: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.

SAF's core objective is to promote regional cooperation through a number of UNESCO Madanjeet Singh Institutions of Excellence in the eight SAARC countries

- Preservation of Cultural Heritage (Kabul, Afghanistan),
- Human Rights and Common Law (Dhaka, Bangladesh),
- Forestry Studies (Bumthang, Bhutan),
- Journalism (Chennai, India),
- Kashmir Studies (Srinagar, India),
- Regional Cooperation (Pondicherry, India),
- Green Energy Technology (Pondicherry, India),
- Climate Research (Maldives),
- Development Studies (Kathmandu, Nepal),
- Visual Arts (Lahore, Pakistan),
- South Asian Studies (Lahore, Pakistan),
- Water Management (Moratuwa, Sri Lanka).

Shri. Madanjeet Singh
UNESCO Goodwill Ambassador (former)
Founder - South Asia Foundation



Madame France Marquet
SAF/MSF Representative to UNESCO



Organising Committee

CHIEF PATRON



Prof. P. Prakash Babu
Hon'ble Vice Chancellor
Pondicherry University



PATRONS



Prof. K. Tharanaikkarasu
Director, SEI & RR,
Pondicherry University



Shri. R. Gunasekaran
Registrar
Pondicherry University



Dr. M. Krishna Murthy
Finance Officer
Pondicherry University

CHAIRMAN



Dr. B.M. Jaffar Ali
Dean(i/c), UMSGETs
Pondicherry University

CO-CHAIRMAN



Dr. Prasanth Ravindran
Head of the Department
Professor, DGET



Dr. R. Arun Prasath
UNESCO Chair - RCESD
Professor, DGET

CONVENOR

MEMBERS - DGET



Dr. P. Elumalai
Professor



Dr. P. Thilakan
Professor



Dr. D.S. Sharada
Professor



Dr. A. Sreekumar
Professor



Dr. S. Sivasankari
Assistant Professor



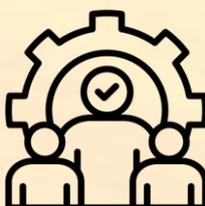
Dr. Krishna Kumar Jaiswal
Assistant Professor



Dr. K. Karthik Selva Kumar
Assistant Professor



Dr. Krishna Villa Harika
DST-Inspire faculty



NWNHS 2026



PROGRAM ADVISORY COMMITTEE



Dr. V. Jayaraman
Director – MC & MFCG
IGCAR



Shri. S. Sridhar
Director – RFG,
IGCAR



Shri. S. Chandra Mouli
Associate Director – FRTG,
IGCAR



Prof. B. Radjaram
Manakula Vinayagar
Inst. of Tech, Pondicherry



Prof. Alok Sharan
Head – Department of physics
Pondicherry University



Dr. Nihar Ranjan Das
Secretary South Asia
Foundation, New Delhi





National Workshop on Nuclear-Hydrogen Synergy 2026
Pathways for India's Clean Energy Transition

NWNHS-2026

Sponsored By South Asia Foundation (MSF/SAF)
Madanjeet School of Green Energy Technologies (UMSGETs)
Department of Green Energy Technology
PONDICHERRY UNIVERSITY

in Collaboration with

Indira Gandhi Centre for Atomic Research (IGCAR)- Kalpakkam
Department of Atomic Energy, GOVERNMENT OF INDIA



Under UNESCO CHAIR(RCESD) activity

PROGRAM SCHEDULE

📍 CCC Auditorium 📅 30.01.2026

| TIMING | EVENTS | |
|---------------------|---|--|
| 8:30 AM – 9:30 AM | REGISTRATION | |
| 9:30 AM – 10:40 AM | INAUGURATION | |
| 10:40 AM – 11:00 AM | HIGH TEA | |
| 11:00 AM – 11:45 AM | Shri. S.N. Sahoo TSD, RFG, IGCAR | Concept and potential of Clean hydrogen Production in FBRs |
| 11:45 AM – 12:30 PM | Dr. Arjun Pradeep Head, EAS, SED, FRTG, IGCAR | Hydrogen Production, Storage and Transportation: Pathways for Nuclear Hydrogen Synergy |
| 12:30 PM – 1:30 PM | LUNCH BREAK | |
| 1:30 PM – 2:15 PM | Dr. Rajesh Ganesan Head, MCD, FMCG, IGCAR | Hydrogen sensors for comprehensive detection of steam leak in sodium cooled fast reactors |
| 2:15PM – 3:00 PM | Dr. K. I. Gnanasekar Head, NCSS, MCD, FMCG, IGCAR | Advances in Hydrogen sensing methodologies for Nuclear and Hydrogen energy applications |
| 3:00 PM – 3:15 PM | TEA BREAK | |
| 3:15 PM – 4:00 PM | Shri S.Kishore Head, PD & ES, ETHD, IGCAR | Steam Leak Scenarios in Sodium heated Steam Generators for Fast Breeder Reactors |
| 4:00 PM – 4:45 PM | Shri Ashish Kumar SE & CDD, FRTG, IGCAR | Sodium Cleaning Techniques Employed for Fast Reactor Components with Controlled Hydrogen Evolution & the Hydrogen Safety Measures Employed |
| 4:45 PM – 5:10 PM | VALEDICTORY SESSION | |

PROGRAM REPORT



The National Workshop on Nuclear-Hydrogen Synergy 2026 (NWNHS-2026): Pathways for India's Clean Energy Transition, held on 30th January, was organized under the UNESCO Chair activity in the Department of Green Energy Technology (DGET), Pondicherry University, in collaboration with Indira Gandhi Centre for Atomic Research (IGCAR).

The inauguration commenced with the Pondicherry University anthem, followed by the traditional lighting of the lamp and honouring of the dignitaries and speeches from the Hon'ble VC, Prof. Prakash Babu, Delegates from IGCAR: Dr. K. I. Gnanasekar, Dr. Rajesh Ganesan, video message from Dr. Benno Boer, UNESCO Regional Head, NWNHS-2026 Team: Prof. Jaffer Ali, Head Dean (i/c), Prof. R. Prasanth, Head DGET, Prof. D. Shardha and Prof. R. Arun Prasath, Convenor of NWNHS-2026. The abstract book was released by VC Prof. Prakash Babu.

The National Workshop on Nuclear-Hydrogen Synergy 2026 (NWNHS-2026) was hosted to explore transformative pathways for sustainable energy generation in India. The core objective discussed about integrating advanced nuclear reactor technologies—including Small Modular Reactors (SMRs)—with the hydrogen economy to produce clean hydrogen without carbon emissions. This synergy is viewed as a critical component for achieving India's "Viksit Bharat 2047" vision and net-zero emissions by 2070.

Key Themes and Technical Discussions: Delegates from the Indira Gandhi Centre for Atomic Research (IGCAR) presented specialized technical sessions on nuclear-hydrogen integration strategies: (a) Nuclear Energy and Hydrogen Production Technologies, Infrastructure, Sectoral Impact, Capacity Expansion from 8.8 GW to 100 GW by 2047 through breeder and modular reactors.

Participation and Outreach: The event successfully brought together 165 registered participants from several reputed institutions.

NWNHS-2026

National Workshop on Nuclear-Hydrogen Synergy 2026:

Pathways for India's Clean Energy Transition

30th January 2026 | Pondicherry University

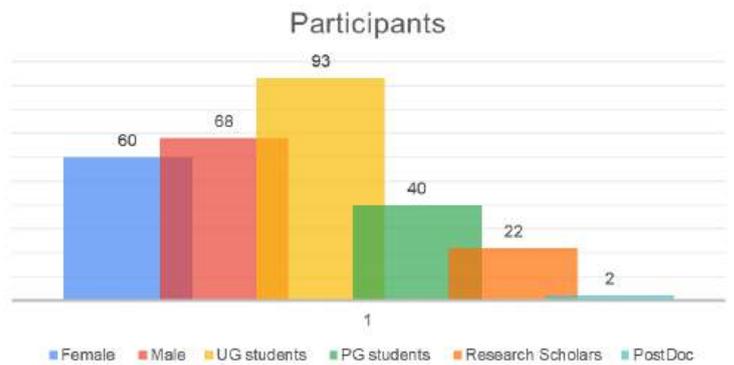


165
PARTICIPANTS

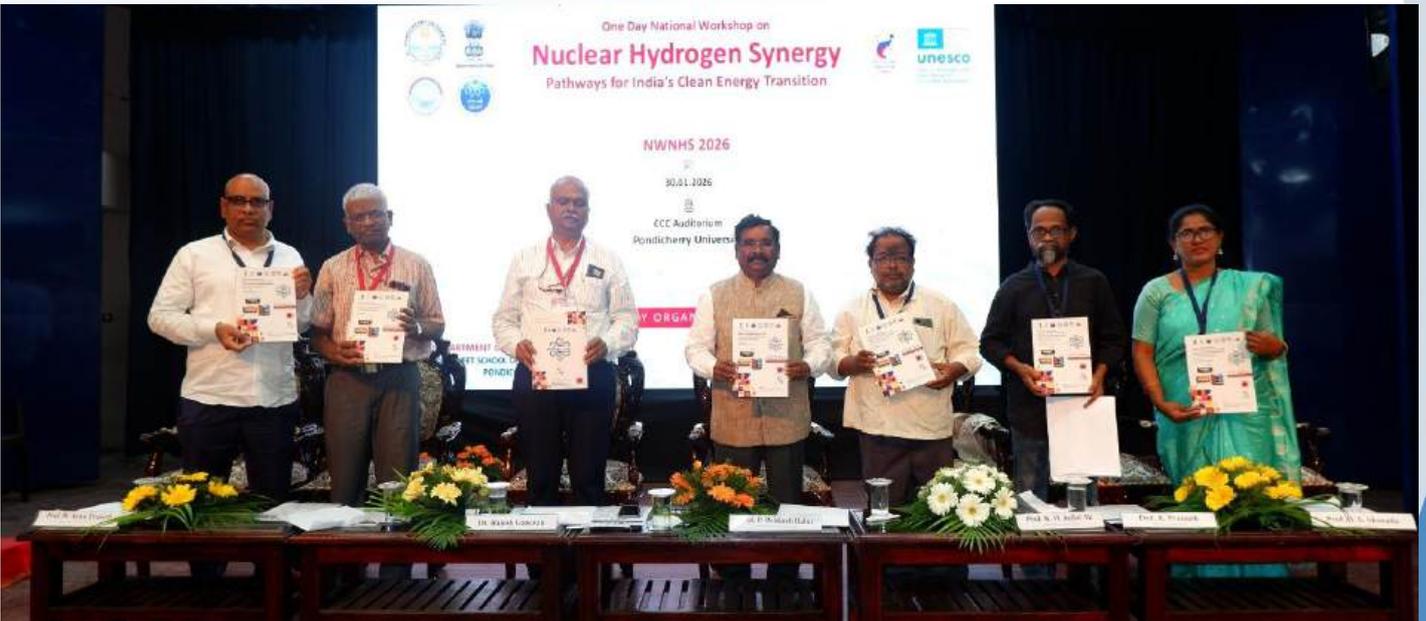
27
SPOT-REGISTERED
DELEGATES

106
EXTERNAL
PARTICIPANTS

59
INTERNAL
PARTICIPANTS



CLICKED MOMENTS



CLICKED MOMENTS



முகப்பு / புதுச்சேரி

தேசிய முன்னுரிமைக்குப் பசுமை ஆற்றல் முக்கியம்: புதுச்சேரி மத்திய பல்கலை. துணைவேந்தர்!

தேசிய முன்னுரிமைக்குப் பசுமை ஆற்றல், கண்டுபிடிப்புகள், திறன் மேம்பாடு ஆகியவை முக்கியம் என்று புதுச்சேரி பல்கலைக் கழக துணைவேந்தர் பேராசிரியர் பி. பிரகாஷ் பாபு கூறினார்.



தினமணி

புதுச்சேரி மத்திய பல்கலை.யில் நடைபெற்ற இந்தியாவின் பசுமை ஆற்றல் மாற்றத்துக்கான பாதைகள் என்ற கருத்தரங்கில் பேசுகிறார் துணைவேந்தர் பி. பிரகாஷ் பாபு.

தேசிய முன்னுரிமைக்குப் பசுமை ஆற்றல், கண்டுபிடிப்புகள், திறன் மேம்பாடு ஆகியவை முக்கியம் என்று புதுச்சேரி பல்கலைக் கழக துணைவேந்தர் பேராசிரியர் பி. பிரகாஷ் பாபு கூறினார்.

புதுச்சேரி மத்திய பல்கலைக் கழகத்தின் பசுமை ஆற்றல் தொழில்நுட்பத் துறை சார்பில் 2 நாள் தேசிய அணு-ஹைட்ரஜன் ஒத்திசைவு கருத்தரங்கு பல்கலைக் கழகத்தில் வெள்ளிக்கிழமை தொடங்கியது.

இதைத் தொடங்கி வைத்து துணைவேந்தர் பிரகாஷ் பாபு பேசுகையில், தேசிய முன்னுரிமைக்குப் பசுமை ஆற்றல், கண்டுபிடிப்புகள், திறன் மேம்பாடு ஆகியவை முக்கியம். இந்த முக்கியத்துவத்தை நிறைவேற்றும் வகையில் புதுச்சேரி பல்கலைக் கழகம் இந்தக் கருத்தரங்கை நடத்துகிறது. மேலும், இந்தக் கருத்தரங்கில் பங்கேற்றுள்ள பிரதிநிதிகள் தொடர்பாகவும், அணு மற்றும் ஹைட்ரஜன் தொடர்பாகவும் விளக்கினார்.

இத்துறையின் பேராசிரியர் ஆர். அருண் பிரசாத் பேசுகையில், இந்தியாவின் பசுமை ஆற்றல் மாற்றம் மற்றும் அணு-ஹைட்ரஜன் ஒத்திசைவு தேசிய முக்கியத்துவம் பெற்றுள்ளது. இந்தியாவின் வேகமான பொருளாதார வளர்ச்சி, காலநிலை மாற்றம் ஆகிய இரட்டை சவால்களையும் எடுத்துரைத்தார். மேலும், அணு-ஹைட்ரஜன் ஒத்திசைவு, எஃகு, சிமென்ட், உரங்கள், அலுமினியம், சுத்திகரிப்பு நிலையங்கள், கனரக போக்குவரத்து போன்ற உயர் ஆற்றல் துறைகளையும், மேம்பட்ட ட்ரோன்கள் போன்ற புதிய தொழில்நுட்பங்களையும் கார்பன் குறைவாக்க உதவும் என்றார்.

யுனெஸ்கோ பிராந்தியத் தலைவர் டாக்டர் பென்னோபோரின் விடியோ செய்தி ஒளிபரப்பப்பட்டது. பசுமை ஆற்றல் தொழில்நுட்பத் துறை தலைவர் பேராசிரியர் ஆர். பிரசாந்த், இடைக்கால டீன் பேராசிரியர் பி. எம். ஜாஃப்ர் அலி, பேராசிரியர் டி. எஸ். சாரதா உள்ளிட்டோர் பேசினர். சிறப்பு பிரதிநிதிகள், நிபுணர்கள், பல்கலைக்கழக அதிகாரிகள், ஆசிரியர்கள், மாணவர்கள் மற்றும் தன்னார்வலர்கள் பலர் கலந்து கொண்டனர்



<https://www.dinamani.com/all-editions/edition-villupuram/puducherry/2026/Jan/31/green-energy-is-crucial-for-national-priority-vice-chancellor-of-pondicherry-central-university>

MEDIA BRIEF

Pondicherry University launches national workshop on nuclear-hydrogen synergy for India's clean energy transition

By **mbdesk2** - February 2, 2026



Pathways for India's Clean Energy Transition, organized under the UNESCO Chair activity in the Department of Green Energy Technology (DGET), Pondicherry University, commenced with the Pondicherry University anthem, followed by the traditional lighting of the lamp and honouring of the dignitaries on the dais.

Prof. R. Arun Prasath then delivered the welcome address, setting the tone for the workshop by underlining its national significance in the context of clean energy transition and nuclear-hydrogen synergy. In his address, Prof. Arun Prasath expressed gratitude to the Honorable Vice Chancellor, Prof. Prakash Babu, for his guidance and support, to the Director of IGCAR, Shri S. C. Pillai, for enabling the participation of eminent nuclear experts, and to the workshop's key supporters, including MSF Trustee Madam France and UNESCO Regional Officer Dr. Benno. He warmly welcomed the nuclear experts from IGCAR, the Dean, HoD, faculty members, students, researchers, media representatives, and all participants. He highlighted the twin challenges of rapid economic growth and climate change, noting that India is projected to remain one of the fastest-growing economies, with a steep rise in energy demand, while still relying heavily on carbon-based fuels.

He emphasized India's strong international commitments, including increasing the share of clean and renewable energy to 50% by 2030, reducing carbon emission intensity by 35% by 2030 (from 2005 levels), achieving net-zero emissions by 2070, and progressing toward the UN Sustainable Development Goals.

Prof. Arun Prasath stressed that meeting these commitments requires a shift from carbon-based fuels to alternatives such as hydrogen, explaining that coal-based power generation emits nearly ~800 g of CO₂ e per unit of power, compared to around ~12 g of CO₂ e for hydrogen-based energy.

He outlined the potential of hydrogen produced from fossil, renewable, and especially nuclear sources, positioning nuclear energy as a clean, reliable option for large-scale hydrogen production. He referred to the Government of India's Nuclear Energy Mission for a "Viksit Bharat 2047," targeting an expansion of nuclear capacity from 8.8 GW to 100 GW by 2047 through fast-breeder reactors, sodium-cooled fast-breeder reactors, small modular reactors, and micro-modular reactors.

He underlined that nuclear-hydrogen synergy, supported by nuclear-assisted electrolysis, thermo-electrochemical processes, advanced sensors, and robust hydrogen storage and transport systems, can help decarbonize high-energy-intensive sectors such as steel, cement, fertilizers, aluminum, refineries, heavy transport, and emerging technologies like advanced drones. He proudly noted that NWNHS-2026 is the first-ever national-level workshop hosted by an academic institution in India dedicated exclusively to nuclear-driven clean hydrogen, and expressed confidence that it will strengthen linkages between academia and research institutions and inspire the next generation of nuclear scientists, engineers, and technologists.

Following the welcome address, a pre-recorded video message from Dr. Benno Boer, UNESCO Regional Head, New Delhi, was played, in which he commended the department and the convener, Prof. Arun Prasath, for organizing this timely workshop and highlighted its importance for the future of students and the nation's clean energy journey. Prof. R. Prasanth, Head of the Department of Green Energy Technology, then introduced the department, outlining its academic activities, research strengths, and milestones, and emphasized its growing contributions in the fields of green and sustainable energy.

Dean (i/c) Prof. B. M. Jaffar Ali delivered the felicitation address, appreciating the department's initiative in conducting a cutting-edge workshop on nuclear-hydrogen synergy and encouraging the organizers to plan similar programs in the future to enhance academic-industry-research collaborations. The Vice Chancellor of Pondicherry University, Dr. Prakash Babu, delivered the presidential address, expressing keen enthusiasm for the workshop's theme and underlining its relevance to national priorities in clean energy, innovation, and capacity building.

Delegates from IGCAR then addressed the gathering, briefly presenting their ongoing work in nuclear and hydrogen-related technologies and offering an overview of the technical sessions and themes to be covered during the workshop. Their interventions provided participants with a glimpse of advanced research, reactor technologies, and nuclear-hydrogen integration strategies that would be elaborated on in subsequent sessions. The inaugural session concluded with a formal vote of thanks proposed by Prof. D. S. Sharada, who acknowledged the support and presence of all dignitaries, IGCAR experts, university authorities, sponsors, faculty members, students, and participants. She also thanked the organizing team and volunteers for their efforts in successfully planning the inaugural program. With the rendition of the Indian National Anthem, the inaugural ceremony of NWNHS-2026 came to a dignified close, marking the beginning of an intensive and forward-looking national workshop on nuclear-hydrogen synergy for India's clean energy transition.



MEDIA BRIEF

<https://mediabrief.com/pondicherry-university-launches-national-workshop-on-nuclear-hydrogen-synergy-for-indias-clean-energy-transition/>

NWNHS - 2026

National Workshop on Nuclear-Hydrogen Synergy: Pathways for India's Clean Energy Transition

1/31/2026 10:57:33 PM



Early Times Report

NEW DELHI, Jan 31: The inaugural ceremony of the National Workshop on Nuclear-Hydrogen Synergy 2026 (NWNHS-2026): Pathways for India's Clean Energy Transition, organized under the UNESCO Chair activity in the Department of Green Energy Technology (DGET), Pondicherry University, commenced with the Pondicherry University anthem, followed by the traditional lighting of the lamp and honouring of the dignitaries on the dais. Prof. R. Arun Prasath then delivered the welcome address, setting the tone for the workshop by underlining its national significance in the context of clean energy transition and nuclear-hydrogen synergy.

In his address, Prof. Arun Prasath expressed gratitude to the Vice Chancellor, Prof. Prakash Babu, for his guidance and support, to the Director of IGCAR, S. G. Pillai, for enabling the participation of eminent nuclear experts, and to the workshop's key supporters, including MSF Trustee Madam France and UNESCO Regional Officer Dr. Benno. He warmly welcomed the nuclear experts from IGCAR, the Dean, HoD, faculty members, students, researchers, media representatives, and all participants. He highlighted the twin challenges of rapid economic growth and climate change, noting that India is projected to remain one of the fastest-growing economies, with a steep rise in energy demand, while still relying heavily on carbon-based fuels. He emphasized India's strong international commitments, including increasing the share of clean and renewable energy to 50% by 2030, reducing carbon emission intensity by 35% by 2030 (from 2005 levels), achieving net-zero emissions by 2070, and progressing toward the UN Sustainable Development Goals.



<https://www.earlytimes.in/newsdet.aspx?q=396555>

MEDIA RELEASES

தேசிய முன்னுரிமைக்கு பசுமை ஆற்றல் முக்கியம்: புதுச்சேரி மத்திய பல்கலை துணைவேந்தர் பேச்சு

புதுச்சேரி, பிப். 2- தேசிய முன்னுரிமைக்கு பசுமை ஆற்றல், கண்டுபிடிப்புகள், திறன் மேம்பாடு ஆகியவை முக்கியம் என்று புதுச்சேரி பல்கலைக் கழக துணை வேந்தர் பேராசிரியர் பி. பிரகாஷ் பாபு கூறினார். புதுச்சேரி மத்திய பல்கலைக் கழகத்தின் பசுமை ஆற்றல் தொழில்நுட்பத்துறை சார்பில் 2 நாள் தேசிய அணு-ஹைட்ரஜன் ஒத்திசைவு கருத்தரங்கு பல்கலைக் கழகத்தில் தொடங்கியது. இதைத் தொடங்கி வைத்து துணைவேந்தர் பிரகாஷ் பாபு பேசுகையில், தேசிய முன்னுரிமைக்குப் பசுமை ஆற்றல், கண்டுபிடிப்புகள், திறன் மேம்பாடு ஆகியவை முக்கியம். இந்த முக்கியத்துவத்தை நிறைவேற்றும் வகையில் புதுச்சேரி பல்கலைக் கழகம் இந்தக் கருத்தரங்கை நடத்துகிறது. மேலும், இந்தக் கருத்தரங்கில் பங்கேற்றுள்ள பிரதிநிதிகள் தொடர்பாகவும், அணு மற்றும் ஹைட்ரஜன் தொடர்பாகவும் விளக்கினார். இத்துறையின் பேராசிரியர்



ஆர். அருண் பிரசாத் பேசுகையில், இந்தியாவின் பசுமை ஆற்றல் மாற்றம் மற்றும் அணு-ஹைட்ரஜன் ஒத்திசைவு தேசிய முக்கியத்துவம் பெற்றுள்ளது. இந்தியாவின் வேகமான பொருளாதார வளர்ச்சி, காலநிலை மாற்றம் ஆகிய இரட்டை சவால்களையும் எடுத்துரைத்தார். மேலும், அணு-ஹைட்ரஜன் ஒத்திசைவு, எஸ்கு, சிமென்ட், உரங்கள், அலுமினியம், சுத்திகரிப்பு நிலையங்கள், கனரக போக்குவரத்து போன்ற உயர் ஆற்றல் துறைகளையும், மேம்பட்ட டிரோன்கள் போன்ற புதிய

தொழில்நுட்பங்களையும் காப்பன் குறைவாக்க உதவும் என்றார். யுனெஸ்கோ பிராந்தியத் தலைவர் டாக்டர் பென்னோபோரின் விடியோ செய்தி ஒளிபரப்பப்பட்டது. பசுமை ஆற்றல் தொழில்நுட்பத் துறை தலைவர் பேராசிரியர் ஆர். பிரசாந்த், இடைக்கால மன் பேராசிரியர் பி. எம். ஜாஃப் அலி, பேராசிரியர் டி. எஸ். சாரதா உள்ளிட்டோர் பேசினர். சிறப்பு பிரதிநிதிகள், நிபுணர்கள், பல்கலைக்கழக அதிகாரிகள், ஆசிரியர்கள், மாணவர்கள் மற்றும் தன்னார்வலர்கள் பலர் கலந்து கொண்டனர்.

National Workshop on Nuclear-Hydrogen Synergy 2026 inaugurated at Pondicherry University

CHENNAI

The National Workshop on Nuclear-Hydrogen Synergy 2026 (NWNHS-2026): Pathways for India's Clean Energy Transition was inaugurated at Pondicherry University, marking a significant step towards advancing India's clean energy goals and Net-Zero 2070 vision. The workshop is being organized under the UNESCO Chair activity by the Department of Green Energy Technology (DGET), Pondicherry University.

The inaugural ceremony began with the Pondicherry University anthem, followed by the traditional lighting of the lamp and felicitation of dignitaries. Prof. R. Arun Prasath, Convener of NWNHS-2026, delivered the welcome address, highlighting the national importance of nuclear-hydrogen synergy in the context of India's rapidly growing energy demand and climate commitments. He thanked Vice Chancellor Prof. Prakash Babu, IGCAR Director Shri S. G. Pillai, MSF Trustee Madam France, and UNESCO Regional Officer Dr. Benno Boer for their guidance and support.



Prof. Arun Prasath underlined India's commitments to increase clean energy share to 50 per cent by 2030, reduce carbon emission intensity by 35 per cent, and achieve net-zero emissions by 2070.

He emphasized hydrogen as a key decarbonisation pathway and stressed the role of nuclear energy as a clean, reliable source for large-scale hydrogen production. Referring to the Government of India's Nuclear Energy Mission for "Viksit Bharat 2047," he noted plans to expand nuclear capacity to 100 GW by 2047 through advanced reactor technologies. He stated that nuclear-driven hydrogen can help decarbonise sectors such as steel, cement, fertilisers, refineries, heavy transport and

other energy-intensive industries. A video message from Dr. Benno Boer, UNESCO Regional Head, New Delhi, praised the initiative and its relevance to students and the nation's clean energy future. Prof. R. Prasanth, Head, DGET, introduced the department and its contributions to green energy research. Dean (I/C) Prof. B. M. Jaffar Ali delivered the felicitation address.

Vice Chancellor Prof. Prakash Babu, in his presidential address, released the NWNHS-2026 booklet and lauded the workshop's relevance to national priorities. Experts from IGCAR outlined upcoming technical sessions. The programme concluded with a vote of thanks by Prof. D. S. Sharada and the National Anthem.



MEDIA RELEASES



<https://www.youtube.com/watch?v=D-7kavvozNI>



<https://www.youtube.com/watch?v=lpkmq3jYNIM>



Expert Talks

ABSTRACTS

NWNHS-2026

Concept & Potential of Clean Hydrogen production in Fast Breeder Reactors (FBRs)

Satyanarayan Sahoo*



India's three-stage nuclear programme provides a long-term framework for achieving fuel self-sufficiency through progressive deployment of PHWRs, Fast Breeder Reactors (FBRs), and thorium-fueled systems. Within Stage II, sodium-cooled fast reactors (SFRs) such as the Fast Breeder Test Reactor (FBTR) & the Prototype Fast Breeder Reactor (PFBR) offer high-temperature liquid-sodium coolant streams ($\approx 480\text{--}560^\circ\text{C}$), presenting an opportunity for direct process-heat coupling with thermo-chemical hydrogen production. This study investigates the technical feasibility and opportunity potential & associated challenges of integrating the Copper–Chlorine (Cu–Cl) hybrid thermo-chemical cycle in particular out of many other electro-chemical cycles available with SFR-based nuclear systems for continuous, CO_2 -free hydrogen generation.

The Cu–Cl cycle requires significantly lower peak operating temperatures ($\sim 530\text{--}550^\circ\text{C}$) than Sulphur–iodine or UT-3 cycles, thereby reducing material stress and corrosion challenges, and enabling closer thermal matching to intermediate sodium loop conditions in FBRs. Furthermore, the electrochemical step in the Cu–Cl cycle reduces overall electrical input requirements relative to low-temperature electrolysis, achieving theoretical hydrogen production efficiencies of $\sim 40\text{--}45\%$. This work examines thermal-hydraulic coupling strategies between reactor secondary loops and Cu–Cl process heat exchangers, process safety boundaries, and materials-compatibility considerations (chloride corrosion, oxygen potential, and system isolation from radioactive sodium domains).

The nuclear-assisted Cu–Cl hydrogen pathway offers a stable baseload alternative to renewable-powered electrolysis and establishes a foundation for co-generation of electricity and hydrogen within nuclear fuel cycle infrastructure. Integrating advanced fast reactors especially the SFRs in Indian context with hydrogen production supports India's strategic objective of Net Zero Emission targets by 2070, reduces dependence on fossil hydrogen in refineries and fertilizer production, and enhances the techno-economic justification for expanded FBR deployment in the context of India's clean-energy future.



Shri Satyanarayan Sahoo
Technical Service Division
Reactor Facilities Group - IGCAR

Mr. Satyanarayan Sahoo is a Chemical Engineering graduate from Indira Gandhi Institute of Technology (IGIT), Sarang, under Biju Patnaik University of Technology, Odisha, having completed his degree in 2011.

He began his professional career at Hindalco Industries Limited, where he worked for about two and a half years as a Senior Process Engineer in the alumina refinery division. During this period, he was actively involved in commissioning activities of Asia's largest alumina refinery, with a capacity of 3.5 million tons per annum, gaining valuable exposure to large-scale industrial process systems and plant operations.

Subsequently, he joined the prestigious 57th batch of the Bhabha Atomic Research Centre (BARC) Training School as an OCES trainee and underwent his training at the Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam. After successful completion of training, he joined the Technical Services Division of the Fast Breeder Test Reactor (FBTR) in 2014.

At FBTR, he has served as the System Engineer for various Safety related & Auxiliary Systems of the reactor. His responsibilities cover a wide range of critical plant systems, including the Steam Water System, Steam Generator Leak Detection System, Condenser Cooling Water system along with Cooling Towers, IOINE & HEPA filter testing of RCB, Reactor Containment Building (RCB) integrated Leak Rate Testing, Sodium Aerosol Detection systems, Compressed air systems, Fire Fighting System, Radioactive effluent management systems, Gaseous systems such as Nitrogen, Argon, And Helium, as well as water systems including Demineralized Water, Service Water, Raw Water, Chilled Water, and HVAC systems for the reactor containment building and other non-active areas.

He has been extensively involved in several system modification, upgradation, and augmentation projects at FBTR. These activities demanded careful engineering design, detailed technical analysis, and meticulous implementation. Incorporating changes into operating nuclear reactor systems required comprehensive system-level evaluation, considering the highly integrated nature of nuclear plant systems, while strictly adhering to applicable codes, standards, and technical specifications.

With a background in chemical engineering, Mr. Sahoo brings versatility in working across multidisciplinary domains, including mechanical systems, process engineering, control and instrumentation, and broader nuclear reactor engineering aspects. Through his professional contributions, he has played a role in enhancing the safety, reliability, and operational experience of the Fast Breeder Test Reactor.



Hydrogen Production, Storage and Transportation: Pathways for Nuclear–Hydrogen Synergy

Arjun Pradeep*, Sanjay Kumar Das, S. Chandramouli



Hydrogen is increasingly recognized as a vital component of the global clean-energy transition, owing to its high energy density, versatility, and zero emissions at the point of use. International studies have identified hydrogen as a critical enabler for decarbonizing hard-to-abate sectors and for strengthening national energy security [1]. As India accelerates its shift towards low-carbon technologies, hydrogen is expected to play a major role across industrial processes, mobility, power generation, and long-duration energy storage.

This talk presents an overview of key hydrogen production pathways, with emphasis on how nuclear energy can complement and strengthen hydrogen systems. Nuclear reactors, with their high capacity factor and ability to provide continuous, carbon-free heat and electricity, offer a strong platform for large-scale hydrogen generation. Nuclear-assisted electrolysis and hybrid thermal–electrochemical processes have gained global attention for their potential to produce hydrogen efficiently and reliably, while minimizing lifecycle emissions [2].

The talk also discusses essential aspects of hydrogen storage, including compressed gas systems, liquid hydrogen, metal hydrides, and chemical carriers such as ammonia and liquid organic hydrogen carriers (LOHCs). Their advantages, limitations, safety considerations, and practical deployment challenges are examined. Key transportation options—including pipelines, tube trailers, cryogenic transport, and carrier-based distribution—are outlined with reference to established engineering practices and technology literature [3].

The presentation concludes by highlighting broader opportunities for nuclear–hydrogen integration, the role of emerging technologies, and the pathways for establishing a robust hydrogen infrastructure aligned with India’s clean-energy objectives.

References

- [1] International Energy Agency (IEA), The Future of Hydrogen, 2019.
- [2] International Atomic Energy Agency (IAEA), Hydrogen Production Using Nuclear Energy, 2020.
- [3] B. Sorensen, Hydrogen and Fuel Cells, Academic Press, 2011.



Dr. Arjun Pradeep

Head, Experiments and Analysis Section (EAS),
Safety Engineering Division (SED),
Fast Reactor Technology Group (FRTG) - IGCAR

Professional Summary

Dr. Arjun Pradeep is a Scientific Officer – G with extensive experience in sodium safety studies for fast reactor applications. As Head of the Experiments and Analysis Section (EAS) in the Safety Engineering Division, he leads programs in sodium fire extinguishment, sodium school, sodium disposal, hydrogen production, and iodine retention studies. He serves as an M.Tech guide at Homi Bhabha National Institute (HBNI), having guided two M.Tech students.

Education

- Ph.D., Engineering Sciences
- M.Tech., Chemical Engineering (Fast Breeder Reactor & Recycle Science and Technology)
- B.Tech., Chemical Engineering

Career Highlights

- Leads experimental and analytical activities in sodium safety studies.
- Developed innovative sodium fire extinguishing powders.
- Course Coordinator, Indian Sodium School, IGCAR
- Provides technical leadership in nuclear-integrated hydrogen production, storage, and transportation studies.
- Over 17 years of R&D experience as Scientific Officer at IGCAR.
- M.Tech guide at HBNI; supervised two students successfully.

Awards and Recognitions

- Best Paper Award (2019) at the 7th Asian Symposium on Computational Heat Transfer and Fluid Flow, Tokyo
- Group Achievement Award (2014) by the Department of Atomic Energy for safety demonstrations in sodium systems

Research Interests

- Nuclear–hydrogen synergy
- Experimental sodium safety studies

Publications

- Journal Papers: 10
- Book Chapters: 1
- Conference Papers: 10



Hydrogen sensors for comprehensive detection of steam leak in sodium-cooled fast reactors

Rajesh Ganesan*



Dr. Rajesh Ganesan
Fuel & Materials Chemistry Group,
Materials Chemistry and Metal Fuel
Cycle Group - IGCAR

A steam leak into sodium in the fast reactor is a crucial event that must be identified at the inception by combining hydrogen sensors working on diverse methods, both in liquid sodium and in argon cover gas. A fraction of hydrogen, generated from steam leaks, dissolves in liquid sodium, while the rest enters the argon cover gas. The relative distribution of hydrogen in sodium depends on several parameters, including sodium temperature, sodium inventory, and the travel time of hydrogen in sodium. Detectors for hydrogen in sodium and argon cover gas are deployed to track the hydrogen in liquid sodium and in cover gas to assess the extent of the steam leak. This talk will cover the R&D activities carried out at IGCAR, demonstrating the usefulness of a hydrogen detection system for monitoring low levels of hydrogen in sodium or argon cover gas over sodium systems during steam leaks in the steam generators of FBRs. The electrochemical hydrogen meter (ECHM) demonstrates its worth in determining hydrogen concentrations in the range of 40–1400 ppb. A thermal conductivity detector (TCD)- based hydrogen detection system helps detect hydrogen concentrations in argon cover gas in the range of 30–3000 vppm, while the tin oxide sensor is reliable for the range of 5–100 vppm. These sensors will be deployed in the secondary sodium circuits of fast reactors, along with the existing instrumentation, as a diversified approach to improve safety. R&D efforts on the search for better sensor materials, electrolytes/electrodes, and design efforts towards miniaturization of the sensors will also be discussed.

Dr Rajesh Ganesan completed his post-graduation in Chemistry from the University of Hyderabad. He joined IGCAR in 1994 after graduating from the 37th batch of the BARC training school. He is a recipient of the Homi Bhabha Gold Medal at BARC Training School. He completed his PhD at the Indian Institute of Technology Bombay in 2006. He is a recipient of the H.J. Arniker award for best thesis. He conducted his postdoctoral research at the University of Vienna from 2008 to 2010. He has been working in the area of phase diagrams, thermochemistry of coolants and the development of sensors for liquid coolant systems. He is a recipient of the DAE Science and Technology Excellence Award. Currently, he serves as Associate Director of the Fuel & Materials Chemistry Group at IGCAR and as a Professor at the Homi Bhabha National Institute.

References

[1] S. Shyam Kumar, et al., Nucl. Engg. Des. 382 (2023) 111388.



Advances in Hydrogen sensing methodologies for Nuclear & Hydrogen energy applications

K. I. Gnanasekar*



Reliable, chemically stable, rugged and energy efficient H_2 sensing devices that respond to the presence of trace levels are required for hydrogen transportation, storage and energy conversion facilities. General methodologies for detection of 1-1000 ppm of toxic gases in air or in specified gas streams were outlined. Desirable characteristics of an ideal sensor and the competent technologies based on Chemi-resistive, fiber optic, surface acoustic wave (SAW), field effect transistors (FET) and Electrochemical principles were reviewed. Choice of a specific methodology and its merits and demerits were brought out for discussion. Fundamental aspects of Chemi-resistive based H_2 sensors developed in IGCAR for steam leaks detection in liquid sodium coolant circuit of fast breeder reactor was outlined in the talk. The advantages of nanostructured thin films of doped SnO_2 sensors and their applications in detecting H_2 in air for the range of 1- 100 ppm of H_2 and their performance was discussed. A new concept of trace level H_2 sensing by ultra thin films of PtO deposited on a thin film of Sb - doped SnO_2 with the latter, operating as the milli-watt heater as well as transduction layer for the sensing film will be discussed. The conceptual design of a sensor, choice of constituents, realization of the multilayered device using pulsed laser deposition of thin films, and demonstration of H_2 sensing behavior of the device was shown. The performance of the device was compared with the state of the art of sensors.

References

[1] K. I. Gnanasekar, Applied Physics A, 129, 1-8 (2023).



Dr. K. I. Gnanasekar

**Novel Chemical Sensors Section,
Materials Chemistry Division,
Materials Chemistry and Metal Fuel Cycle Group - IGCAR**

K. I. Gnanasekar obtained his Ph.D. degree in the field of 'High Tc thin films by pulsed laser deposition' from Indian Institute of Technology, Bombay, Mumbai in the year 1995. He then joined the Chemical Group of IGCAR in the year 1996 and has been working on the development of chemical sensors for nuclear industry. He contributed to the development of pulsed laser deposition facility in IGCAR and delivered H_2 sensing devices to FBTR for monitoring hydrogen in cover gas, generated from steam leaks into the sodium circuit. He was a post doctoral fellow in Southern University, Baton Rouge, USA where he worked on thin film based Li-batteries and sensors. He has more than 150 papers in international journals to his credit.



Steam Leak Scenarios in Sodium heated Steam Generators for Fast Breeder Reactors

S.Kishore*, Krishnakumar. S, Vijay Singh Sikarwar, Parmanand Kumar, V.Vinod, S.Chandramouli



Shri S. Kishore

**Head, Process Development and Experiments Section
Experimental thermal hydraulics Group
Fast reactor Technology Group - IGCAR**

Sodium heated Steam Generator (SG) is a crucial component in the heat transport system of a fast breeder reactor (FBR). In case, one of its water/steam carrying tubes becomes defective, water/steam leaks into sodium, flowing in the shell side, causing sodium-water reaction, which is highly exothermic and producing corrosive NaOH and hydrogen. The effect of steam generator leak depends largely on the magnitude of the leak rate. Accordingly, steam leaks are classified into four [1] as shown in below table.

The main effects of intermediate and large leaks are hydrogen pressurization and heat generation. A micro leak damages the leaking tube itself, which is called self wastage. Due to self wastage, the leak will gradually enlarge into a small or even intermediate leak. The principal effect of a small leak, is 'damage of a single adjacent tube', which is usually designated as impingement wastage or adjacent tube wastage. Once a tube develops a small leak, minutes or even seconds are sufficient to puncture one of its adjacent tubes, causing a secondary leak, which will be much higher than the original one. Each kind of leak is detected using specific hydrogen sensors and managed by means of safety actions.

Experiments are being carried out in IGCAR, simulating steam leak into sodium, to study the phenomenon of impingement wastage on Mod 9Cr 1Mo steel, which is the SG tube material of Prototype Fast Breeder Reactor (PFBR). This article talks on SG leaks, its detection and hydrogen management during a leak incident.

| | |
|---------------------------------------|---|
| Designation | Head, Process Development & Experiments Section, Experimental thermal hydraulics Group, Fast reactor Technology Group Indira Gandhi Centre for Atomic Research Kalpakkam |
| Qualification & experience | <ul style="list-style-type: none"> • BTech in Chemical Engineering from University of Kerala in 1995 • Joined as Scientific Officer -C in Fast Reactor Technology Group, IGCAR • MS in Chemical Engineering in IIT madras • Presently heading Process Development and Experiments Section in FRTG |
| Field of expertise | Sodium Technology particularly sodium - water reaction, steam generator, sodium purification, development of sodium components, Hydrogen meters in sodium, etc. |
| Member | Indian Nuclear Society, Indian Institute of Chemical Engineering |

| Steam Leak | Magnitude of leak | Main Effect |
|-------------------|-------------------|---|
| Micro Leak | < 50 mg/s | Self wastage of the leaking tube. |
| Small leak | 50 mg/s – 10 g/s | Wastage of single adjacent tube |
| Intermediate leak | 10g/s – 1000 g/s | Multiple tube damage, heating, slow hydrogen pressurization |
| Large leak | >1000g/s | Sudden hydrogen pressurization |

References

[1] Hori, M et. al, , Sodium-water reaction studies for MONJU steam generators, In IWGFR Study Group Meeting on Steam Generators for LMFBR's, Bensberg, FRG, 14-17 Oct 1974.



Sodium cleaning techniques employed for Fast Reactor components with controlled hydrogen evolution and the hydrogen safety measures employed

Ashish Kumar*, S. Ignatius Sundar Raj*, Y. V. Nagaraja Bhat*, Sudheer Patri*, S. Chandramouli*



Fast reactors are typically sodium-cooled and use components that operate in direct contact with liquid sodium. Effective sodium cleaning of these components, tailored to their specific end-use requirements, is essential for ensuring the safe, reliable, and sustainable operation of these reactors. Over the years, several sodium-cleaning techniques have been developed, with established practices now including the Water Vapor–Carbon Dioxide (WV–CO₂) process for cleaning of reusable components, the Steam–Nitrogen process for non-reusable components, and a combination of alcohol cleaning and the WV–CO₂ method for selected specialized applications. A defining feature of all these operations is the generation of hydrogen, whose controlled management from the instant it forms to its final discharge, plays a pivotal role in maintaining operational safety and process integrity. The hydrogen evolution rate is tightly governed through strict control of reaction kinetics, maintaining hydrogen concentrations safely below the Lower Explosion Limit (LEL) at all times. Simultaneously, a diversified and redundant hydrogen monitoring set up delivers continuous, cross-validated oversight of hydrogen levels. Gas samples are drawn from multiple locations and analyzed using independent hydrogen analyzers capable of operating reliably under inert conditions. The hydrogen-bearing gas mixture is then safely vented through a flame arrestor. In the WV–CO₂ process, an additional water-washing stage follows the reaction phase, necessitating particular vigilance. The initial rinsing is performed under continuous hydrogen monitoring, with provisions for immediate intervention in case any residual sodium reacts with the incoming water.

Together, these measures form a tightly controlled safety envelope, ensuring that hydrogen management remains consistently robust throughout every phase of the sodium cleaning process.



Shri Ashish Kumar

**Sodium Experiments & Component Development Division
Fast Reactor Technology Group– IGCAR**

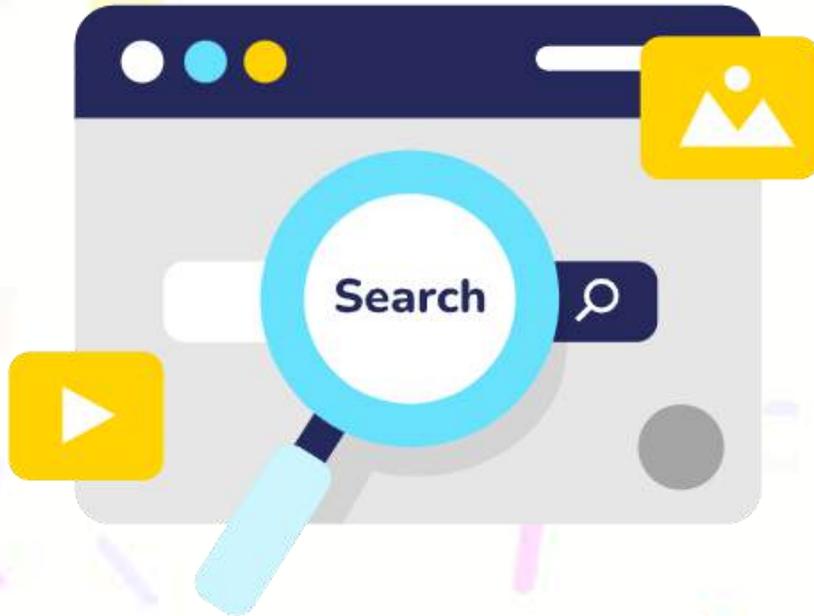
Shri Ashish Kumar is from the 60th batch of the BARC Training School at the IGCAR campus. He joined the Department of Atomic Energy (DAE) in 2016 after completing his Bachelor's degree in Mechanical Engineering from Chhattisgarh Swami Vivekananda Technical University. Since 2017, he has been serving as a Scientific Officer at the Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam.

Over the years, he has been involved in commissioning activities of the Prototype Fast Breeder Reactor (PFBR). His technical works spans the design and development of experimental setups, qualification of reactor components through sodium testing, and the mechanical design, analysis, and experimental evaluation of fast reactor components

He has acquired substantial hands-on experience in sodium cleaning operations for both reactor-grade and experimental components, an area crucial to fast reactor technology. His contributions include developing and refining methodologies for the safe and effective removal of residual sodium, thereby ensuring the operational readiness of reactor components. Presently, Shri Ashish Kumar is engaged in research and development of advanced sodium removal technologies, particularly the evaporative vacuum technique for sodium removal from complex components. He is also involved in the establishment of a full-scale sodium pump testing facility, contributing to the development of infrastructure vital for future fast reactor program.

Shri Ashish kumar is the recipient of the Dr. Shekhar Basu Memorial Award (2022), recognizing his technical contributions to the programmes of DAE. His M.Tech project, titled "Mechanical Design of Sweep Arm Scanner for Scanning Fast Reactor Core," received an Appreciation Award during the IGCAR Foundation Day in 2019. He has six publications to his credit in national and international forums one of which received the best poster award.





<https://sites.google.com/pondiuni.ac.in/nwnhs2026>





NLCEST

2026

PONDICHERRY UNIVERSITY, INDIA
16th April, 2026



South Asia Foundation(SAF/MSF) Sponsored

NATIONAL LEVEL COMPETITIVE EXHIBITION ON SUSTAINABLE TECHNOLOGIES

Under UNESCO Chair(RCESD- PU) activity

WHERE INNOVATION MEETS SUSTAINABILITY

www.nlcestexpo.in

NLCEST IS A NATIONAL LEVEL SUSTAINABLE TECHNOLOGY COMPETITION AND EXHIBITION COMMEMORATES THE 100th BIRTH ANNIVERSARY OF SHRI MADANJEET SINGH, A LEGENDARY PEACEBUILDER, AN ADVOCATE FOR SUSTAINABILITY AND THE VISIONARY FOUNDER OF THE MADANJEET SCHOOL OF GREEN ENERGY TECHNOLOGIES (UMSGET) ORGANIZED BY THE DEPARTMENT OF GREEN ENERGY TECHNOLOGY, UMSGET, PONDICHERRY UNIVERSITY, IN PROUD PARTNERSHIP WITH THE UNESCO CHAIR – RCESD AND THE SOUTH ASIA FOUNDATION (SAF/MSF – INDIA) WHERE STUDENTS, RESEARCHERS, AND INNOVATORS PRESENT THEIR PROJECTS AND IDEAS, WHILE INDUSTRY SPONSORS SHOWCASE RELEVANT TECHNOLOGIES AND PRODUCTS.

www.nlcestexpo.in



REGISTER FOR OUR NEXT
BIG EVENT

PONDICHERRY UNIVERSITY
Department of Green Energy Technology
Madanjeet School of Green Energy Technologies



The Convenor- NWNHS 2026

Prof. R. Arun Prasath
UNESCO Chair on RCESD | Department of Green Energy Technology
Madanjeet School of Green Energy Technologies
Pondicherry University | R.V. Nagar Kalapet, | Puducherry 605 014
+91 9487769611 | raprasath@pondiuni.ac.in | dgetconference@pondiuni.ac.in