St. Philomena's College (Autonomous), Mysore

One Day Seminar On

Nuclear Energy And Its Potential– 2024

7 March, 2024

Report

Date: 7 March, 2024

Venue: UG Auditorium,
St. Philomena's College, Mysuru

Number of Participants: More than 200

Introduction

As the world moves toward cleaner and more sustainable energy solutions, nuclear energy stands out as a crucial component in the global effort to combat climate change and secure reliable power. With countries like India setting ambitious goals for reducing carbon emissions and transitioning to non-fossil energy sources, the poten tial of nuclear energy has never been more relevant.

This seminar aims to promote the advantages of nuclear energy and explore its benefits, and address the challenges that lie ahead. Through a series of insightful presentations, panel discussions, and networking sessions, we hope to foster a comprehensive understanding of nuclear energy's role in achieving a sustainable future.

Objectives

1. Education and Awareness: To educate participants on the principles and benefits of nuclear energy.
2. Technology and Innovation: To explore the latest technological advancements in nuclear energy.
3. Policy and Regulation: To discuss the policy frameworks and regulatory environments required for the safe and effective deployment of nuclear energy.
4. Sustainability and Climate Goals: To examine how nuclear energy can contribute to global sustainability efforts.

The seminar started by an inaugural lecture by Shri. Deshpande M S, Head, Chemical Technology Division, BARC, Mumbai. His talk was focused on applications and envisioned Indian programs of nuclear energy. The was on the relevance of nuclear energy in the present case scenario. The talk covered the topics such as he greenhouse gas emission, global warming, towards net zero carbon emission, options for India, role of Nuclear Energy, three stage program of DAE, non-power uses of nuclear energy in Medical, Agriculture, Industrial, municipal waste management, food preservation, etc.

Followed by this lecture, Dr.A.Chanadrashekara, Officer-in-Charge, SMFC, BARC, Mysuru delivered a talk on Nuclear Energy and Radiation Safety Aspects. His talk encompassed the significat contribution of Department of Atomic Energy for the development of the nation by promoting use of nuclear energy and radiation with due consideration of safety aspects on priority. Applications of nuclear energy/radiation have opened up new horizons. It is therefore necessary to understand in the true perspective, the various advantages of nuclear energy and protection aspects. He educated students of the college about nuclear energy, its applications and safety aspects. In general the application of nuclear energy encompasses each and every walks of our life. Nuclear energy/nuclear radiations are used in various fields such as power production, Industrial, Medical, research, national security, environmental hygiene, etc. He also talked about the misconception in minds of some public about nuclear installation that surrounding public areas have significant level of radiation.

Followed by this talk, Dr. P.Anand, Scientific Officer, BARC, Mysuru, delivered a lecture on Application of Isotopes in Medicine. One among the important uses of ionizing radiation is its application in diagnostic and therapeutic fields of various diseases. Starting with the discovery of natural radioactivity by Henri Becquerel to the latest innovation of Positron Emission Topography by Peter Alfred Wolf, many people have made the field of nuclear medicine a reality. Radiopharmaceutical is a pharmaceutical molecule with a radio isotope tracer attached. Radio isotopes are used in biochemical analysis, diagnostic and therapeutic modalities and radiation therapies. Radionuclides are produced using cyclotrons, nuclear reactors and generators. The diagnostic applications are in the field of oncology, cardiology, neurology,

thyroid and kidney imaging and in identification & localization of infection and inflammation. The therapeutic applications include cancer therapy for neuro endocrine tumors, thyroid cancers, palliative of pain, bone metastasis and prostate cancers. The radioisotopes are organ specific which emits beta or gamma radiations which depend upon its application. Positron Emission Topography (PET) has revolutionized cancer management with its whole body diagnostic capabilities. Also in the field of cardiology the identification of viability of myocardial tissue has been a boon for patients as it avoids unnecessary procedures. Mapping functional brain tissue identifies degenerative neurological diseases much early. Overall, radioisotopes have revolutionized health care and going to be a major diagnostic and therapeutic tool with the continued invention of new radio pharmaceuticals in future.

Followed by this lecture, S.S.Ajai, Scientific Officer, BARC, Mysuru gave an insightful talk on Novel Reactor – A Potential Step for Achieving Net Zero Carbon Emission. Energy is the prime mover of economic growth and sustainable development goals. It has a direct impact and influence on the quality of life and human welfare. India's per capita energy consumption is $1/3^{rd}$ of world's average and highly dependent on Fossil fuel energy resources. Historically, industrial development has been synonymous with fossil fuel consumption and dependency. The challenge posed to welfare of the planet by the climate change has necessitated increasing global efforts to limit earth's average surface temperature increase to $1.5^{o}C$ above pre-industrial levels as per Paris Agreement. Further as per India's recent commitment in Climate of Parties (COP) annual climate conference summit, is to increase the non-fossil energy capacity by 2030, phase out fossil fuel energy by 2050 and achieve Net Zero Carbon Emission by 2070. The energy transition requires rigorous discussions on the transition pathways and clean technologies for its adoption. The options for clean energy sources are renewable energies like Hydro, Solar, Wind etc. and non-fossil clean fuel sources like Green Hydrogen and Nuclear energies. To achieve clean energy transition, it calls for needs to shift to highly energy efficient processes and systems, in all our activities. Amongst the low-carbon sources of electricity, Nuclear energy has been especially endowed with low lifecycles greenhouse gas (GHG) emissions and low material intensity per unit of electricity generation. It is the largest energy source of base load power with minimum carbon foot print. Thus, Nuclear energy is a

promising choice for energy transition strategy to achieve deep de-carbonisation and provides access to clean, reliable and affordable energy, mitigating the negative impacts of climate change. This envisages three to four-fold increase in nuclear power generation. Harnessing nuclear energy is a capital – intensive process and public investments alone will likely fall sadly short of the requirement. It is by adopting energy mix policy and introduction of many Small Modular Reactors (SMRs) with novel advance inherent safety features. SMRs are ideal choice to partially help in lifting the huge gap of energy demand, with less carbon foot print. The world is looking for selecting a suitable design and also robust policy framework addressing safety and techno-commercial viability.

Followed by this inspiring talk, Mohini Gupta, Scientific Officer, BARC, Mysuru shed a light on the topic Scientific/Technical Career and Educational Opportunities in DAE. Ms. Gupta, gave all the information about the joining the department of atcomic energy through various possible means. She talked about the possibiblities and opportunities to work in the nation building process throught nuclear energy. She also mentioned varioues incentivies and promotions based on meritorious perfomances.

All the talk were enriching, informative and eye oprning. Audience enjoyed the talk and interacted well with the speakers through interesting questions. These talks gave clarity about the sustainability of nuclear energy and its applications. They were well received talk amongst the audience.

Photographs


One Day Seminar & Poster Exhibition on
Nuclear Energy and its Potential
Jointly organized by
the Department of Physics,
St. Philomena's College, Mysuru,
Indian Nuclear Society (Mysuru)
and Bhabha Atomic Research Centre, Mysuru.
Venue: UG Auditorium,
St. Philomena's College
Day: March 07, 2024
(Thursday)
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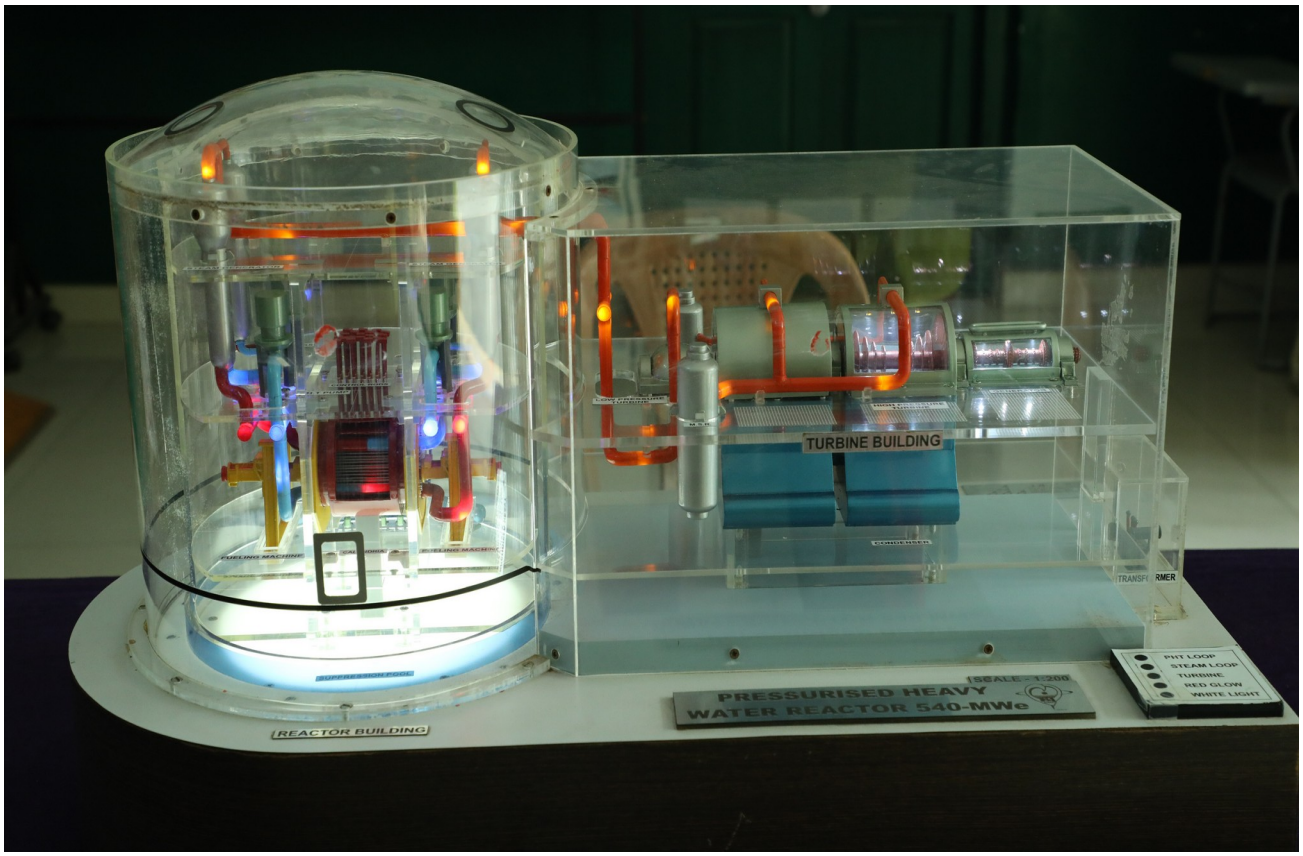
Language Lab


TURBINE BUILDING
REACTOR BUILDING
SCALE - 1:200
PRESSURISED HEAVY
WATER REACTOR 540-MWe
PHT LOOP
STEAM LOOP
TURBINE
RED GLOW
WHITE LIGHT