

**A Report On Industrial Visit**  
**Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam - Tamil Nadu**  
**Organized by Department of Computer Science and Engineering**  
**01 September 2023**



**Submitted by : Dr. K. Sudhakar, Senior Assistant Professor, Department of Computer Science and Engineering.**

Received On: 27.09.2023

**Attended Students and Faculty:** 49 Students from II CSE and III CSE with 2 Faculties from Department of Computer Science and Engineering.

The Industrial Visit has started from MITS at 1.30 AM

#### **About Indira Gandhi Centre for Atomic Research (IGCAR):**

Indira Gandhi Centre for Atomic Research [IGCAR], the second largest establishment of the Department of Atomic Energy next to Bhabha Atomic Research Centre, was set up at Kalpakkam, 80 KMs south of Chennai [MADRAS], in 1971 with the main objective of conducting broad based multidisciplinary programme of scientific research and advanced Engineering, directed towards the development of sodium cooled Fast Breeder Reactor [FBR] technology, in India. This is part of the second stage of Indian Atomic Energy Programme, which is aimed at preparing the country for utilization of the extensive Thorium reserves and providing means to meet the large demands of electrical energy in 21st century. In meeting the objectives, a modest beginning was made by constructing a sodium cooled Fast Breeder Test Reactor [FBTR], with a nominal power of 40 MWT, based on the French Reactor, RAPSODIE. The reactor attained its first criticality on 18th Oct, 1985 and has been in operation at its maximum attainable power level of 10.5 MWT with a small core. It is the first of its kind in the world to use Plutonium Uranium mixed carbide as a driver fuel. Over the years, the Centre has established comprehensive R & D facilities covering the entire spectrum of FBR technology related to Sodium Technology, Reactor Engineering, Reactor Physics, Metallurgy and Materials, Chemistry of Fuels and its materials, Fuel Reprocessing, Reactor Safety, Control and Instrumentation, Computer Applications etc., and has developed a strong base in a variety of disciplines related to this advanced technology. With the experience and expertise gained by the successful operation of FBTR, the Centre has embarked upon the design and construction of 500 MWe, Prototype Fast Breeder Reactor [PFBR]. Various R & D activities in the areas of Structural Mechanics, Thermal Hydraulics and flow induced vibration, Component Testing in high temperature sodium environment, sodium-water reaction, hydraulic development of sodium pumps etc., were pursued and the design was completed. The PFBR is under advanced stage of construction and commissioning by BHAVINI.

As a part of efforts for closing the fuel cycle, a Fast Reactor Fuel Reprocessing Plant is under construction.

A 30 KWT, U233 fueled mini reactor [KAMINI] has been made operational for neutron radiography, neutron activation analysis etc., IGCAR utilizes its expertise and resources in enhancing its standing as a leading Centre of research in various branches of basic, applied and engineering sciences that have a bearing on Nuclear Technology like Structural Mechanics, Heat and Mass Transfer, Material Science, Fabrication Processes, Non-Destructive Testing, Chemical sensors, High temperature thermodynamics, Radiation Physics, Computer science etc.,

Apart from thrust areas related to nuclear technology, the Centre has credentials as a leader of research in various frontier and topical subjects like Quasi crystals, Oxide superconductors, Nano-structures, clusters, SQUID fabrication programs, exopolymers and experimental simulation of condensed matter using colloids etc., IGCAR has extended its expertise and facilities to other vital sectors as Defence, Space and other industries of India to develop techniques for reliable solutions to specialized problems. It has collaborations with educational and R & D institutes like Indian Institutes of Technology, Indian Institute of Science, Piloni, Regional Engineering Colleges, National Research Laboratories, Public Units and Institutes abroad.

A modern Library comprising 62,000 volumes of books, 41,000 back volumes, about 920 journals and 1.95 lakhs reports in all disciplines caters to the technical needs of the Scientists and Engineers. The Central Workshop is fully equipped with sophisticated machines for the fabrication of precision components.

The Computer Division houses Silicon Graphics Power Challenge L servers, SGI workstations, 8 Noded Xeon Servers to meet the computational demands of the users. The centre has sanctioned staff strength of 2814 including 1187 Engineers and Scientists. The annual outlay of the Centre is around 754.47 crore rupees towards its activities and plan.

### About the Visit:

The total 49 Students from II CSE and III CSE with two faculties (Dr. K. Nidhiya, Professor and Dr. K. Sudhakar, Senior Assistant Professor) from Computer Science & Engineering Department of MITS College of Engineering, Angallu, visited [Indira Gandhi Centre for Atomic Research](#) (IGCAR), Kalpakkam, TamilNadu.

The students' visit schedule is as follows.

- 10:00 am - 11:00 am: Power point presentation - IGCAR introduction. Overview of IGCAR activities & video
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- 11:00 - 12:30: Visit of various power production units.
- 1.30 PM to 3.30 PM: Visit of Computer Servers, Virtualization Servers and Data Centers
- 4.00 PM: Departure.