



Bharatiya Vidya Bhavan's
SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)
Andheri (W) Mumbai – 400058

MECHANICAL ENGINEERING DEPARTMENT

LANDLINE: 022-26232192

EMAIL ID: hod_med@spce.ac.in



Industrial visit to CrTD, BARC, Mumbai by TESA-SPCE

A one-day Industrial visit was conducted to **CrTD, BARC, Mumbai** on **Saturday, 30 September 2019** by **TESA-SPCE**. This visit to one of the premier research organizations of our country was organized by **Prof. Parag K. Muley, Faculty Advisor, TESA-SPCE** for the academic benefit of students of elective course **'Introduction to Cryogenics'** instructed by him and was attended by **20 students**. The program started in the Conference Room, **CrTD, BARC** with introduction of students of SPCE and a brief presentation about SPCE by **Prof. Parag K. Muley** to the team of scientists at CrTD, BARC. This was followed by the lectures by distinguished scientists of CrTD, BARC in the first half as follows:

1. **"Introduction to Cryogenics and CrTD Department"** by **Dr. Mukesh Goyal**- Overview of applications of Cryogenic Technology at Department of Atomic Energy (DAE) such as Super Conducting Magnets and SRF activities for TOKOMAK etc., Experimental facilities at CrTD, BARC like LHP 500, CP 1000, CP 2000 etc.
2. **"Cold box and Piping"** by Mr. **Naseem Ahmed**- Overview of construction, piping, multilayer insulation, leak-proof fabrication, use of radiography to eliminate leakage.
3. **"Turbo Expander"** by **Scientist Mohananand Jadhav** - Overview of materials, High strength 707T6 for Turboexpander, Turbomachinery selection – Balje Chart, Sealing of Turboexpanders etc.
4. **"Heat Exchangers"** by Mr. **Abhilash Chakravarty**- Overview of Cryogenic Heat Exchangers, Development of Plate Fin Heat Exchanger (PFHE) at CrTD etc.
5. **"Gas Lubricated Bearings"** by Mr. **Ankit Jain**- Overview of Bearing selection for high speed Turboexpander, Cryogenic transfer lines, Bayonet connections etc.
6. **"Safety in Cryogenics"** by Mr. **Rajendran S. Menon**- Overview of hazards at cryogenic temperature such as Oxygen deficiency, Fire, Explosion and Oxygen enrichment methods etc.

The second half was dedicated to visit of students to high-end research laboratories and state of the art experimental facilities at CrTD, BARC such as:

- Bayonet connections, Multilayer insulations,
- Testing of shafts,
- Testing of turboexpanders,
- Helium Leak testing,
- Experimental facilities (LHP 50, CP1000, etc.),
- Workshop and Control Room.

The team of scientists provided our students with practical exposure and valuable information of all above testing and experimental research facilities at CrTD, BARC. The visit to this premier research organization thus provided knowledge of scope and applications of cryogenics in atomic energy research. Electronic gadgets were not allowed in the premises of CrTD, BARC due to confidential research activities and strict security measures. The program was concluded with a MCQ Test of students and feedback and vote of thanks by **Prof. Parag K. Muley**.



भाभा परमाणु अनुसंधान केंद्र
BHABHA ATOMIC RESEARCH CENTRE

अमृतं तु विद्या

Bharatiya Vidya Bhavan's
Sardar Patel College of Engineering
(Government-Aided Autonomous Institute)
MUNSHI NAGAR, ANDHERI (WEST), MUMBAI - 400 058.

Tel : 91-22-2623 2192
91-22-2628 9777
Fax : 91-22-2623 7819

E-mail : principal@spce.ac.in
Web : www.spce.ac.in

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To
Division Head, CrTD,
BARC, Mumbai.

Through: Head of Dept.(Mech.)

Sub.: Industry Visit of B. Tech. (Mech.) students to CrTD, BARC.

Dear Sir,

It is a pleasure to extend consent for the conduct of one day visit by B.Tech.(Mech.), Semester-VII students of our institution to your esteemed research organization of BARC, Mumbai. These students are studying the elective course of 'Introduction to Cryogenics' instructed by our faculty Prof. Parag Muley, Mechanical Engineering Department. We are sure that during this visit, our students will be provided with valuable guidance and exposure to research in the domain of cryogenics by your experts. Please find enclosed herewith Annexure-I for details of students participating in this one day visit. The students will be accompanied by Prof. Parag Muley during this visit.

We look forward to your kind co-operation in the academic interest of our students.

Regards,

PRINCIPAL

Encl: As above.