



DEPARTMENT OF ECE

A Report on

Industrial Visit to Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota

Department of ECE organized an Industrial Visit to " Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota" on 15-09-2022 for IV ECE - A & B students. Total of 106 students along with 4 staffs attended the visit. Satish Dhawan Space Centre - SDSC is a rocket launch centre operated by Indian Space Research Organisation. It is located in Sriharikota in Andhra Pradesh. Sriharikota Range was renamed in 2002 after ISRO's former chairman Satish Dhawan.

The objective of the visit was to provide a Technical Exposure to the students about Space Technology and advancements in Technology. The visit not only provided a good insight into the quality of research happening in the area of space technology but also gave great exposure to the students about the future career prospects and areas of research in applied sciences.

After several security checks and administrative formalities, Students were taken to a central building. In this place, they were shown a video – 'Gateway to Space' – on the ISRO, its history, and the current facilities available.

As a part of it, we visited SHAR Library, MIssion Control Centre, Launch Pad 1 & 2, Space Museum.

THE 'GATEWAY TO SPACE VIDEO':

The GSLV and PSLV are the two launch vehicles used currently by ISRO to launch satellites into the geosynchronous and polar orbits respectively. The GSLV has 3 stages – the first is a solid (fuel) stage, the second a liquid (fuel) stage and the third is a cryogenic stage. The satellites launched so far have applications such as National development/infrastructure, telecom, disaster warnings, resource management, etc

The PSLV can launch multiple satellites simultaneously at a low cost and high reliability. The various facilities at SDSC were listed and their functions are explained in

brief. Weather prediction is another important factor at the time of launch, and the SHAR boasts of this facility too. The latest addition to the SDSC was the S200 propellant plant. The strap on motors, their dimensions and use were elucidated.

The countdown begins at (t-57) hours. At this time, the liquid propellants are filled into the system. At (t-16) hours, the mobile service car is withdrawn and the system is connected to the Launch and Mission control centre (which are placed 6km from the launch site) through electrical wires only. The cryogenic fuel is set around the launch site. The performance is monitored in real time. At about 17 minutes after blast off, the GSLV completes the mission – puts the satellite in geosynchronous orbit.

Machine Control Centre (MCC):

At first we visited Machine Control Centre (MCC). It has various chambers of all the dignitaries in various fields . During the time of launch this crew assembled here to observe each and every stage of the rocket from the time of launch till the entry of satellite into its respective orbit. Just opposite to their chambers there is a lounge where VIPs watch the entire launching process over the large projected screens displayed at a height of 10 to 15 meters from the ground.

SECOND LAUNCH PAD:

Later we visited second launch pad, this is the location that we see every time a launch is broadcast on television. The rocket is assembled and brought to the launch pad. The rocket is electrically insulated from lightning by 4 lightning protection towers. These towers also house high resolution cameras at several levels to monitor the various stages of the rocket. These cameras are protected by concrete enclosures. The launch pad itself is about 70m high. This means that the protection towers are even taller. An anchor is present to hold the rocket in place until the time of blast off.

Separate pipes are present to deliver cryogenic fuels, which are supplied at 180 degrees Celsius.

Finally, there are exhaust deflection ducts which deflect the exhaust gases through underground tunnels to a place which is a few tens of metres away. In case the flame returns to the rocket, balance will be lost and the rocket may topple. The tunnels are filled with water to reduce pressure and temperature. Also, cryogenic fuel tanks are available in separate towers. Each floor in the launch pad is 4m high. This launch pad is called 'umbilical' due to the presence of the pipes which feed fuel to the rocket.

Launching pad is surrounded by four large towers which are helpful to capture the launch images and also to ground the potential during thunderstorms to protect the launching pad.

FIRST LAUNCH PAD:

Later we visited first launch pad, unlike the 'umbilical' type, this is a pedestal type. The whole tower moves away from the rocket just before the blast off. As there is a PSLV launch in the next month and that process was taking place at the time, entry was denied and we were allowed to see this from a distance. At the end we visited Space Museum.

PHOTOS



At Narayana Engineering College, Nellore (Before Starting to SDSC SHAR)



At Space Museum - SDSC SHAR



At SHAR Entrance - IV ECE - B



At SHAR Entrance - IV ECE - A