Godrej *Express*

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GODREJ CONTRIBUTES TO INDIA'S 1ST MISSION TO THE MOON WITH "CHANDRAYAAN – 1"

"Chandrayaan – 1", the unmanned spacecraft, weighing more than 1300 kg, successfully took off today morning at 6.20 a.m. from India's Space Launching facility at Sriharikota, AP.


Vikas Contour Engine

Godrej & Boyce Mfg. Co. Ltd., Precision Components & Systems Division & Tooling Division: Godrej has been contributing to India's Space Program led by the Indian Space Research Organization (ISRO), since 1985. Chandrayaan - 1 is carrying a total of 11 payloads, 5 developed by Indian scientists and 6 selected from the International scientific community for inclusion in the mission. It will also be carrying an article carrying the Indian flag which will be dropped from the spacecraft onto the surface of moon. While it will make impact on the surface of moon, various cameras and sensors are going to study the condition of the surface which will help to judge the properties of moon.

Godrej is actively involved in all aspects of the systems used in Chandrayaan - 1. These are:

1. **The Launch vehicle:** ISRO identified PSLV (Polar Satellite Launch Vehicle) as the launch vehicle for this mission to put the satellite in polar/solar orbit for remote sensing purpose. The second stage of the PSLV called Vikas Engine, is manufactured by Precision Components & Systems (PCS) Division, Godrej. So far Godrej has delivered more than 50 such engines. Further, the 50N thruster for the fourth stage reaction control system of this launch vehicle is also supplied by PCS.

2. **The Lunar Orbiter:** The next challenge for ISRO was to design a light weight spacecraft which can carry maximum payload and orbit the moon for a long duration of two years. Thrusters of 10 N and 22 N capacities have been supplied by PCS which will be used for maneuvering this spacecraft as per the planned trajectory and also during its orbiting across the moon, throughout its life span.

3. **Remote Sensing Antenna:** Chandrayaan - 1, because of the far distance it will travel, was required to have a very powerful Antenna for receiving and sensing signals and due to limitation of weight, was required to be made out of composites. PCS supplied the mould of very high accuracy and surface finish for casting this Antenna.

4. **Ground System Antenna:** ISRO's next challenge was to establish deep space networking antenna for then receiving the data from the spacecraft. Normally, antennas for remote sensing and for communication are in the range of 2 m to 11 m whereas for deep space, antennas in the range of 18 m to 36 m are required. Dr. Madhavan Nair, Chairman of ISRO encouraged ISRO Telemetry Tracking & Command Network (ISTRAC) to develop a 32 M diameter Antenna with participation of experts within ISRO Research Institutes, large academic institutes and the industry. For some of the critical parts of this Antenna, PCS took up the challenge and supplied Dichroic Plate, Feed Horn in S and X Band, sub Reflector, ADE Reflector Mould, Diplexer and other Feed Systems. The Tool Room Division, Godrej, supplied Mirror and Moulds for stretch forming of Antenna Panels.

This mission is a giant leap in India's space program. For the first time, we will be crossing beyond well known space upto 36,000 kms (geo-synchronized orbit). **With the launch of this spacecraft, India will be joining the elite club of 5 countries in the world after Russia, USA, China and Japan.**

The Moon is more than 1 lac km away from the earth's surface and Chandrayaan - 1 will take around 2 weeks to enter into the moon's gravitational area. Subsequently it will go as close as 100 km in the next 15 days and it will have a planned life of around 2 years.

The cost of the entire mission is about Rs. 400 crores and it has taken roughly 5 years from its conceptualization. This launch is based on the confidence demonstrated by Department of Space, Govt. of India and it has already sanctioned the next mission which will be far more richer in scientific experiments than the first and is planned in the next 2 years.

While conceptualizing this mission and taking it to its success, scientists have come across many challenges right from size, shape, weight of the space craft (lunar orbiter), configuration of launch vehicle, programming of the trajectory, monitoring this trajectory during the mission and giving various commands, receiving the information gathered from the payloads on the Chandrayaan - 1 at the receiving station and convert it in the form, scientists and other researchers require for their study.

Mr. D K Sharma, VP Tooling Division, who was present at the launch had this to say: "The atmosphere at the launch was exuberant. The flawless execution had 0% error at all four stages. Chairman of ISRO, Mr. Madhavan Nair expressed his heartfelt thanks to the entire Godrej team."

Godrej is proud to have contributed substantially to Chandrayaan - 1, a historical achievement for India. Senior officials of ISRO have congratulated PCS and Tooling Division teams for their contribution to this great scientific achievement.

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