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Industrial Visit organized by
Aeronautical Department on 02/05/2025

Report on Industrial Visit to HAL Foundry & Forge Division, Bengaluru

About HAL Foundry & Forge Division

HAL was established in Bangalore in 1940 and its Foundry & Forge division which manufactures components for various aircraft, engines and systems has been a part of HAL since its inception. It is the largest foundry and forge facility in Asia and a leading facility in the world for aerospace component manufacturing.

This division provides forgings and castings and manufactures intricate components for various aircraft, helicopters, drones, engines, accessories and aggregates for military and civil application. Also, it provides components for use in satellites and space crafts for Indian space programs apart from manufacturing large spacecraft structures.

Apart from the manufacturing facilities for aerospace and defence castings and forgings, this division has extensive facilities for metallurgical testing, mechanical and chemical testing, material research, and NDT facilities exclusively used for defect and accident investigations.

In addition to catering for the domestic requirements for LCA, LCH, LUH, Su-30MKI and so on, this division is currently manufacturing and exporting aerospace parts to global aerospace giants in different fields such as

- Aircraft parts for Boeing
- TPE331 engines for Honeywell
- Components for Dornier 228 for RUAG, Switzerland
- Aircraft parts for Airbus SAS
- Composite materials for Israel Aerospace Industries
- Steel and nickel alloys to GE Aviation, USA and so on

VISIT TO HAL FOUNDRY & FORGE DIVISION

The students from 6th Semester Aeronautical Engineering made a visit to HAL F&F DIVISIONon 2nd May 2025.After the security clearance and briefing, the students were taken to the Aluminium forging and casting section of the division. The process of making pattern and mold in sand and

how the molten metal is poured and cooled – are explained in detail and various processes involved are shown in the Shop. Wax molding section was shown and explained in detail. The recycling of sand and automation process used for sand molding were explained in detail. Students could see ingots of Al, Ti and Nickel alloys kept for processing. Nickel alloy casting process was going on and students could witness that and got a feeling of high temperature furnaces in the shop. Ring rolling machines and Pressing machines were also shown and explained by HAL executives.

Fig.1 Group of 6th semester Aeronautical Engineering Students of MVJCE during their visit to HAL F&F Division, Bengaluru on 2nd May 2025.

Students' exposure to various facilities such as: -

- Aluminum forging and casting
- Nickel superalloy casting
- Sand molding

- Wax molding
- Ring rolling
- Pressing
- Various engine and aircraft components
- Landing gear casting
- Gearbox casing casting

Outcome of the Industrial Visit

- Students practically learned about various casting and forging processes involved for manufacturing of critical aircraft and engine components.
- The students could learn about the materials used for aerospace applications and manufacturing methods.
- They could physically see the casting processes for aircraft components Jaguar and Hawk aircraft

Acknowledgment

The entire group of students of 6th semester Aeronautical Engineering is grateful to the management of MVJCE for arranging such a wonderful industrial visit to HAL Foundry and Forge Division. The students are very thankful to General Manager, HAL F&F Division for giving the permission for this visit and to senior executives Mr. Narasimha Raju and Mr. Deenesh Patel for their technical interaction and making all arrangements inside the Foundry & Forging Division.