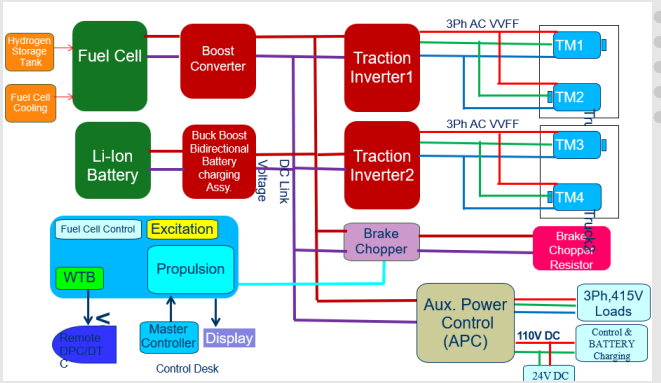
Project 1: Hydrogen Fuel Cell DEMU

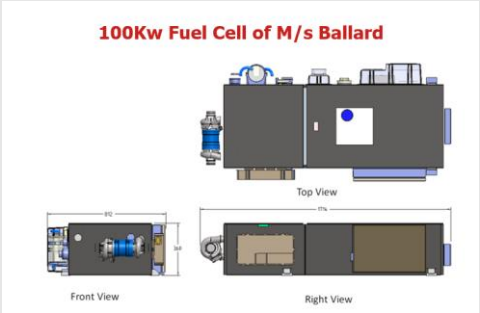
- **System Overview**

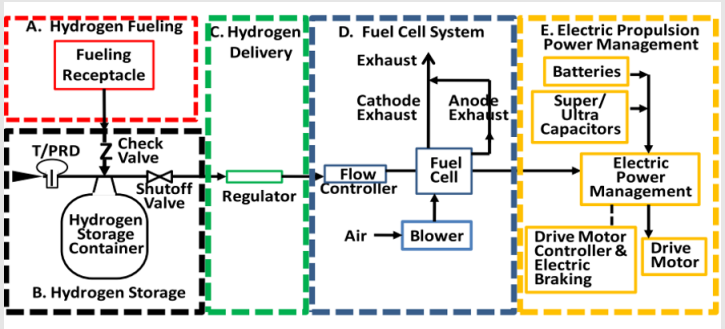
The project involved designing an advanced thermal management system for a hydrogen-powered Diesel Electric Multiple Unit (DEMU), integrating active cooling strategies to enhance fuel cell efficiency.

- **Key Contributions:**

✓ Designed a structural cooling system to support heat exchangers and blowers, replacing traditional HVAC.
✓ FEA & Structural Analysis – Validated load-bearing capacity.
✓ Optimized Weight – Reduced system weight by 12% while ensuring high structural efficiency.
✓ Thermal Performance Simulation – Evaluated temperature gradients & airflow to enhance efficiency.







Project 2: Air Duct Design for Vande Bharat Express-freight

R&D Mechanical Engineer | Duration: Sep 2021 – May 2023

- **System Overview**

Developed an airflow management system for traction motor cooling, optimizing heat dissipation for high-speed train applications. The project focused on reducing thermal loads, improving system durability, and ensuring compliance with railway standards.

- **Key Contributions:**

✓ CFD-Optimized Air Ducts – Increased cooling efficiency by 15%, minimizing pressure drop.
✓ FEA & Structural Analysis – Ensured duct durability by simulating loads.
✓ Thermal Performance Simulation – Evaluated temperature gradients & airflow to enhance efficiency.
✓ Manufacturing & Quality Control – Led fabrication inspections and ensured GD&T compliance.

Ducts Installation in the field.

Traction Motor 1 Air duct

Traction Motor 2 Air duct

Traction Motor 3 Air duct

Traction Motor 4 Air duct

- **Key Contributions**

✓ 8 Ducts of each type were manufactured and installed.

✓ Negotiated with suppliers to maintain cost efficiency, while ensuring compliance with engineering specifications.