



Hydrogen Project: Key Parameters at a Glance

Parameter	Details
Project	India's First Hydrogen Fuel Cell Trainset
Executing Railway	Northern Railway
Technical Partner	RDSO
Formation	2 HDPC + 8 Trailer Coaches
Passenger Capacity	2600
Installed Power	2400 kW (3200 HP)
Power per HDPC	1200 kW (1600 HP)
Design Speed	110 km/h
Proposed Route	Jind–Sonipat (at max sectional speed of 75 kmph)
Hydrogen Storage on Train	440 kg @ 350 bar
Hydrogen Storage at Plant	3000 kg
Fuel Cells	8 (4 per HDPC)
Battery Technology	Lithium Ferro-Phosphate (LFP)
Ventilation System	08 Fans Per HDPC
CCTV	06 Per HDPC
Hydrogen Leak Detectors (Train)	15
Heat Detectors (Train)	7
Flame Detectors (Train)	3
Hydrogen Leak Detectors (Plant)	34
Flame Detectors (Plant)	7
Independent Safety Auditor	TÜV SÜD, Germany



INDIA'S FIRST HYDROGEN FUEL CELL TRAINSET

Towards Clean, Sustainable and
Future-Ready Rail Transportation



2400 kW
(3200 HP)

Installed Power
(1200 kW per HDPC)



10
COACHES

2 HDPC +
8 Trailer Coaches



~2600
PASSENGERS

High Capacity
Passenger Rail



ZERO
DIRECT EMISSIONS

Only Water Vapour
and Heat



A pioneering step towards Atmanirbhar Bharat, National Green Hydrogen Mission and India's commitment to achieve **Net Zero** emissions.





भारतीय रेल
INDIAN RAILWAYS
Lifeline to the Nation

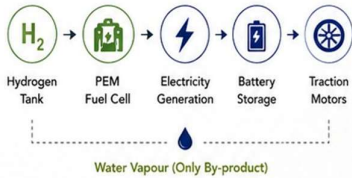


NORTHERN RAILWAY
Leading the Way

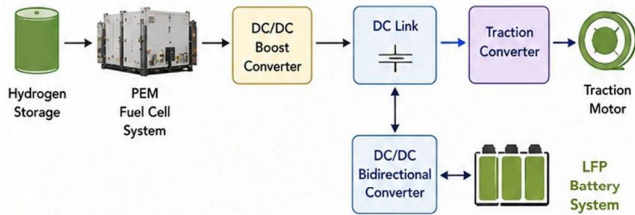
CUTTING-EDGE TECHNOLOGY & GREEN PERFORMANCE

OPERATING PRINCIPLE

The hydrogen stored in the train reacts with oxygen in the fuel cell to generate electricity. This electricity powers the traction motors and charges the onboard battery, ensuring efficient and clean propulsion.



HYBRID PROPULSION ARCHITECTURE



- 2400 kW**
Total Power
- 3200 HP**
Maximum Power
- 4**
Fuel Cells per Power Car
- LFP Battery**
High Safety, Long Life

GREEN ADVANTAGES

ZERO EMISSION
No CO₂, NO_x or particulate emissions during operation.

WATER VAPOUR ONLY
The only by-product is pure water vapour.

QUIET OPERATION
Significantly reduces noise pollution for a better environment.

GREEN HYDROGEN
Produced using renewable energy through the electrolysis process.



India's First Hydrogen Fuel Cell Trainset is a pioneering step towards a sustainable, self-reliant and green railway future.



भारतीय रेल
INDIAN RAILWAYS
Lifeline to the Nation



NORTHERN RAILWAY
Leading the Way

2 Hydrogen Driving Power Cars + 8 Passenger Coaches = 10 Coach Train



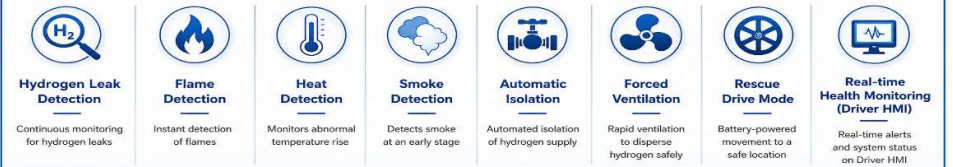
8 FUEL CELLS
(4 per HDPC)

440 kg
HYDROGEN STORAGE @ 350 bar
(220 kg per HDPC)

110 km/h
DESIGN SPEED
(Operational on Jind-Sonapat Section @ 75 km/h)

~2600
PASSENGER CAPACITY

MULTI-LAYER SAFETY SYSTEM



PROJECT HIGHLIGHTS



CLEAN ENERGY



SAFER RAILWAYS



STRONGER INDIA



POWERING A GREENER TOMORROW. DRIVING INDIA'S SUSTAINABLE FUTURE.