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ArcelorMittal Nippon Steel India

ArcelorMittal Nippon Steel India Pvt Ltd.
Visakhapatnam.



**“Reduction of Stack Emissions
by Adopting Modu Power HFPS
Technology in ESP”**



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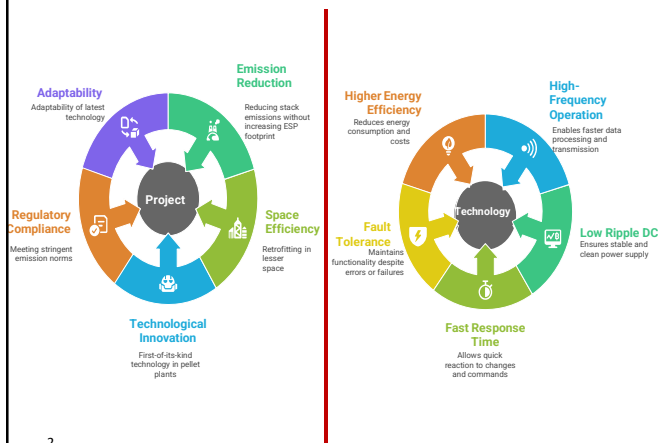
Trigger of the Project :-

The aim is to reduce stack emissions w.r.t current level of 50 mg/ Nm³ to **30 mg/Nm³** within the existing footprint of Electrostatic Precipitator (ESP) .

Date of Commencement :

Conceptualized in CY-2023 at the time of expansion plan of New Pellet plant-III.
Project initiated on Jan -2024 & completed on 30th March 2025.

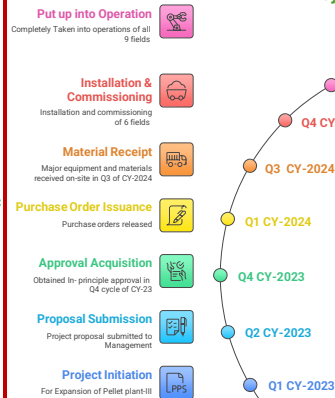
Uniqueness



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Project Timeline

Project Cost: ₹ 6.25 Crores



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Tangible Benefits

Environment, Energy and Operations Gain

Environmental Benefits:-

- Achieved over 50% reduction in particulate emissions compared to existing PM levels.
- Significantly decreased re-entrainment, wrapping, secondary particle migration & puffing phenomena.
- Aligns with the Sustainable Development Goal #3,9,11 & 13. (Good Health and Well-being, Sustainable Cities and Communities, Climate Action, Affordable and Clean Energy, Industry- Innovation and Infrastructure)

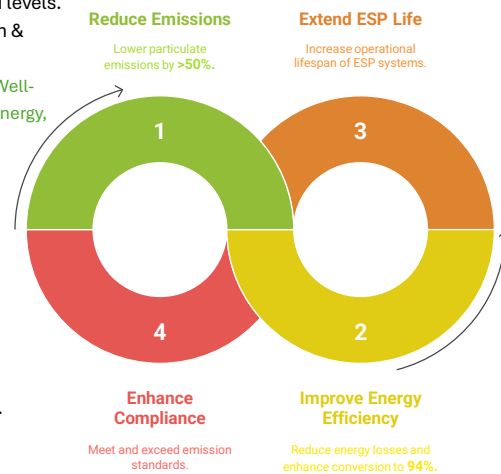
Energy Benefits:

- Energy losses reduced from 35% → ~6%.
- Energy conversion efficiency improved from 63.4% → 90–94%.

Operational Benefits:

- Extended ESP operational life.
- Reduced maintenance intervals → increased uptime.
- Enhanced compliance with emission standards.
- Minimized downtime and maintenance costs thanks to better spark handling.
- No need for physical expansion, saving on capital expenditure and space.

HFPS Benefits Cycle



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Intangible Benefits

Upgradation of Skill

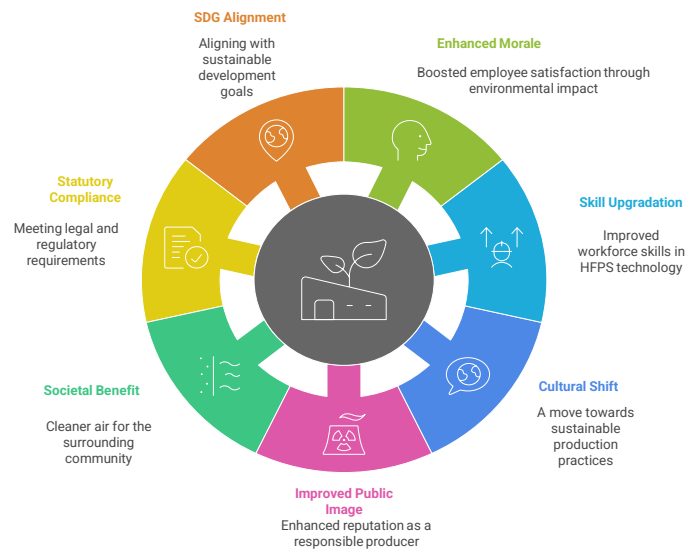
- Acquainted with cutting-edge technology.
- Embraced and developed skills in latest technologies.

Statutory Compliance

- Clearly visible cleaner stack.
- Enhanced trust among stakeholders
- Strengthened public goodwill and brand reputation.



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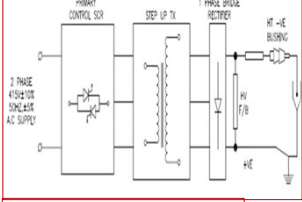
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Evidences of Implementation

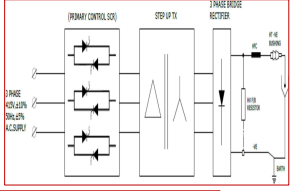
1996
Pellet Plant-1 is equipped with a Multi Cyclone System.



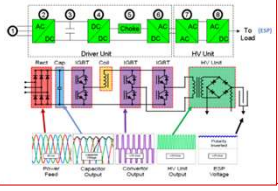
2007
Pellet plant ESP with Single Phase TR's

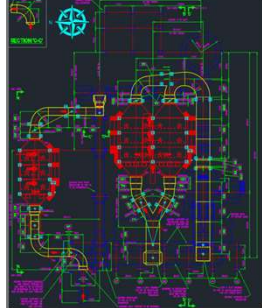


2017
Pellet plant ESP with three Phase TR's



2024
Pellet plant ESP with High Frequency power source(HFPS)






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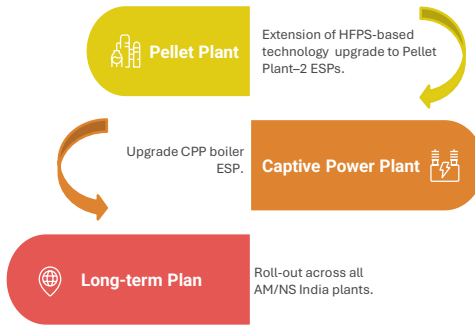
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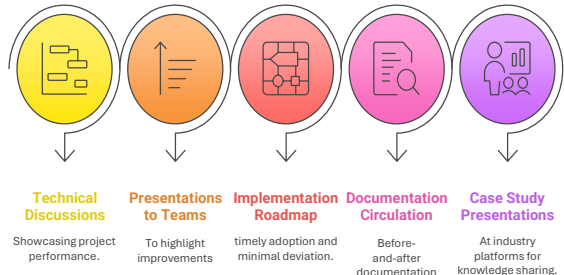
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Replication Potential of Project within sector

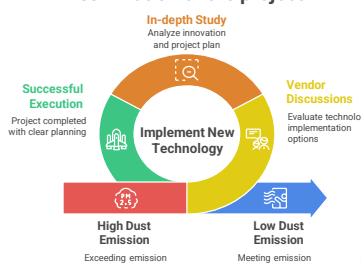
ESP Replication Potential



Intra plant Knowledge Sharing



Assimilation of the project

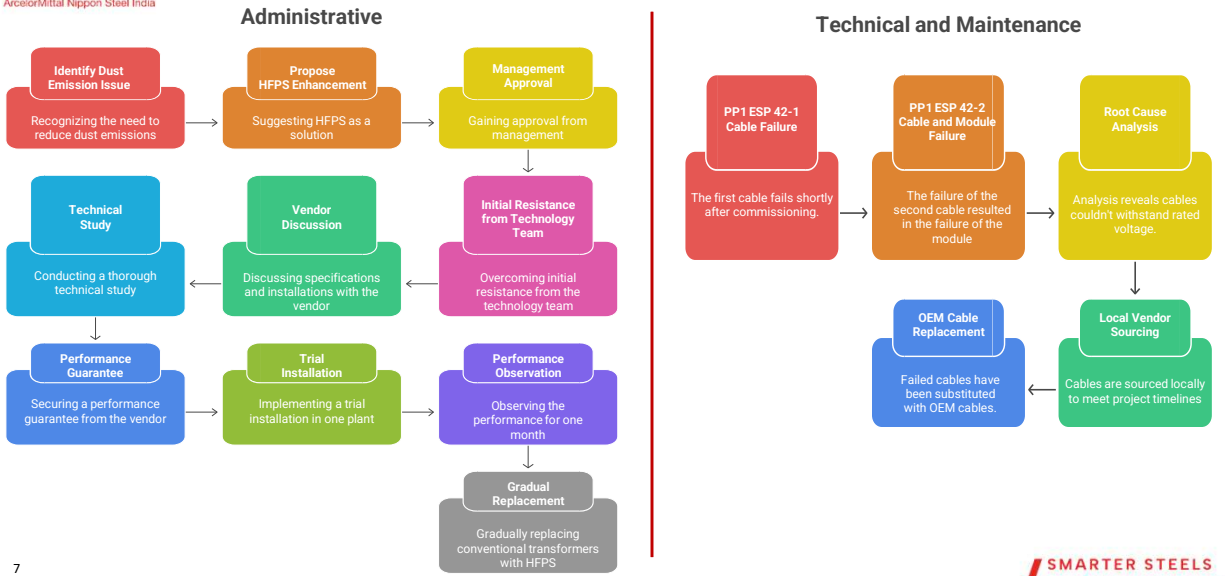


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Challenges faced and counter measures



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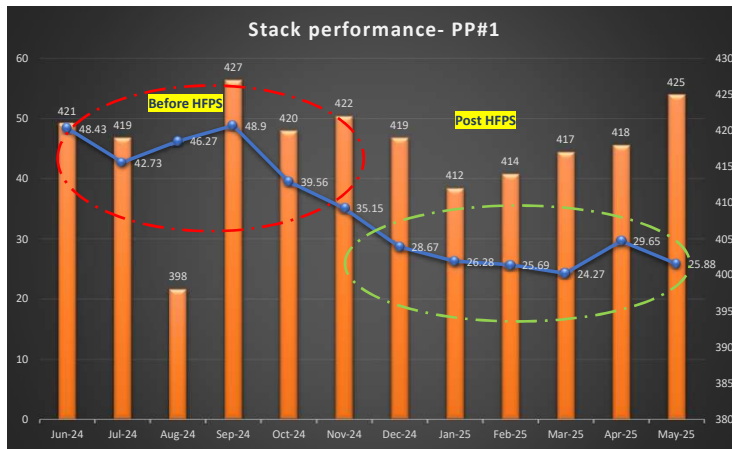
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Achieving National Benchmarks and Standards

Post-Modu Power HFPS Emission Performance: Emission levels reduced to 20-30 mg/Nm³ across all operating loads.



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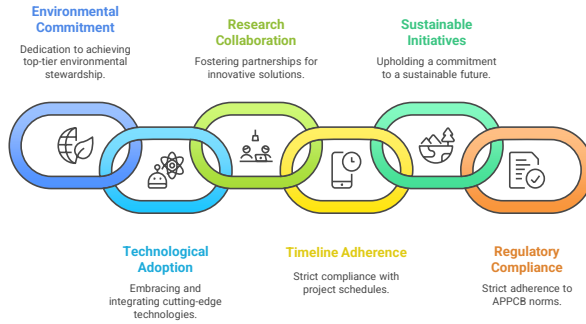
- The pellet plant's stack emission performance improved significantly after adopting the HFPS system, with stringent emission norms of 30 mg/Nm³, demonstrating compliance with national environmental standards while maintaining steady production.


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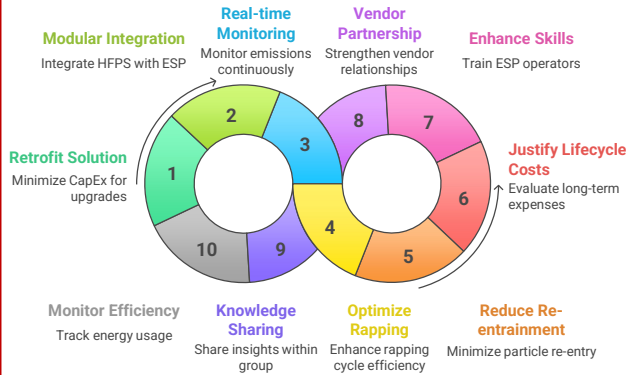
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Success Enablers in Project Execution

Key drivers for Project Success



Best Practices



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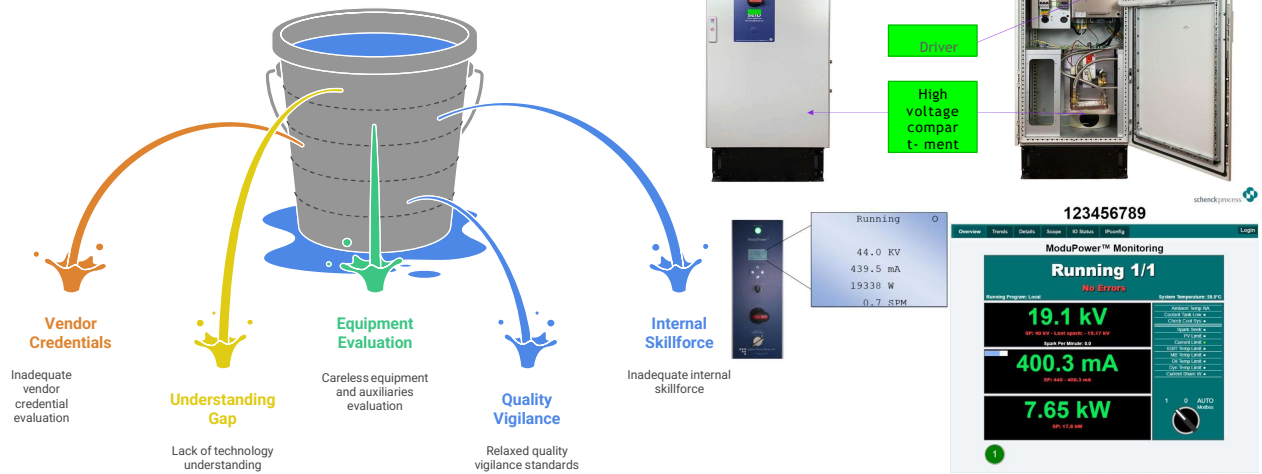
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Key Learnings from the Project

Technology Transition Challenges



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