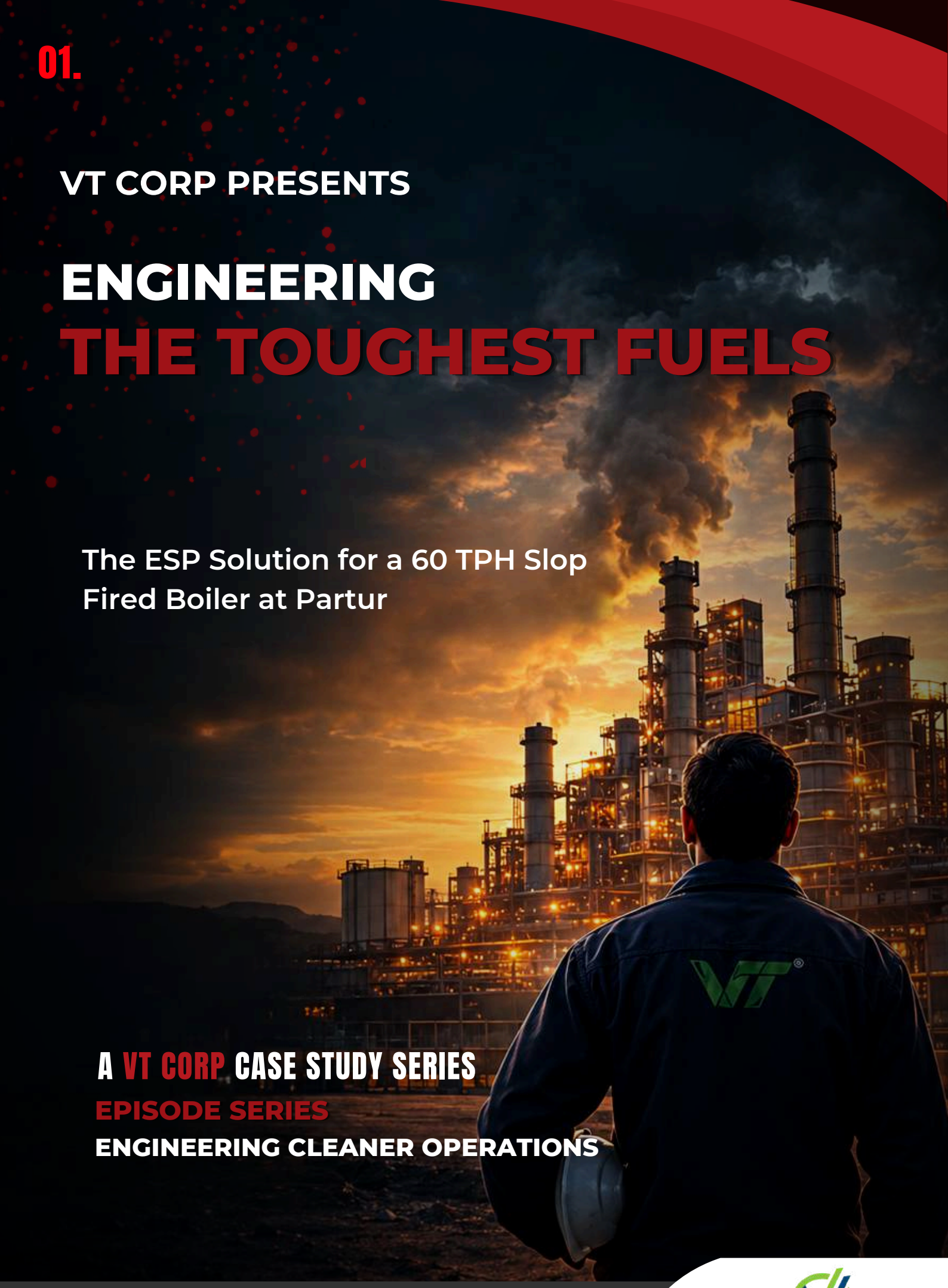
01.

VT CORP PRESENTS

ENGINEERING
THE TOUGHEST FUELS



The ESP Solution for a 60 TPH Slop Fired Boiler at Partur

A VT CORP CASE STUDY SERIES

EPISODE SERIES

ENGINEERING CLEANER OPERATIONS

VT Corp

02. INTRODUCTION

SEASON 1

SOME FUELS ARE DIFFICULT. SLOP-FIRED BOILERS ARE IN A DIFFERENT LEAGUE.

In the sugar and distillery industry, managing emissions from spent wash-based boilers presents unique engineering challenges. Unlike conventional particulate matter, spent wash ash is highly sticky, corrosive, and difficult to collect efficiently. This often results in accelerated wear of pollution control equipment, increased maintenance requirements, and reduced operational reliability.

For a **60 TPH boiler installation at Partur**, the customer required a high-performance emission control system capable of handling a challenging fuel mix consisting of:

- 40% SPENT WASH
- 60% BAGASSE

The slop-fired application demanded a robust and customized ESP solution that could withstand the aggressive nature of the dust while ensuring reliable long-term performance.

TO ADDRESS THIS CHALLENGE

VT CORP engineered and supplied a specially configured Electrostatic Precipitator (ESP) system incorporating a pre-collector arrangement designed specifically for this critical application.

ONE MISSION

CLEANER OPERATIONS. STRONGER FUTURE.

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03. CLIENT OVERVIEW

A DISTILLERY BOILER OPERATING ON CHALLENGING FUEL CONDITIONS

The project involved a 60 TPH boiler operating on a combination of spent wash and bagasse fuel.

While this fuel combination offers environmental and operational benefits, it also creates significant challenges for emission control systems due to:

- HIGHLY STICKY PARTICULATE MATTER
- INCREASED DUST LOADING
- FASTER WEAR OF ESP INTERNALS
- FREQUENT MAINTENANCE REQUIREMENTS
- REDUCED EQUIPMENT LIFE
- OPERATIONAL RELIABILITY CONCERNS

The client required a solution that would not only achieve emission control targets but also improve the overall longevity and reliability of the ESP system.

For this critical requirement, the client partnered with VT CORP.

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04. EPISODE 1

THE CHALLENGE

WHEN DUST BECOMES THE REAL ENEMY

Not all dust behaves the same.

In slop-fired boilers, particulate matter generated from spent wash combustion is extremely sticky in nature. Once inside conventional ESP systems, this dust tends to adhere to internal components, resulting in:

- ACCELERATED WEAR OF ESP INTERNALS
- FREQUENT MAINTENANCE SHUTDOWNS
- REDUCED EQUIPMENT LIFESPAN
- REDUCED COLLECTION EFFICIENCY
- INCREASED OPERATIONAL COSTS

The challenge became even more demanding due to the critical fuel composition:

Fuel Composition

40%	60%
SPENT WASH	BAGASSE

The customer required an emission control system capable of:

- HANDLING STICKY SPENT WASH DUST
- PROTECTING ESP INTERNALS
- REDUCING MAINTENANCE FREQUENCY
- IMPROVING EQUIPMENT LIFE
- ENSURING CONTINUOUS BOILER OPERATION

This required a solution beyond a **conventional ESP design.**

VT Corp

05. EPISODE 2

VT CORP STEPS IN

REENGINEERING THE COLLECTION PROCESS

After detailed process evaluation, VT CORP identified that a conventional ESP alone would face long-term operational challenges due to the nature of the spent wash dust.

THE SOLUTION?

A DEDICATED PRE-COLLECTOR INTEGRATED AHEAD OF THE ESP

Instead of allowing the entire dust load to enter the ESP directly, **VT CORP** engineered a pre-collector section as part of the overall ESP system.

THE OBJECTIVE WAS SIMPLE:

Remove a significant portion of the dust before it reaches the ESP.

This innovative approach created a two-stage collection process that significantly improved system reliability and lifecycle performance.



VT Corp

06. EPISODE 3

THE GAME CHANGER:

THE PRE-COLLECTOR ADVANTAGE

The pre-collector became the hero of this project.

Installed ahead of the ESP fields, the pre-collector captures a substantial portion of the incoming particulate matter before it reaches the main collection zones.

VT CORP engineered the ESP system to achieve:

PERFORMANCE BENEFIT

Approximately

30–40%

of the total dust load is collected within the pre-collector itself.

This resulted in:

- REDUCED DUST LOADING ON THE ESP
- IMPROVED COLLECTION EFFICIENCY
- LOWER INTERNAL WEAR
- REDUCED MAINTENANCE REQUIREMENTS
- INCREASED EQUIPMENT LIFE
- ENHANCED OPERATIONAL RELIABILITY

By preventing excessive sticky dust from entering the main ESP fields, VT CORP significantly extended the operational life of the complete system.

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07. EPISODE 4

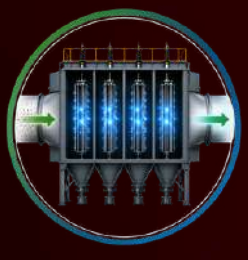
ENGINEERING THE CORE

THE 4 FIELD ESP

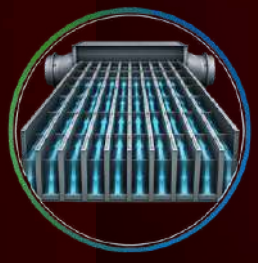
To meet the demanding process conditions, **VT CORP** supplied a high-capacity Electrostatic Precipitator featuring:



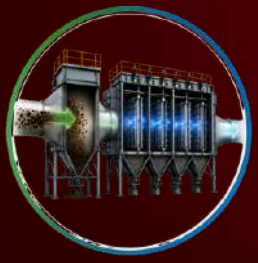
ESP CONFIGURATION



4 Field ESP



22 Gas Passages



Integrated Pre-Collector Arrangement



High Voltage TR Set System



Optimized Gas Distribution Design

The multi-field configuration provides progressive particle collection across successive fields, enabling higher collection efficiency and stable operation even under fluctuating dust loads.

The 22 gas passage arrangement ensured uniform gas flow distribution across the ESP, maximizing collection performance.

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08. EPISODE 5

WHEN SPACE LIMITATIONS
SHAPE THE SOLUTION

Every project comes with a challenge beyond the process itself.

For this installation, one of the major engineering constraints was limited available space around the boiler and ID fan arrangement. A conventional straight outlet duct configuration was not feasible due to routing limitations.

THE SOLUTION?

VT CORP designed a Top Exit Outlet Arrangement. This design allowed the outlet duct to be routed directly towards the ID fan despite severe space restrictions.

BENEFITS INCLUDED:

- EFFICIENT DUCT ROUTING
- OPTIMIZED PLANT LAYOUT
- REDUCED SITE MODIFICATIONS
- EASIER INTEGRATION WITH EXISTING INFRASTRUCTURE
- IMPROVED INSTALLATION FEASIBILITY

VT Corp

09. EPISODE 6

EXECUTION UNDER DEADLINES

Large industrial projects demand speed, coordination, and precision.

From manufacturing through installation support and commissioning assistance, VT CORP completed the project within an aggressive schedule.

Project Duration: Approximately 6 Months



The project scope included:

- Detailed Engineering
- ESP Manufacturing
- Pre-Collector Integration
- Structural Design
- Site Coordination
- Erection Support
- Commissioning Assistance

The result was a seamless execution aligned with the customer's project timeline.

10. FINAL EPISODE

THE RESULT

WHEN THE RIGHT DESIGN CHANGES EVERYTHING

By combining a customized 4-field ESP with a specially engineered pre-collector arrangement, VT CORP delivered a solution specifically designed for one of the industry's most challenging applications.



LOCATION: PARTUR

BOILER CAPACITY: 60 TPH

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