ENGINEERED SOLUTIONS
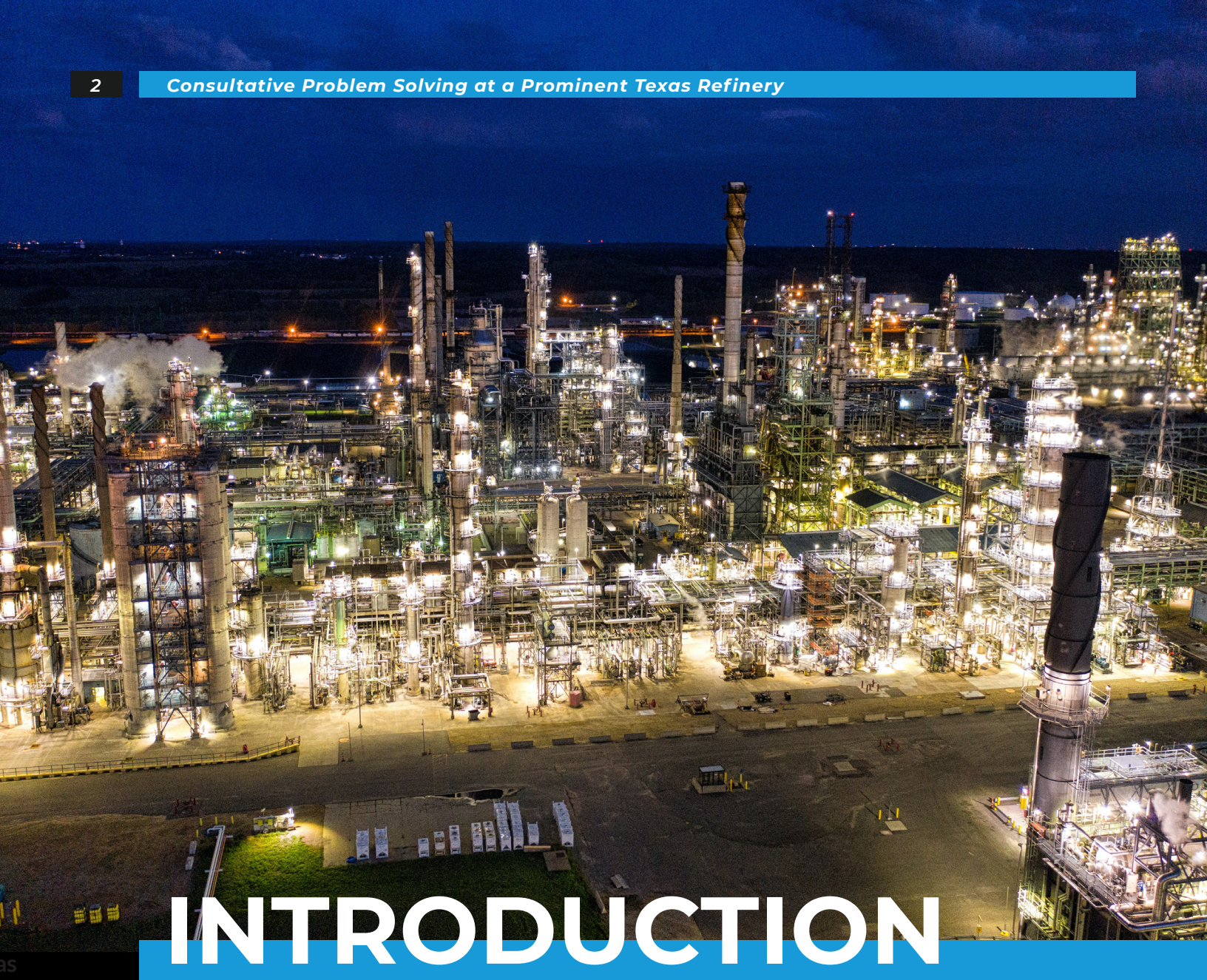
CASE STUDY

Consultative Problem Solving at a Prominent Texas Refinery

INTRODUCTION

The refinery was facing challenges with the flame detection product used on their utility boilers, resulting in a high number of nuisance shutdowns.

This case study revolves around one of the world's largest oil & gas companies and one of their refineries located in Texas. The refinery was facing challenges with the flame detection product used on their utility boilers, resulting in a high number of nuisance shutdowns. The utility boilers play a critical role in providing steam throughout the plant, and any disruption in steam production can cause process interruptions and compromises.

The utility boilers play a critical role in providing steam throughout the plant, and any disruption in steam production can cause process interruptions and compromises.

CHALLENGES & OBJECTIVES

1 Configuration and Setup Were Not Done Correctly

2 Incorrect Analog Flame Signals

3 Delays and Disruptions

4 Goal Was to Set Up Flame Detection System Corectly

01 CONFIGURATION AND SETUP WERE NOT DONE CORRECTLY

The Texas refinery contacted Relevant Industrial to address issues they were facing with nuisance shutdowns on their utility boilers. Upon investigation, it was discovered that the configuration and setup of the flame detection system were not done correctly.

02 INCORRECT ANALOG FLAME SIGNALS

The analog flame signals sent to the control room appeared to be high, but the signal at the unit was actually low and just above the "flame off" threshold, creating a significant discrepancy. The refinery believed they had healthy flame signals, but in reality, they were riding very close to the "flame off" threshold, leading to unexpected burner trips.

03 DELAYS AND DISRUPTIONS

These trips resulted in production compromises and required maintenance personnel to physically relight the burners, causing further delays and disruptions.

04 GOAL WAS TO SET UP FLAME DETECTION SYSTEM CORECTLY

The objectives of the project were to realign and set up the flame detection system correctly, increase the actual flame strength, and linearize the output signal to provide accurate indications of flame health. The goal was to eliminate the nuisance shutdowns, improve production stability, and minimize the need for manual intervention.

SOLUTION IMPLEMENTATION

1 Increased Overall Flame Strength Entering the Processor

2 Adjusted the Output Signal

3 Implemented Adjustments Across 16 Burners

The Relevant Industrial team visited the refinery and meticulously examined the configuration and setup of the flame detection system. It was determined that the flame signals had not been linearized, resulting in misleading indications of flame strength. To resolve, we took the following steps:

01 INCREASED OVERALL FLAME STRENGTH ENTERING THE PROCESSOR

We realigned the scanners, applied proper gain settings to the processor, and increased the overall flame strength entering the processor.

02 ADJUSTED THE OUTPUT SIGNAL

Additionally, we adjusted the output signal to accurately reflect the actual flame signal, providing operations with a realistic indication of flame health.

03 IMPLEMENTED ADJUSTMENTS ACROSS 16 BURNERS

These adjustments and enhancements were implemented across 16 burners in the utility boiler system.

RESULTS & BENEFITS

1 Boiler Performance Improvement

2 Accurate Flame Signals

3 Enhanced Production Stability

01 BOILER PERFORMANCE IMPROVEMENT

After implementing the recommended changes and enhancements, the Texas refinery observed significant improvements in the performance of their utility boilers. The nuisance shutdowns were effectively eliminated, and the burners operated more reliably and consistently.

02 ACCURATE FLAME SIGNALS

The accurate flame signal indications provided by the enhanced flame detection system allowed for better monitoring and control of the boilers.

03 ENHANCED PRODUCTION STABILITY

As a result, the refinery experienced enhanced production stability, reduced disruptions, and minimized the need for maintenance personnel to physically relight the burners.

CONCLUSION

By addressing the configuration and setup issues with the flame detection system, Relevant Industrial successfully resolved the challenges faced by the refinery. Our expertise and knowledge in optimizing the flame detection system allowed us to improve the reliability and performance of the utility boilers, which are vital for steam production throughout the facility. This project not only eliminated nuisance shutdowns but also contributed to enhanced production and minimized manual interventions. Our collaboration with the refinery showcased our capabilities and solidified our reputation as a trusted provider of flame detection solutions.