ENGINEERED SOLUTIONS

CASE STUDY

Predictive Maintenance Success at Energy Infrastructure Facility

relevant.

FAMILY OF BRANDS

BACKGROUND

The primary goal was to find a predictive maintenance solution that would predict motor or pump failures before they happen to prevent unplanned downtime and significant lost revenue.

A leading energy infrastructure company operates vast tank farms and pipelines nationwide. The primary goal was to find a predictive maintenance solution that would predict motor or pump failures before they happen to prevent unplanned downtime and significant lost revenue. Additionally, the maintenance team recognized the need to prove out the concept without interfering in the day-to-day operations of the facility. They needed a reliable solution for vibration monitoring. The goal was to predict potential failures and optimize maintenance processes, particularly in fuel tank operations. The initial proof of concept was implemented in the northwest corner of California.

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PROJECT SCOPE & CHALLENGES

PROJECT SCOPE

1. Tank farm with 30 tanks
2. Seven sensors installed on motors and pumps
3. Showcase the effectiveness of predictive maintenance

CHALLENGES

1. Develop a predictive maintenance system
2. The company manages hundreds of tanks
3. 4+ hour downtime could mean Losses

PROJECT SCOPE

01 LOCATION

A tank farm with 30 tanks covering approximately 25 acres.

02 MOTORS & PUMPS

Seven sensors installed on motors and pumps, testing different configurations.

03 PURPOSE

A pilot project to showcase the effectiveness of predictive maintenance through vibration monitoring.

CHALLENGES

01 OPERATION CONSTRAINTS

Develop a predictive maintenance system that could seamlessly integrate with their Distributed Control System (DCS) once proven, all while running independently during the critical Proof of Concept (POC) phase.

02 SCALE AND COMPLEXITY

The company manages operations from El Paso, Texas, northward, involving hundreds of tanks. The potential to scale to 4,000 tanks on the West Coast.

03 CRITICAL DOWNTIME

Any downtime exceeding 4 hours could result in financial losses, emphasizing the need for a robust predictive maintenance solution.

SOLUTION & IMPLEMENTATION

SOLUTION

Seven sensors were strategically placed on motors and pumps, collecting data on temperature, pressure, and vibration.

IMPLEMENTATION

1

A separate server setup was used to demonstrate the system's capabilities

2

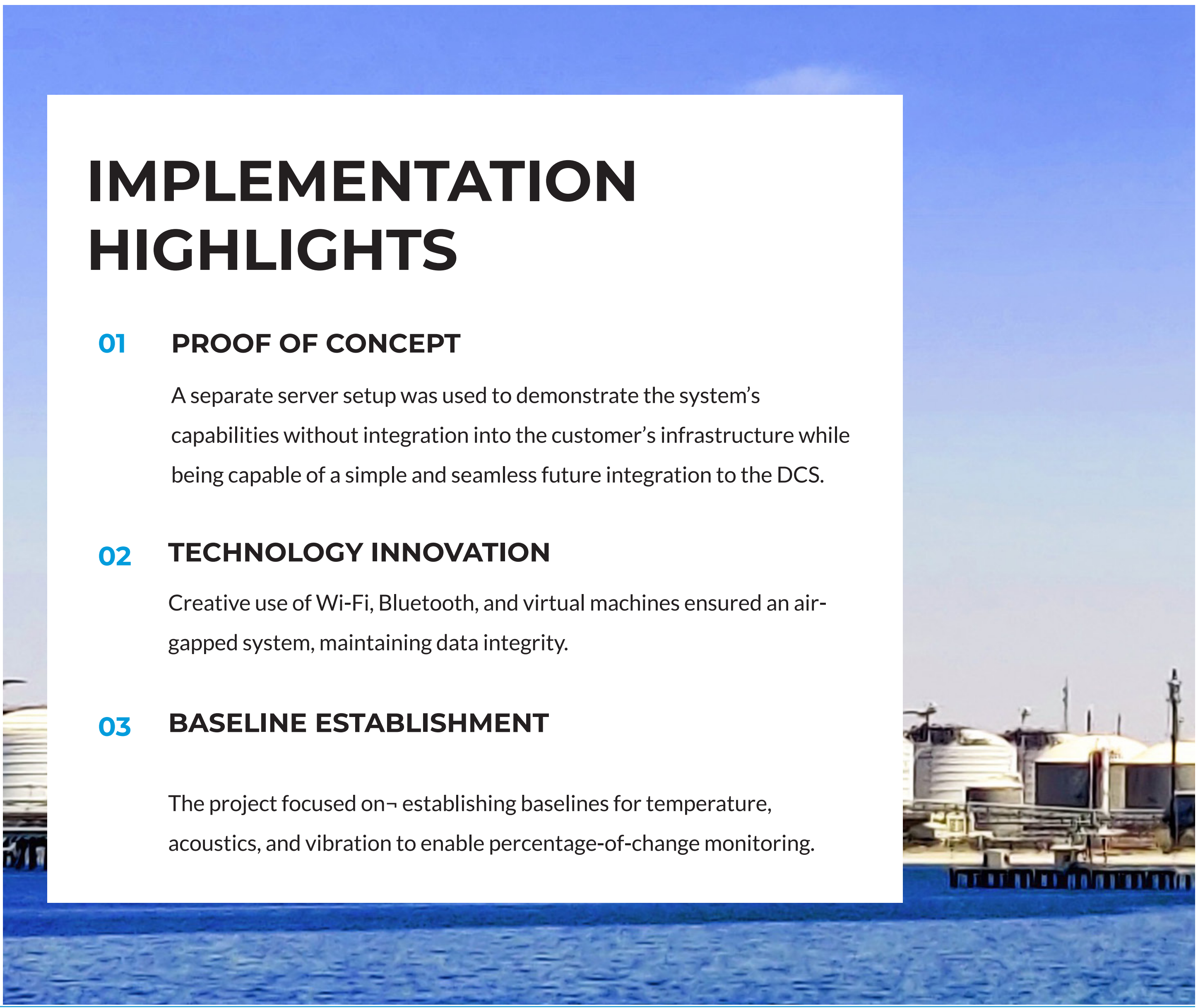
Creative use of Wi-Fi, Bluetooth, and virtual machines

2

Focused on establishing baselines for temperature, acoustics, and vibration

SOLUTION OVERVIEW

Relevant Industrial created a digital twin that ran in parallel to the existing operation and partnered with Honeywell's Versatillis product for advanced vibration monitoring. Seven sensors were strategically placed on motors and pumps, collecting data on temperature, pressure, and vibration. The system aimed to trend this data in parallel to the customer's DCS, allowing for real-time monitoring and predictive insights without interfering in normal operations.



IMPLEMENTATION HIGHLIGHTS

01 PROOF OF CONCEPT

A separate server setup was used to demonstrate the system's capabilities without integration into the customer's infrastructure while being capable of a simple and seamless future integration to the DCS.

02 TECHNOLOGY INNOVATION

Creative use of Wi-Fi, Bluetooth, and virtual machines ensured an air-gapped system, maintaining data integrity.

03 BASELINE ESTABLISHMENT

The project focused on¬ establishing baselines for temperature, acoustics, and vibration to enable percentage-of-change monitoring.

RESULTS, LESSONS & CONCLUSION

RESULTS & PROSPECTS

1. System created baseline for monitoring parameters
2. System proved its potential to enhance uptime
3. Relevant built strong relationships and trust
4. Plans to expand to additional sites

LESSONS LEARNED

1. The company manages hundreds of tanks
2. Significance of conducting proof of concept without interfering with operations

RESULTS & FUTURE PROSPECTS

01 BASELINE ESTABLISHED

The system successfully created baselines for monitored parameters, providing a foundation for predictive analytics.

02 OPERATIONAL ENHANCEMENT

While no failures were detected during the trial, the system showcased its potential to enhance uptime and reduce the risk of operational disruptions.

03 POSITIVE RELATIONSHIPS

Relevant Industrial developed strong relationships and trust with the customer's maintenance teams, laying the groundwork for future collaborations.

04 SCALABILITY

Plans to expand to additional sites, including those in snow-prone areas near Reno, showcased the solution's scalability and versatility.

LESSONS LEARNED

01 REFINERY APPLICATION

Leveraging success at this facility has proven its fit for adoption in risk-averse refineries with its stand-alone and future integration capabilities.

02 PROOF OF CONCEPT APPROACH

Highlighting the significance of conducting a proof of concept without interfering with ongoing operations, facilitating smoother integration.

CONCLUSION

This case study demonstrates the power of digital twins, responsive innovation, and predictive maintenance through innovative vibration monitoring solutions. Relevant Industrial, in collaboration with Honeywell, successfully showcased the potential to revolutionize the customer's operations, paving the way for future installations and industry-wide adoption. The project's success is a testament to the ability of advanced monitoring technologies in preventing unplanned downtime and optimizing critical industrial processes.

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