ENGINEERED SOLUTIONS

CASE STUDY

Enhancing Environmental Safety and Efficiency: A Smart Sump Monitoring Case Study for a Leading Chemical Manufacturer



A FAMILY OF COMPANIES



INTRODUCTION

Relevant's objective was to implement a smart system to detect and prevent sump overflow conditions while considering the absence of power in that specific area.

This case study highlights where Relevant Industrial provided instrumentation, remote monitoring, remote solar power, and eventual DCS integration. The project originated during a routine visit in 2019, when a Relevant account manager was discussing our capabilities with the instrumentation engineer at a leading chemical manufacturer's Texas City facility. The challenge revolved around the facility's sumps, which lacked monitoring infrastructure and posed the risk of overflow during rainstorms or flooding, leading to multiple environmental events annually that required reporting and fines. Through collaboration with our client, the objective was to implement a smart system to detect and prevent sump overflow conditions while considering the absence of power in that specific area.

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MONITORING **INFRASTRUCTURE**

01 LACK OF SUMP

The Texas City facility had 8-12 sumps that required monitoring, but there was no existing infrastructure in place to track their conditions and prevent overflow incidents.

02 ENVIRONMENTAL COMPLIANCE **AND RISK** MITIGATION The chemical address potential sump overflow events, which cost up to \$10,000 adverse environmental

CHALLENGES & OBJECTIVES

1

Lack of Sump Monitoring Infrastructure

2 Environmental **Compliance and Risk** Mitigation



03 POWER **CONSTRAINTS**

The designated sump area lacked power supply, necessitating an innovative solution that could operate autonomously without relying on external power sources.

To address the challenges and achieve the desired outcomes, we proposed and implemented a comprehensive solution:

SMART SUMP MONITORING SYSTEM 01

We designed and installed a solar power station connected to a series of relays and a level switch. This system provided real-time monitoring of the sumps and activated a loud buzzer and a prominent red flashing light when an overflow condition was detected. A green indicator ensured normal operation and safety.

MANUAL OVERRIDE CAPABILITY 02

To facilitate remediation efforts, we incorporated a push-button mechanism that allowed operators to temporarily silence the alarm and flashing light during maintenance or troubleshooting activities.

COST-EFFECTIVE INSTALLATION 03

We successfully deployed the smart sump monitoring system at a cost of \$16,000. This initial installation promptly prevented two floods within the first six months, saving the chemical manufacturer from significant financial and environmental consequences.

OLUTION INDEMENTATION

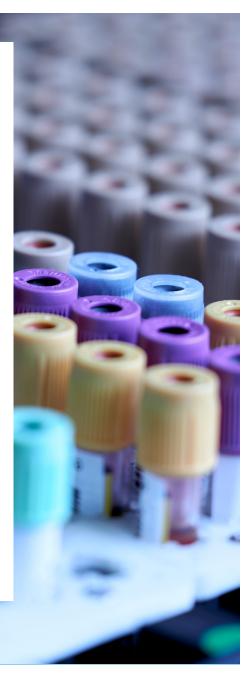


Smart Sump Monitoring System 2

Manual Override Capability



Installation





RESULTS



Risk **Mitigation and** Environmental Compliance



Cost Savings

Trust and Expanded Collaboration

3



Enhanced Monitoring Capabilities

Enhancing Environmental Safety and Efficiency

The implementation of our engineered solution yielded remarkable results:

RISK MITIGATION AND 01 **ENVIRONMENTAL COMPLIANCE**

The implementation of the smart sump monitoring system prevented potential sump overflow events, ensuring environmental compliance and avoiding the associated costs of reporting and environmental damage.

TRUST AND EXPANDED 03 **COLLABORATION**

The success of the project strengthened the partnership between the chemical manufacturer and our team. As a result, the company has consistently engaged us for unrelated control panel challenges, highlighting the trust and confidence they have in our expertise.



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02 COST SAVINGS

By averting two floods in the first six months alone, the chemical manufacturing facility avoided expenditures of \$10,000 or more per event. This resulted in significant cost savings and improved operational efficiency.

ENHANCED MONITORING 04 CAPABILITIES

Subsequently, we installed a wireless transmitter that seamlessly integrated with the facility's Distributed Control System (DCS). This enabled real-time reporting and enhanced monitoring capabilities, further optimizing operational efficiency and risk management.

CONCLUSION

This case study exemplifies our commitment to delivering innovative solutions that address critical operational challenges while prioritizing environmental safety and compliance. By implementing a smart sump monitoring system powered by solar technology, we provided the chemical manufacturer with a cost-effective solution that prevented floods, mitigated risks, and resulted in substantial cost savings. The success of this project solidified our partnership and positioned us as a trusted advisor for future control panel challenges. We remain dedicated to providing tailored solutions that enhance efficiency, reduce risks, and support the long-term success of our valued customers.











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For more information or to speak to our team about our engineered solutions, please contact: es@relevantsolutions.com relevantsolutions.com/casestudies | 1.888.605.1458