

# ENGINEERED SOLUTIONS

## CASE STUDY

Enhancing Environmental Safety and Efficiency:

A Smart Sump Monitoring Case Study for a Leading Chemical Manufacturer



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# 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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# CHALLENGES & OBJECTIVES

1

Lack of Sump  
Monitoring  
Infrastructure

2

Environmental  
Compliance and Risk  
Mitigation

3

Power  
Constraints

## 01 LACK OF SUMP MONITORING INFRASTRUCTURE

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 manufacturer aimed to address potential sump overflow events, which cost up to \$10,000 per event and also had adverse environmental implications.

## 03 POWER CONSTRAINTS

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

# SOLUTION IMPLEMENTATION

1

Smart Sump  
Monitoring System

2

Manual Override  
Capability

3

Cost-Effective  
Installation

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

## 01 SMART SUMP MONITORING SYSTEM

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.

## 02 MANUAL OVERRIDE CAPABILITY

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.

## 03 COST-EFFECTIVE INSTALLATION

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.



# RESULTS

1

Risk Mitigation and Environmental Compliance

2

Cost Savings

3

Trust and Expanded Collaboration

4

Enhanced Monitoring Capabilities

The implementation of our engineered solution yielded remarkable results:

## 01 RISK MITIGATION AND 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.

## 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.

## 03 TRUST AND EXPANDED 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.

## 04 ENHANCED MONITORING 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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