**Manufacturing**

*Title: Reducing Incidents of Jerrycan Failures*

1. **Client Background**

The client, is a leading provider of plastic containers and packaging solutions. They specialize in producing jerrycans used for the storage and transportation of liquids. The jerrycans are widely used in various industries, including automotive, chemical, and household sectors. However, the client has been experiencing an alarming increase in incidents of jerrycan failures, resulting in leaks and spills that pose safety risks, environmental hazards, and financial losses..

1. **Problem Statement**

The project was initiated in response to a significant increase in reported incidents of jerrycan failures in a manufacturing. These failures included leaks, cracks, and handle breakages, which compromised the safety and reliability of the jerrycans. The primary objectives of the project were to identify the root causes of failures, implement corrective actions, and ultimately reduce the number of incidents

1. **Initial Assessment**

To begin the project, Dexterity Consult conducted a comprehensive initial assessment to understand the scope and severity of the jerrycan failure problem. This involved collecting data on incidents, inspecting failed jerrycans, and interviewing key personnel within the company. The assessment revealed a significant increase in failure incidents over the past year, with various types of failures reported, such as cracks, leaks, and structural deformities.

1. **Root Cause Analysis**

Dexterity Consult proceeded with a thorough root cause analysis to identify the underlying factors contributing to jerrycan failures. The team conducted a series of tests and experiments on both failed and intact jerrycans, including material analysis, stress tests, and simulated usage scenarios. They also collaborated with experts in polymer engineering and manufacturing processes to gain insights into potential design flaws or production issues.

The analysis highlighted several key root causes, including:

a. Inferior Material Quality: The jerrycans were found to be made from low-quality plastics, resulting in reduced strength, poor resistance to impact, and increased susceptibility to degradation.

b. Manufacturing Deficiencies: Inadequate quality control measures during the manufacturing process led to inconsistencies in wall thickness, improper sealing, and weak handle attachments.

c. Design Limitations: The existing jerrycan design lacked reinforcement in critical stress areas, rendering them vulnerable to excessive pressure, rough handling, and temperature fluctuations.

**5. Solution Development**

Based on the findings from the root cause analysis, Dexterity Consult devised a multi-faceted solution to address the jerrycan failure problem. The proposed solution involved:

a. Material Selection and Specification: Collaborating with material scientists, Dexterity Consult recommended the use of high-density polyethylene (HDPE) with specific additives to enhance the jerrycans' strength, impact resistance, and chemical stability.

b. Improved Manufacturing Processes: Working closely with the company's manufacturing team, Dexterity Consult implemented stricter quality control measures, including tighter tolerances on wall thickness, improved sealing techniques, and enhanced handle attachment mechanisms.

c. Redesigned Jerrycan Structure: Leveraging their expertise in engineering design, Dexterity Consult developed a redesigned jerrycan with reinforced stress points, optimized wall thickness distribution, and improved ergonomics for better handling and stability.

**6. Implementation and Monitoring**

Dexterity Consult assisted the company in implementing the recommended solutions on a pilot scale, replacing a subset of the existing jerrycans with the redesigned versions. They also established a monitoring system to track the performance of the new jerrycans in real-world scenarios, capturing data on incidents, durability, and user feedback.

Over a period of six months, Dexterity Consult closely monitored the performance of the redesigned jerrycans, analyzing the collected data and making necessary adjustments to further optimize their design and manufacturing processes.

**7. Results and Benefits**

The implementation of Dexterity Consult's solutions resulted in significant improvements in reducing incidents of jerrycan failures for the company. Key results and benefits included:

a.50% reduction in reported failure incidents within the first three months of implementation.

b. Elimination of leaks and spills,reducing environmental and safety hazards.

c. Enhanced customer satisfaction due to improved product reliability and performance.

d. Reduction in product replacement and liability costs for the company.

e. Positive impact on the company's reputation and brand image.

**8. Conclusion**

Dexterity Consult successfully addressed the challenge of reducing incidents of jerrycan failures through a systematic approach that involved root cause analysis, solution development, and careful monitoring. Their collaboration with the company resulted in the implementation of improved jerrycans, ultimately leading to enhanced product reliability, reduced risks, and increased customer satisfaction. The case study exemplifies Dexterity Consult's expertise in identifying and resolving complex engineering problems, showcasing their ability to deliver practical and effective solutions for their clients.