

CASE STUDY

# Enhancing Reliability in Pool Equipment Design with ReliaSoft

Our customer is a global leader in providing smart, sustainable water solutions, with a mission to help people move, improve, and enjoy water.

The company holds a strong position in the pool and spa industry, offering a wide range of products from pumps and filters to automation systems and lighting.

The team we work with are committed to innovation, continuous improvement, and delivering high-quality, reliable products to its customers

## Challenge

A leading pool equipment manufacturer faced the challenge of ensuring long-term reliability for its innovative and complex products in diverse and demanding environmental conditions, which lead to unforeseen failure modes and high warranty claims.

## Solution

By integrating HBK's ReliaSoft XFMEA, Weibull++, and Accelerated Life Testing software, the company proactively identified and mitigated design risks, analyzed product life data, and accelerated testing to ensure reliability.

## Result

The implementation of the ReliaSoft suite allowed for standardization and resulted in a significant reduction in product development time, 10% revenue growth due to reduction in warranty costs, and enhanced customer satisfaction by seeing customer complaints reduced by 14% due to more robust and reliable pool equipment.



## The Challenge

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As a leader in the pool equipment industry, our customer must ensure its products perform reliably under a wide variety of operating conditions. The complexity of modern pool equipment, which often includes sophisticated electronics and mechanical components, presents a significant reliability challenge. Products are exposed to harsh environments with constant exposure to water, chemicals, and extreme temperatures. These factors lead to a variety of failure modes, which, if not addressed during the design and development phase, results in costly warranty claims, damage to the brand's reputation, and decreased customer satisfaction. Their challenge is to have a standardized approach to bring innovative products to market quickly while ensuring that they meet the highest standards of reliability and durability.

## The Solution

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To address these challenges, our customer implemented a comprehensive reliability engineering program using HBK's ReliaSoft software suite. This involved a multi-faceted approach, leveraging the unique capabilities of XFMEA, Weibull++, and the Accelerated Life Testing module.

- **Proactive Risk Assessment** by using ReliaSoft XFMEA, the design and engineering teams proactively identified failure modes in new product designs before they are built. This process involved a systematic analysis of the design to determine how it might fail and what the effects of that failure would be. By identifying high-risk items early in the design process, the team implemented mitigation strategies to improve the product's reliability and safety.
- **Life Data Analysis** with ReliaSoft Weibull++ allowed their engineers to analyze life data from testing and from the field to understand the reliability characteristics of their products. This enabled their team to analyze data to determine a product's expected life, failure rate, and other key reliability metrics. This information is crucial for their forecasting warranty returns, planning for maintenance, and making data-driven decisions about design improvements.
- **Accelerated Life Testing (ALT)** was used to simulate the product's entire life cycle in a fraction of the time. By subjecting their components to higher stress levels (e.g., temperature, humidity, vibration), the software extrapolated the results to normal operating conditions, providing rapid feedback on the product's long-term reliability. This allowed for faster product development cycles without compromising on reliability.

## Results & Impact

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The integration of HBK's ReliaSoft software into our customer's product development process had a significant and lasting impact. By systematically identifying and mitigating risks, analyzing life data, and accelerating testing, our customer achieved the following results:

- **Improved Product Reliability:** A proactive approach to reliability engineering led to more robust and durable products, resulting in a 14% reduction of failures in the field and increased customer satisfaction.
- **Reduced Time to Market:** Accelerated life testing allowed for faster validation of new designs, enabling the company to bring innovative products to market months ahead of schedule.
- **Lower Warranty Costs:** By identifying and addressing potential failure modes before products are released, the number of warranty claims was significantly reduced, leading to 10% revenue growth.
- **Enhanced Brand Reputation:** A reputation for producing high-quality, reliable products is a significant competitive advantage. By investing in reliability engineering, our customer strengthened its brand and customer loyalty.

## Conclusion

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For a company operating in the competitive pool equipment market, product reliability is not just a goal, but a necessity. By leveraging the powerful tools within HBK's ReliaSoft suite, consumer goods companies can implement a world-class reliability engineering program that ensures its products meet the highest standards of quality and reliability. The result is a win-win: customers get the reliable, long-lasting products they expect, and the company benefits from reduced costs, faster innovation, and a stronger brand.

ReliaSoft XFMEA: [ReliaSoft XFMEA: FMEA and Related Analyses](#)

ReliaSoft Weibull++: [ReliaSoft Weibull: Life data analysis](#)