

CASE STUDY

RLPC Recirculation Pump Upgrade



The Challenge

The Ras Laffan Operating Co (RLPC) faced an issue at their Ras Laffan A Power & Desalination Station in Qatar concerning their Brine Recirculation Pump (BRP) hydraulic ends. The existing pumps, originally from OEM Termomeccanica, featured a design comprising of 'top and bottom halves'. RLPC required reverse engineering and a design upgrade for seven of these pump ends.



The Solution

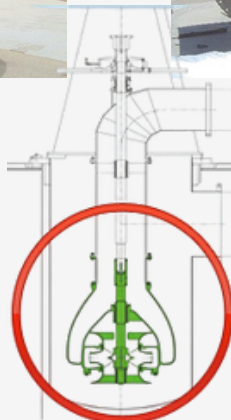
The solution centred on a comprehensive design upgrade of the existing BRP hydraulic ends, replacing them with high-efficiency Torishima hydraulic components. The new design represented a significant advancement, featuring a one-piece cast construction in Duplex Stainless Steel. This modern approach not only improved performance and durability but also eliminated the previous split 'top and bottom half' configuration used in the original design.



Before



After



Improvements

The implementation of the upgraded Torishima hydraulic design delivered several critical improvements to the Brine Recirculation Pumps:

- **Enhanced hydraulic performance:** The redesigned pump ends significantly improved flow characteristics, reducing vibration and cavitation issues that previously led to casing cracks and operational instability.
- **Increased efficiency:** The new hydraulic profile achieved higher energy efficiency, directly contributing to more reliable and cost-effective plant operation.
- **Advanced material selection:** The pump ends were manufactured using Duplex Stainless Steel, offering superior strength, corrosion resistance, and longevity compared to the original material.
- **Monoblock construction:** The one-piece cast design replaced the previous split configuration ('top and bottom half'), eliminating weak points and improving overall structural integrity.
- **Operational stability:** As a result of the upgrade, the plant experienced a more stable operation, reduced downtime, and lower maintenance demands, dramatically improving performance, as shown in the before-and-after comparison.

Commercial and Environmental Benefits

The primary outcome of this upgrade is the improved efficiency of the Brine Recirculation Pumps, resulting in significantly reduced energy consumption. This delivers clear commercial benefits through lower operating costs, while also supporting environmental sustainability by reducing the overall energy footprint of the desalination station.

Additionally, the use of Duplex Stainless Steel and the one-piece cast construction are likely to enhance durability and reduce maintenance requirements, offering further long-term operational and cost-saving advantages.

Conclusion

The successful upgrade of the Brine Recirculation Pump hydraulic ends at the Ras Laffan A Power & Desalination Station demonstrates the value of engineering innovation in enhancing both performance and efficiency. By integrating a modern, high-efficiency Torishima design with advanced materials and construction methods, the project not only addressed critical operational challenges but also delivered long-term commercial and environmental benefits. This outcome reinforces the importance of strategic pump upgrades in maintaining reliable and sustainable plant operations.



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