

FLOW VERIFICATION & OPERATIONAL VALIDATION OF FIRE WATER & COOLING MEDIUM PUMPS



AVT Reliability® was engaged to assess the operational performance of Fire Water Pumps and Cooling Medium Pumps under varying duty conditions. The objective was to validate system flow, confirm pump performance against specification, and provide data-driven insights to support safe and reliable operation.

THE PROBLEM

The Fire Water and Cooling Medium Pumps form a critical part of the site's infrastructure. Fire Water Pumps must meet minimum duty requirements to ensure emergency response capability, while Cooling Medium Pumps maintain stable process temperatures.

Variations in system pressure, pipe resistance, and operational conditions can affect flow performance. Accurate verification was required to confirm the pumps were operating within specification and to address discrepancies between measured flow and DCS readings.

OUR APPROACH

AVT Reliability® carried out structured pump performance testing across multiple duty points, including conditions such as 600 m³/h at 7 bar. Measurements of temperature and pressure were taken on common discharge lines while operating two pumps simultaneously.

Testing included:

- Flow and pressure measurements across varying system conditions
- Analysis of minimum duty compliance
- Investigation of deviations between measured values and DCS flow readings
- Closed-loop system testing, including monitoring of the pressure safety/relief valve above 13 bar
- Validation of measured data against manufacturer pump curves
- Consultation with process technologists to confirm operational interpretation

This method ensured that performance verification was technically robust and aligned with both hydraulic design and real-world operating conditions.

OUR FINDINGS

Flow Verification

Initial discrepancies between field measurements and DCS values were investigated and resolved. Final validated measurements aligned with total cooling medium system flow, reaching up to 700 m³/h. This verification provided valuable new operational insight for the site team.

Pump Performance

The Fire Water Pumps met the specified minimum duty requirements. Cooling Medium Pumps were tested extensively at multiple operating points, and any observed deviations were analysed and explained in relation to system pressure and resistance characteristics.

Collaboration and Data Validation

Measurement data was reviewed in coordination with operators and process technologists. Comparative analysis against pump performance curves confirmed the reliability of results and strengthened confidence in system capability.



Performance testing gives clarity. By validating the data against real operating conditions and pump curves, we provide the site with confidence in both capability and compliance.

- AVT Reliability Engineer

THE SOLUTION

The structured testing programme confirmed that both Fire Water and Cooling Medium Pumps were operating within expected performance parameters. Validated measurement data provided the operations team with a clearer understanding of system behaviour under different duty conditions.

Where deviations were identified, these were contextualised and explained, eliminating uncertainty and supporting informed operational decision-making.

FOLLOW UP

The validated data now serves as a reliable reference baseline for future performance assessments.

By confirming minimum duty compliance and system behaviour under high-pressure conditions, the site has reduced operational risk and strengthened confidence in emergency and process-critical pumping systems.

Need advice?
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