



AW-LAKE
PROCESS FLOW MEASUREMENT



APPLICATION SPOTLIGHT

Improving Flood Gate Positioning at Hydroelectric Dam



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APPLICATION:

A government water authority in Costa Rica contacted AW-Lake with a unique challenge: how to improve the accuracy and reliability of sluice gate positioning data on a large hydroelectric dam. The dam plays a critical role in regulating reservoir head pressure, discharging water for flood control, and ensuring steady power generation. Because the gates must be precisely positioned to balance these competing demands, even small inaccuracies in measurement can compromise safety, efficiency, and energy output.

PRODUCT SUPPLIED:

- **JVA-60BBV-NS** Gear Meters installed on the hydraulic cylinder supply lines
- **EDG2-2B-13S** Flush Mount EDGE Sensors providing high-resolution pulse outputs

CHALLENGE:

The existing system relied on string potentiometers—linear position sensors that operate like a tape measure. While cost-effective in theory, this technology was ill-suited for the dam's harsh, outdoor environment. Over time, the sensors suffered from corrosion, mechanical wear, and unreliable readings, leading to maintenance issues and inconsistent data for the control system. The water authority needed a more rugged and precise solution that could

withstand the elements and deliver accurate positional feedback for years to come.

SOLUTION:

AW-Lake partnered closely with the local engineering firm to re-engineer how gate position was measured. Instead of relying on vulnerable string potentiometers, AW-Lake recommended monitoring the hydraulic fluid that actuates the massive cylinders controlling the sluice gates.

By installing AW-Lake's gear flow meters directly in the hydraulic supply lines, paired with the two-channel EDGE sensor, the system could generate precise electronic pulse signals proportional to cylinder movement. The PLC only needed to count these pulses to determine the exact gate position.

A key advantage of the EDGE sensor is its quadrature output: with two probes detecting the gear teeth offset by 90 degrees, the PLC can easily determine both direction and movement. If Output A leads Output B, the gate is opening; if B leads A, it's closing. This design not only doubles positional resolution compared to the old method but also provides unambiguous direction feedback.



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RESULTS:

- **Enhanced Accuracy:** The PLC now receives high-resolution, pulse-based data for exact gate positioning.
- **Directional Feedback:** Built-in quadrature output ensures the system always knows whether the gate is opening or closing.
- **Long-Term Reliability:** Ruggedized gear meters and sensors withstand outdoor exposure, eliminating corrosion issues.
- **Improved Safety & Efficiency:** With reliable control over flood gate operation, the authority can better manage head pressure, water release, and power generation.
- **Partnership Approach:** Through collaboration with the local engineering firm, AW-Lake tailored a solution that fit the application's unique demands, ensuring successful implementation and long-term performance.

CONCLUSION:

By replacing outdated string potentiometers with AW-Lake's robust flow meters and EDGE sensors, the Costa Rican water authority gained a reliable, precise, and long-lasting solution for flood gate control. This project highlights AW-Lake's commitment to working hand-in-hand with customers and engineering partners to solve complex challenges with innovative, durable instrumentation.

