Jewell Instruments

Tainter Gate Positioning

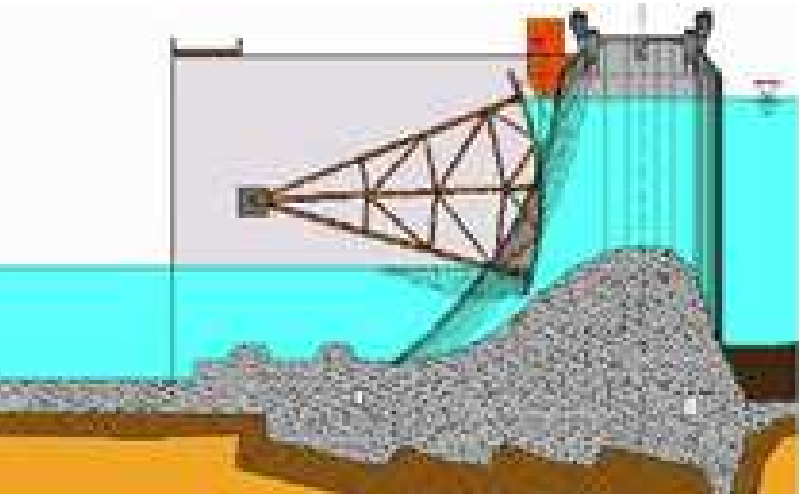
- **Objectives:** Measure tilt of dam gate to manage water flow
- **Solution:** Jewell Instruments LSOX
- **Benefits:** High-precision and vibration-resistance
- **Results:** Reliable control of Tainter gate

Project

The Tainter gate is a type of radial arm flood-gate used in dams and canal locks to control water flow. It is named for Wisconsin structural engineer Jeremiah Burnham Tainter. The gate must be positioned at certain angles in order to allow a necessary amount of water to flow according to weather conditions, water table level, etc... With the constant, powerful flow of water, a significant amount of vibration is involved with this application.

A side view of a Tainter gate resembles a slice of pie, with the curved part of the piece facing the source or upper pool of water and the tip pointing toward the destination or lower pool. The curved face, or skinplate, of the gate takes the form of a wedge section of cylinder. The straight sides of the pie shape, the trunnion arms, extend back from each end of the cylinder section and meet at a trunnion that serves as a pivot point when the gate rotates.

The LSOX inclinometer is a highly precise unit with a resolution of 1 microradian, which is suitable for providing the precise measurements needed to position the gate. The sensor is also fluid-damped to prevent outside noise and vibration from interfering with the necessary tilt readings. A typical dam may have a couple of gates – while others might have 10 to 20 – with an inclinometer mounted on each gate.



Side view cut-away diagram of the radial arm of the Tainter gate, Ice Harbor Dam, Snake River, Pasco, Washington (USACE)

Phone : +1 (603) 669-6400

Email : info@jewellinstruments.com

Web : jewellinstruments.com

Results

The LSOX was provided to the customer as a part of a complete package that included a readout system to monitor and control the gate. The LSOX inclinometer is mounted on tainter gates to calculate the vertical opening of the gate with a significant level of vibration.

The Jewell LSOX Single-Axis Analog Inclinometer series are a rugged, high precision tilt sensor designed for peak performance in extreme conditions. These RoHS compliant sensors feature a fluid damped mechanism to deliver superior noise rejection in high shock and vibration environments, as well as excellent output stability.

Jewell Instruments LSOX Single-Axis Analog Inclinometer

About Jewell Instruments

Jewell Instruments is a world leader in the design, manufacture, and distribution of high-precision products. Our expertise includes acceleration and tilt sensors, electronic compasses, avionics components, solenoids, and panel meters. The extensive application knowledge we have obtained through decades of experience allows us to provide custom solutions for a diverse group of industries. In fact, customers from all over the globe contact us for solutions to aerospace, medical, industrial, and telecommunications applications - to name a few.

To find out more, visit our website!

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