Jewell Instruments

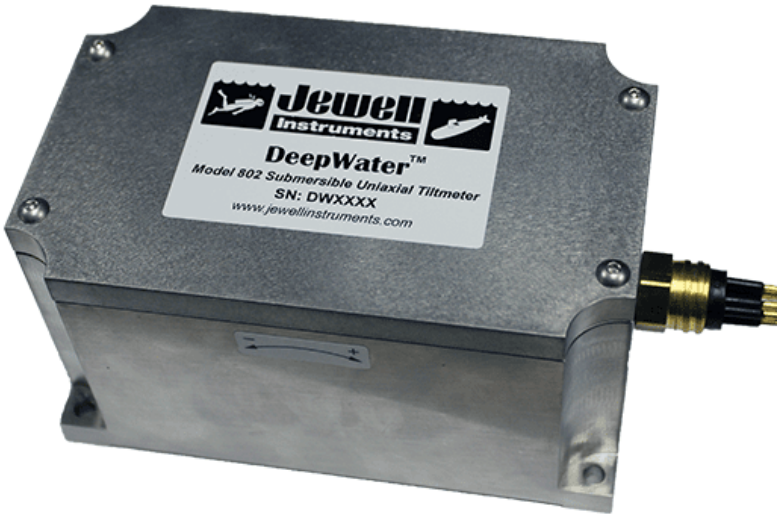
Riser/Ball Joint Angle View System To Monitor Angle Between Ball Joint And Riser

- **Objectives:** Monitor Blowout Preventer Angles
- **Solution:** **Jewell Instruments DeepWater Tiltmeter**
- **Benefits:** High-precision and water-resistance
- **Results:** Accurate monitoring to avoid rig down-time

Problem

Offshore drilling uses a riser to conduct drilling fluids from the subsea wellhead back to the drill ship or platform. The bottom end of the riser is connected to a blowout preventer (BOP) on the ocean bottom via a ball joint (flex joint). The ball joint enables the riser to flex at the connection as the riser moves laterally in response to ocean currents. Problems arise when the angle between the bottom end of the riser and the BOP exceeds about 2 degrees. When this occurs, the drill pipe may rub against the inside of the riser and cause wear. In a worst-case scenario, the friction wears a hole through the riser or damages the BOP. In such an occurrence, the operator loses days or even weeks of valuable rig time while replacing damaged equipment. Damage to the riser and BOP can be prevented by monitoring the angle between them and stopping drilling or making adjustments until the angle is less than 2 degrees.

A common method is to install bull's eye levels above and below the ball joint and then send down a remotely operated vehicle (ROV) to view them. The ROV takes a video of the two levels which is sent back to the control room on the rig, where the operator determines the ball joint angle. However, ROVs cannot operate in stormy conditions or when ocean currents exceed the ROV's rated velocity. When these conditions occur, the rig operator must either take a risk and drill without this important information or stop drilling until ocean conditions improve and the ROV can be deployed.



Jewell Instruments DeepWater Tiltmeter

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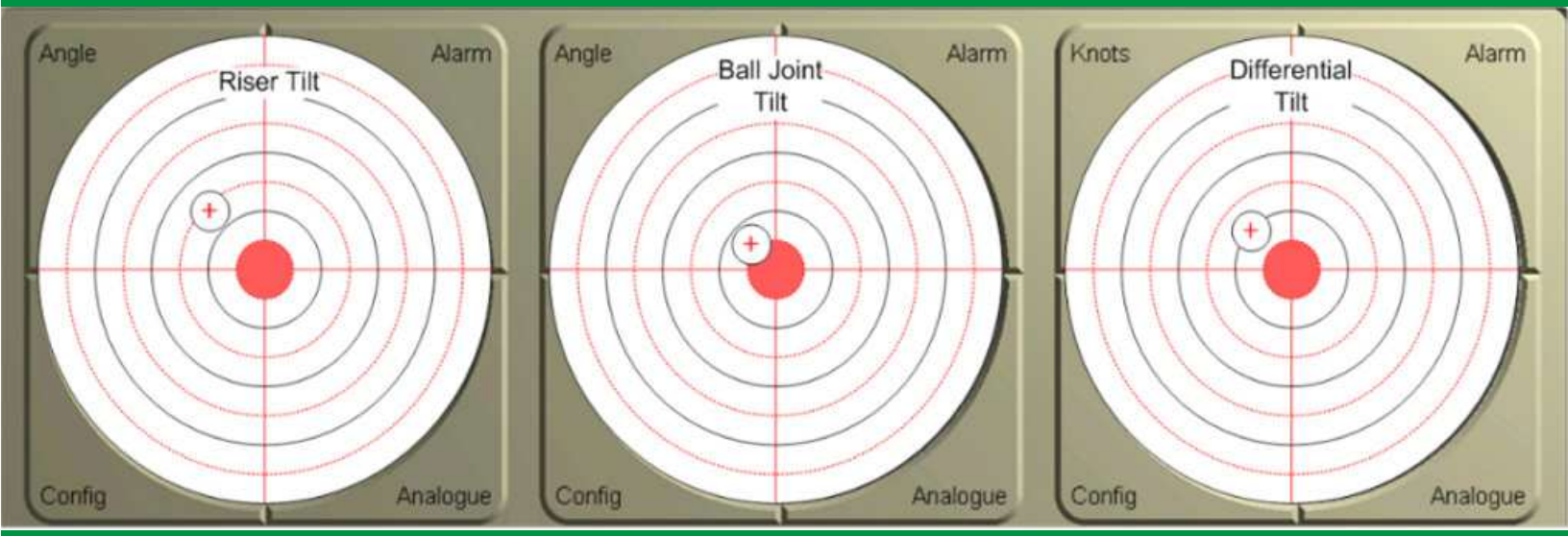
Solution

Jewell Instruments developed the Riser/Ball Joint Angle View System to continuously monitor the angle between the riser and the BOP. In this system, Model 802 Digital DeepWater high precision tiltmeters measure the angle between the riser and the BOP at the ball joint. DeepWater tiltmeters (photo above) have resolution equal or better than 0.01 degrees depending on configuration and are rated for operation to 8000 ft ocean depth. In a typical application, one biaxial tiltmeter is installed below the flex joint and one above it. Communication with the surface is by copper conductor, fiber optic cable, or acoustic transponder.



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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