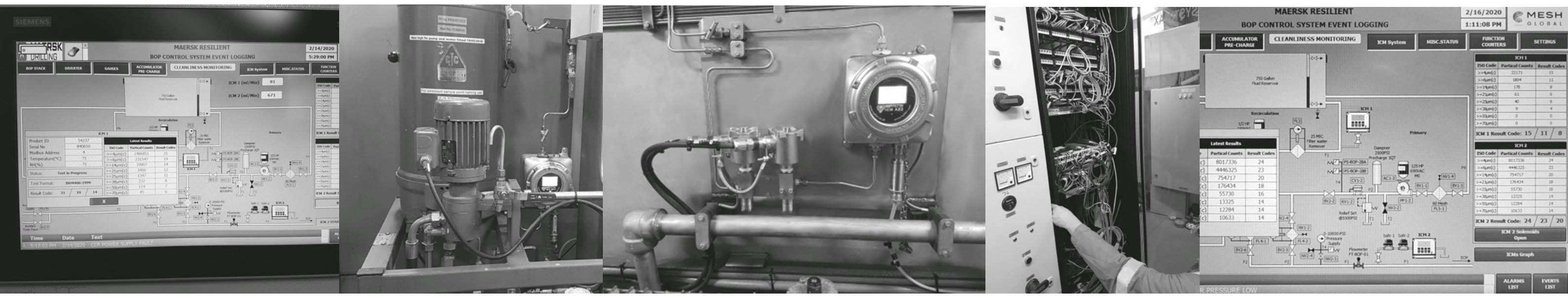
Inline Contamination Monitoring

MESH GLOBAL

Noble Drilling

Inline Contamination Monitoring

Case Study



Duration

10 Weeks

Scope Overview

- Initial review of existing hardware.
- Development of specification documentation, including hardware requirements, operating system/ software, programming environments, functional requirements, data requirements, and interfaces to all external systems.
- Completion of the following pre-delivery scope: generating all Factory Acceptance Test documentation, and conducting a final integration test using simulation where physical devices were not available.

Provision of personnel for the following tasks:

- Decommissioning of the existing system.
- Installation and commissioning of the new system.
- Conducting offshore training on the system covering operation, maintenance and fault finding.

Achievements

The client now has a fully supportable system that will aid them in continuously determining fluid condition, thereby mitigating equipment damage or downtime.

Additional Information

The Inline Contamination Monitoring system can be implemented as a stand-alone system or integrated with pre-existing PLC based system infrastructure. Additionally, two other associated systems can be combined to further enhance this system: RFID pressure monitoring and cycle counting / condition monitoring. For additional information on these associated systems, please refer to their respective case studies.

Background

Noble Drilling enquired about an enhanced method of monitoring fluid cleanliness on a well control system. Despite having an integrated filtration system, they sought precise NAS level readings from the fluid within the storage tank, as well as the fluid being sent from the accumulators to the BOP. This required an understanding of the fluid condition currently stored within the accumulators.

Requirement

It was crucial to accurately determine the fluid condition in both the BOP Control System mix tank and accumulator bottles. This ensured that the fluid condition is known at all times and can be rectified if it's condition deteriorates. It was especially beneficial to know the cleanliness being sent to the BOP on actuation of the RAMS. The system is also able to provide early detection of fluid cleanliness issues via it's integrated alarm system.

Approach

Sampling the fluid condition within the tank was relatively straightforward and utilised the existing systems filtration as a tie in. Generally, determining the condition of fluid within accumulators is difficult due to the fluid being in a pressurised, stagnant state. Therefore, it was determined that sampling the fluid that it supplied from the accumulators was the best approach via the supply manifold. Sampling the fluid at high pressure and with a high flow rate when operating the Blow Out Preventer was also not an option. The system therefore samples the fluid after the BOP function has been completed. This ensures that the fluid loss from the sample cannot affect the required pressure or volume of fluid being sent to the BOP. The system recognises when a function on the BOP has been activated and waits until the function has been completed. It then activates the fail safe solenoids to allow flow through a needle valve to the fluid cleanliness sensor at the optimal pressure and flow. This provides a cleanliness reading without affecting the operation of the system.

Results

The client now has continuous, accurate readings of the fluid cleanliness within the system. The supply manifold inline contamination monitor will automatically take a sample after any function activity, or can be manually actuated whenever the client wishes to check the cleanliness of the fluid within the supply manifold. All historical readings are saved within the system to allow for analysis and identification of trends.

Benefits

The client can accurately monitor fluid cleanliness in the system and more precisely determine and isolate cleanliness issues within the system. Damage from fragments of worn components or debris has a greater chance of being detected before causing damage to expensive capital equipment such as the BOP.

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