

UK Service Teams Improve Maintenance and Safety at Nuclear Power Station

Background

As part of the cooling water inlet works for the a nuclear power station in the UK, several screens are used to prevent debris from entering the system. The screens are washed in a 6.5 m x 2.2 m x 3.4 m (21 ft x 7.3 ft x 11 ft) deep screening tank where further filtration occurs before discharge into the English Channel.

The original system had two NOV CA210 munchers, two agitators of unknown origin, and two submersible centrifugal pumps but suffered several issues. the customer could not maintain, repair, or exchange the pumps and munchers in the deep screening tank without complete plant isolation and shutdown because of the confined space entry.

In addition, the existing control panels were old technology and of fragmented construction over a number of years. The customer had poor level control of the sump pump and could not remove one discharge pump for maintenance or repair due to a lack of isolation valves. Also, the ingress of metallic debris damaged the munchers.

Solutions

NOV redesigned, supplied, installed, and commissioned the entire pumping system and elevated the pumps, agitators, and

munchers to the surface. We constructed a platform and provided our proven progressive cavity pump technology, which can perform suction lifts and accommodate the high solids content.

Our Manchester, UK facility manufactured the Mono pumps, Chemineer™ mixers, and Mono munchers, while the Fiber Glass Systems facility in Plymouth built the Pipex™ corrosion-resistant handrails and grating.

For easy access to the NOV CA210 munchers and pumps, our expert field service technicians installed a mounting frame, composite handrails and grating, and additional penstocks. These features allow the equipment to be removed, repaired, or re-installed from the surface without shutting down the maceration system. The installation of correct isolation valves and non-return valves allows automatic cyclic operation and one discharge pump to be maintained while the other remains in operation.

The level controls were upgraded from conductive to ultrasonic, thus providing a level control feedback loop, superior level detection, and inverter control of equipment. The pumps can now adjust their flow to allow proportionate changes to the sump level operating on a duty standby basis.

Case study facts

Location: UK

Customer: Confidential

Timeframe: 2020-2021

Results:

- The nuclear power station screenings maceration system no longer must shut down for pump, agitator and muncher maintenance.
- Eliminated confined space entries, improving safety and equipment accessibility.
- Proper sump pump level control protects the equipment, enhancing performance and reliability.

Also, we implemented GoConnect™, our real-time condition monitoring application that provides data-driven insights into the health and performance of the equipment.

Results

Our customer no longer must shut down the maceration system to maintain, repair, and replace the pumps, agitators, and munchers, lowering costs and improving equipment reliability and performance. Accessing the pumps and equipment at the surface also eliminates confined space entry, enhancing maintenance efficiency and safety.

