

Condensate polishing: A highly important safety net for more efficient plants

Condensate polishing is the unsung hero of efficient plant operations, as it can remove impurities, prevent leaks, and avert shutdowns.

Condensate polishing is an understated but extremely vital aspect of plant maintenance. Polishing condensate prevents the concentration of soluble impurities, which could corrode internals and cause damage to boilers and turbines. Corrosion, in turn, could cause insoluble impurities such as copper, iron, and silica to re-circulate in the stream.

If left unchecked, these impurities could eventually result in plant failure. Condensate polishing is especially crucial in supercritical or ultra-supercritical generators, where all impurities from the boiler directly enter the turbine. This process results in the buildup of hard deposits which bring about inefficient operation, increased costs, and even cause unplanned and disastrous shutdowns.

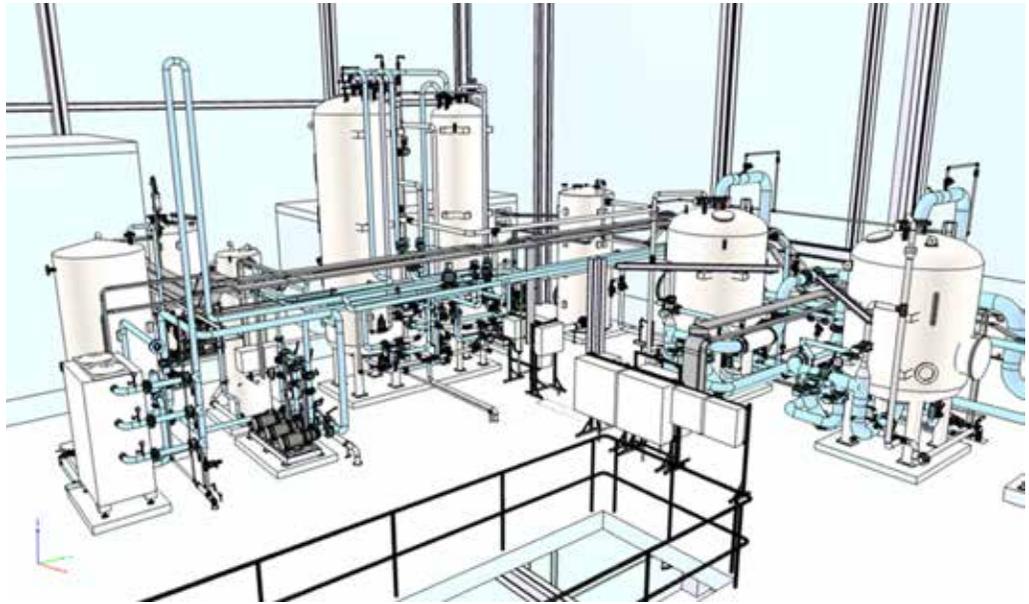
A condensate polisher also protects the system against condenser leaks. In the event of a leak, a condensate polisher gives operators time to shut down the boiler for cooling waters with high total dissolved solids (TDS). For low TDS cooling waters, a condensate polishing systems can even allow the condenser to continue operations while awaiting maintenance work.

By removing these dangerous impurities, condensate polishing systems aid in preserving cycle purity and efficiency. Although polishers do not make plants immune to chemistry issues, they nonetheless lessen the impact of chemistry problems and often allow a plant to continue operating with a minor condenser tube leak or air in-leakage problem that might otherwise require an immediate shutdown. Plants with condensate polishers can also be started up more quickly, which will save utilities time and money and allow more operation flexibility.

Introducing SeparIX

Veolia has been designing, building and commissioning condensate polishing plants for over 30 years. Using this knowledge base, a range of standardized mixed-bed units for condensate polishing has been created. Standardized units reduce time to market, optimize cost, facilitate maintenance and represent proven solutions.

"We try to focus more on condensate polishing to actually recover the condensate. This is especially critical for coal-fired power plants. We want to focus our time and technology into this area, where we can bring a more sustainable plant to our customers," says Veolia's Regional Market Manager Aaron Seah.



"If a condenser breaks down, the whole power plant can be shut down. We see many unreliable plants in Asia, so we really want to improve the quality of these plants for our customers," he added.

Veolia's newly-developed SeparIX technology is a simple and exceptionally robust process which uses a high degree of separation to externally regenerate the mixed bed resins of condensate polishing plants. The system consists of two vessels for resin separation and regeneration as well as a third vessel for interim storage of the interface resin.

SeparIX's edge

Compared to previous solutions, SeparIX does not require difficult and costly sensor technology or additional chemicals as its separation process is based solely on the physical characteristics of the resins. The high purity of regenerated resins enables ammonia cycle operation.

Exhausted mixed bed resins are pre-regenerated to achieve constant resin layer heights in the separation vessel, independent from their grade of exhaustion. Only after regeneration are resins separated. This

process eliminates the need for costly sensors or specialty chemicals to identify and separate the resin types.

This procedure eliminates the main source of resin cross contamination. The regenerated cation resin is conveyed to the anion regeneration vessel and after subsequent mixing of both resin types the regenerated batch is ready to be transferred back to the mixed bed ion exchangers.

The highly efficient transfer from the regeneration vessel back to the service vessel ensures the high purity of the next batch. A spare resin charge can be stored in the SeparIX system to reduce the downtime of the service polishers during regeneration.

SeparIX has several benefits compared to other processes. The system does not require sensors to detect resin types, it requires no additional chemicals for separation of cation and anion resins. Its robust mechanical process has low maintenance requirements and high reliability, and has a simple displacement of operational resin loss through resin hopper of interface resin vessel. The simple construction of its separation vessel is also similar to conventional mixed bed ion exchangers with internal regeneration.

Veolia's condensate polishers are in line with the company's goal to help develop more sustainable and reliable plants in Asia. Veolia has been present in the ASEAN for over 20 years. Water is integral to the efficiency of power plants, and Veolia Water Technologies is at the forefront of providing unique solutions to the ASEAN's booming power industry.

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