POWER INDUSTRY

CASE STUDY

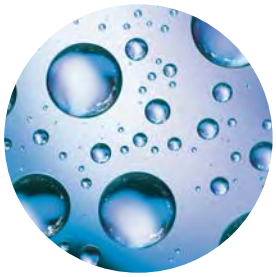
FGD Scrubber Effluent Treatment - Italy

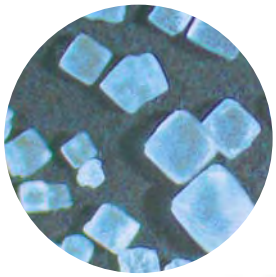
Zero Liquid Discharge (ZLD) System

FGD Purge Treatment

The effective treatment of wastewater resulting from flue gas desulfurization (FGD) scrubbers in coal-fired power generation can vary depending on the type of coal, water sources, and environmental regulations.

Evaporation technology is an effective alternative to conventional treatment processes that allows for water reuse in addition to minimizing the overall wastewater volume up to zero liquid discharge (ZLD).





Project Description

Stricter environmental policies and regulations worldwide are changing how industry approaches all aspects of business. Likewise, EU (European Union) environmental policies governing air, soil, and water quality have become progressively stringent.

These policy changes affect the power industry's balance of meeting growing European energy demands with compliance to environmental standards.

The Client's Needs

In order to conform with EU standards specific for flue gas, a coal-fired generation plant (at the time owned by Endesa, Italia, S.p.A.) in Monfalcone, Italy, undertook the measure of installing a state-of-the-art FGD (flue gas desulfurization) system at their facility. This system would remove SO_2 (sulfur dioxide) from the emissions for the 336 MW coal-fired power station.

Treatment of the effluent stream generated from the purge of these FGD scrubbers must also be addressed to comply with environmental regulations. This wastewater can be challenging to process as it contains heavy metals, suspended solids, and salts such as calcium, magnesium, and sodium chloride. Since aqueous discharge is not allowed, a Zero Liquid Discharge (ZLD) solution to wastewater treatment is required.

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Project & Technology Solutions

HPD® evaporation and crystallization technology from Veolia Water Solutions & Technologies was selected as the primary effluent treatment of the FGD purge stream at the Monfalcone plant. Thermal processes are capable of eliminating aqueous waste while recovering valuable water for reuse in the facility as a true ZLD system. When designed correctly, the only waste from the thermal system is a crystalline solid that is able to be landfill disposed.

This achieves important environmental objectives of eliminating liquid discharge to the environment as well as recycling water back to the plant for reuse. Conventional physical and chemical processes that treat FGD wastewater cannot achieve ZLD nor recover any water for reuse.

Veolia was selected to provide this system due to a history of successful installations in the power industry worldwide and experience with Zero Liquid Discharge systems in several industries.

Duro Felguera, S.A., a specialist in turnkey design and construction of energy facilities, executed the ZLD project as the main overall contractor.

Scope of Supply

Veolia was responsible for the process design and major equipment supply for the ZLD plant. This included the following key components:

- A pretreatment system using softening and clarification to reduce suspended solids, calcium, magnesium, and heavy metals
- Brine concentrator utilizing falling film evaporation technology to recover greater than 80% of the water from the effluent stream for reuse in plant processes
- Brine crystallizer for further water recovery and brine concentration to produce a solid, non-hygroscopic salt cake for disposal (<15% by moisture)
- Chemical addition silos and mix tanks
- Sludge dewatering system
- All major and ancillary equipment

The Results

The ZLD plant, designed and supplied by Veolia with execution by Duro Felguera, was started up in the summer of 2008. The system is performing as designed and running on a continuous basis.

The high-quality distillate produced from recovery of the wastewater from the FGD purge system is utilized throughout the plant. The recycled water produced is below the maximum TDS (total dissolved solids) limit of 20 ppm.

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