

# New generation NALMET™ Technology helps a European coal plant in reaching its commitment towards environmental protection



## INTRODUCTION

The importance of using sustainable practices, resources and raw materials is one of the key business drivers of a major power plant in Germany. The plant utilizes mainly coal and gas-fired resources to produce energy. Environmental considerations, including the use of low hazard and environmentally friendly products was the focus area in which Nalco Water's new NALMET technology for heavy metal removal provided a key differentiator.

## BACKGROUND

In Germany, the local environmental authorities have set very stringent restrictions in the limits of heavy metal content in water discharges coming from industrial processes. Moreover, a specific national water hazard classification (WGK) categorises all substances into three classes with regards to their hazard to water: classification 1 (low hazard), classification 2 (hazard) and classification 3 (severe hazard). Working with environmental friendly products which represent lower hazard to the environment was a requirement of the power plant

## CURRENT SITUATION

The flue gas desulfurization wastewater plant treats wastewater coming from the flue-gas scrubber system. The wastewater treatment plant includes the following main steps:

1. **Neutralization tank:** wastewater is treated with lime and a flocculant for solid-liquid separation and some heavy metals precipitation.
2. **Clarifier:** In this tank, wastewater solids and heavy metals are settled. The overflow is treated with a specific heavy metal removal program.
3. **Second neutralization tank:** it receives the clarifier's overflow.  $\text{FeCl}_3$  and flocculant are added to further coagulate and remaining solids, heavy metals and other contaminants
4. **Secondary clarifier:** this is the final treatment step before the treated effluent is used in the cooling towers before being discharged to the river.
5. The sludge from the sedimentation tanks is dewatered in a filter press and disposed externally.

The heavy metal removal program - after treatment step 2 - is critical as it should ensure the removal of all heavy metals to levels below the discharge limit.

## CUSTOMER'S GOALS

Key Performance Indicators (KPIs) for the customer included:

- Improved safety and environmental protection
- Safe, constant, stable operation
- Continuous compliance to applicable legislation

## SOLUTION

Due to the strict legislation in heavy metals discharge and hazard classification of substances to water, Nalco Water proposed to the plant how the new heavy metal removal program could help them to reach its commitment towards environmental protection. The Nalco Water next generation NALMET Program for heavy metal removal is classified as practically nontoxic as opposed to the former program used by the plant, which had a much higher hazard to water classification. This meant that the power plant could transition from using a product categorised in the specific national water hazard classification (WGK) from the classification 3 (severe hazard) to

the classification 1 (low hazard). This did not only enhance the plant's sustainability image but also reaffirmed its continuous commitment to the environment.

After receiving agreement to test the new heavy metal removal program, the Nalco Water expert team designed a tailor-made program to treat the residual heavy metals in the Flue Gas Desulfurization (FGD) wastewater. The new Nalco Water heavy metal removal program showed that at comparable wastewater characteristics and dosages the treated effluent was still below the discharge limit.

## RESULTS

- New heavy metal program successfully decreases the risk of aquatic toxicity and contributes towards achieving the environmental commitment of the plant by eliminating the use of treatment products with a high hazard to receiving waters
- The program continues guaranteeing heavy metals content in the treated effluent to a much lower value than the established discharge heavy metal limit.

## CONCLUSIONS

By implementing the new NALMET Heavy Metal Removal Program, Nalco Water was able to support a coal fired power plant towards reaching its sustainability business drivers. The new NALMET program's low-hazard characteristics to water contributes to reduced risks to the environment and therefore strengthens the plant's commitment to a safer environment. Likewise, the new heavy metal removal program could continue ensuring the low heavy metal residual in the treated effluent and therefore meet the effluent discharge limits.

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