



France

## REUSE of stripping effluents from nuclear power plant

*Treatment of stripping effluent from a boiler structure in preparation for a surface coating renovation application*

## REUSE of stripping effluents from nuclear power plant

CTP environnement set up a treatment solution that provided the customer with several reuse options:

- Recycling on an ultra-high pressure stripping unit with the following water quality constraints:  $T^{\circ} < 30^{\circ}\text{C}$ , pH 6-8, TSS < 5 ppm, COD < 20 ppm, metals < 5 ppm, conductivity < 1000  $\mu\text{S}/\text{cm}^2$
- Refrigeration of pre-treated water
- Washing and rinsing water



Because of the high cost of disposal, it was impossible to discharge the effluent. It was therefore necessary to treat the 250 m<sup>3</sup> of hot, highly charged effluent from the stripping process on line and minimise its volume:

- TSS > 1 g/L,
- Metals > 100 mg/L,
- Lead > 10 mg/L,
- COD > 100 mg/L

The recommended technical solution was as follows:

- Physico-chemical treatment (metal insolubilisation, coagulation, flocculation and decantation)
- Dewatering sludge in geotextile membranes 1 m<sup>3</sup>
- Filtration of clarified water, then adsorption on activated carbon
- Addition of plate heat exchanger cooling before GAC

The meticulous and frequent analytical monitoring, with a field laboratory, set up during the operation enabled:

- Adjustment and optimization of the treatment
- Demonstration of changes in the load and quality of treated water:  $T^{\circ}$ , pH, COD, SS, metals, conductivity, etc.

The results were very positive, with effective treatment of the 250 m<sup>3</sup> of reused effluent, resulting in:

- Treated water with a very significant reduction in suspended solids, metals, lead and COD, with stabilization of conductivity
- < 2 tons of solid sludge with a dryness of > 50 %
- < 50 m<sup>3</sup> of water used vs. 250 m<sup>3</sup>, an 80 % saving
- 20 m<sup>3</sup> of clarified effluent + 1 ton of solid waste eliminated

The total cost of the service, including waste disposal, has been cut in half compared with conventional effluent disposal.

