

Power Industry



The Challenge

Jindal Steel & Power's 6 MTPA integrated steel plant envisaged a coal gasification based reduction gas facility. During the coal gasification process, liquid effluents are generated; these effluents contain fluorides, cyanides, sulphides, thiocyanates, nitrogen, phenols and various heavy metals. Other parameters are biological oxygen demand (BOD) up to 4,000 mg/l, chemical oxygen demand (COD) up to 6,500 mg/l, total suspended solids (TSS) 125 mg/l as well as oil and grease up to 50 mg/l. These toxic contaminants are harmful to the environment and aquatic life and need to be treated before discharge; they are also extremely challenging to treat. Environmental sustainability concerns led JSPL to seek a state-of-art effluent treatment plant so that the treated effluent would meet stringent discharge parameters.

The Solutions

Ion Exchange Waterleau, our joint venture with Waterleau, Belgium, was awarded the turnkey contract for treating the complex liquid waste generated in the greenfield expansion project of Jindal Steel and Power Limited (JSPL) at Angul, Odisha.

The contract also includes turnkey civil design, complete electricals, instrumentation and a remote monitoring system.

Effluent Treatment: The plant is designed to treat a combined flow of 400 m³ /h consisting of 350 m³ /h stripped gas ammonia liquor (SGAL – effluent post ammonia stripper) and 50 m³ /h oily waste and rainwater. Apart from oil removal, the process employs cyanide and sulphide removal technologies and advanced biological treatment (ABT) where several stages of anoxic and aeration significantly reduce BOD, COD, TKN, trace phenols and cyanides. The effluent is further subjected to a tertiary treatment process. The final treated effluent is pH neutral, containing BOD <30 ppm, COD <150ppm, TKN <10 ppm, NH₃N <5ppm, oil & grease <10 ppm, cyanide<0.2 ppm, fluoride <2ppm, sulphide and phenol <1 ppm.

Solid Waste Treatment: The plant includes two belt filter presses (BFPs) for treating solid waste (chemical and biological sludge) generated during treatment. Solids will be concentrated to 18-20 per cent slurry for safe disposal. The excess water drained from the BFPs is recovered and treated in the main effluent treatment plant.

Auxiliary Process Equipment with Air Treatment: Since the process uses a large quantity of lime, a sophisticated, automated lime handling, solution preparation and dosing system are provided with a lime dust handling system to meet the stringent air/particulate emission limits.