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Treatment Systems for Industrial Waste Water

Engineered Systems: Micro-Electronics

Case History: LG Engineering, UK

Background

Satec were awarded a contract with L G Engineering to design, supply, install and commission a treatment plant to process the waste effluent streams emanating from the production of micro-chips at their facility in Newport, South Wales.

In phase 1 of the project, the plant has been designed to treat a total flowrate of 4,200 m³/day of effluent, which is received at the plant inlet as 5 separate streams:-

- Flouride and back grinding (HF/BG)
- Heavy Metals (HM)
- Hydrogen Peroxide (H2O2)
- Acid/Alkali (A/A)
- Organics (OG)

Effluent is treated to a standard that complies with the Environment Agency guidelines prior to discharge into the river Ebbw.

Equipment Installed

HF/BG Stream : Design flow 40 m³/hour pumped through reaction tanks with lime, caustic soda, ferric chloride and polymer dosing, then through clarifiers for removal of fluoride as calcium fluoride.

HM Stream : Design flow 7.5 m³/hour pumped into HF/BG reaction tanks for removal of heavy metals as hydroxides.

H_2O_2 Stream : Design flow 27.5 m³/hour pumped to reaction tanks with caustic soda dosing and activated carbon filters for removal of hydrogen peroxide.

OG Stream : Design flow 15 m³/hour pumped through reaction tanks with acid and caustic soda dosing to neutralise.

A/A Stream : Design flow 120 m³/hour pumped through reaction tanks with acid and caustic dosing to neutralise.

Biological Stage : The above treated streams are combined, dosed with sodium bicarbonate, and pumped through 4 Nº bio towers for removal of ammonia, by nitrification, followed by dual media filters for suspended solids removal.

Final effluent is monitored and discharged.

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Sludge Treatment : Sludge from the various stages is pumped through a picket fence thickener and plate type filter press prior to skip disposal as 30% cake. Filtrate is returned to the plant inlet.

Control System : Allan Bradley PLC and SCADA system with operator interface to control the fully automatic operation of the plant.