

Southern Water And Success On Brighton Seafront

In order to comply with bathing water directives Southern Water has recently built an offline storage tank at Brighton. This facility has been constructed to intercept post-storm discharges from the sewer system and contain them until such time as the sewerage system can effectively process them. The system has been designed to contain the volumes of stormwater generated by a storm intensity, which occurs once in every 50 years.

The storage tank facility involved the construction of a 6m diameter storm water storage tunnel that runs under the Brighton Sea Front for a distance of some 5 kilometres. At specific locations along the tunnel, there are dropshafts that allow storm water to overflow into the tunnel.

The tunnel and shafts are continuously ventilated by fans located in each shaft. The air is usually exhausted only at Hove Street shaft, whilst being drawn in at the other five shafts.

Southern Water had to engineer a system that ensured H₂S emissions from the tunnel were at levels barely perceivable by the local community. Thus a Monitoring and Telemetry station was installed within a "Victorian" lifeguard building to control the speed of a large extraction/dispersal fan.

The problem did not revolve around an ability to decrease the presence of hydrogen sulphide, but rather the capacity to sense a build-up of the gas, and control an automated dispersal system. Traditional detection methods, such as catalytic/pellistor and infrared, were not practical as they prove unreliable when brought into contact with either hydrocarbons or more importantly water vapour. These methods are also incapable of detection at the 1.3ppb level that was required.

After research into specialised instrumentation, Southern Water's contractor Cegelec Projects brought the problem of detecting low levels of Hydrogen Sulphide in a wet environment to ABLE Instruments & Controls. ABLE have a well-established reputation for trace level Hydrogen Sulphide measurement, and have pioneered much of today's leading technology in this field. After consideration of the requirements, ABLE designed and built a complete hydrogen sulphide analyser system for unattended monitoring and control.

The analyser is based around a patented gold film sensor, which when exposed to sampled air, allows any hydrogen sulphide present to be adsorbed by the sensor, which in turn is registered as a proportional change in electrical resistance. The gold film sensor's selectivity to hydrogen sulphide eliminates interference from SO₂, CO₂, CO and most importantly from water vapours.

Data is continuously updated every hour, or as required, since the system is user programmable with new samples of air being drawn into a custom-built electropolished stainless steel reservoir. The data from the analyser is fed into the control system, which consists of a data logger, indicators and a set of trip amplifiers. The trip amplifiers form an integral part of the hydrogen sulphide dispersal system, and govern the speed of six huge four meter diameter fans. Any odour 'events' are reported via a telemetry system to the control room five kilometres away at Blackrock.

This continuous odour control system ensures that the existing sea air quality is not compromised, thus the public can continue to enjoy fresh sea breezes.



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