# Grit plant optimisation - a smart investment

As Ofwat moves to ensure that water companies place an emphasis on resilience with its new report, the 'systems thinking' that this requires should put grit plant optimisation at the heart of wastewater treatment strategies.

The move to Totex has also created a major change in strategy for water utilities; one that puts the onus of responsibility on suppliers to demonstrate that their products and services support the delivery of outcomes for water companies. This compares with the previous Capex focus, which tended to emphasise capital investment outputs at the expense of more holistic thinking.

Moving from 'outputs' to 'outcomes' mean Capex and Opex are now part of a greater whole, which means the life cycle cost impacts of procurement decisions are being examined, placing greater emphasis on cost efficiencies, driven by technical and business process innovation.

A comprehensive Totex strategy for inlet works has to take into consideration the benefits of protecting pumps and other assets throughout the treatment process. At this stage, it is important to emphasise the critical role played by grit removal.

While effective grit removal is often not seen as a key process, it is essential at the preliminary treatment stage, because if grit plant is not performing well or is not able to retain sufficient grit, the downstream effects of even relatively fine abrasive detritus on the rest of the treatment train can be severe. Grit accumulates wherever flows slow down; in tanks, channels and chambers where if it builds up it will require costly removal. It also increases wear on expensive equipment, notably pumps, reducing their expected life, and increasing maintenance for sensitive parts such as the vulnerable impellers.

Optimisation of grit plant requires proactive, preventive maintenance to ensure equipment does not fail unexpectedly. And when failures do occur they often go unnoticed until serious effects on downstream assets become evident causing on-going problems for the rest of the treatment process, whereas optimally functioning grit plant enables utilities both to save money and reduce their environmental impact.

Ensuring grit plant is working correctly is an important issue for utilities, because grit extraction cycles such as air washing and lifting on air pump assemblies are sometimes set incorrectly and maintenance is not done because, superficially, the plant appears to be working. However, inefficient plant has an impact on a treatment works' maintenance costs, energy use and treatment capacity, because grit in downstream treatment systems reduces the available treatment volume and process efficiency. This, in turn, can impact on final effluent quality, the amount of energy required to achieve the works' discharge requirements and the efficient operation of sludge digestion plant.

For example, Jacopa was recently asked to refurbish a J+A Jeta Grit Trap and classifier at a major treatment works. On investigation, the Company found that the plant had not been running efficiently for years, leading to a massive grit build-up downstream that had compromised biofilters, many pumps and other critical plant. Following refurbishment and commissioning, including plant optimisation, the works is now running far more efficiently.

Because of this and other similar experiences, Jacopa is now offering free Health Checks for grit plant at wastewater treatment works. These checks enable the Company to identify any maintenance that is required and, where appropriate, to recommend action on refurbishment and optimisation.

The free health check allows utilities to leverage Jacopa's grit plant expertise to ensure their plant is working correctly and achieving the intended treatment outcomes. The check is also an opportunity to identify potential upgrades for valued equipment. Jacopa has a comprehensive portfolio of grit removal products, and is well placed to provide the optimum solution for the varying requirements of treatment works.

Grit plant may not always be as well maintained as other equipment, and issues are not always recognised until they become critical. However, when problems do occur their impact on downstream processes can be severe, and costly.

A Totex strategy must then include protecting vital assets such as pumps, but cutting operational expenditure (Opex) is also an important element within the overall Totex plan. This has generated an intensified focus on maintenance rather than the previous capital-intensive solutions. Utilities have a new mandate to get more out of existing assets by ensuring that they continue to operate at optimum performance levels. Reductions in energy use and on-going efficiencies are then also integral parts of a forward-looking Totex strategy.

Given the move to Totex, expenses such as remediating the damage caused by grit have considerable impact, and must be factored against the costs of ensuring grit plant is functioning optimally on an on-going basis. The increased emphasis on extending asset life and maintaining performance in AMP 6 also means assisting customers and project management teams both in long-term decision-making and short-term judgements on individual assets, which implies a need for basic preventive initiatives such as grit plant optimisation.

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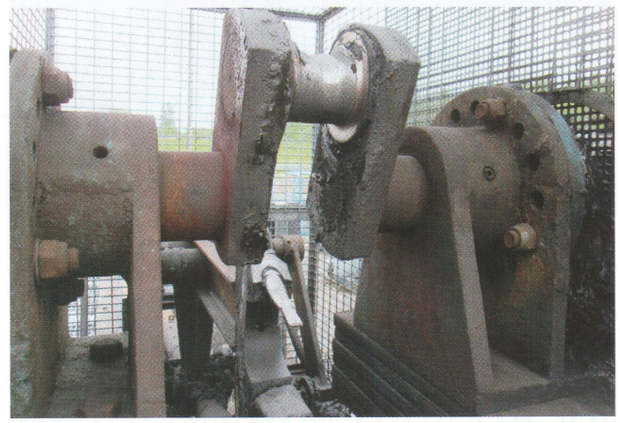
Jacopa has a comprehensive portfolio of products for grit removal, as well as Classifier systems and Grit Pumps for a variety of site configurations and requirements. As one example, the rugged J+A Crossflow Detritor grit trap is designed to remove 95% of 0.2mm grit to produce a largely grit-free effluent that's cleaned, well-washed and drained.

When space is an issue, the J+A Jeta® grit trap will provide a high level of grit removal within a minimal footprint. The simple, slow-rotating mechanism is highly efficient and uses minimal energy. If it's necessary to deal with a mixture of solids from unscreened sewage sources to produce a cleaner grit than a standard classifier the J+A Bache Classifier grit washer is an excellent choice. Made from either stainless or mild steel with few moving parts, it is easy to maintain for maximum design life and durability.



These solutions are an integral part of the comprehensive range of options available to water companies to ensure that grit will not escape through the preliminary treatment stage to create problems downstream. Given that removing grit from treatment systems can be a very significant cost with downtime jeopardising compliance, it is evident that addressing grit plant optimisation is in reality a smart investment in the efficient operation of a treatment works.