The Knowledge

A worn bearing next to a new bearing

Top Tips for... System Totex

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Ofwat's decision to move to investment decisions based on Totex has caused a radical shift in strategy for the water sector Capital expenditure and operational cost are now part of a greater whole, and both the shorter and longer life cycle cost impacts of procurement decisions is under scrutiny System Totex is key to employing this approach for inlet works, and these tips around the example of debris, screenings and grit removal provide guidance on applying it.

6 TOP TIPS

1 Establish a case for shorter-term investment

Ofwat's new emphasis on Totex requires an understanding of how decisions are made on inlet works investment, not just in terms of a set of parameters, but in achieving much wider customer-focused deliverables.

The new thinking provides the flexibility to move from the traditional 20-year whole life cost, output-focused investment approach to a shorter term, five-year horizon that addresses the levels of service customers believe are important to them, and which are a significant element in Ofwat's thinking.

Creating a solid case for this type of short-term investment, which resonates with the five-year AMP cycle, means shifting the focus from long-term Capex to Opex or short-term Capex to meet the required outcomes more closely. The approach focuses on the system in its entirety, which involves assessing many factors that affect Totex cost as well as the usual capital costs.

2 Assess the indirect costs of gaps in maintenance

A comprehensive system Totex strategy must include consideration of the benefits of proactive maintenance for inlet works, for example, by protecting pumps ahead of and throughout the treatment process.

Effective screening removes debris that can affect the efficiency of downstream equipment and processes and ensures that downstream operational and maintenance costs are minimised. Debris, either from storms or dumped material, is a well-known cause of damage and blockage to critical pumps, leading to long periods of down time for repairs. And, as pumps are often very significant in terms of both capital and operational investment costs, protecting them is hugely important to utilities. Effective grit removal reduces wear on equipment such as pumps and pipework, while at low velocities grit not removed at the inlet works accumulates downstream in channels and tanks.

3 Assess efficiency

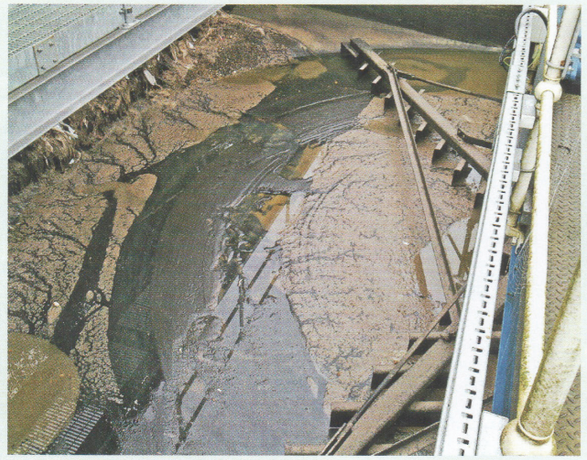
It is also vitally important to assess the efficiency of the assets within the inlet works and choosing the right screen for the sewage inflow to the inlet works is critical. For example, the straight through escalator-type fine screen and centre flow band screens are specifically manufactured to provide effective inlet works protection for assets further into the treatment process. With the increased emphasis on efficiency and customer service in mind, it is important that such screens are competitively priced and have easily replaceable screen panels and low cost replacement parts.

These screens have impressive screenings capture ratios and a much-reduced risk of screenings carry-over Versions of these screens are easy to fit into existing inlet channels or new works and the modular construction chimes with the industry's increasing focus on modularity and standardisation, which significantly reduces downtime – another important Totex factor

With grit plant, ensure the plant that has been installed or upgraded, works as designed and the simple operational and maintenance instructions are followed.

4 Assess by-product production

Successful inlet works system Totex requires an assessment of the by-products to be removed at the inlet works treatment stages and how these should be dealt with, and the associated costs.



Grit accumulation in a crossflow detritor

It is important to assess what happens if debris, screenings and grit are not removed at the inlet works and the consequences for operational efficiency, compliance and costs if they penetrate further into the downstream treatment process.

Automatic trashrakes are increasingly becoming a product of choice to protect pump stations and all pumping installations, particularly those that have a strategic importance. Multifunctional trashrakes cut costs by combining a trashrake, overhead conveyor and debris loading equipment into one system to create an effective and safe automatic turnkey solution to screen and dispose of debris.

The solution is typically put in place to protect larger system-critical pumps at water and wastewater treatment works, which are used for either abstracting raw water at water treatment works or raw wastewater from wastewater treatment works' deep intakes.

5 Build larger risk and compliance issues into the equation

It's also important, when considering system Totex, to provide support to water companies in assessing the hydraulic conditions, for example in storm conditions and requirements for attenuating flow upstream of inlet works by flow control. Additionally the maintenance of storm tanks by flushing gates should be considered, to clear debris and to reduce odour nuisance of storm systems filled with debris, screenings and grit.

Innovative electrical, or hydraulic-mechanical regulators help water companies to manage hydraulic overloads at wastewater treatment plants and storm systems.

Grit settlement in a screen channel

6 Is an Opex solution better than a Capex one?

Cutting operational expenditure (Opex) is also vital, and there is increasingly an intensified focus on maintenance and a move away from previous capital-intensive solutions. The new imperative for water companies is to get the most from existing assets by ensuring they are working at optimum performance levels. We must also look to deliver reductions in energy use and drive ongoing efficiencies by keeping equipment operating at optimum performance.

The value of this approach is evident from the example of grit plant: this might often be less well maintained than other equipment, and it is not always obvious that a grit plant is not performing properly so the consequence of under-performance is usually not immediately evident.

However, when problems arise they can have a profound effect on the entire works' processes and equipment. Even fine particles can affect expensive equipment such as pumps, causing them to fail or become damaged, and grit can also erode pipes and reduce pump efficiency. Grit collects at critical points, from where it must be removed, generating a further expense. Treatment efficiency can be reduced, processes are affected, and operating risk increases.

A Totex approach involves looking at the system holistically rather than, as in this instance, looking at the grit plant and seeing a saving in not maintaining, refurbishing, or replacing it, and instead understanding that this approach can have a significant negative effect on the efficiency of the entire treatment works.