

CASE STUDY

CLIENT: **Anglian Water**

Site: **Shillington STW**

Background

As part of M&N Electrical & Mechanical Services Ltd's extended remit to its Anglian Water framework agreement, the company was appointed a 'first inspection contract' to oversee the successful integration of all new screens and associated equipment included in their 5-year PPM servicing contract which commenced on the 1st April 2015.

The site inspection at the Shillington STW highlighted the following issues that needed to be addressed to improve and maintain operational efficiency:

- Existing (non-M&N) brush screen failing consistently due to age and wear



- Significant resultant backwash due to screen failure



- Heavy flow to bypass channel further hampered by restrictive 6-inch concrete inlet channel infrastructure



Inspection findings & recommendations

1. The existing brush screen had deteriorated to a point whereby it was considered beyond economical repair.
2. Opening up of the inlet channel to remove restrictions of 6 inch inlet points would create more manageable flow of liquid to screening unit, minimising backwash potential.
3. Improvements to screen layout and access could be incorporated during the installation.

Product selection

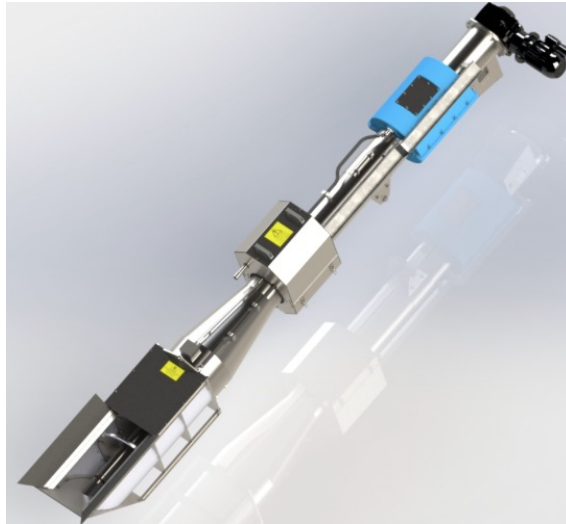
The deterioration of the existing brush screen highlighted a common problem faced by many screen manufacturers. A significant number of brush screening units experience significant wear to inlet screening brushes as the rotating auger drops onto a unit's basket as a natural consequence of operational wear.

In line with the TOTEX business methodology, providing a long term solution, improving operational stability and much reducing the risk of unplanned repair costs M&N design engineers selected the company's in-house designed & manufactured **MNSS5 Combined Spiral Brush Screen** as the most appropriate replacement unit to meet these objectives.

Awarded a UK patent for its bottom end bearing the **MNSS5** has undergone many rigorous site tests over an 8 year period which has positively highlighted many of its design innovations and operational benefits when compared to similar screening equipment.

In addition the M&N's MNSS design has been put through a comprehensive and independent evaluation of its **Average Screening Capture Ratios** at the **National Screen Evaluation Facility** at Chester Le Street STW by Thompson RPM.

[Average Screening Capture Ratios = 53%]



THE MNSS5 COMBINED SPIRAL BRUSH SCREEN

To meet the specific operational needs of the Shillington STW M&N's technical team highlighted a number of modifications that could be incorporated to the unit prior to site installation and put the enhanced unit through virtual testing ahead of making their recommendations.

The MNSS5 product design benefits include:

- Bottom end bearing design (*preventing metal to metal contact*)
- Simplified wash process (*solenoid valves removed from wash system*)
- Development of hardwearing 'grit resistant' screening brush (*found to last up to 4 times longer than other manufacturers' brushes under normal operational circumstances*)
- Capable of handling flow rates of 120litres/sec
- Configuration of shaft/gearbox assembly minimises operational wear
- Easy maintenance incorporated into unit design (*top end wash covers are easily removed, bottom end shaft can be replaced in situ & the unit benefits from 360° screen pivot*)

"As with several of our in-house designs the MNSS Combined Spiral Brush Screen unit was developed to be retro-fitted within existing inlet works infrastructures to simplify the screening process."

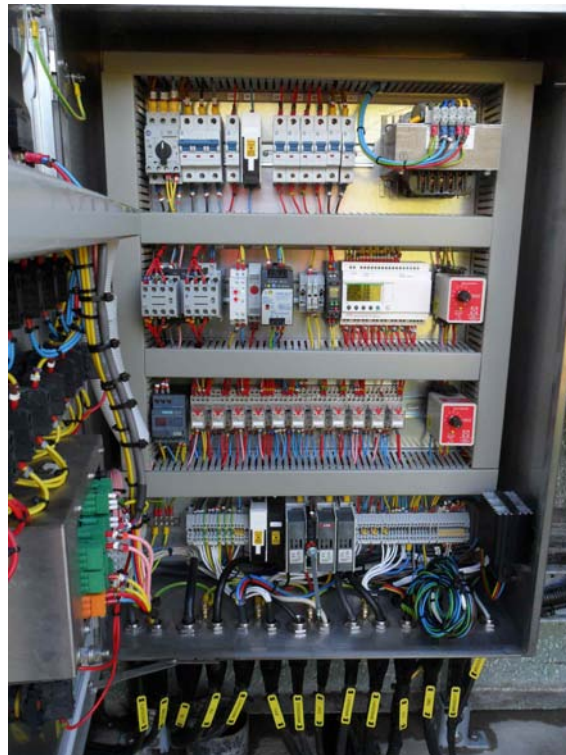
Ian Hayward **Technical Manager** at M&N

Installation

Re-construction of concrete housing structure.



MNSS5 retro-fitted to existing STW infrastructure alongside new Control Panel with telemetry capabilities.



M&N's dedicated electrical control panel team fabricated a bespoke state-of-the-art unit to control all aspects of the MNSS5's functionality, including the modifications detailed by the technical team.

Results

- Installation of new screening unit delivered on schedule with minimal disruption to operations
- Bespoke modifications incorporated into MNSS5 in line with Anglian Water's operational requirements
- M&N and civil works team delivered significant improvements to infrastructure, including removal of restrictive 6 inch concrete inlet channels
- Immediate improvement to resultant screenings
- Ongoing maintenance efficiencies incorporated into installation

