

## CASE STUDY

### Complex screen replacement project Runcorn WwTW : United Utilities

#### Project Overview

Originally constructed in the 1960's Runcorn WwTW is one of United Utilities major treatment works servicing a population in excess of 96,000. 2 long-standing escalator screens carried out screening operations at the site. The works proximity to the sea, significant impact of H<sup>2</sup>S to equipment and operational fatigue was causing the screens to fail regularly, requiring ongoing and costly repair.

Carried out in 2017 by framework partner M&N, the project consisted of supply of new screening equipment, installation and commissioning. The unique and challenging site dynamics resulted in the expansion of M&N's remit to deliver a complex installation with close collaboration with United Utilities personnel and relevant 3rd party service providers.

#### Objectives

- Maintain screenings operations during phased removal of failing screens & installation of new equipment.
- Provide a screening solution that would fit into existing Inlet channel and handle high flow rates.
- To overcome site specific challenges and ensure minimal disruption to the rest of the Works.



#### Challenges

- Building roof to be removed to replace screens
  - Significant health & safety implications of extensive work on site
  - Electrical power linked to complex fibre optics across site infrastructure which could not be compromised
  - Co-ordination of multiple parties to carry out project
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## The Solution

As part of the initial removal / installation discussions, United Utilities briefed M&N to look at the costs and operational implications of removing the buildings roof to enable crane access.

M&N engineers identified the potential to propose an alternative lifting solution, one that would significantly reduce costs, health & safety concerns, and disruption to the treatment works whilst the project was carried out.

Working closely with contractors M&N oversaw the installation of a 2.5 tonne Linian Lifting Module that was built into the existing building structure, making the removal of the roof unnecessary.

This not only solved the immediate screen removal and replacement issue, it also ensured that any future screen maintenance or channel access could be carried out more efficiently.

Taking into account the corroding effects of H<sup>2</sup>S at the site, significant flow rate handling requirements and the dimensions of the Inlet channel, the M&N sales team looked at various options for replacement screens.

2 FSM Frankenberger GmbH & Co Escalator Screens were selected to replace the failing equipment as they offered significant performance and design benefits when compared to similar screens.

Based on the equipment's operational superiority, site suitability and projected TOTEX benefits, United Utilities followed M&N's recommendations and the new screens were ordered, installed and operational within just 20 weeks.

As part of the installation M&N's specialist Controls & Automation division were tasked to upgrade the electrical controls. This had to be carried out without compromising the complex fibre optics infrastructure managing multiple functions across the Works.

The team liaised directly with the MCC manufacturer to facilitate upgrades to the PLC replacing all relays, buttons, timers and instrumentation controls.

## Equipment Installed

### FSM FRS III 6mm Escalator Band Screen

Independently tested at Chester Le Street the FSM FRS III Escalator Band Screen achieved average screenings capture ratios of 85.33%.

#### Operational Suitability:

- Offered for 60 degree installation into existing Inlet channel
- Fabricated in Grade 316 stainless steel to offset H<sup>2</sup>S impact
- Capable of handling maximum flow of 625 litres/sec with headloss of 115mm

#### Design Benefits:

- Unique Brush Positioning offering optimum cleaning
- Self adjusting brush
- Choice of perforation sizes
- Screen frame, covers, chains, sprockets, filter panels, shafts & discharge chute all manufactured from Stainless Steel
- Screenings lifters fitted to every 10th panel (as standard)
- Rag lifters on screen prevent build up in front of screens
- Easy to retrofit
- 100+ UK installations



The PLC software was upgraded at M&N's Portland headquarters and returned to United Utilities to link seamlessly within the fibre optics management infrastructure.



### Results

The new FSM FRS III 6mm Escalator Band Screens demonstrated their performance benefits with immediate effect, delivering:

- Lower power consumption
- Significant improvement to SCRs
- Improved quality of screenings discharge



### Project Summary

M&N's proactive, collaborative approach and sole access to superior screening equipment ensured that what was originally only scheduled to be a screen removal / installation project became an opportunity to provide a fully integrated 'turn key' solution to United Utilities.

- Significant cost & time savings delivered
- Superior equipment sourced and supplied to site specifications
- TOTEX cost advantages projected
- Enhanced controls & automation built into complex fibre optics infrastructure
- 2.5 tonne lifting capabilities established
- Minimal disruption to Treatment Works operations throughout duration of project
- Install complete in just 20 weeks

### Testimonial

"From initial scoping to final delivery, M&N proved invaluable to the smooth running of this project. They were not only able to provide a superior screening solution in an unrivalled timeframe, their innovative thinking helped to us avoid disruption across the Works. Ultimately, they have delivered significant performance benefits and saved us time and money. The other contractors involved in the project commented on how easy it was to work with the M&N team and made specific reference to their professionalism throughout the process."

Darren Howarth, Inlet Screens Range Manager: United Utilities