

**HUBER**

## Detection System Safety Vision

Innovative digitalisation module for the HUBER Multi-Rake Bar Screen RakeMax®

- ▶ Detection of critical material to protect the screen and downstream machines
- ▶ Screenings volume-dependent control of downstream machines
- ▶ Optimal machine utilisation through adaptive operation based on event detection

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## Challenges in mechanical preliminary wastewater treatment

The main task of the screens used and installed in the inlet to the sewage treatment plant is to remove coarse contaminants from the incoming wastewater flow. At the same time, such preliminary screens also protect the operation of downstream machinery and units, such as a screw conveyor or a wash press, and ensure the smooth operation of the entire wastewater treatment plant.

In addition to the type of material to be expected, however, other unforeseen materials are increasingly entering the sewage treatment plant influent, such as canisters, square timbers and tyres. Even though screening plants are built for coarse and bulky material, such matter can cause damage, resulting in longer downtimes, higher costs and, above all, additional stress. To prevent this, HUBER has developed a worldwide unique system for wastewater screens: *the HUBER Detection System Safety Vision*.



Figure 1: HUBER Safety Vision installed on a HUBER Multi-Rake Bar Screen RakeMax®.

## HUBER Safety Vision – innovative digitalisation module

The innovative HUBER Detection System Safety Vision enables the screen to “see” the screenings and reliably identify potentially critical contaminants. This is achieved by precise real-time measurement of the screenings with sensors, fast processing of the measurement results, and an intelligent evaluation logic that examines the measurement results for defined anomalies. As soon as potentially critical screenings are detected in this way, the operation of the screen stops immediately. At the same time, an image of the situation in the screen is recorded and transmitted to the operator.

Based on this message, the operator can decide individually whether the screen should continue to be operated or should stop until the debris is removed. This effective protection mechanism reliably prevents damage to the screen or the downstream equipment, which not only increases the availability of the machines involved, but also improves the operational safety of the entire plant technology.



Figure 2: Exemplary image for operator notification – pipe sealing cushion on the rake bar of a HUBER Multi-Rake Bar Screen RakeMax®.

## Advantages and benefits of impurity detection

- ▶ Effective protection of the screen and downstream machinery
- ▶ Reliable prevention of damage to the machines
- ▶ Increased machine availability
- ▶ Increased operational reliability of the entire plant technology

## Adaptive operation

Adaptive operation addresses the challenge of sewer flushing surges. These occur primarily shortly after the onset of heavy rainfall events and cause an extremely high pollutant load in the inflow to the treatment plant. In unfavourable cases, the screen, as indicated in figure 3, can become overloaded by the high freight volumes and fail, with the result that the wastewater reaches the next process stage almost unpurified.

To safely avoid such situations, the measurement results recorded by Safety Vision are used and checked for known events with the help of a sophisticated evaluation. If the evaluation registers signs of an incipient flush surge, the screen is automatically run clear and set to „flush surge mode“. This has the positive effect of reducing the risk of overloading the screen to a minimum. If, in the course of time, the pollutant load and thus also the risk of overloading the screen decreases, the screen adapts to the current conditions by automatically switching to the appropriate operating mode. Adaptive operation thus both prevents overloading of the screen and ensures that the screen is always optimally utilised. However, this function does not only affect the screen, but also includes other HUBER machines that are directly connected to the screen.

## Further functions – Run-time optimisation and adaptive operation

In addition to the impurity detection function, the measurement results obtained are also used to enable two further functions. The adaptive operation of the machine combination based on the detection of events and the optimisation of the runtime of downstream machines.

## Advantages and benefits of adaptive operation

- ▶ Avoids screen overloading due to anticipatory freeing of the HUBER machines at the beginning of a surge.
- ▶ Optimal utilisation of the HUBER machines
- ▶ Reduced machine running time during heavy rainfall events with low pollution loads
- ▶ Lower energy demand
- ▶ Reduced operating costs



Figure 3: High pollution load on a rake bar.

## Runtime optimisation

The third Safety Vision function – runtime optimisation – pursues a goal similar to optimal machine utilisation. With the help of this function, it is possible to reduce the operating times of downstream machines such as the HUBER Wash Press WAP® or HUBER Screw Conveyor Ro8 T by up to 40%.

This is achieved by permanently evaluating the measured screenings volume on the rake bar. The intelligent control system then ensures that the addressed

machines are activated according to the actual screenings volume present and not according to rigid specifications. By reducing the running time of the machines, not only the operating costs can be reduced, but also wear. This consequently leads to both lower maintenance costs and a longer machine service life.

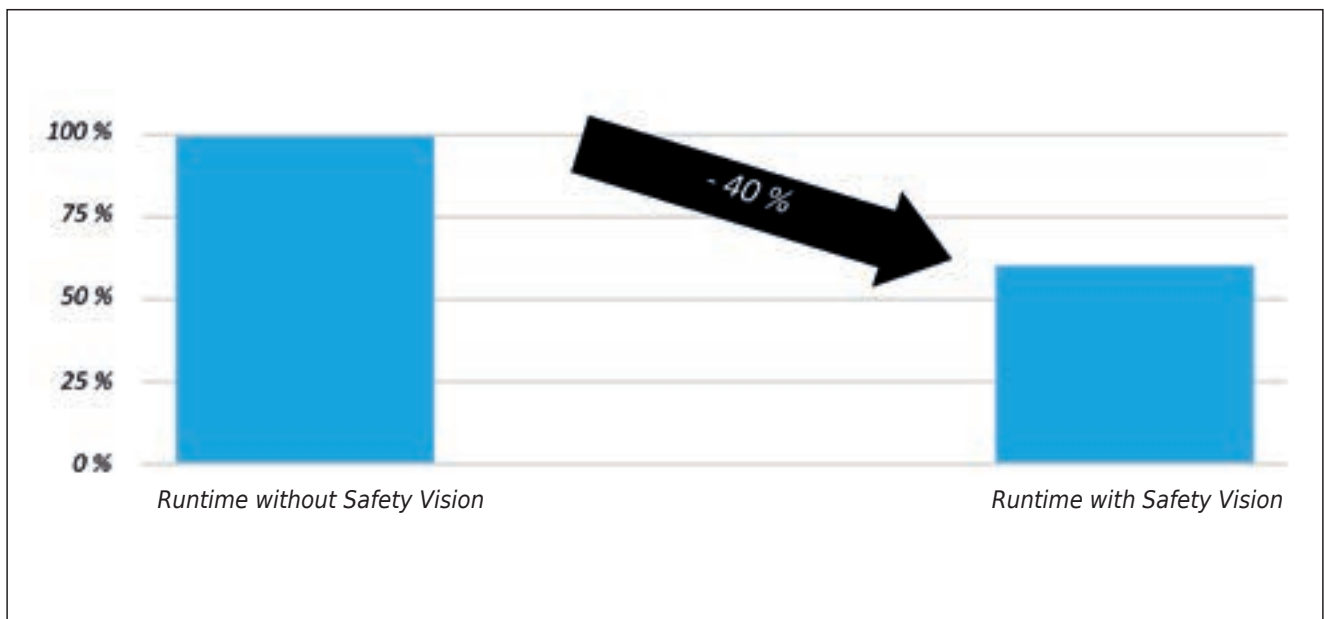


Figure 4: Potential for runtime reduction of downstream machines with the use of Safety Vision.

## Advantages and benefits of runtime optimisation

- ▶ Optimum utilisation of downstream HUBER machines
- ▶ Reduction of operating times of downstream HUBER machines by up to 40%
- ▶ Reduced operating costs
- ▶ Reduced wear
- ▶ Lower maintenance costs
- ▶ Longer machine service life

## QuickFacts Safety Vision

- ▶ Maximum machine availability and operational safety through protection of the screen and downstream machines
- ▶ Reduced wear and maintenance, increased machine lifetime and reduced costs by optimising the runtime of the downstream HUBER machines
- ▶ Optimum machine utilisation through adaptive operation based on event detection

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