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RM CASE STUDY // 001

CLIENT: DREDGE OPERATOR
APPLICATION: DREDGING
LOCATION: GLESSEN, NETHERLANDS

SOLUTION USED: 355MM (14")
REPLACED: NONE
TEMPERATURE: 18-21C (65-70F)

DESCRIPTION:

Partnership of dredging specialists based in the Netherlands. Having realised hundreds of dredging projects, the inherent problem of density measurement is something to which they had grown accustomed. Upon discovering the Red Meter, the dredge operators were eager to explore if the Red Meter could be their measurement and operations solution.



⊖ PROBLEM

Profit margins are being severely squeezed due to escalating energy costs, which cannibalize a greater proportion of the total expenditure of operating a dredge system. In order for projects to remain in the black, it has become even more important to keep the cost per unit mass of dredged solids to a minimum.

The slurry flowing in the dredge pipeline is, of necessity, primarily water (>60%.) However, pumping excess water can prove to be extremely costly and inefficient. The end goal is to minimize the amount of water and maximize the amount of solids passing through the pipeline as close to the optimum levels that can be practically maintained. The primary function of the dredge and its operator is to produce a slurry with the maximum practical density to flow continuously through the discharge pipeline at the target velocity.

Presently, the most common way for specific gravity of a dredging slurry to be estimated is by the human eye, often from several meters away. This instinct based estimation has historically been acceptable but is certainly not accurate enough to obtain realistic production figures. Modern dredging operators, require an accurate measurement of density with near real time latencies in order to run their dredge operations efficiently and profitably.

⊕ SOLUTION

Multiple measurements are taken as media passes through the flexible in-line cartridge of the Red Meter. The density is calculated using data recorded by the sensors and computed using our proprietary machine learning algorithms. The calculated readings are displayed and graphed on screen. This data can be output in real time as well as exported for archival and analysis.

This continuous measurement of density thus solves one of the ongoing problems of understanding, in real time, exactly what is happening within the slurry. Armed with this information, the operator can make immediate decisions in order to maintain consistent production.

The Red Meter is made to withstand highly abrasive slurries that are ubiquitous throughout all dredging applications, and also can adjust for the tilt and roll that occurs on working dredges.

By having an accurate density reading the need to conduct systematic hydrographic surveys becomes less necessary. Furthermore, dredge operators can avoid any proof of work or billing queries with our highly precise data reporting stored via logged and live data.

- **Increased Energy Cost**
- **Excess Water:**
- **Extremely Costly and Inefficient**
- **Inaccurate Data Gathering Leads to Unrealistic Production Figures**



- **Real-Time Exact Density**
- **Highly Accurate & Repeatable**
- **Measurements In-Line / Non-Invasive**
- **Adaptable On Working Dredges**
- **Avoid Proof of work queries**
- **Remove need for systematic hydrographic surveys**



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CONCLUSION

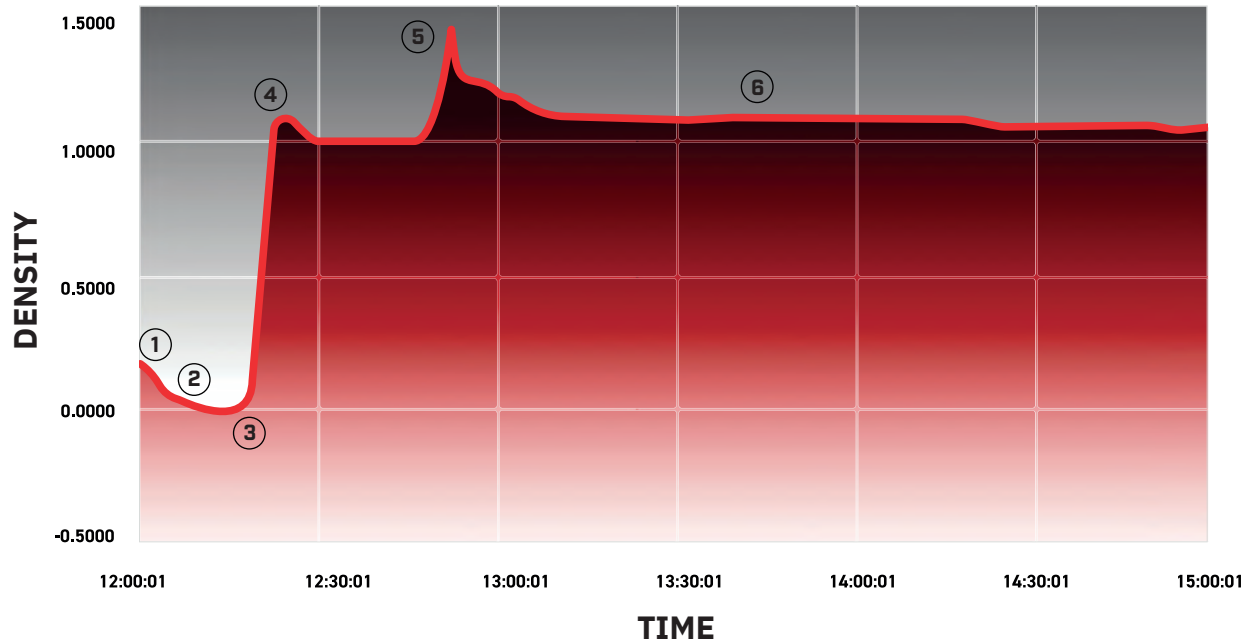
The Red Meter's ability to quantify the production amount has proven to be invaluable to the operation. This small change has given a significant amount of operational data to dredge operators. This data has multiple key benefits, the first being real-time visibility of operations, ensuring more efficient dredging to save energy and wear on equipment. The second benefit is the ability to review and analyze, with detailed accuracy, for billing and auditing. Perhaps the more valuable benefit, the Red Meter allows dredge operators to maneuver the dredge with a level of efficiency that was previously impossible. The data chart on the following page is a rendering of the dataset from this operation. The dredge operators are now able to visualize exactly what was happening during dredging operations and when.




 **40% INCREASED PRODUCTION**

DATA

DREDGING EFFICIENCY AVAILABILITY



The chart on the left shows a snapshot of the dredging operation which gives an indication of the level of efficiency available to the dredge operator. Numbers on the chart highlight important events.

-  **DENSITY READING**
- ① — **PUMP STARTED**
- ② — **DREDGE TRAVELS OUT TO BANK**
- ③ — **SLIGHT VACUUM AS SUCTION IS ENGAGED**
- ④ — **DREDGING BEGINS**
- ⑤ — **BANK COLLAPSES**
- ⑥ — **SUSTAINED OPERATION**

