Example Application

Land-forming Monitoring and Control

Requirement: Measure density profile in ship-based land-forming operations

Management at the interface of land with our oceans/seas has created the global industry of land-forming and remediation.

Well-known examples are found in the many Dubai islands and in The Netherlands; but land-forming actions are worldwide.

Typical operations use special ships able to remove/store sea bed material and precisely direct it to a target site.

The typical ship shown can pump 30,000 tonnes of material per hour from a spray tube having a diameter of about one metre.

For efficient and safe operation, continuous measurement of the density distribution of the mud/water slurry is critical. Too much water causes material to diffuse away from the target site. Too much mud overloads pumps and reduces projection range control.
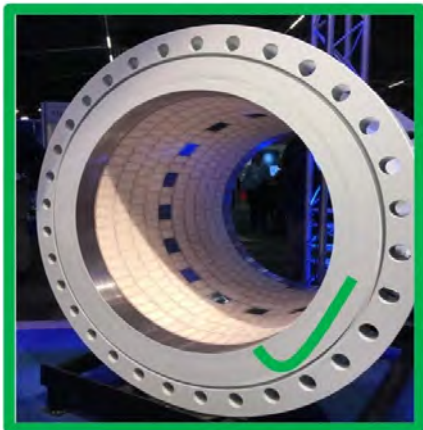
In the past gamma radiation density sensors were used. These have safety concerns, need regular replacement, and incur delays for certification when a ship moves between states.

Ships are being refitted with tomographic sensors.

The sensor unit is mounted in the slurry pumping pipeline as shown in this example.

This is connected to an *Industrial Tomography Systems* **P2+** Processing System which computes the cross-sectional instantaneous density distribution, and flow velocity estimation. Its enclosure is clearly visible alongside.

Control of the raw material flow is essential to provide optimal effectiveness and efficiency.

A display enables precise control of pumping and deposition. Sophisticated features provide detailed current performance and trend logging for all critical parameters.
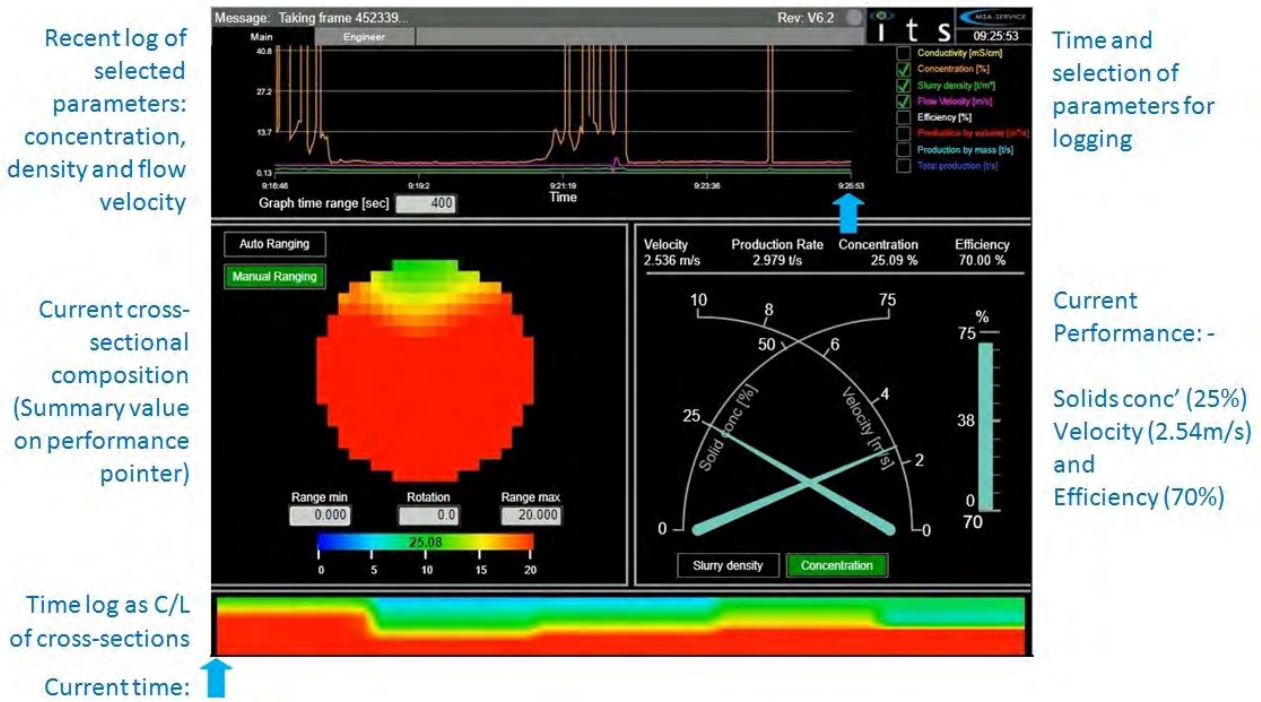
In conclusion..

Seeing inside this process..

 enables radioactive-source free safe and reliable monitoring and control,

 delivers consistent information on performance,

 provides optimum efficiency minimising fuel consumption and emissions.