

### SANDtrac<sup>™</sup> Velocity Profile Service

CiDRA's clamp-on SONARtrac<sup>®</sup> flow technology has been extended to measure and characterize the rheology or state change of a hydrotransport or coarse tailing slurry. SONAR algorithms and multiple sonar-arrays located at different circumferential positions on a single sensor band provides a direct measurement and characterization of the slurry velocity profile, thus enabling operators to measure and visualize when a sand bed is developing in a slurry pipeline. This information can be leveraged to provide value-driven solutions in a variety of areas.

#### Stationary Sand Bed Detection

For years, oil sands operators have been utilizing data acquired from existing instrumentation and equipment such as flow indication, pressure, pump amps and density. There are also models employed that take into consideration such inputs as ore and slurry data. In spite of all this, sand-outs still occur, costing an operator sometimes millions of dollars in lost production and clean-up costs. *Why do these traditional indicators not always predict or prevent all sanding events?* One explanation is that process conditions and ore properties are always changing. There is no way to measure changing ore conditions and properties on a real-time basis. Measurements provided by traditional instrumentation and modeling require some interpretation by the operator and with some of these instruments, the data reported will actually lag the formation of a sand bed. As a result, a sand-out can occur before an operator can take preventative action costing millions of dollars in downtime, lost production and clean-up costs.

#### Intervention Mitigation

Based on the interpretation of data provided by several conventional instruments, an experienced operator can sometimes intervene to avoid a pipe sand-out condition. Depending when the high degree of stratification or sanding event is noticed, the intervention can last hours. Typically, when an operator detects a potential sand-out condition, the procedure is to increase the flow velocity and increase the amount of water of the slurry mixture. Depending on ore grade, d50 and a variety of other factors, the interventions can last minutes or many hours. Even if/when a pipe sand-out is prevented, the operation usually sustains negative consequences, regardless of the intervention. In a hydrotransport conditioning slurry line, for example, more water added to the slurry mixture means less bitumen recovery in the PSC. In both hydrotransport and slurry lines, increased water usage translates into higher energy requirements. By leveraging the velocity profile information provided by the SANDtrac velocity profile technology, the operator can mitigate the number of interventions by receiving advanced warning of a high degree of stratification and/or the formation of a stationary sand bed.

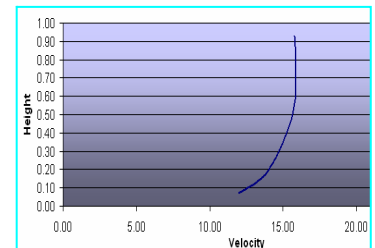
#### Water Flushes

Depending on a number of process variables, there are times when a stationary, or standing, sand bed remains in the pipe after a water flush. When the process is brought back up, together with a variety of other factors, this sand bed can exacerbate conditions which can lead to an intervention or a sand-out event. The information provided by a SANDtrac velocity profile system can indicate when a stationary sand bed remains, after a pipeline water flush. Conversely during a flush, the SANDtrac velocity profile system can also provide an indication that a stationary sand bed no longer is present, thereby minimizing unnecessary water and energy usage.



#### SANDtrac Velocity Profile

- Sand Bed detection warning provided to DCS through 4-20mA output
- Option for Velocity Profile delivered to desktop via ethernet or modbus connection
- Low upfront equipment fee with monthly subscription payments
- Multipoint plans available



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