CPT Potash Recovery System (PRS)

Potash recovery is a unique and demanding flotation application – flotation must take place in a brine solution and very coarse particles must be recovered.

Effects of Brine Flotation

Flotation requires generation of a large quantity of very small bubbles. In a brine environment, localized gas expansion and evaporative cooling results in formation of potash crystals that interfere with the bubble generation equipment. The CPT **SlamJet®** overcomes this problem by using a very high air jet velocity that inhibits local crystallization.

The high salt concentrations in brine flotation cause accelerated corrosion of metal parts. Wetted parts of the CPT **SlamJet®** are fabricated of 2205 Stainless Steel which is highly resistant to corrosion.

Recovery of Coarse Particles

The requirement to recover very coarse (+500 µm) particles imposes special constraints on flotation. First, there must be a good mix of bubbles sizes, from very small (to recover the fines) to rather large (to recover the coarse material). The CPT **SlamJet®** can be easily adjusted to provide the correct bubble size distribution for this application.

Second, once a coarse particle has successfully adhered to a bubble, it is necessary to avoid high turbulence that can cause the particle to disengage from the bubble. Lost particles must then be recovered all over again. Mechanical flotation requires high intensity agitation to generate air bubbles and is therefore highly turbulent. Recovery in a single machine is typically low, and many mechanical flotation machines in sequence are often required in order to achieve acceptable recovery.

The CPT **Potash Recovery System**, on the other hand, provides a very low energy, non-turbulent environment that efficiently promotes particle/bubble contact and adhesion, and also allows the particle/bubble aggregates to safely make the journey to the froth zone for recovery.

When a loaded bubble reaches the top of the flotation machine, there is another problem – the bubble must travel laterally to find a launder in order to be recovered. The CPT **Potash Recovery System** utilizes multiple circular internal launders to significantly reduce the travel distance for a loaded bubble, thus enhancing coarse particle recovery even further.

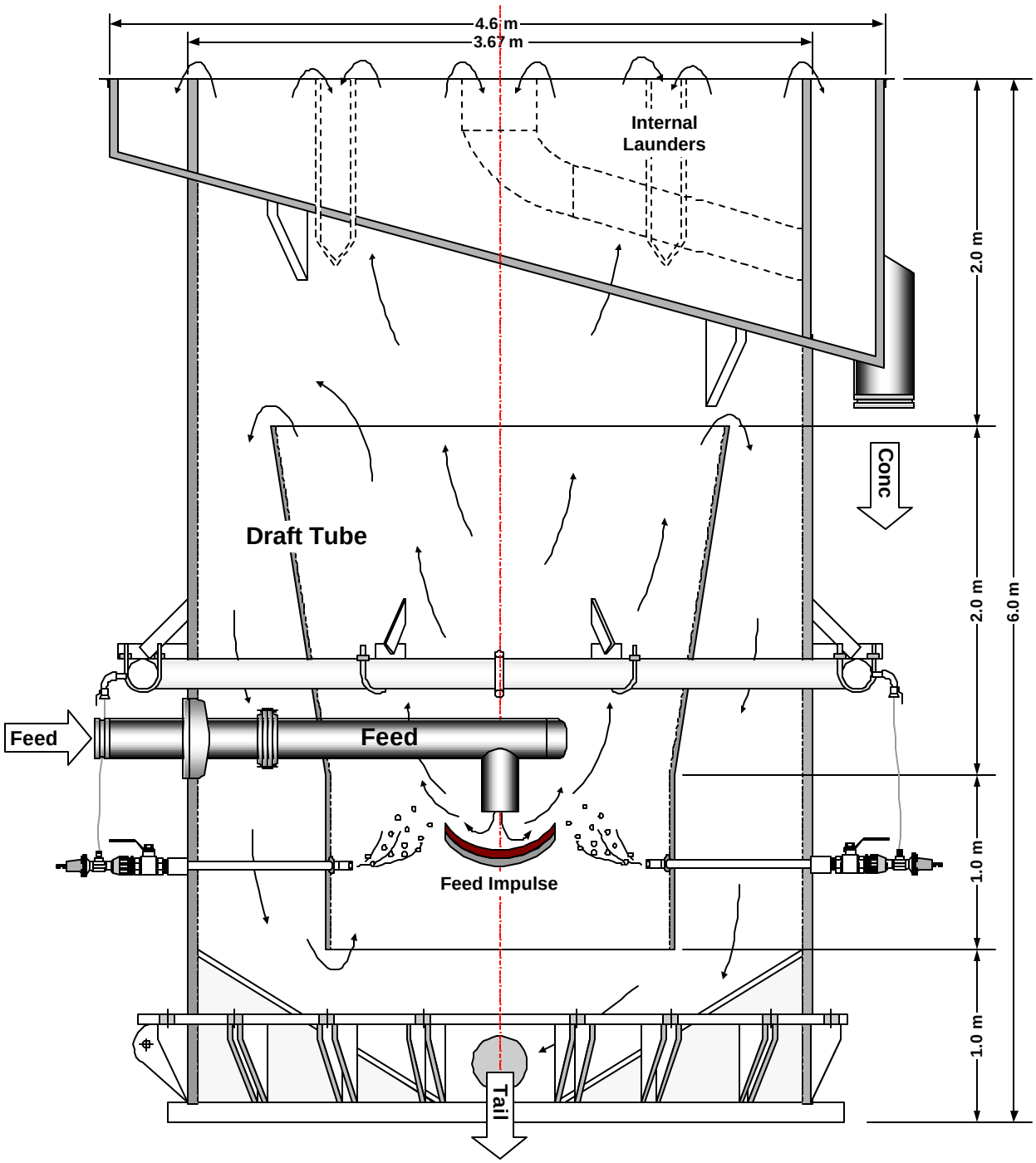
Conventional Columns versus CPT Potash Recovery System

A flotation bubble that is loaded with coarse potash particles is heavy and rises slowly. In conventional columns there is a net downward movement of the slurry – from the feed point down to the underflow discharge – and the loaded bubbles must rise against this flow. This leads to low recovery.

In the CPT **Potash Recovery System**, the feed is injected closer to the bottom of the cell and the design of the feed distribution system imparts an upward impulse to the slurry flow. Loaded bubbles and slurry are therefore both moving upwards, and recovery is enhanced.

The CPT **Potash Recovery System** also incorporates a unique internal recirculation draft tube with air injection at the bottom of the draft tube. This arrangement serves to contain and direct the slurry and loaded bubble mixture in the upward direction to enhance recovery. The upper portion of the draft tube is flared out to a larger diameter, allowing the slurry and loaded bubbles to slow down in a controlled manner prior to engaging the froth layer. At the top of the tube, any particles that are weakly adhered to bubbles and would have difficulty lasting all the way to the launder are allowed to recirculate down the outside of the draft tube where they are re-introduced into the collection zone by natural circulation. This internal recirculation works like a scavenger to further enhance potash recovery.

The features of the CPT **Potash Recovery System** are illustrated in the attached diagram, which shows the multiple internal launders, the positive impulse feed distribution assembly, the **SlamJet®** gas sparging system and the internal recirculation draft tube. Small arrows indicate slurry flow vectors.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