

FOR Pulp and Paper

Intelligent Process Monitor

FALCONEER Technologies, LLC

- ❑ Patented Method of Minimal Evidence methodology dramatically simplifies configuration.
- ❑ OPC-based option uses existing DCS and PLC system information.
- ❑ SPC used to identify effectiveness of tuning and degree of system control.

Benefits

- ❑ Real-time validation of measurements.
- ❑ Direct impact on process reliability and uniformity to reduce waste and downtime.
- ❑ “Measure” process parameters without adding sensors.
- ❑ Avert Sheet breaks.
- ❑ Accommodate Stock Changes.
- ❑ Alert the operator in real-time by sending results back to the DCS or PLC.

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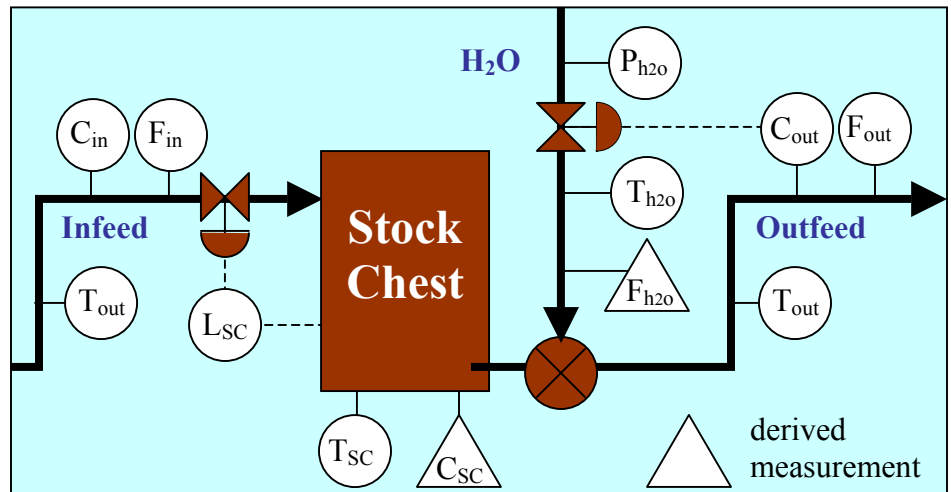
A well-instrumented paper machine provides abundant measurements about the paper making process, but while the controller operates the machine within normal process ranges it may be going out of control...

- Uncontrolled variables impact sensor readings
- Sensors can be fouled, drifting, stuck, damaged or miscalibrated
- Valves may be sticking or poorly tuned

Process models used in engineering the system can monitor these measurements to let you know whether or not it is under control.

A Consistency Monitor Example

Consistency monitor equipment is an important measurement in the paper process to insure uniformity, quality and process stability. In addition to fouling and drifting, consistency sensors are sensitive to routine process variations such as stock velocity and changes to furnish.



The Solution is to monitor the Stock Chest Process as a whole

By developing just four process equations for Mass Balance, Energy Balance, and Consistency Balance...

$$\begin{aligned}0 &= F_{in} + F_{h2o} - F_{out} - d(L_{SC})/dt \\0 &= (F_{in} \times T_{in}) + (F_{h2o} \times T_{h2o}) - (F_{out} \times T_{out}) - (d(L_{SC})/dt \times T_{SC}) \\0 &= (F_{out} - F_{h2o}) \times T_{SC} + (F_{h2o} \times T_{h2o}) - (F_{out} \times T_{out}) \\0 &= (C_{in} \times F_{in}) - (C_{out} \times F_{out}) - (L_{SC} \times d(C_{SC})/dt) - (C_{SC} \times d(L_{SC})/dt)\end{aligned}$$

...Our approach automatically generates fifteen additional models that completely verify all existing measurements, calculate an unmeasured Stock Chest consistency, and intelligently compensate the consistency readings.