

Logic for PM web breaks.



Hydraulic reduction valves

**OEHLANDT ENERGY OY**

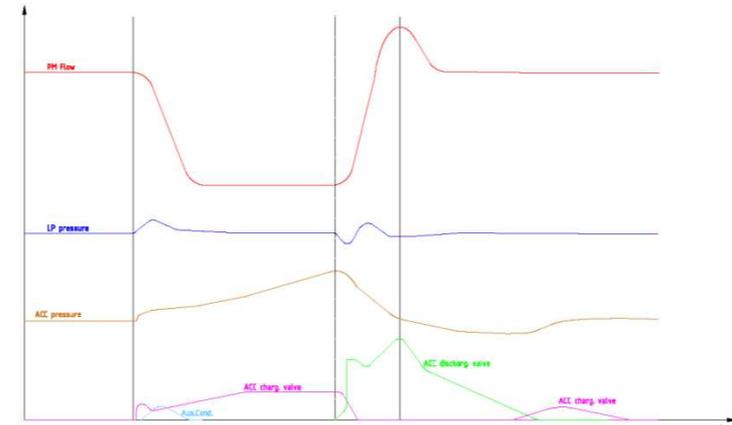
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**OEHLANDT ENERGY OY**

**Steam Balance Control**



An optimised system -



gives time for hobbies and saves the nature.  
(Hiking on Kebnekaise)

**What means Steam Balance Control?**

Steam balance control is a control structure that is taking care of the difference between steam production and consumption. The purpose is to keep the steam pressures stable on different steam headers and not to cause stress for the equipment. The control structure connects together the boilers, the turbines the reduction stations the consumers and the auxiliary components as e.g. steam accumulator's, auxiliary condensers and venting valves.

**Why is a Steam Balance Control needed?**

The consumption changes are faster than the production components are able to handle in an efficient way.

**Why is a Modern Steam Balance Control System needed?**

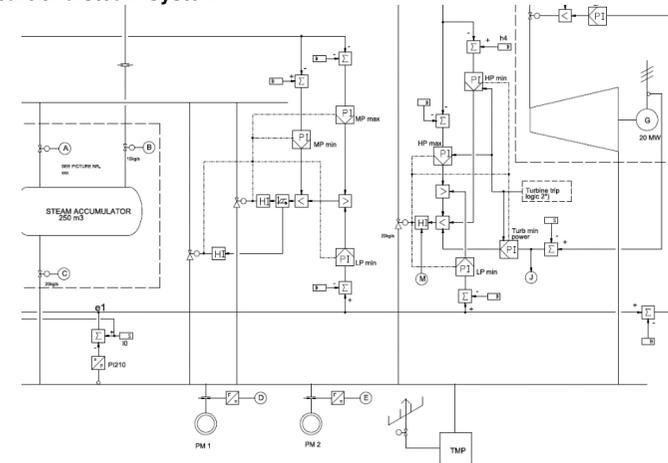
- The factory requirements for the steam quality have increased. E.g. web speed has increased and paper quality requirements are higher.
- The high energy prices of today don't allow wasting of energy.
- The operation reliability requirement of the mills has grown. Uncalculated stops are not accepted anymore.

Earlier with stand-alone-controllers, it was difficult to accomplish a Steam Balance Control System. Nowadays, with modern automation systems, experts have tools to create an optimal Steam Balance Control System.

An optimised steam system.



A part of a steam system



**An old Steam Balance Control System (SBCS).**

An old SBCS is usually built only with a few closed loop control loops and is wasting energy. The loops are not connected together to work as a system. Normally also every closed control loop has its own pressure measurement. The control is done by producing additional energy that in the worst case is blown out to the sky or it is put in to the auxiliary condenser. The additional steam can also be let to a condensing turbine. This is normally not wise, as this steam is often produced with high value fuel as e.g. oil. The disadvantages of an old SBCS are high energy losses and big variations in the steam header pressures. Those are disturbing the whole production of the mill.

**A modern Steam Balance Control System (SBCS).**

A modern SBCS consists of several closed loop controls, which are connected as a system together. The operating (adjusting) of the demand pressures and the operating mode is set in a central recipe picture. In a modern SBCS it is possible to move from one operation mode to another without any operations of the operator. E.g. in case of a web break of the paper machine the turbine can automatically change from outlet pressure control mode to inlet pressure control mode. The aim of a modern SBCS is also to work energy efficiently optimally for not to waste expensive fuel. Because of the centralized optimal controls also the pressure variations are smaller. This allows e.g. to put a lower set point on the low pressure steam header. That is increasing the turbine's electric power generation.