

Advanced Monitoring System (AMS) for process control

by Pedro Avram, Dr. Boris Morgenroth, Stefan Pfau and Björn Köllmann



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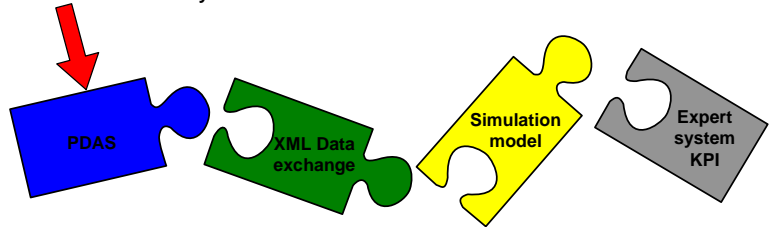


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AMS - Objectives

- AMS is a software tool processing data of the Process Data Acquisition System (PDAS) & laboratory system => complementary link between condition and performance monitoring.
- AMS based on standard, industry accepted and proven software: Sugars™: Process modelling software; Visio®: Process visualization software
- AMS is an integrated on-line mass- energy and colour balance of the process based on the Sugars™ program.
- Approx. 100-150 input variables are necessary compared to up to 3.000 values recorded by the processing system and in the laboratory to model the process.

Process Control System (PCS)
& laboratory data



AMS - Targets

Consistent mass- energy and colour balance of the process => transparent factory.

Equipment performance is directly shown.

AMS based on processing modules – avoids mathematical (connection)-errors.

System is fully open and programmable – limited manufacturer reliance.

Easy handling & training for „non-graduates“ e.g., control terminal staff.

Quick and easy adaptation of the factory model in case of changes in the process scheme.

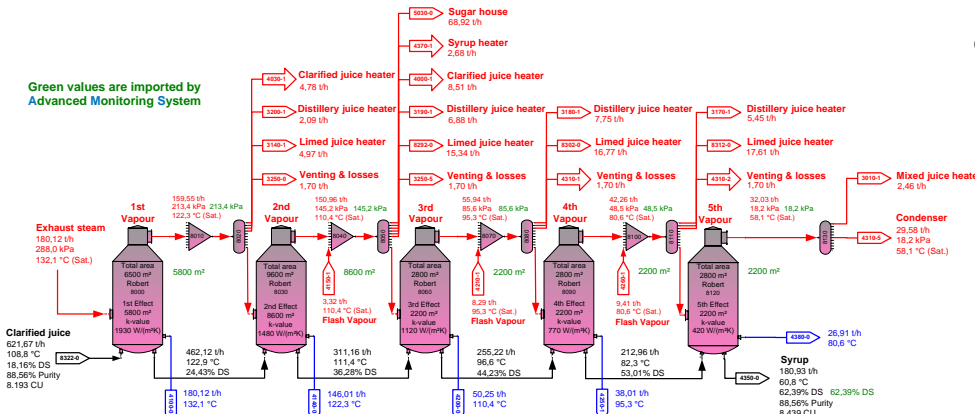


Figure 2: Simulation model of an evaporation station

AMS - Summary

- Basis for future expert systems
- Sugars™/AMS offers an excellent process overview
- Reconciliation of process values versus the Sugars™/AMS calculation
- Reduction of process automation and control equipment
- Maintenance and personnel cost reduction

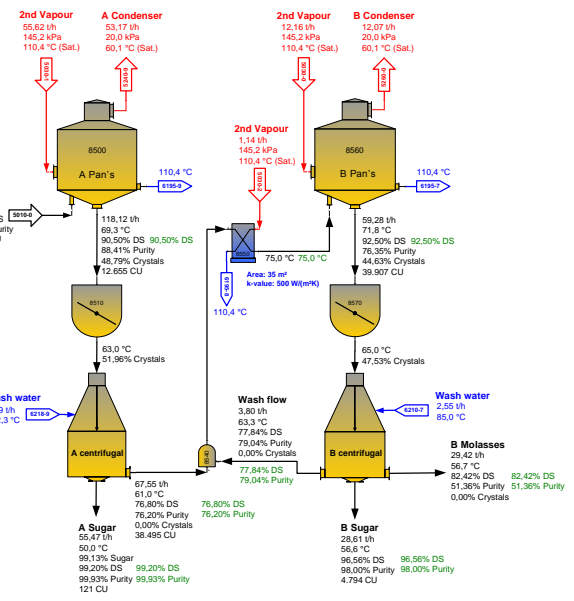


Figure 1: Sugar house simulation model

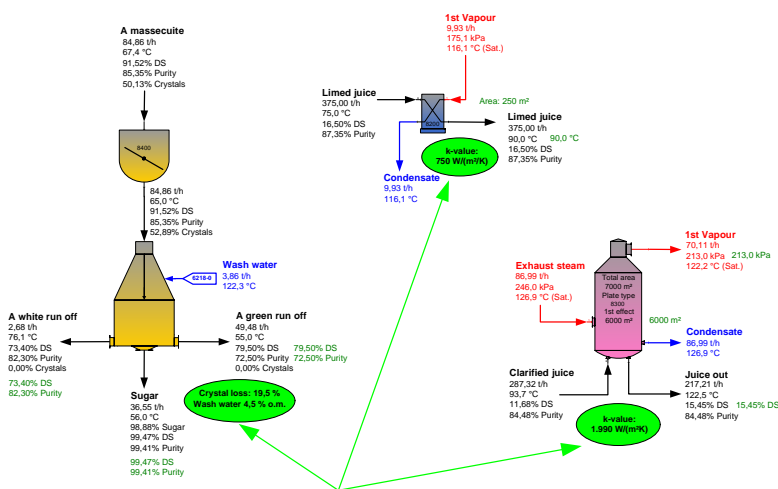


Figure 3: Key Performance Indexes (KPI) of chosen equipment



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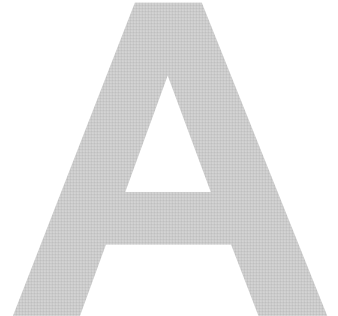


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Key benefits of Sugars™ and AMS

- ☛ Simple and clear visualisation of the process.
- ☛ All important physical medium properties are already included.
- ☛ Process is simulated on the basis of individual station models.
- ☛ Mathematical connection errors can not occur in comparison to Excel spreadsheets.
- ☛ Time to create and to modify a balance of a factory is much shorter than with other tools.
- ☛ The process connections can easily be rearranged on the screen.
- ☛ A colour balance can be included and the product quality can be determined.
- ☛ "On line" comparison between measured values and calculated values.
- ☛ Determination of bottlenecks in the factory.
- ☛ Modelling and simulation allow rapid evaluation of each alternative to arrive at process and/or equipment changes that can reduce the energy consumption of a factory.
- ☛ Research and Development (R&D) projects can be modelled and simulated before funds are committed.
- ☛ Sugar yield can be increased by process and/or equipment changes.



AMS - References

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