ELIPSE PLANT MANAGER INTEGRATED TO AN ADVANCED CONTROL APPLICATION AT KLABIN, THE BRAZILIAN PAPER AND CELLULOSE MANUFACTURER

Elipse Software's solution is employed as the basic infrastructure for implementing an Advanced Control application with TriNMPC, Trisolutions's non-linear, multivariable controller, at Klabin's Monte Alegre Industrial Unit

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Needs

Klabin is Brazil's largest paper producer and exporter, and stands out as the leading manufacturer of paper and board for packaging, corrugated board packaging, and industrial bags, in addition to marketing timber in logs. It is also the only Brazilian company to simultaneously supply hardwood pulp (eucalyptus), softwood pulp (pine), and fluff pulp to the market. Established in Brazil in 1899, it has 18 industrial units (17 in Brazil and one in Argentina), sales offices in eight Brazilian states, and a branch office in the USA, as well as sales representatives and agents in many countries.

One of these units is the Monte Alegre Unit, in Telêmaco Barbosa, state of Paraná in South of Brazil. The company has implemented an Advanced Control system in this unit to optimize its operational efficiency and reduce variability of its key performance indicators. With this action, Klabin has assured that the maintenance of the process will be able to meet its due specifications.

Solution

The Advanced Control solution application has integrated several systems and fulfilled several steps in order to ensure the final solution operates according to the specifications. Among the systems employed in this solution, we highlight Elipse Plant Manager (EPM) and TriNMPC.

Developed by Elipse Software, the EPM is the application's information management system. The platform is responsible for acquiring, storing, and supplying the process's data, and is instrumental for setting up and providing the models to be used by the controller as well as for following up results and quantifying the benefits of the installation.
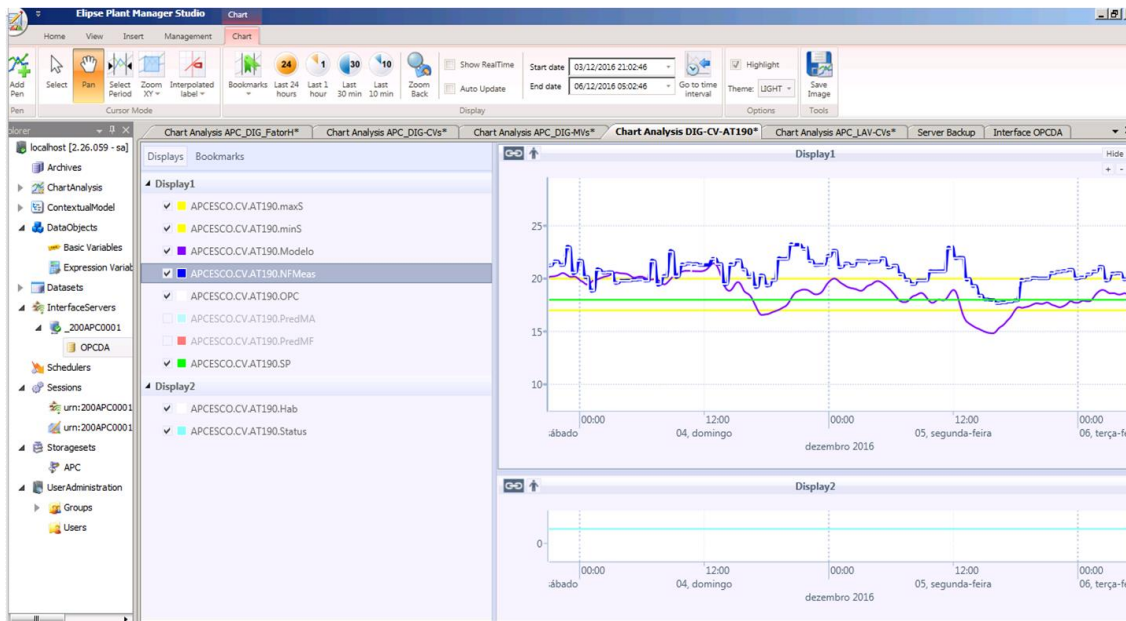
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Figure 1. EPM Studio's Chart Analysis screen verifies process data against their restriction

The TriNMPC, controller developed by Trisolutions, is able to operate both with linear models, such as the traditional MPC controllers, and with non-linear models. This ensures the highest spectrum of applications possible, thus generating better results.
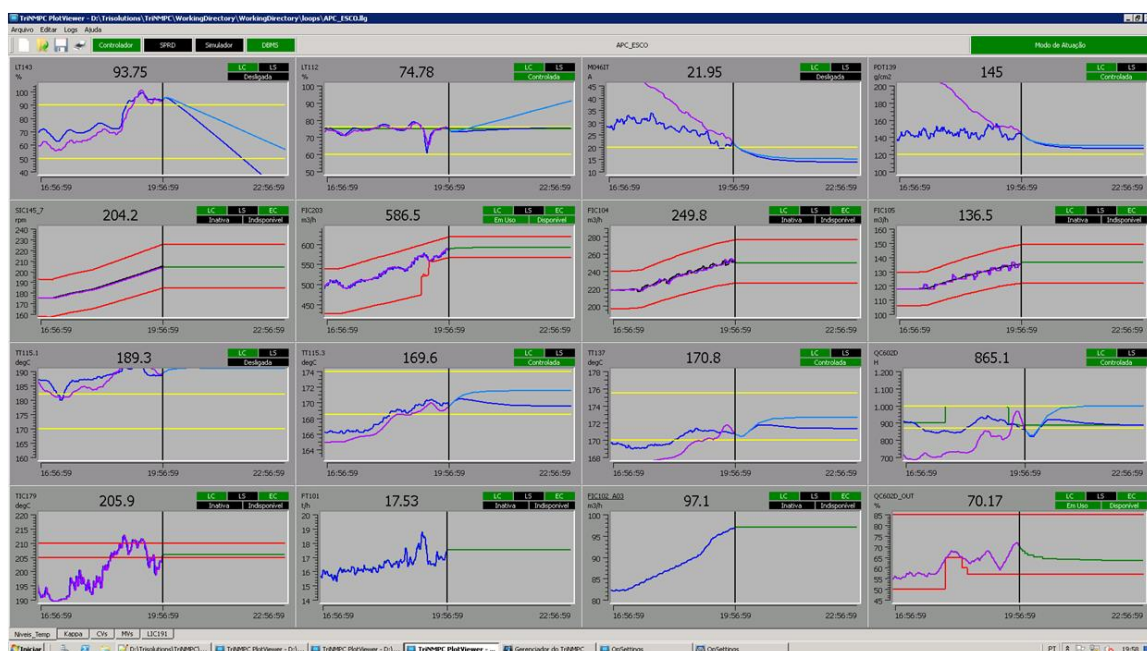

Figure 2. PlotViewer screen follows the operation at TriNMPC controller

The implementation of the Advanced Control solution has covered the following steps:

- Designing the solution's conceptual project;

- Analyzing and improving the process's basic control;

- Identifying the process's model and its phenomenological modelling;

- Setting up the system;

- Commissioning and starting up the controller;

- Assisting the operation and training panel operators;

- Evaluating its performance and profitability.

In this system, the TriNMPC controller is the responsible for accessing the process data via OPC server, and is managed from operational screens created directly at the SDCD. The EPM, on the other hand, is the responsible for providing data for tuning the PID control loops, identifying the process model to be used by the controller, monitoring the application's performance, providing the assisted operations, and quantifying the gains from the Advanced Control application.
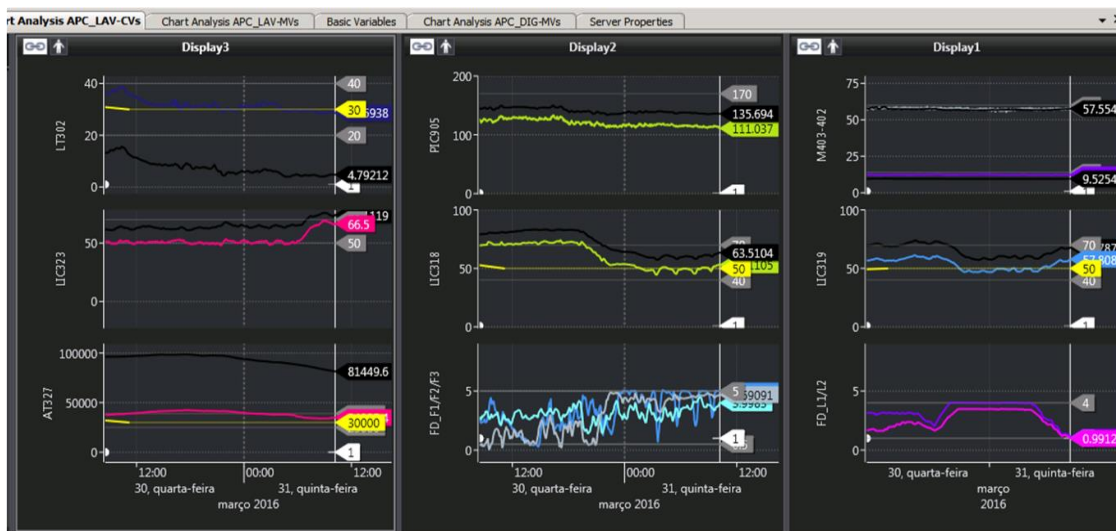

Figure 3. EPM Studio's Chart Analysis screen following the process in real time

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Benefits

- Reduced standard deviation of kappa (key property in cellulose), which allows changing the process's operational point;

- Reduced standard deviation and average of pulp conductivity. This stability involves less input consumption during washing;

- Greater washing system stability from controlling filter levels ranges and improving filters' performance via dilution factors control;

- Reduced number of interventions in the process due to a more stable system operation.

DATASHEET

Client: Klabin SA - Monte Alegre Unit

System Integrator: Trisolutions Engineering Solutions

Elipse package used: Elipse Plant Manager

Number of copies: 1

Platform: Windows Server

Number of I/O points: 1000