



UNIVERSITAT ROVIRA I VIRGILI



MONITORING OF THE CONTROL LOOPS IN THE PAPER MACHINE

Master Thesis presented by Jose Manuel Monge Soldevilla to
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Company supervisor: Anna Navarro Alabart

URV Tutor: Josep Bonet

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SUMMARY

In this project there has been carried out the monitoring of the control loops of the Paper Machine 5 at Essity, Puigpelat. This monitor consists in several improvements in existing tools: Proficy, Proficy Historian and DCS systems. Doing this, it will not only be easier to know when a control loop has changed its behaviour, but to know which needs to be further studied. Furthermore, a crucial aspect to validate the results of the tune of the control loop is to reduce the variability obtained on the paper, by optimizing the process' control loops. The principal part of the project has been the tuning of a tank level control loop following the literature of ABB, the principal supplier of Essity related to automation. The results of this tune have been completely positive, decreasing the variability of the principal KPI fixed before the tune, such as the overshoot of the response, consistency of the line or time to reach the level desired among others. The priority of the tune has been to keep working the refiner of the LF line when doing both rising and decreasing the tank level more than a 1% step size, that it was the maximum with the old PID. With the new PI proposed, this step size has been increased to 5%, saving a considered amount of time to the operators, so they can focus on other important tasks of the machine. Furthermore, a safety analysis of several incidents in the company have been carried out, with the conclusion of a new DCS screen that has make safer the process environment. Moreover, a new window in Proficy which monitor all control loop parameters such as integrative time, process gain and so on, has been created, in order to check the health of the control loops and to keep them under control.

Finally, an introduction of a paper machine has been explained to make clearer the understanding of the parts of the machine and the influence of the KPI to the reel, as well as an explanation of the next steps to be followed in order to continue with the optimization of the control loops and its health check in both short- and long-term period.