ABB's Paper Machine Drive solution enables improved productivity by means of enhanced datalogging, maintenance tools and expert services – at site or remotely

Drive parameter tools, data historian tools or other informative tools, together with the drive control, work as a logical entity, allowing the production personnel to search relevant information and assist the experts by means of well established sets of details.

In the PMC800 systems this combination is three-fold: operators' views of the drive status, electricians' view to the detailed drive status and history events, and ultimately the drives experts' broad experience combined with the customers' own expertise in analyzing the situation.

Operators' information

ABB's Operator Station includes an informative set of different system status displays. Similar information can be showed on the control panels in operators' desks. This includes basic information of motor and drive: load, draw, operating status, control mode and alarms. Master display of a drive point gives information about interlockings, set points and actual values. Tension displays show tension values, differences, limits and status. However, the operator needs support and assurance for the equipment not to fail under his supervision.

Correctly focused maintenance actions will save money, save machinery from idling during production, and avoid costly over-servicing.

Analyzing the System data

A lot of system data is usually measured and available for investigation, for example for a paper machine drive system. The data is most useful, when not analyzed in overwhelming amounts. When the taken measurements are designed for an appropriate time window, measured with correct accuracy and filtered for likely phenomena in the different parts of the equipment, they will provide the best results. This requires lots of process and drive knowledge. However, the reward is that predictive conclusions are faster to make, and root causes of disturbances can be narrowed down more easily without unexpected downtimes.

Typical reports could be the following:

"…at the beginning and end of the acc/dec tension varies less than +/-30 N/m and during constant acceleration less than +/-15 N/m. Tension levels are stable when machine speed is constant. During the splice Unwind tension varies about +/-50 N/m. To improve existing situation, see..."

Today in modern Paper Machine Drive installations FFT analyses are made automatically by means of the PMC800 Datalogger connected to each drive directly. Torsional disturbances originating from the process or equipment, and causing additional stress to shafts, couplings, gears, etc. can be detected. This allows timely maintenance and process controls tuning before actual quality or production losses happen.

The PMC800 Datalogger enables the user to specify history lengths, which typically are 30 days. The PMC800 Datalogger supports statistical calculations for the collected values and mathematically created variables. The values are collected as often as they are updated in the drive communication link between the drive and the application controller, typically 10-100ms. This ensures enough data to detect the undesired process phenomena, which can be corrected by means of the drive system controls.

In aging machinery, there are more possible interference sources. Effective filtering measurements with event triggered analysis may have even greater impact in improving quality and availability of the production.

Expert support – remotely and smoothly

"…Mechanical brake opening and closing delays varies according to the conditions in pneumatic/hydraulic system. This is normal and it seems that above mentioned delays need to be checked to decrease start-up breaks..."

When the drive control is well designed for different process variations, the equipment behaves expectedly and the drive system filters minor issues most of the time.

Typically, remote service is used to assist mills in solving problems with software modifications and enhancements by tuning the drive system. Besides fast trouble shooting, who would not like to be assured by the Drive expert, from time to time, that fine tuning was just done and operation can continue smoothly.

"…For better function of the calender, it was decided to compensate frictions of top and bottom rolls separately. New friction compensation was added and measured values were calculated to the program…"

ABB's Paper Machine Drive delivery for Hamburger Hungaria kft. PM7 project at Dunaujvaros consists of Paper Machine and Winder Sectional drives with 59 ACS800 Multidrive inverters and motors, and Process drives of 93 ACS800 Multidrive inverters and 204 motors. Altogether PM7 has 184 invertes for the process motors.

The Paper Machine and Winder drive systems have also PMC800 Dataloggers, 800xA Process Portal Operator Stations , Process Panel 800 control panels, and remote connectivity to the drive systems.

The turnkey delivery includes drive cabinet installation, training and start-up.

The PMC800 solution is built on a common ABB platform. The essence is integration between ABB's drive control, tools and experience.

Power and productivity for a better world™