

# Paper Slitter-Rewinder Edge Control Retrofit

A relocated paper web processing machine requires previously unused edge position control sub-system redesign and deployment to production. This series covers system evaluation, control scheme prototyping, and production form factor system completion to production go-live.

## Design Task

A paper slitter-rewinder purchased from one factory and relocated to another arrived at the new site with a set of sensors and partial PLC code for the purpose of web-edge position control. Often in paper web handling output edge uniformity on the finished roll is guaranteed by an “edge trim” that presents a clean and uniform edge on the side face of the output roll as shown below.



Some applications do not permit an edge trim and must regulate the input roll lateral position to maintain a degree of uniformity on the output roll face. For example, when slitting one roll into two with a single cutter in the middle with no cutters trimming a small waste strip on each side.

With no edge trim the open-loop performance of the machine will drift the edge slightly as load conditions change with increasing mass on the output roll relative to the depleting input roll. Feeding-back edge position to an input rack hydraulic servo drive compensates for this open-loop drift.

## **Performance Target and Project Approach**

The goal is to achieve the best-possible output edge control given existing components if possible. Tens-of-thousands of an inch uniformity over the output roll face based on visual assessment of rolls from other machines deemed satisfactory from operator experience.

- Project Approach
  - Enable resident control scheme and tune/modify. If not sufficient,
  - Characterize the plant.
  - Redesign control scheme within existing PLC or,
  - Design new edge control sub-system atop existing sensors and drives.

The last option became the solution following characterization and a decision to not deal with equipment and legacy expertise challenges associated with using the resident PLC.

## **Next: System Configuration**