



European Power Quality Survey

PULP AND PAPER INDUSTRY

PULP AND PAPER MANUFACTURERS SUFFER SIGNIFICANT LOSSES

Today's Pulp and Paper industry, faced by operating and energy cost increases, seek production optimization and stability. Unreliable power supplies are a major barrier to achieving this goal and create significant additional unplanned maintenance costs. The European Copper Institute (ECI) Power Quality Survey has identified that pulp and paper companies lose up to 11 per cent of their turnover as a result of poor Power Quality.

ELECTRIC POWER SYSTEMS STILL FAR FROM IMMUNE

The industry's continuously improving manufacturing lines, however new and sophisticated, are often still dependent on older, unchanged power supply systems. Consequently, **those new lines are not as immune to voltage dips and electric power interruptions as you would expect.** The industry's resulting losses can be equal to its annual electricity bill.

Power interruptions create significant losses

Short interruptions to power supply can stop a production line. The immediate consequences are:

- ▶ **Equipment damage.** From basic less expensive components such as protective devices, to larger more costly equipment such as ovens. Even with the low cost items, the costs quickly mount up when the interruption frequency is high.
- ▶ **Wasted Work In Progress** and raw material
- ▶ **Wasted man-hours** between stoppage and re-start
- ▶ **Extensive maintenance efforts** to clean the system of partially processed production

This wastage in its turn often triggers a whole range of **penalties**, from environmental, to utility, to client contract and personnel claims. Last but not least, unexpected stoppages can play havoc with production planning, resulting in **delivery delays**, loss of reputation for reliability, and consequently loss of business.

The losses caused by poor electric supply **tend not to be assessed as a totality** relating as they do to different cost centres and occurring at different moments in time.





This industry's poor Power Quality losses are equal to its annual electricity bill.

Individual pulp and paper factories lose up to 11 per cent of their turnover due to poor Power Quality

Understanding the problems – designing the solutions

ECI's PQ Survey demonstrates that the majority of the Power Quality problems faced by the pulp and paper industry result from the end users' own electrical installations' inadequate design. The solutions therefore lie very much in the industry's own hands.

Electrical design engineers involved in this survey recommend a holistic approach to review all the issues at hand, based on three operational pillars:

- **Correct measurement**, to assess the full impact of power quality events, and why they are happening.
- **Appropriate design** for the electric installations, ensuring reliability and resilience.
- **Considered investment** justified by assessing system renovation cost set against the accumulated losses.

VOLTAGE INTERRUPTIONS AND EARTHING PROBLEMS

The engineering workshop manager of a medium-sized pulp factory recorded each power interruption event that had taken place in the past five years. Each time a power degradation was experienced, one or more of the lines were shut down. This resulted in raw material wastage, personnel downtime, and destroyed production line equipment. The cost of this was around €40,000 euro per year.

Voltage interruptions were however not the only Power Quality problems to this company. A recent failure in the earthing system was costing the company a further €300,000. In this way the total cost of poor Power Quality rose to over 5 per cent of this sites' annual turnover or over 1.5 per cent of the group's national annual profit.

LOSING A CONSOLIDATED AMOUNT UP TO 11 PER CENT OF TURNOVER

A large paper mill's annual wastage due to poor Power Quality rose to 11 per cent of that company's turnover.

As the factory was not running at 100 per cent of its capacity, lost production due to poor Power Quality was thought to be recoverable during the annual slack. But that did not reckon with the extra maintenance department costs. Each voltage dip or power interruption unbalanced the system and caused overheating leading to premature equipment failure. Moreover, by the year end, not all lost production could be made up at other times of the year.

The resulting consolidated loss was "hidden" as its constituent parts were never evaluated together.

INEXPENSIVE COMPONENTS CAUSE LARGE FINANCIAL LOSSES

At a large multi-national end-product paper manufacturer, individually inexpensive components were causing a disproportionate amount of wastage. The components could not cope with dips and interruptions in the power supply resulting in production line stoppages. These caused in their turn lost revenue, staff downtime, extra maintenance costs and damaged equipment. As a consequence - the multi-national was losing over 8 per cent of their annual profit.

PROFITABLE INVESTMENT OPPORTUNITIES

The pulp and paper sector suffers unnecessary financial losses caused by their own electrical power systems that often cannot cope with a variable electric power supply. ECI's Survey has identified significant losses and wastage due to poor PQ throughout the industry's different process centres. It has demonstrated that PQ solutions often cost less than the financial losses they resolve.

Current investment into power quality solutions in this sector is under 2 per cent of turnover, or 30 per cent of the losses and wastage experienced annually.

Do you know what PQ is costing your organization?

Your engineering management can contact us at <http://contact.leonardo-energy.org> to find out how the issues raised here may be affecting your company.