MECHANICAL OVERLOAD IN SUGAR MILLS, ITS CONSEQUENCES AND AVAILABLE SOLUTIONS

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A GENERAL focus in the sugar industry is, as in all industries, limiting downtime. Process capacity requirements have put stronger demands on driveline components, preventative maintenance and process control systems.

Using the right torque limiting coupling has a major influence on a driveline's downtime, efficiency, stability, reliability and therefore on the production of a plant.

In general there are three solutions dealing with overload problems:

- **Ball and spring couplings**

  This solution automatically sets the coupling, but requires a lot of space. It gets very inaccurate when the ball seats are worn and the springs are fatigued. Torque adjustment is rather complicated and inaccurate.
- **Shear pin couplings**

  This solution is low-cost, but is only accurate initially due to material fatigue after several releases. Resetting is a time consuming process.
- **Torque limiting friction couplings**

  Although they are not pre-set automatically, they are highly accurate (+/– 10%), cause no false releases, can be reset quickly, and are easily integrated and require minimal maintenance.

Torque limiting friction couplings show highly favourable characteristics in protecting a drive line. High accuracy allows operators to adjust the coupling just below critical torque level. Upon overload, the coupling reacts instantly (10–20 ms) by releasing and saves the drive line from serious damage. By replacing a simple shear tube and re-pressurising the coupling, the transmission is put back into operation.

Briefly:

- Hydraulic torque limiting couplings can be set closer to the margins of the maximum machine drive capacity and therefore enable higher production.
- They do not cause false releases and only create needed downtime, thus maximising the life of drive line components.
- Due to lack of unnecessary releases, maintenance can be mainly preventative instead of problem-solving.