

System for on-board weighing on maintenance trucks

Background

In Norway it is proven large deviation between automatic data collection systems on maintenance trucks (AD) and manual reports from contractors. The difference between the theoretical value based on the control panel settings and the actual amount can differ more than 50 percent.

Unsatisfactory quantity control can have as consequences:

- Measures are not executed according to the standard requirements
- Systematic errors means that one party loses money
- Double bookkeeping requires extra work by both contractor and road owner
- Poor confidence in data from AD systems implies that transition to billing based on electronic records takes a long time

Purpose

It is well known that the spreader control box continue to send signals even if there is a “bridge” in the container hindering the material flow or if the container is empty. A weighing system is considered as one way to control the actual spreader activity and the purpose with the on-board weighing system is to make the system for reporting the amount of dry material and liquid more effective and reliable. One of the goals with the project is also to integrate a self-calibrating system on the spreader based on the continuous data from the weighing system.

Methods

The weighing system has been developed in co-operation with European spreader manufacturers and companies within automation.

Basic components are load cells and pressure transmitters, and the system works both with screw feeding and weighing of the conveyor belt. The components are customized to the type of spreader.

The systems works both on plan strapped spreaders and spreaders with a hook lift, but there has been some challenges with the attachment on plan strapped spreaders to avoid that the strapping influence on the load cells.

Results

As a part of the development, the weighing system has been tested on more than 10 trucks in a pilot project. The final breakthrough came the winter season 2014/2015 with less than 2 percent reported deviations between the weighing system and weight controlled on an external weight.

Conclusion

With the results gained, it has been decided to introduce a requirement for an on-board weighing system in some of the maintenance contracts on bid and renewal the autumn 2015. The specifications includes requirement for self-calibration of the spreaders. The new contracts with demand for weighing system on the maintenance trucks will start per September 1st 2016.

In the coming winter season the focus will be on the functionality and stability of the weighing system and development of routines and procedures in operation of the system. Full implementation is expected from the autumn 2017.