Weighing fish precisely in bulk on a seagoing ship

Weighing fish precisely in bulk on a seagoing ship

Some applications, designed for the processing industry, find their way into other markets. In a completely different environment, the - often well-developed - applications are used for the same basic principles as in the processing industry. But it can also be the other way around: applications from other working areas find their way into the processing industry. This time: weighing fish exactly in bulk on a sailing ship

Bart Driessen

Processing fish on a large trawler, constantly vibrating and moving with the waves, is quite a challenge. Nevertheless, the weighing of fish on a sailing ship is possible. The accuracy with which bulk quantities of fish are now weighed in batches on the Navigator is an absolute novelty.

The weighing installation for the Navigator was supplied by Penko. Mario van den Heuvel is Penko's field service engineer. Together with his colleagues he wrote the programming for the weighing installation for the Navigator. Van den Heuvel: "The reason why fishing companies weigh and pack their products as precisely as possible primarily is a matter of money. Supplying extra fish actually means a loss for the supplier. On a large processing ship, such as the Navigator, we easily are talking about thousands of kilos of "given away" fish. Exactly that's why precise weighing and dosing is extremely important. By weighing precisely, the fisherman can reduce the amount of extra supplied fish to a minimum. Our challenge therefore was to provide a weighing solution that operates much more accurate than existing solutions. "

The section **Excursion** focusses at techniques and instrumentation for the processing industry being used in other sectors.

Waves and vibrating machines

What challenge are we talking about? Van den Heuvel: "In itself, weighing with a very high accuracy is no challenge for us. That we have been doing for quite some time. Our weighing instruments perform 1600 weighing's per second, a speed that, to my knowledge, has not yet been exceeded, with an accuracy of ≤ 0.01%. But weighing on a big ship is a different story. Weighing and ways are two verbs that come very close together, but actually do not tolerate each other. The sea is always in motion and creates swells, causing every weighing being constantly changed. And certainly if you want to weigh the fish on a conveyor belt. You can compensate for those swells with advanced software, but that is not the whole story. At least as important are the engines and machines of the ship itself. The ship's engine, the propeller shaft, all kinds of pumps, winches and hoisting parts provide vibrations with even more effect on the weighing data. "

Corrected weighing

How do you solve the measurement problem when the ship constantly shakes and vibrates? Van den Heuvel "Our solution consists of the compensation of all these deviations of the weighing signal. The weighing's themselves are carried out by means of ten load cells mounted over the full length of the conveyor belts. By weighing the belts on the mainland, we established the first deviations. We then measured the deviations at sea, with the conveyor belt empty and the belt filled with fish. Based on these differences, we can determine a corrected measurement value. The result is a corrected measured value that comes very close to the reality under all circumstances. So what we do is corrected weighing. "

The Navigator is a factory trawler with a length of 121 meters and a loading capacity of 4065 metric tons

Dosing exactly

Apart of the weighing, the machine also has to create precise batches; what means dosing. Van den Heuvel: "In the Navigator, the fish is dosed at the end of the conveyor belt into batches of 1280 kilos. The fish then is manually divided over 64 boxes or frosters of approximately 20 kilos, which are then stored in the freezer compartment. An important requirement for the dosing is the batch size should never be less than 1280 kilos. At the same time, the extra quantity of fish must be as small as possible for each batch. During the tests we succeeded in reducing that extra quantity per batch to a minimum. The nice thing is that our dosing solution does so automatically. And also very quick. Already after five dosing actions, the dosage ended with a surplus of around 0.5%. A smaller quantity of weighed fish is therefore very feasible. "

Making data accessible

Another part of modern machine automation nowadays is making all kinds of data accessible. The weighing system of the Navigator also is equipped with a solution for the storage and analysis of data. "To make data accessible we supply DataReporter with every new weighing application", explains Van den Heuvel. "With DataReporter the user can collect data for storage into databases. A second function is the presentation of data graphically, so clearly. The third function is diagnosing; so the analysation of batches, formulas and stagnations. Other diagnoses are also possible. New about DataReporter is this solution now can register and report 15 different processes simultaneously. As a result, reports and analyses based on data stored in SQL are also possible. Especially trend information about dosing and filling in different packages is very interesting for the Navigator.

Cooperation with AFAK

The project of the weighing application by Penko is part of an even bigger project that is being carried out by Afak Techniek on behalf of the Icelandic owner Uthafsskip. Afak from Katwijk (NL) is the main contractor for this type of projects and specializes in the development and construction of machines for fish processing companies. These are used both on the mainland and on board of fishing vessels.

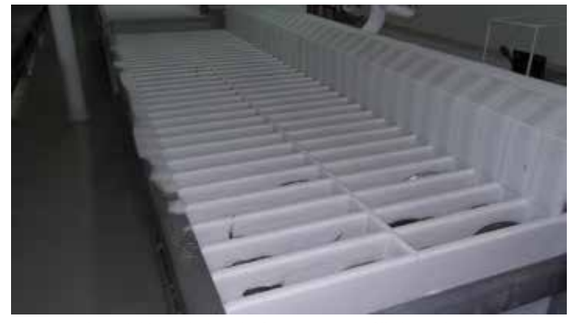
The Navigator

The Navigator is a factory trawler and part of the Icelandic shipping company Uthafsskip. With a length of 121 meters it is one of the largest ships in its category. The Navigator is used for catching and freezing the fish. Important fishing grounds are located in the Atlantic Ocean, for example off the West African Coast.

The Navigator catches pelagic fish and freezes it immediately

One of the weighing belts, built by Afak and equipped with Penko weighing technology

The frosters previously were overfilled



Thanks to the weighing solution, the frosters are now filled exactly