

Maintenance Units helped Asian dairy producer reduce equipment downtime by 78%



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Customer

Asian dairy producer.

Challenge

Improve maintenance procedures, reduce downtime and associated costs.

Solution

Conducting filling-machine maintenance using Maintenance Units (MU) and combining several parts to perform function together.

Results

- Reductions in filling-machine downtime – 5.5 h (Maintenance Units) vs. 24.5 h (using single parts)
- Reduced operational costs
- Increased efficiency and quality

Customer challenge

Several customer plants were interested in improving their maintenance procedures, reducing downtime and associated costs. They agreed to let us perform the same service on two identical filling lines and two identical distribution lines, comparing different methods.

Filling: The plant operates 20 filling lines ranging from Tetra Pak A1 to Tetra Pak A3/Speed, it was time to perform an overhaul of two comparable TBA/19 filling machines. Both machines had been installed at the same time and were approaching 10,000 hours of operation.

Distribution: The plant operates a total of 20 distribution lines from various suppliers. When two of these lines were due for scheduled maintenance at 9,000 hours of operation, we planned maintenance of the Helix accumulator's Spider unit.

Our solution

Since an average filling machine has thousands of parts, regularly checking and replacing parts is a time-consuming process. To shorten maintenance time and increase reliability, Tetra Pak has developed Maintenance Units that combine many parts that perform a function. These units come pre-set and tested, so they can be installed without any fine-tuning. And each unit comes with a warranty, so performance is guaranteed.

Given the planned maintenance on the four lines described, the customer agreed that this was the perfect opportunity to see how using Maintenance Units compared to performing a conventional overhaul using single spare parts.

Filling: The components chosen for the test were left and right cutting jaws and left and right pressure jaws on filling line A and B. All necessary single spare parts for line A and Maintenance Units for line B were ordered and delivered to the site in time for the trial.

Because line B had been exhibiting a lower mechanical efficiency than line A, it was chosen as the recipient of the Maintenance Units. The idea was to see if using Maintenance Units could help raise the efficiency to the same level as that of the other machine. The first week was devoted to the regular overhaul of the first machine using single spare parts. The second machine was then serviced the following week using Maintenance Units instead.

Distribution: The Spider unit is a very sophisticated piece of equipment, so it is extremely important to make sure people with specialised knowledge handle it in a controlled environment. One line was serviced with a Maintenance Unit. The Spider on the other line was serviced using single spare parts, as is commonly done.

For both trials, everything was carefully logged in order to be able to compare both methods.

Maintenance Unit

Maintenance Units are complete plug and play units that further simplify the handling of parts and maintenance. They are made up of single parts that together perform a function in the machine. With these pre-assembled, pre-set and pre-tested units, you get more efficient maintenance, save time and make long term cost savings. Ultimately, they improve your operations by increasing uptime and reliability.

Results achieved

Using Maintenance Units as an alternative to overhauling machines with separate parts leads to reduction in downtime plus increased efficiency and quality.

Filling: Servicing line A resulted in a total downtime of 24.5 hours. By comparison, line B only required 5.5 hours of downtime, or 19 hours less downtime from the point of dismantling the equipment to restarting the machines. And when you add in preparation time for ordering, picking and sorting parts, the overall time savings are even greater.

When we looked at data from the Packaging Line Monitoring System (PLMS) we saw that line B with the Maintenance Units had increased its efficiency with 3 percentage points and was now running at around 98% efficiency. That was a significant improvement compared with before the service, and even higher than line A, which ran at about 95% efficiency.

Distribution: When comparing service on distribution lines, the results were also favourable: 2 hours for the Spider Maintenance Unit versus 5.5 hours when using separate parts. Both methods required 35 minutes for dismantling the Spider unit from the machine, installing the replacement or serviced unit in the machine and adjusting a few settings. Ramp-up time was also the same in both cases, 30 minutes. The big difference was that nothing else needed to be done using the Maintenance Unit. So the machine was up and running again just two hours after we started.

Service event	Hours		
	Spare parts	Maintenance Units	△
Dismantling unit	0.5	0.5	0.5
Cleaning unit	4.5	1	3.5
Disassembling unit			
Cleaning parts			
Inspecting parts			
Assembling			
Setting	0.5	0.5	0
Installing unit			
Setting (in machine)	5.5	2	3.5
Total			

Additional advantages

Plants are not always equipped with the right tools or workspace for dismantling and cleaning these components. The conditions on-site are far below what we consider satisfactory for this type of work, especially when you compare with the specialised workshops at Tetra Pak, where Maintenance Units are assembled and tested.

Filling: During the overhaul on line A, several 'surprises' were revealed as the work progressed. One of the carriers showed lots of wear, as well as one of the bearing houses, which serves as the heart of the jaw. We also found that the chrome finish on one of the axles was gone, which could easily lead to an unsterility if put back into the machine.

Fortunately the customer had these items in stock. But if they hadn't, which is often the case, the amount of downtime could have been several days longer while waiting for replacement parts to arrive. Unless of course the customer takes the risk of putting defective parts back into the machine, which would pose a huge risk in terms of reliability. With Maintenance Units there are no such risks, which is why Tetra Pak can give a guarantee.

Distribution: When servicing a Spider unit the conventional way using spare parts according to the list, only the most common parts such as bearings, seals, etc. get replaced.

But with the Maintenance Unit even parts that normally don't get taken care of are replaced. So if the goal is to get the Spider unit back to its original condition it is actually more expensive to rebuild it on-site than to use a Maintenance Unit. In addition, picking parts took just one day instead of two. We also saved another day by not having to sort parts according to GTL.



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