



## ZETES CASE STUDY | Mitsubishi Caterpillar

### Mitsubishi Caterpillar Forklift Europe: a world premiere with RFID

*For Mitsubishi Caterpillar Forklift Europe (MCFE), a highly automated production process allows them to stand out from the competition. So the company strives to pioneer new solutions. About five years ago, Zetes started working for MCFE for the first time, together with @Work Management Associates. At that time, the assembly line was streamlined with a wireless network and associated hand-held and truck-mounted terminals. The fast growth in production gave rise to the next step: the introduction of RFID. The following report outlines the three-phase project.*

MCFE in Almere is a company with an international outlook. With its parent company in Japan, and a sister company in America, the Dutch plant produces forklift trucks for Europe, Africa and the Middle East. At Almere, 55 new Mitsubishi Caterpillars roll off the production line every day. Soon, the production capacity will be ratcheted up to 70 trucks, and the figure is due to reach 90 by the end of 2008.

Producing ninety forklift trucks per day in the same space. Is that really possible? Henri Snijders of @Work Management Associates was the man faced with that question. He is one of the permanent @Work -consultants who have been advising the IT department of MCFE for the last nine years about ERP and Microsoft CRM projects. At that time, the introduction of IND truck-mounted terminals was one of the new ideas. He says: "Those terminals are still working fine, even today. Zetes provided a robust solution. Actually, the terminals never break, unless you attack them with a hammer."



### Scanning with radio frequency

The growing demand for forklift trucks called for a new automated solution. Henri Snijders: "Increasing production by over 60% in the same space is not that easy. You can only do it by limiting stocks. Every forklift truck has about 1,200 parts. If you have too many parts lying around, or you never completely use all the stock, it takes up a lot of space unnecessarily. MCFE wants to have lean production: zero stock, everything delivered just-in-time."

Of course, the stock problem has been eased in recent years by the manual scanning of trucks and masts. But according to Henri Snijders, it was time for RFID, an identification and registration methodology that is also used in the car industry. "RFID uses radio frequency and RFID readers can automatically read the data from moving RFID tags. So just imagine if we could fit the tags to the trucks we were producing and equip the assembly line with RFID readers. We could then monitor the production process down to the last detail. We would be able to effectively control the machines, the production of sub-assemblies and our suppliers."

### Project 1: CE test facility

Based on the positive working relationship we had during the previous project, Zetes was the obvious partner for @Work in implementing the RFID project. Zetes' RFID Specialist Bennie Cuijpers was brought in to run the project step by step. He says: "Compare operating RFID with operating a mobile phone. Sometimes reception is limited. You have to bear in mind that at MCFE, RFID needed to work in a harsh industrial environment. Other processes could cause interference but of course, that could not be allowed to happen. The reading of the tags needed to be done without a hitch."

So Zetes and @Work started working on MCFE's testing line. On the testing line, assembled forklift trucks are tested extensively, for example for manoeuvrability and braking. Henri Snijders says: "The test data was input manually, but international certification demanded independent results. So test results could not be influenced by human intervention." After thorough research, seven RFID readers were fitted on the testing line: two at the entrance and exit, and the other five in each of the test phases. Bennie Cuijpers of Zetes: "At the start of the testing line, each forklift truck is fitted with an RFID tag. The test results required are collected via a unique code. The truck goes through its paces and the results are read automatically after each step and downloaded into the ERP system. Human judgement is no longer part of the testing. The data is independent, reliable and can be checked at any time afterwards."

## Project 2: Assembly line

The results on the testing line were so positive ("The read reliability of the RFID tags is 99.9 plus per cent", Bennie Cuijpers says proudly), that MCFE wanted to move on to the production environment. There too, the management wanted faster and more reliable data. So the assembly line was fitted with no fewer than twenty scanners and every truck that was being made was fitted with a reusable tag right from the outset. Bennie Cuijpers: "The tags move down the production line at a fixed speed which gives the scanners enough time to read and transmit all the data. We use the same tags for Dutch National Railways for the automatic identification of moving trains and they move quite a bit faster."

He continues: "Since the tags are scanned automatically, the data is a lot more reliable than with manual scanning. Manual scanning also means crooked scanning, sideways scanning or forgotten scanning". @Work-consultant Henri Snijders adds: "Now we scan more often. Previously, trucks on the assembly line were scanned once every two hours, but now it happens every six minutes. That means we can manage the stock accurately and suppliers only have to deliver exactly what is needed, just in time."

## Daring to be a pioneer

It may seem a huge project, but Henri Snijders says that in practice, the introduction of RFID went better than expected. "It was a matter of installing and testing, and it worked. The experience with the testing line alone was enough to convince us of the benefits and to move forward with a rapid implementation across the whole production process." What did the workforce think? "They are happy with RFID too", he answers. "The only thing they needed to get used to was that there are now twenty posts with a terminal on them. Because they don't have to scan manually anymore, they can concentrate on their core job: assembling trucks. The really nice thing is that the terminals give work instructions."

The management of MCFE are overwhelmed by the positive reactions. "Here in Almere, we are a long way away from our parent and sister companies in America and Japan. In some respects, we are even taking things further than the car industry. In Almere, the whole production process is now tightly and neatly automated. The production shed is clean, tidy and quiet and that inspires confidence in customers, dealers and shareholders. We can now proudly show dealers exactly where the forklift truck they ordered is in the process."

## Project 3: Stock transport

Anyone who thinks that MCFE has done enough innovating is wrong. There is more to come: The next step in the RFID process could be a world premiere. @Work consultant Henri Snijders: "The stocks for Almere come from Japan. Previously, they were transported on pallets, but now they come in reusable plastic crates which generates much less waste." As you would expect, MCFE wants to be able to track the crates wherever they go. Currently, all the crates are fitted with a unique barcode, and are scanned automatically when they arrive in Almere. He continues: "But individual crates still disappear. Searching for a lost crate wastes a lot of time."

A future RFID project for the government offers new prospects for MCFE. "The government has provided funds for an RFID project at Schiphol and in the port of Amsterdam. In future, incoming goods will be scanned automatically and it would be great if we could be part of that project. If we fit all our crates with an RFID tag, we can automatically record them when they arrive in the Netherlands, and when they arrive at the plant, giving us two check points."

According to RFID Specialist Bennie Cuijpers things have not yet reached that stage. "Quite a lot of research is needed first. Scanning a crate is not really a problem but how does the hardware work when you have a stack of ten crates, or perhaps many more? We need to test that thoroughly." For MCFE, there seems to be no reason not to join in the project phase. Henri concludes: "That is the great thing about MCFE, they don't only think in terms of short-term cost cutting, but they strive to be pioneers and pioneering gives this company real opportunities."