



Copenhagen Airport

Solutions for Aviation

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Lars Peter Larsen, System Specialist, Copenhagen Airport

GE Intelligent Platforms Proficy Software optimizes baggage sorting in Copenhagen Airport

Proficy HMI/SCADA - iFIX, which for years has monitored baggage sorting in Copenhagen Airport (CPH), has now been joined by two more components of the Proficy Software suite: the OEE monitoring solution Proficy* Plant Applications Efficiency, and the software administration solution Proficy Change Management. Together, they can help reduce waiting times and improve efficiency for CPH's business-critical baggage sorting systems.

The fully-automated baggage-handling systems at Copenhagen Airport play a central role for most of the personnel and companies either working in or using the airport.

The system, which currently handles between 20,000 – 25,000 items of baggage each day, is owned and maintained by Københavns Lufthavne A/S, CPH.



CPH looks after its business-critical systems and is now in the process of upgrading its Proficy iFIX and install new solutions to ensure even more efficient baggage handling.

GE Intelligent Platforms' OEE solution, Proficy Plant Applications, is in the process of being installed on all the conveyor belts, and will reduce waiting times. CPH has also installed Proficy Change Management recently, to control the system's PLCs.



Solid and flexible

The fully-automated baggage sorting system and its numerous conveyor belts have been controlled, regulated and monitored by GE Intelligent Platforms' Proficy iFIX version Fix32 since 1997 when it was built. Proficy HMI/SCADA – iFIX is a flexible, integrated solution that provides superior process visualization, data acquisition, analytics and supervisory control of operations.

"iFIX has done an excellent job over the years, and continues to be one of the most solid and flexible SCADA system platforms on the market," says Lars Peter Larsen, who has worked as System Specialist at CPH ever since 1997.

His colleague, Henning Pind, has only been System Specialist at the baggage terminal for a few years, but has sufficient knowledge of SCADA to be able to give an expert opinion on the system. "Proficy iFIX is particularly strong, because it is so configurable and can talk with so many different PLCs. The specialists here in the airport have always been able to maintain the solution and set up new screen graphics, databases and alarms as and when necessary," says Pind.

And over the years, there have certainly been plenty of new screen graphics! The Proficy solution has grown from two to four SCADA servers and from around 8,000 to over 25,000 I/O points. Twenty-three general PLCs run the main lines, along with 500 minor PLCs.

Many of the I/Os are pure digital signals, with a lesser degree of regulation. But the solution is large, and with 18 flat screens and associated keyboards on a single desk, the control room could easily be featured in a modern Hollywood production.

"The existing version Fix 32 was upgraded to iFIX 3.5 in 2003, and we are now switching to Proficy iFIX 5.0 in a continuous process, in the course of which we will undoubtedly introduce new features and functionality. We are not fully utilizing the potential in iFIX to the utmost at this time, and there are sure to be lots of things we can do better," concludes Pind.



Double-click for maintenance

Functionality has been much improved as Proficy iFIX has been given more functionality. For example, it currently supplies data to SAP's maintenance module which administers the various maintenance intervals of the system.

A single double-click on an iFIX alarm sends it to SAP, which then automatically sets up a work order. That's how simple it is.

The maintenance intervals are basically defined by the various system vendors, but the Maintenance Department also uses historical data from Proficy iFIX, if an error reoccurs and the maintenance interval needs to be adjusted.

OEE picture completed

Henning Pind describes investment in the Efficiency Module of GE Intelligent Platforms' Proficy Plant Applications solution as a natural part of ongoing optimization of the baggage system. This software monitors and controls performance with a comprehensive view of factors such as OEE and equipment downtime.

Copenhagen Airport is well used to uptime criteria and in fact only the conveyors running from the check-in desks to the sorting systems are not measured on uptime now. The three fully-automated sorting systems, all supplied by Danish company Crisplant, supply data for uptime measurement.

But as Pind comments, there is a lot more potential in performing uptime measurement on a sorting system if the same is done on the belts delivering baggage to it. "We could have chosen to implement our OEE needs in SAP – but we have a good relationship with our SCADA vendor Novotek, and that's why we decided to go with GE's Plant Applications and Proficy Change Management for configuration management of our PLC software."



Optimization and documentation

OEE measurement must and can be used for many things, and Pind highlights the obvious potential the management tool and internal optimization tools have for those departments linked to the large system.

But the OEE tool is also intended for other, more specific roles, such as being able to document the system's uptime to the airport's various partners, including the handling companies CPH works with, which is vital to CPH.

"Our responsibility starts when the baggage rolls onto our conveyor belt, which runs behind the check-in desks, and ends when a handling company employee loads the baggage from the box and onto a cart to take it to the plane.

The handling companies, such as SAS Ground Service and Novia, depend on the efficiency of our systems, which is why it's vital that we can prove uptime," he said.

No more queues!

Once the solution is fully configured on all belt lines, it will be measured specifically on queue times. Queues have many causes, and can occur almost anywhere. During peak periods, up to 40,000 pieces of baggage per day can be handled, which means queues can form even when everything is working smoothly – just like on a motorway.

"We are now finalizing our uptime solutions, which will give a much more detailed picture of the problems and options we have. We are developing a KPI bus, on which we can collate all OEE figures in a dedicated database. And when it is ready, the solution will give a general picture of the entire system and the ability to be able to define a very detailed picture of a line, an error, a stop cause etc.

"The web application Proficy Plant Applications Web Server included in the bundle from Novotek can be customized to meet the needs of each unique user, and instead of them calling me, they will be able to log in to their own personal OEE browser in future, to check the figures they want," says Pind.

Important risk management

"The GE Intelligent Platforms Proficy Change Management solution we installed back in the summer is a tool for configuration management of our PLC software. The module monitors the system and ensures that the software we have on the PLC is identical with the version we have on the server," explains Pind. "Any changes are logged and documented, plus who has been in and out and changed what and when is also logged."

The baggage sorting system has to run day and night, and 'fire-fighting' situations which arise are those which cause problems. If a technician for example goes into the system remote on a Saturday evening and forgets to log changes, there will be discrepancies when a new technician arrives Monday to fix the error properly.

There is always a risk of a discrepancy in such a large system as ours, and the fact that most of our PLCs run in tandem as an extra safety feature, does not make things any better. Discipline is needed to ensure identical changes are made in both PLCs, including the one which is not in operation," states Pind.



Change management is a must

"A change management solution is a must for such as us. And even though we may initially have minor bugs in our software, we are generally very satisfied with the solution.

The solution provides first and foremost security, and then gives us vital history and documentation of changes." According to Pind, the control room personnel know exactly who to call for an explanation on software changes and the like. And if the technicians are also willing to write a comment to their changes, it makes things easier for everyone.

"Our change management solution was a relatively small investment of about DKK 250,000, and will quickly pay for itself," concludes Pind.

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