Trials & Tribulations

Upgrading Your Maintenance Software

by Gavin Miller

As featured in Vertical Magazine

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Mike Reyno Photo

The effectiveness and efficiency of a maintenance department is largely dependent upon the effectiveness and efficiency of its internal processes. How well do your procedures effect good control of the work that needs to be done? Is accurate information available where you need it, when you need it?

There are many circumstances that might have you thinking it's time for a new maintenance and inventory management system. Perhaps the accounting department or upper management has decided it's time to get better control of operating costs, or lost inventory. Maybe the regulators have paid you a visit to perform an audit, and you came out something less than squeaky clean. Maybe you want to computerize your paper system, or perhaps you simply spend too much time "working around" an outdated, computerized system. Imagine having all those clipboards, log books, P/O books, white boards, spreadsheets, and inspection forms in one integrated computer system, all at your fingertips, from any office or base.

Whatever the reason, when it's time for a serious upgrade to your maintenance

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and inventory procedures and software, there are definitely good ways and bad ways to go about it. This two-part article aims to help smooth out the rough spots for *Vertical's* readers, by following one company, Airborne Energy Solutions (AES), through the task of reviewing and upgrading their maintenance and inventory management system.

AES is a unique and dynamic company that primarily supports "the oil patch" in Northern Alberta *(see Vertical p.34, Aug-Sept 2003)*. With a large, diverse fleet of approximately 50 helicopters and fixed-wing aircraft including Robinsons, Bells, Eurocopters, Pipers, and Cessnas, they are more than just an aircraft-for-hire operation, priding themselves on their ability to provide many oil company support services.

The Research Process

Harvey Siemens, AES, QA manager, had been growing more and more frustrated with the old DOS-based software that the company was using for maintenance and inventory management. This was partly due to the fact that the system was virtually unsupported, and upgrades to it had stopped. In early 2003, he decided it was time to start seriously shopping for a system that was a good fit for their organization.

Siemens put a high value on customer support. "Good support is essential. That is ultimately why we were looking for a new system in the first place. Once we narrowed our options to a short list, we focused on support. We asked other users for the truth. We tried to find people who had switched from our old system, to find out how well the transition had gone for them and what problems they faced."

Siemens based his search for a new system and supplier on these vital aspects:

Logical work flow - The new system had to integrate not only AES' inventory and maintenance processes, but be able to work well with their "realworld" operation. The aircraft and the people doing the maintenance are often hundreds of miles from head office in Whitecourt, AB, where all maintenance tracking and inventory supply is located.

Intuitive processes - In addition to the training required with the implementation of any new system, the program needed to make sense and integrate well with the work flow of the various people who would use it - even users who are not too comfortable with computers.

Help and support - The selected system had to have useful and relevant help functions, and the company that developed it needed to have a good understanding of the aviation business, as well as a good reputation for customer support.

Implementation assistance - Switching to the new system could mean a major upheaval in the daily workflow. Since AES can't close its doors while staff developed and learned new processes, there would need to be experienced assistance to help plan and implement the new system.

A good user base - If the system has been deployed with many users, it likely has worked well, and the company that developed it will likely be around in the long-term to support it.

A good security system - In AES' case, Siemens wanted the Quality Assurance functions restricted to those staff with a need to access them.

Flexible report generators - One of the problems with their old system was that the information being input could not always be retrieved in the desired format.

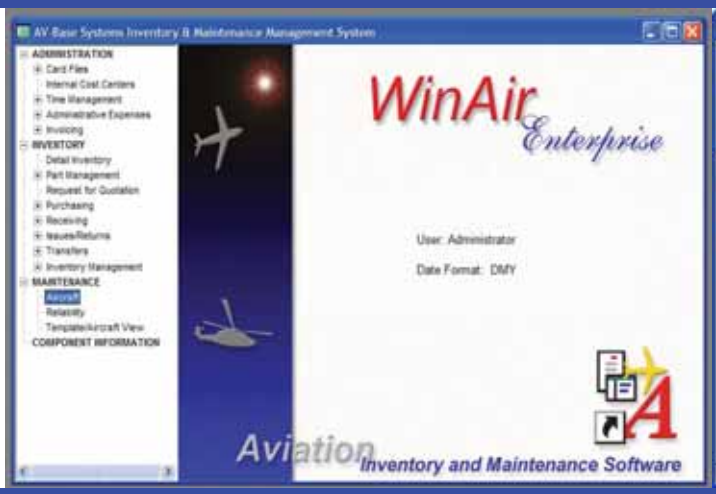
Flexible handling of procedural difficulties - There are always hiccups in the way the real world works as compared with the processes envisioned by software developers. For example, if there is no price available when parts are received, will the system allow cost to be left at zero until it is available? If a part, shipped for repair, is exchanged by the vendor with another SN, can the replacement be received? What if the PN has changed because of a modification at repair? These little problems can become big ones if the system does not make allowances for them.

Unusual cycle counting - The system needed to handle complex cycle counts across aircraft & engine types, such RINs on Bell machines, and Ng and Np cycles on Turbomeca engines.

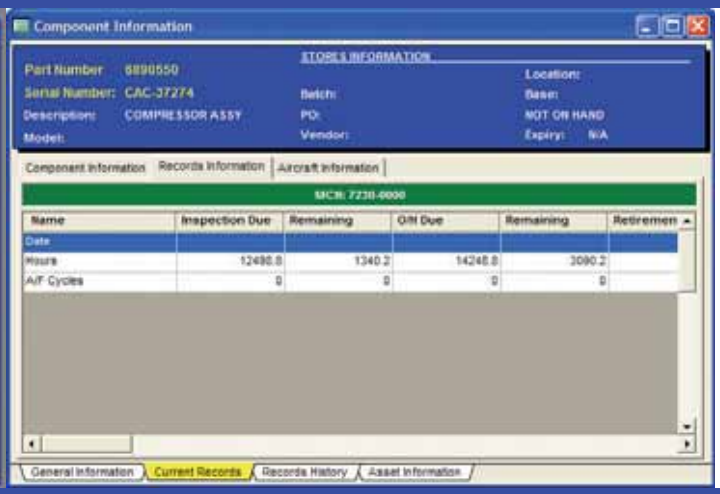
Set-up - Data templates should be available for different aircraft types, to make set-up quick and correct. Experienced people should be available to help with the implementation.

Value - The system should be priced appropriately for its functionality, as compared with similar alternatives.

Armed with a good idea of what he wanted, and what he didn't want, Siemens started his search on the internet. He then talked to other operators and did the trade show circuit. Not satisfied with the assurances of sales people either, he insisted on seeing any potential new system in action, demonstrated by someone who knew his business and his problems. He wanted a good understanding of how well it would integrate with existing AES processes, and what would need to change. "Change is not always bad," he said, "but it has to be for the sake of improving procedures, not just for the sake of change itself."



■ WinAir is quickly gaining popularity among operators and repair stations, and is available in four scaleable editions from AV-Base Systems Inc.



■ The integrated nature of the system allows access to component details whether they are in stock, installed, or our for repair.

Selection and Planning

By November 2003, AES had seen live demonstrations of several systems, and Siemens selected WinAir, a scalable, Windows-based application produced by AV-Base Systems of London, ON. WinAir is in use with many operators, the smallest with only one or two helicopters and a single computer, and the largest with dozens of wide-body jets and hundreds of users. AV-Base has a good reputation for support, and he liked the way the system functioned. Stated Siemens: "These guys have thought through the physical processes, and have made the software conform. Data entry is easy because it matches the real world." By this time, Ernie Beauliua had joined AES as VP of Maintenance. Beauliua had already seen an AV-Base system improve the maintenance department at his previous company.

Once the desired WinAir edition and options had been selected, Siemens had an AV-Base representative come on site for a few days to review their current procedures, and to help plan the implementation process. "You have to know what you are getting into, and come up with a realistic implementation plan," explained Siemens, "otherwise even the best system can become a mess real quick!" In consultation with AV-Base, they decided on a two-stage process. The first would involve upgrades to their network and some of their computers, followed by software installation and a week of on site training for their senior staff. This would focus on how to get the system set up as much as possible, prior to "going live" with it, and beginning to abandon their old system.

The second stage would involve switching over to the new system for daily processes. This would happen concurrently, with a second week of training for users, so that someone with experience in implementing the system would be on site to help them through the inevitable teething pains. Siemens envisioned these two stages being about a month apart, and he scheduled the whole process to happen during their slowest months, January and February.

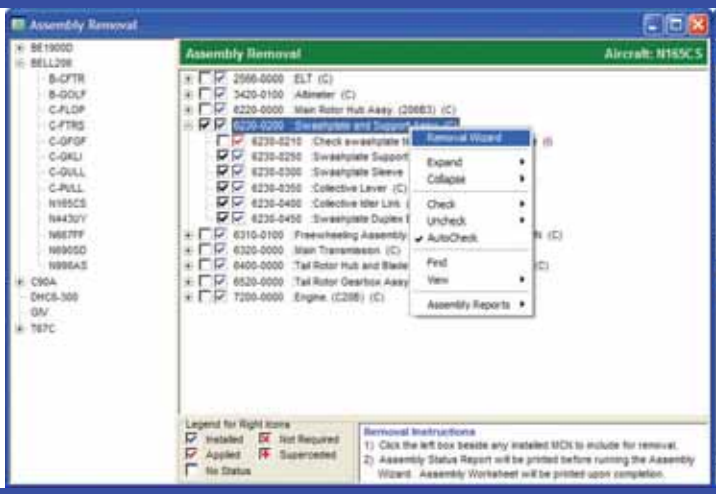
Siemens also elected to purchase maintenance schedule templates for AES aircraft, from MPLAN Solutions of Duncan, BC. MPLAN has an agreement with AV-Base to provide these maintenance and parts packages for the entire range of WinAir editions. The templates would dramatically reduce the time required to get their aircraft properly set up for live maintenance tracking. Said Siemens: "MPLAN templates are very thorough, all the details from the manufacturer are included. Installing them is a very good exercise in Quality Assurance - it forces you to take a fresh look at all the items that MPLAN has included, and confirm (hopefully for the second time) each item's applicability. There are good parts lists and inspection sheets as well. Well worth the money."

Set-Up and Implementation

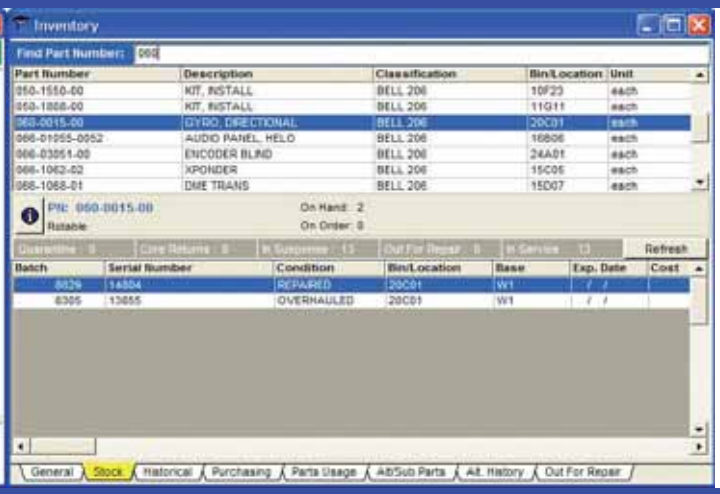
In late January 2004, the new system was installed and the first week of training was delivered by AV-Base. Over the course of the week, senior staff from each department attended lessons in a makeshift classroom on site, where two computers were set up temporarily for practice and discussion. The best set-up processes were discussed, and any required changes in staff duties were hammered out. The accounting department was brought in to plan procedures to be followed by purchasers. When this was complete, phase two of the implementation was tentatively scheduled for one month after the first.

During that month, several things happened:

1) Senior maintenance planning staff began to set up the technical records for their fleet of over 50 aircraft. One at a time, each of these was entered into the new system, and the results were double-checked against a report from the old software. In the process of reviewing all of the maintenance requirements built



■ Major assemblies can be removed and installed with all their subcomponents. These are all defined in the Maintenance Schedule Templates available from MPLAN Solutions.



■ The inventory system integrates requisitions, purchasing, distribution, and cost reporting with complete history for both rotables and consumables.

into the templates by MPLAN, a good amount of self-auditing was performed, with good results.

2) As each aircraft was completed in the new system, it was abandoned in the old one, and, from that point forward, scheduled maintenance was updated in the new system only. Planning staff began to get familiar with how the system worked, and how to use the reports.

3) Vendors, customers, and personnel were set up in the new system. The license expiry dates for inspectors was entered, and the new system took over the tracking of these.

4) Serialized Tools that need to be recalibrated regularly were also set up, and the new system took over the calibration date tracking. Those coming due for recalibration were sent out on Repair Orders in the new system. This gave staff some experience with the new purchasing and receiving system without switching over completely.

5) The stores room was reorganized to make better use of space. Since the new system would be used to locate any part in the system, less emphasis would be placed on keeping parts on the shelf in order of part number. This would make more efficient use of the space available, and commonly required stock items could be placed closer to hand.

6) Bin locations and min/max levels were set up for master part numbers in the new system. Any part numbers that had not been set up by the MPLAN templates, or transferred electronically by AV-Base, were manually entered, along with any substitute or alternate part numbers.

Bert Vergeer of AV-Base Systems was impressed with the way AES approached the implementation project. Stated Vergeer: "The aim of the static set-up phase is to bring the new system up to the most complete possible state of readiness, without actually beginning to use it for live purchasing, parts distribution, and work order processing. It's like a good paint job, the more time you spend on the preparation, the better the outcome will be. If the switch is made too early to a live system that is not ready, staff can quickly become overloaded, and the entire implementation process may be compromised. A good system poorly implemented can be worse than no system at all! AES did a good job of planning for the best possible outcome."

We will pick up the second part of the story as AES switches "live" to their new system, and follow them through the first week. We will also follow up with Siemens to find out how the new system is working for AES, and get his thoughts on what, if anything, he would do differently next time. Stay tuned!

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AV-BASE Systems Inc. *develops and supports a series of Aviation Inventory and Maintenance Software products known as the WinAir Series*

WinAir *is widely recognized as the easiest-to-use, most structurally integrated and most affordable system for handling aviation maintenance and inventory control.*

Trials & Tribulations Part II

Upgrading Your Maintenance Software

by Gavin Miller

■ Companies using WinAir can purchase and install Maintenance Schedule Templates specific to the aircraft types that they operate, like this MD 500D.
Mike Reyno Photo

In part one of our story (*see Vertical p. 60, Oct-Nov 2004*), we introduced you to Airborne Energy Solutions (AES), a helicopter and fixed-wing operator servicing Alberta's oil patch with a fleet of about 50 aircraft including Bells, Eurocopters, Robinsons, Pipers, and Cessnas. They had gone through the process of selecting new maintenance and inventory tracking software, and had begun set-up and implementation of this new system. In their research and review process, they had focused on the functionality, cost, and support of various software systems. From the resulting findings, Harvey Siemens, Airborne's QA Manager, had selected WinAir, produced and supported by AV-Base Systems of London, ON, as the software that best suited AES.

In this second part of the story, we find out how the installation worked out, and if Siemens is happy with his decision. With time to reflect on the entire process, Siemens responded: "Overall, I would rate our software choice as nine out of 10 – I will not call it 10 because there is always room for improvement!"

One of the things that attracted Siemens to WinAir was that they could also purchase and install Maintenance Schedule Templates specific to the aircraft types that they operated. He reported that these templates from MPLAN Solutions Inc. are particularly attractive because they include parts requirements for specific scheduled tasks, and that inspection check sheets are generated automatically for each task. These can then be easily edited in the software, making revisions happen seamlessly.

Picking Up Where We Left Off

When we left them in the last issue, AES had received a week of training and implementation assistance at their facility from one of AV-Base's trainers. They also had a "to do" list that would bring the new system as close as possible to being ready to go live, and had begun managing maintenance and inventory


Realistic Air

Airframe Log

Date	Vol	Page	Hours Cycles	TTSN TCSN	Description	Corrective Action	Mech Insp	MO/Task MCN
10/03/2003	65	57454	1.3 1	10997.0 5795	Main Rotor Hub Assy (206B3) (INSPECTION)	Main Rotor Assy installed on aircraft as per Bell Maintenance Manual	CHS01 BAS01	030105-1 6203-0900
16/03/2003	65	57458	1.3 1	11000.4 5792	Torque chronos of main rotor hub 3 to 6 hours after installation. (INSPECTION)	Main Hub retorque carried out.	DAL01 DAL01	030105-2 6220-0010
01/04/2003	65	57467	2.4 1	11023.9 5805	197 - Track bar out of limits on VOR - VOT says 000, track bar 7 degrees out.	Pictorial Navigation Indicator replaced and navigational system tested serviceable.	CLD01 MUH01	030107-1
07/04/2003	65	57470	1.0 1	11033.1 5810	199 - Spike knock on landing from pedal fail.	A/C inspected for damage from off level landing (resulted from spike knock felt by aircrew). No damage found.	MUH01 MUH01	030107-2
10/04/2003	65	57474	0.0 0	11041.7 5815	Governor, Bendix (C20b) (OVERHAUL) Extended to 11051.2	Governor replaced.	ART01 DAL01	030105-2 T300-2100
			0.0 0	11041.7 5815	Fuel Nozzle (C20B) (INSPECTION)	Fuel Nozzle replaced with repaired unit.	ART01 DAL01	030105-7 T310-2100
			0.0 0	11041.7 5815	Starter Generator (INSPECTION)	Starter Generator replaced.	ART01 DAL01	030105-8 8010-0000
22/04/2003	65	57474	0.0 0	11041.7 5815	100 HOUR INSPECTION (INSPECTION)	100 Hour Inspection carried out.	BAF01 DAL01	030105-4 0500-0010
			0.0 0	11041.7 5815	Ni-cad Battery (INSPECTION)	Ni-Cad Battery replaced with inspected / tested unit.	ART01 DAL01	030105-5 2400-0000
			0.0 0	11041.7 5815	200 HOUR INSPECTION (INSPECTION)	200 Hour Inspection carried out.	ART01 DAL01	030105-6 0500-0020
			0.0 0	11041.7 5815	Alternator (INSPECTION)	Alternator replaced. Pitot / Static leak check carried out. Encoder correction test carried out. Results as per attached data sheet.	CLD01 DAL01	030105-9 3420-0100
26/05/2003	66	58060	1.0 1	11129.9 5868	199 - Possible spike knock on autorotation landing.	Spike Knock Inspection carried out, no faults found.	DAL01 DAL01	030107-3
06/06/2003	67	58705	0.0 0	11145.2 5881	Flap restraint sticking.	Flap Restraint replaced. Main Hub Re-torque required 11194.2 - 11153.2	TEM01 TEM01	030104-2
06/06/2003	67	58707	0.0 0	11145.2 5881	Document inspection (INSPECTION)	Documents inspected.	RES01 TEM01	030105-10 0530-0900
09/06/2003	67	58708	0.0 0	11145.2 5881	Hydraulic pump leaking.	Hydraulic Pump replaced IAW Bell M.M.	TEM01 TEM01	030104-4
12/06/2003	67	58708	0.0 2	11145.2 5881	Engine Driven Fuel Pump oil seal leaking.	Removed Engine Driven Fuel Pump and replaced seal and O-Ring as per Rolls Royce M.M.	ROG01 TEM01	030104-3

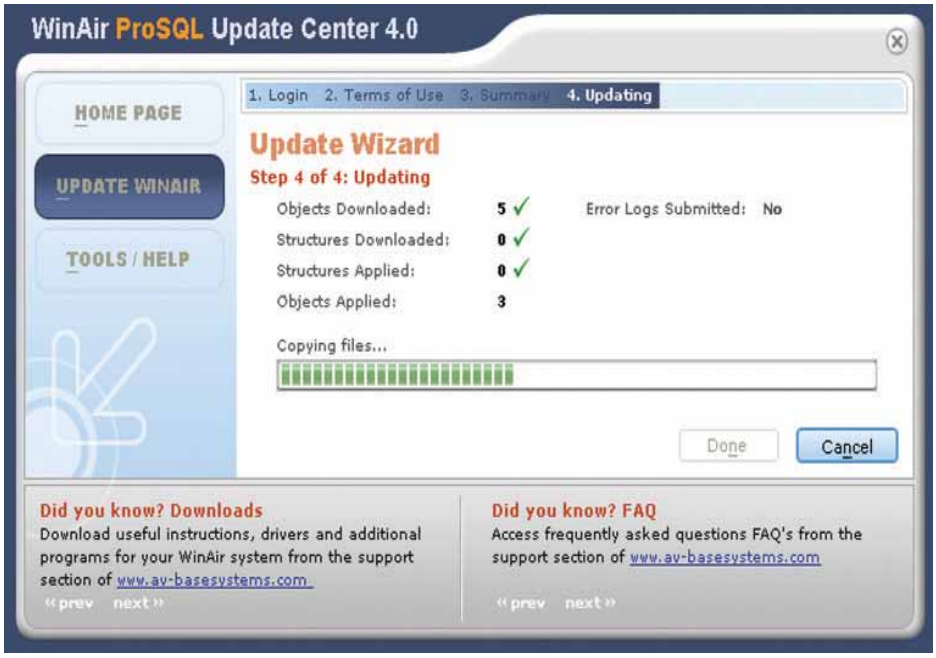
tracking in real time. The AV-Base staff were scheduled to arrive one month after the initial training to help with the switch to the new system. Siemens gave the staff an eight out of 10 for their efforts in making the implementation go smooothly. "In some areas, we didn't realize the importance of a choice or decision we were making, nor the significance of those decisions." This illustrates the importance of good training and implementation assistance from the beginning. It is without a doubt the most critical phase of the switch to a new system.

By the time the month between training sessions was up, much of the set-up had been accomplished as planned. But, there were unforeseen challenges, including one key staff member unexpectedly giving his notice, which left the remaining staff with a little more to do while another maintenance planner was sought. Nonetheless, much had been accomplished before then. All of the Maintenance Schedule Templates ordered from MPLAN Solutions had been delivered and installed. Shelly Mason in the Tech Records department had set up several aircraft in the new system, and, as a result, a few irregularities not seen in the old system were revealed.

While Mason was busy setting up aircraft, Stores manager Jennifer McKay tackled the well-stocked AES Stores room. She had taken the opportunity to rearrange the Stores Room to take better advantage of the capabilities of the new system with regard to locating parts on hand. Shelves and bins were all labeled, and the parts catalogue was loaded with the new default locations. In order to get a good clean start, the switch to the new system was to happen concurrently with a physical inventory count. To make this go quickly, McKay had stores staff pre-count and bag all loose stock ready for batching.

A minor challenge arose when the new bar code printers refused to function as intended, but the support staff at AV-Base helped resolve the problem in time to keep the implementation on schedule. Siemens said that he would rate the support provided by AV-Base at nine out of 10 because of the quality of service provided during set-up, and because of the people involved in the continuing support.

Another bonus is that WinAir comes with an automatic update routine that is capable of updating the software on the entire network in one simple process. Siemens mentioned that one of the many improvements over their previous system has been these continual automatic



improvements and upgrades to the software to satisfy AES' suggestions and requirements. By contrast, it had been three or four years since updates had been available for their old system.

Going Live With the New System

When the week arrived for the switch to using WinAir "live", an extra computer was set up in the Stores department for the set-up process, and several extra hands were commandeered from the shop floor. The three regular Stores staff were at the computers entering stock counts and generating new bar code labels, while the extra bodies moved boxes from the shelves to the computers and back again. Setting up rotables in WinAir is relatively simple since the inventory cost of repairable rotables is normally left at zero. WinAir will automatically expense rotable repair costs back to the aircraft that the parts were removed from, so that the rotables themselves can have a fixed asset value which does not interfere with day-to-day stores processes.

Once inventory was set up, the new purchasing and receiving processes were activated. Since the work order system integrates the inventory and maintenance tracking functions, and produces maintenance log reports and detailed costing, the decision was made to wait until the inventory and maintenance tracking systems were running smoothly, before introducing the improved work order processes. In the interim, temporary work orders were created for stock issues and repair charges. When the AV-Base staff left AES, the system was controlling 60% of AES' day-to-day processes, and the plan to bring the rest of the system on line was well defined.

The Follow-Up, Bad News First

We contacted AES about six months later to find out how they thought the new system had improved their efficiency, and ultimately their ability to meet the needs of their customers. Siemens, in response, had a lot to say. First, he detailed what problems remained unsolved. He told us that maintenance task control for aircraft in the field was still a challenge, particularly for those that move around a lot. Because the paperwork for certifying maintenance is generated by the planning department when the job is due, these task cards and inspection sheets must be delivered to the technician on the job, and they are currently doing this by physically moving the paper. If the aircraft has moved by the time the paper reaches it, the chase is on. On these occasions, it's difficult to avoid creating another copy of the task card.

We contacted AV-Base about this. According to Bert Vergeer, VP Marketing, "This difficulty can easily be overcome if maintenance bases have access to the internet. By installing the WinAirWeb interface on the main computer at head office, technicians in the field can access the information and functions they need from any computer, anywhere, anytime. This system works much the same way as internet banking – all the technician needs is a login ID and password, and they can print off their own task cards when the job is going to be performed. They can also perform inventory inquiries, and even update the log hours on their aircraft and print maintenance forecasts."

Since AES may have aircraft literally out in the field, where there is no internet access, this solution will not work for them. But, as Siemens stated, they have found a compromise. "We have solved this dilemma for now by allowing the engineers in the field to create their own task cards using blank forms. We have less central control, but it works reasonably well."

And, Now the Good News

We then asked Siemens what old problems had been solved. He replied: "Paper flow in general has improved a lot. We have a much better handle on what was done and when, who did the work, and who released the work. WinAir has encouraged us to become much more real-time with technical records, maintenance recording and tracking, and with inventory control. We can now actually tell exactly what parts were used for what tasks, rather than just which aircraft or work order they were issued to. We now have real live tracking of current stock levels and min/max levels in inventory. The SQL data structure allows many users access to the same information at the same time." He

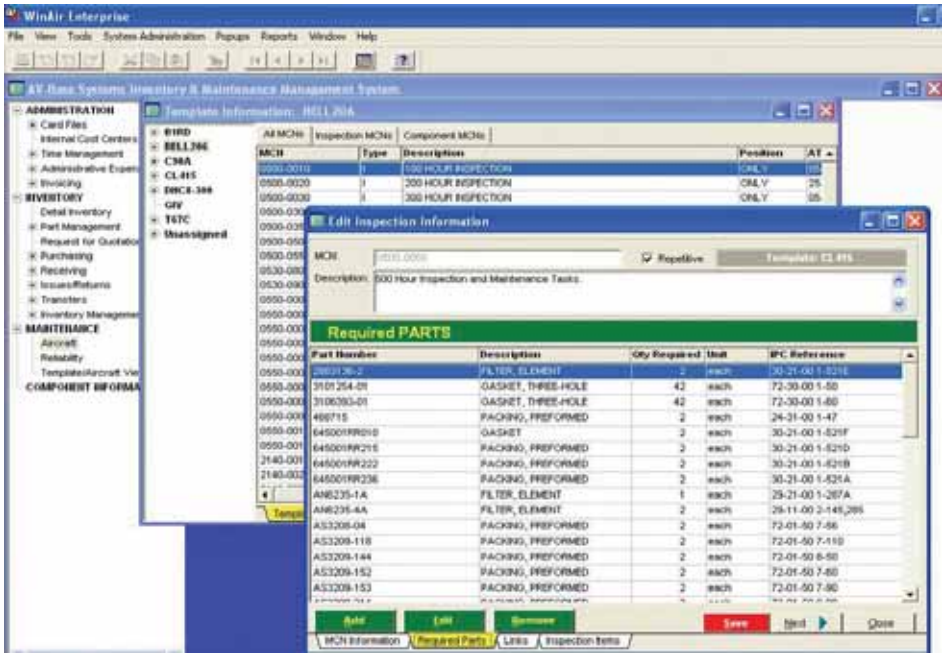
mentioned that accounting challenges are fewer too. "Instead of the Accounting department getting a mountain of paper from the Maintenance department, now they only need access to the program to get their information."

Siemens also stated that there are areas of the software in which they are not yet taking full advantage. In the future, they plan to expand into tracking Maintenance staff work hours as related to specific tasks, using the Time Cards module. This will allow them to get very accurate costs for each maintenance task, which will help with cost accounting, budgeting, and monitoring of DOCs. They plan to add to the MPLAN Templates to set up their own in-house maintenance tasks with check sheets and parts requirements. This will help them to better control regular processes that, although not scheduled, do happen regularly. They will also probably add the Enhanced Requisition/RFQ module to improve quote and purchase tracking, and perhaps the Enhanced Sales module to improve control over parts orders and sales to outside customers. Although WinAir comes with these basic features, which are adequate for many companies, larger organizations with a high volume of parts movement can benefit from the enhanced modules.

Said AV-Base's Vergeer: "We aim to rate 10 out of 10 on both product and support, and we have a team dedicated to that end."

Planning For Implementation

We asked the AV-Base implementation team to provide some advice for our readers who might be implementing a new WinAir system. Their suggestions can actually benefit all of *Vertical's* readers:



1) Consider the implementation carefully and understand the process. Plan a workable schedule, put it on paper, and follow it. Have regular meetings with staff and amend it as required.

2) Be specific about who is going to do what during the implementation process. Consider hiring some temporary help to lighten the load of your senior people when they are needed most.

3) If possible, bring over as much clean data as you can from the old system, if you have one. But, resist the temptation to move too much, as installing a new system is the perfect time for a thorough audit.

4) Pay close attention when setting up the master P/N list. Think about which P/Ns should be master numbers, and which should be alternates. Classify parts appropriately by aircraft type, as rotables vs. consumables, etc.

5) Don't be scared to pay for good training and assistance from professionals who have done this before – it's cheaper in the long run.

6) Install a temporary database to play with. It helps a great deal to be able to try out your processes without fear of making mistakes that might be hard to fix later.

Appropriately, we wanted to give the last word to the man who started the whole process at AES, their QA Manager, Harvey Siemens: "These guys have thought through the physical processes, and have made the software conform. Data entry is easy because it matches the real world."

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