

Know Your Software

Treating software on aircraft systems the same way you would a hardware part could save you a lot of headaches.

Most aircraft these days have some form of equipment with software in it, whether it be navigation/communications equipment, flight/engine instruments, or fuel control systems. Many of these systems can have a direct impact on the safe flight and landing of the aircraft.

That's why software configuration management is becoming more critical, says Andrew Rooney, CAA Team Leader Avionics.

Operators and maintainers need to ensure the correct software is installed and that appropriate updates are made.

Advisory Circular AC43-15 & AC91-18 *Aircraft Software Configuration Management* provides guidance on how to manage software and its configuration and control.

Andrew says the AC hasn't changed but it's becoming more prevalent.

"Even though we've recently introduced a streamlined process for Part 91 operators to get their navigation approvals, software control and management is still crucial. As they're applying for their approval we're asking 'who's looking after your software?' It's a really good opportunity for us to check companies' policies and plans."

What are the Pitfalls?

Andrew says operators tend to get caught out because either they don't keep their software current or they apply a software update that isn't suitable.

"We have had instances where people have inappropriately updated their

software and it's invalidated their navigation approval. We even had one instance where it caused aircraft to violate operating limits."

Clayton Hughes, CAA Avionics Support Engineer, says be aware of what you're buying and installing.

"A classic example would be navigation equipment that's sat on a shelf for a long time. It then gets installed but it could have an old software version that's no longer approved or does not have the updates installed to correct discrepancies."

Software manufacturers will send out update alerts, but the updates aren't always compatible.

"For example, even though you might have equipment made by Manufacturer X and Manufacturer X comes out and says 'update the software' the updates may not work with your aircraft or your particular configuration," says Andrew.

He says people also need to be aware that there are different levels of software.

"Some systems will have the operating system, a database of information, and possibly unique configuration files particular to that aircraft and that operation."

When a Third Party is Involved

Andrew Rooney says an operator can contract someone to take care of their software, but they need to be mindful of a couple of things.

"What we would want to see is a contract or similar agreement between

the parties and we would also review the configuration management policy of the third party that's looking after the software management."

Clayton Hughes says operators can also get caught out when sending parts away for repair.

"There have been occasions when software has been updated during the repair, with no one noticing. One way to negate this is to ensure the operator is made aware of any changes, or stipulate up-front that software changes are not to be made without letting the operator know."

Treat it Like a Part

Andrew says there needs to be a process for controlling software configuration, receiving and assessing updates, and checking and maintaining the configuration.

He recommends dealing with software the way you would a regular part.

"If you're updating a part in your aircraft, you go through a design change process to make sure that you understand the changes, the consequences of them, and if your aircraft remains safe to operate."

So test any software change before you go into a risky environment.

He says a good practice is to mark units onboard with their hardware part number, software part number, and in some cases a configuration part number.

Additionally, the maintenance records should identify the software status of all equipment fitted. ■