

**55<sup>th</sup> CONFERENCE OF DIRECTORS  
GENERAL OF CIVIL AVIATION ASIA AND  
PACIFIC REGION**

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**AGENDA ITEM 3: AVIATION SAFETY**

**NEW TECHNOLOGY AIRCRAFT IN THE PACIFIC REGION**

Presented by Fiji

**INFORMATION PAPER**

**SUMMARY**

E-enablement was established to support the integration of aircraft "IT based technology" using communication management systems on the ground and in the aircraft. (e.g. flight operations, aircraft airworthiness and maintenance, cabin operations) and IT-infrastructure to enable new airline business processes and safety controls to improve existing ones. Fiji's national carrier, Fiji Airways is adopting E-enabling to improve passenger service, increase operational efficiency, enhance aircraft performance; boost revenue and reduce costs. This will ultimately improve safety.

## NEW TECHNOLOGY AIRCRAFT IN THE PACIFIC REGION

### 1. INTRODUCTION

In many ways it can be argued that although aircraft design and operations have embraced technology and developed exponentially since the Wright Brothers first ventured into the air, it can also be said that it has retained a cautious and conservative approach to new technology.

Understandable, perhaps, but it is true that aviation has been slow to adopt "IT based technology" as part of an aircraft's configuration and has remained fixed in the conventional (and trusted) 'avionics bubble' of ARINC based, on board systems. Today, the concept of e-Enabled aircraft (the generic term given to such designs) is very much embedded in commercial aviation and a greater recognition of the benefits are being realised, not only by operators, but all stakeholders in aviation including regulators.

It was not until the very late 1990's early 2000's that manufacturers began to explore the concepts and opportunities of on-board Transmission Control Protocol [TCP] /ethernet networks and all that they have to offer. Today, many new generation aircraft are designed with this philosophy as a fundamental component of their operating systems, including the Boeing 737 MAX, B787, B777, and the Airbus A350/380. There are many e-Enabled aircraft in operation today and the technology is becoming common place, but even allowing for this, the understanding, familiarity and acceptance are not yet universal.

Undoubtedly future products from all manufacturers will feature some form of e-Enabling, so it is important to recognise the benefits and challenges and prepare for them to avoid costly future compromises and lost opportunities.

### 2. DISCUSSION

Fiji through its national carrier, Fiji Airways will see delivery of the first Max B737 aircraft in the South Pacific region in November 2018. With it comes e-Enablement.

*So what is e-Enablement and what are the benefits?*

e-Enablement, uses conventional Information Technology infrastructure and services to connect the aircraft to the airline's information networks for the exchange of data between the aircraft and a company's ground-based systems, such as Engineering, Flight Operations and Operations. This capability provides an operator with the opportunity to maximise operational efficiency in a way never before possible.

Constructed with a secure network and an on board network server, the aircraft, when configured with appropriate options, allows connectivity using a variety of methods including, WiFi, Cellular and Satellite services, with a secure IT ground infrastructure that can be used as an interface with other airline systems.

This can provide the opportunity to extract operating data from the aircraft, in real time if necessary, allowing greater insight into the aircraft condition, enabling analysis and proactive maintenance; the ordering and or creation of software parts (a 737Max has around 150 but a 787 may have as many as 500 installed in 8-900 locations); and integration with Electronic Flight Bags [EFB's] and other systems to assist with logistics and passenger operations.

It should be noted that to comply with certification requirements, the security of the aircraft network is protected using Public Key Infrastructure (PKI) encryption and certificates, together with robust business processes, which facilitate a chain of control, segregation and traceability. It should also be recognised that the aircraft systems are physically and logically separated from any public facing systems such as on board WiFi and In-Flight entertainment.

Given the above, what are the challenges of introducing such aircraft, particularly in terms of the resources, skills and infrastructure that are required.

Whilst none of the introduction activity requires skills outside of those normally found in an airline engineering or IT environment there are some components which require temporary expertise or additional learning and there are certainly some pre-conditions and requirements that need to be recognised prior to commencing an introduction of this type.

Firstly, it is almost certain, that some may view the technology with suspicion and as an unnecessary departure from convention and accepted best practice, so perhaps the first requirement of a successful introduction is familiarisation and an open minded intent to lose any prejudice and embrace the opportunities, whilst also affording the project the status and recognition that is required across all stakeholders.

Secondly, a successful outcome is dependent on three fundamental project components; People, Process and Technology.

If any of these elements are missing or in short supply the project will not be successful, so it is critically important that the required roles/skills, process development and technology elements are integrated into a single plan that recognises the dependencies on each other. It is essential that there is clear leadership of the project with active involvement of Subject Matter Experts from all of the major stakeholder groups.

Thirdly, time is the universal enemy, and unless sufficient time is allocated and planned into the project, it is unlikely that the required level of knowledge maturity, process development and technology implementation will match project expectations and operational readiness. It is therefore critical, no matter what the distractions or the thought that 'we don't have to do this yet and can start in a while' that the project starts early and isn't left to the last minute.

Fourthly, an understanding and acceptance that there is a cost to completing the project successfully, not only in procuring aircraft and ground based hardware options and software, but also in identifying, recruiting and or training resources, not only for delivering the project but also for maintaining and operating the production [frontline] processes and services.

Specific challenges for the Pacific island region are the availability of reliable telephony/internet infrastructure with the required bandwidth at economic cost, availability of hardware, software and their support and maintenance within the local economy, which may necessitate offshore supply arrangements, with the attendant logistical considerations and the availability of trained local resources in sufficient numbers to support both the introduction and line operations.

However, notwithstanding these challenges, it is obvious that the technology is here to stay, as a mainstream element of aviation and that the resources, policies and solutions to support it need to be recognised, created and fostered within the region.

### **3. ACTION BY THE CONFERENCE**

3.1 The Conference is invited to note the information contained in this Paper.

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