International Civil Aviation Organization

**WORKING PAPER**

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**(Information paper)**
**English only**

# ASSEMBLY — 40TH SESSION

## TECHNICAL COMMISSION

**Agenda Item 30: Other issues to be considered by the Technical Commission**

## REDUCED CREW OPERATIONS

(Presented by the International Federation of Air Line Pilots' Associations)


**EXECUTIVE SUMMARY**

At their 2019 Annual Conference in Berlin, the International Federation of Air Line Pilots' Associations (IFALPA) declared that "our enviable safety record and culture is based upon two properly rested, fully qualified, and well-trained pilots. It is imperative that any future evolution of this benchmark improves upon it and does not degrade the safety and security level in any area."

It is the Federation's position that because reduced crew operations carry significant additional risks over existing dual pilot operations, they will result in a serious reduction in flight safety. It is essential to fully address these risks and safety shortfalls before the industry accepts changes to the Standards which have built the safest transportation system in history.

IFALPA believes that it is critically important that all Member States are aware that some aviation stakeholders have been actively considering and planning for reduced pilot operations to one degree or another.


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| *Strategic Objectives:* | This information paper relates to Strategic Objectives to maintain the highest level of safety when introducing any new technologies to aviation. |
| *Financial implications:* | No additional resources are needed to maintain the current multi-crew operations. Extensive resources are needed to change the status quo. |
| *References:* | NASA, ALPA White Paper – The Dangers of Single Pilot Operations |

## 1. INTRODUCTION

1.1 Significant advances in automation and other technologies in recent years have led some in the aviation industry to suggest that reduced-crew or single-pilot operations could save money without compromising safety.

1.2 The objective of presenting this information paper is to educate the international aviation community about the safety concerns of IFALPA regarding reduced-crew or single-pilot operations.

## 2. DISCUSSION

2.1 Pilots mitigate safety and operational risk on a frequent basis by adapting to changes in circumstances including direction from air traffic control, weather, equipment malfunctions, airport congestion, and flight diversions. This ability to adapt to a dynamic environment is critical.

2.2 Two pilots seated side by side in the flight deck are able to closely coordinate their actions via constant communications, including nonverbal cues such as head nods and other gestures that indicate a message has been heard or a task is being performed. The pilot monitoring also plays an important role monitoring the pilot flying, watching out for errors or declines in cognitive ability. Should the pilot flying become incapacitated for health reasons during a flight, the pilot monitoring can quickly take control of the aircraft.

2.3 Under reduced-crew or single-pilot operations, a combination of autonomous systems and ground based pilots with the ability to control the aircraft would be expected to partially offset the extra workload. However, numerous studies by National Aeronautics and Space Administration (NASA) and others indicate that these proposed solutions do not provide the same safety margin as having a second qualified pilot in the flight deck. In addition to increasing workload, reduced or single-pilot operations negatively impact communication and pilot performance. They also do not defend against pilot incapacitation. Moreover, there are many examples of incidents where two pilots in the flight deck were needed to recover from equipment malfunctions that otherwise would have likely resulted in disaster.

2.4 To truly replace the second pilot in the flight deck, machines would need to replicate the sensing, assessing, reacting, adapting, and interacting capabilities of a human in a complex and dynamic environment. This level of automation is decades away from becoming reality. Current automation technology is capable of handling specific, limited tasks, but even these systems are prone to errors, which, if undetected, can be compounded over time.

2.5 There are significant human factors considerations when taking one pilot out of the physical flight deck. Extensive studies would have to be conducted in order to properly magnify the psychological implications upon the remaining flight deck crew member, often for long periods of time, and to assess how these would affect the overall safety of the operation.

2.6 The enhanced air-to-ground communications and automation capabilities necessary to implement reduced-crew or single-pilot operations could leave aircraft vulnerable to new forms of tampering or attack. Hackers might, for example, jam signals being used to remotely operate an aircraft, or even take control of a flight via cyberattack. Signal encryption is the best defense against such attacks; however, encryption introduces signal delays, often lasting for seconds, which could make it difficult to operate an aircraft remotely in an emergency. Moreover, countries have different laws governing the use of encryption technology, and some have banned it altogether.

2.7 The two-pilot minimum provides a critical layer of redundancy in the cockpit in the event that one pilot becomes incapacitated or impaired for medical reasons during flight. Should incapacitation happen during single- pilot operations, a remote pilot would be responsible for flying and landing the aircraft safely. This approach is unacceptably risky because a remote pilot lacks the full situational awareness of an onboard, alert pilot.

2.8 Although incidences of pilot incapacitation in flight are statistically rare, the sheer volume of airline aviation activity worldwide is such that they occur with some frequency.

## 3. CONCLUSION

3.1 IFALPA fully supports any developments that improve the current safety Standards in commercial air transport. Our enviable safety record and culture is based upon two properly rested, fully qualified, and well-trained pilots. It is imperative that any future evolution of this benchmark improves upon it and does not degrade the safety and security level in any area.

3.2 It is the Federation’s position that because reduced crew operations carry significant additional risks over existing dual pilot operations, they will result in a serious reduction in flight safety.

3.3 IFALPA believes that it is critically important that all Member States are aware that some aviation stakeholders have been actively considering and planning for reduced pilot operations to one degree or another.

3.4 It is essential to fully address these risks and safety shortfalls before the industry accepts changes to the Standards which have built the safest transportation system in history.

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