ALPA Japan NEWS
日乗連ニュース
www.alpajapan.org Date 2013.7.18 No. 36 – 51

発行：日本乗員組合連絡会議・ALPA Japan
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マニュアル操縦のススメ(FAA/EASA が指針を発行)

FAA（米国連邦航空局）と EASA（欧州航空安全機関）がフライトオペレーションデータ(通常フライト、インシデント、事故を含む)を分析した結果、マニュアル操作におけるエラー（Manual Handling Error）が増加していることが明確になりました。これを受け、マニュアル操縦の技術と知識を維持、向上させることは、安全な運航に不可欠であると結論付けています。

最近の航空機は、安全性向上のために自動操縦（Autopilot、Autothrottle/Autothrust）を利用することが推奨されています。一方で自動操縦を多用する結果、異常な状態（Undesired State）からの回復操作における技術低下を招いていることは否定できません。自動操縦が外れた場合や、自動操縦が使用できない状態においてパイロットが航空機を適切に操作することが求められることは当然です。

そこで、FAA は 2013 年 4 月に SAFO(Safety Alert for Operator)を発行、同月に EASA は Safety Information Bulletin を発行し、下記の事項を考慮しながらマニュアルフライトを実施するよう求めています。

・Phase of flight
・Workload conditions
・Altitude/Flight Level (non-RVSM)
・Meteorological conditions
・Traffic density
・Air Traffic Control (ATC) and Air Traffic Management (ATM) procedures
・Pilot and crew experience
・Operator operational experience

日本の乗員文化としては、条件が合えばマニュアルフライトを実施することが多いと思われますが、B787 では限定取得時の SIM 訓練でも Autothrottle を使用して場周経路飛行の科目を実施するなど、Auto Flight System を使用する頻度が高くなる傾向にあります。これが良いか悪いかを議論しているのではなく、今後は FAA や EASA の指針の通り、積極的にマニュアルフライトを取り入れる必要があり、いざという時の技量を向上させておくことが重要です。

すでに High Category Approach や RVSM 適用空域における巡航、RNP Approach 等では Autopilot/Autothrottle が必須となっています。また、2020～2025 年に試行される予定の NextGen(米国)、SESAR(欧州)、CARATS(日本)の各計画では、4 次元管制の精度向上のため多くの Phase で Manual Flight が禁止される可能性があります。つまり、空域の最適化や運航効率、運航精度の向上という目的の為に、今後もマニュアルフライトの機会がさらに減少していく可能性があります。FAA/EASA の指針は、今後も Autopilot とマニュアルフライトは両立すべきものであるとのメッセージだと言えるでしょう。

（ALPA Japan ホームページでは、このニュースに FAA/EASA 発行の指針文書を付加掲載しています）

Human Performance（HUPER）委員会

U.S. Department
of Transportation
**Federal Aviation
Administration**

SAFO

Safety Alert for Operators

SAFO 13002
DATE: 1/4/13

Flight Standards Service
Washington, DC

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo

A SAFO contains important safety information and may include recommended action. SAFO content should be especially valuable to air carriers in meeting their statutory duty to provide service with the highest possible degree of safety in the public interest. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO.

Subject: Manual Flight Operations

Purpose: This SAFO encourages operators to promote manual flight operations when appropriate.

Background: A recent analysis of flight operations data (including normal flight operations, incidents, and accidents) identified an increase in manual handling errors. The Federal Aviation Administration (FAA) believes maintaining and improving the knowledge and skills for manual flight operations is necessary for safe flight operations.

Discussion: Modern aircraft are commonly operated using autoflight systems (e.g., autopilot or autothrottle/autothrust). Unfortunately, continuous use of those systems does not reinforce a pilot's knowledge and skills in manual flight operations. Autoflight systems are useful tools for pilots and have improved safety and workload management, and thus enabled more precise operations. However, continuous use of autoflight systems could lead to degradation of the pilot's ability to quickly recover the aircraft from an undesired state.

Operators are encouraged to take an integrated approach by incorporating emphasis of manual flight operations into both line operations and training (initial/upgrade and recurrent). Operational policies should be developed or reviewed to ensure there are appropriate opportunities for pilots to exercise manual flying skills, such as in non-RVSM airspace and during low workload conditions. In addition, policies should be developed or reviewed to ensure that pilots understand when to use the automated systems, such as during high workload conditions or airspace procedures that require use of autopilot for precise operations. Augmented crew operations may also limit the ability of some pilots to obtain practice in manual flight operations. Airline operational policies should ensure that all pilots have the appropriate opportunities to exercise the aforementioned knowledge and skills in flight operations.

Recommended Action: Directors of Operations, Program Managers, Directors of Training, Training Center Managers, Check Pilots, Training Pilots, and flightcrews should be familiar with the content of this SAFO. They should work together to ensure that the content of this SAFO is incorporated into operational policy, provided to pilots during ground training, and reinforced in flight training and proficiency checks.

Contact: Questions or comments regarding this SAFO should be directed to the Air Carrier Training Branch, AFS-210, at (202) 267-8166.

EASA Safety Information Bulletin

SIB No.: **2013-05**
Issued: **23 April 2013**

Subject: Manual Flight Training and Operations

Ref. Publications:
EASA SIB 2010-33 on Automation Policy
EASA SIB 2013-02 on Stall and Stick Pusher Training
Commission Regulation (EU) 965/2012 of 5 October 2012
Commission Regulation (EC) No 59/2008 of 20 August 2008
FAA SAFO 13002 on manual flight operations

Applicability: National Aviation Authorities (NAAs), Operators, Training Organisations, Flight crews.

Description:

Modern aeroplanes are commonly operated using auto-flight systems (e.g. autopilot or auto-throttle/auto-thrust). Generally, automation has contributed substantially to the overall improvement of flight safety by increasing the timeliness and precision of routine procedures, and reducing the opportunity for errors and the associated risks to the safety of the flight. It also generally decreases workload, allowing flight crews to dedicate more attention to monitoring activities and maintaining situational awareness.

Nevertheless, continuous use of automated systems does not contribute to maintaining pilot manual flying skills. According to recent studies and publications, and the results of the EASA Cockpit Automation Survey, continuous use of auto-flight systems could lead to potential degradation of the pilot's ability to cope with the manual handling of the aeroplane. A pilot is normally required to revert to manual flight operation in case of automation failure or disconnection, or when an aircraft is dispatched with an inoperative auto-flight system.

Today, operators' automation policies, which include provisions for manual flying, vary significantly across Europe, spanning from mandating the use of full automation at all times, except take-off and landing (when not required by operations), to encouraging disconnecting the automation whenever possible, below a certain altitude/flight level.

This is information only. Recommendations are not mandatory.

This SIB is issued to remind NAAs and operators of the importance of manual flying during recurrent simulator training and also, when appropriate, during flight operations.

The overall aim is to reach an appropriate balance between the use of automation and the need to maintain pilot manual flying skills.

A similar recommendation has been issued through other publications, such as the FAA SAFO 13002.

Recommendations: Operators are encouraged to consider incorporating emphasis of manual flight operations, as a means of maintaining basic flying skills, into training (initial and recurrent) and, when feasible, line operations.

Operational principles should be developed by operators and included in their automation policy. The operator should identify appropriate opportunities for pilots to practice their manual flying skills, taking into account factors such as:

- Phase of flight;
- Workload conditions;
- Altitude/Flight Level (non-Reduced Vertical Separation Minima (RVSM);
- Meteorological conditions;
- Traffic density;
- Air Traffic Control (ATC) and Air Traffic Management (ATM) procedures;
- Pilot and crew experience;
- Operator operational experience.

Note: This is not a complete list of potential factors.

It is also important that pilots clearly understand the circumstances under which automated systems have to be used, such as during high workload conditions, while operating in traffic congested airspaces, or when following airspace procedures that require the use of autopilot for precise operations.

Therefore, the conditions and procedures for manual flying should be clearly described in the operator's manual and agreed with the competent NAA.

Furthermore, tools like Safety Management Systems (SMS) and Flight Data Monitoring (FDM) should be used by operators to closely monitor the potential impact on the number, magnitude and pattern of deviations from consolidated average flight precision, to effectively balance the benefits and the drawbacks of manual flying and adjust policies accordingly. Operators implementing an Alternative Training and

Qualification Programme (ATQP) should tailor their training programme based on available data.

Competent NAA's and operators should work together to ensure that the content of this SIB is incorporated into operational policies, provided to pilots during theoretical training, and reinforced during practical training.

Contact(s): For further information contact the Safety Information Section, Executive Directorate, EASA. E-mail: ADs@easa.europa.eu.