

**57<sup>th</sup> CONFERENCE OF  
DIRECTORS GENERAL OF CIVIL AVIATION  
ASIA AND PACIFIC REGIONS**

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AGENDA ITEM 3: AVIATION SAFETY

**RISK BASED APPROACH IN ENSURING ORGANISATION  
READINESS FOR AIRCRAFT RETURN TO SERVICE (RTS)  
ACTIVITY**

Presented by Malaysia

**SUMMARY**

*Airlines and operators have started to resume their passenger flights and to support the increase in air travel demand, aircraft that are parked or stored and sometimes for long period of time are being progressively returned to service. This paper highlights a streamlined and structured aircraft RTS process used by Malaysia based on principle of risk management with the aid of a comprehensive questionnaire checklist to ensure aircraft continued to maintain its safety level while in-service.*

## **RISK BASED APPROACH IN ENSURING ORGANISATION READINESS FOR AIRCRAFT RETURN TO SERVICE (RTS) ACTIVITY**

### **1. INTRODUCTION**

1.1 As States reopen their borders and uplifted travel restrictions, many airlines are expected to increase their level of activities to support the increase in demand for air travel.

1.2 Aircraft that are subject to parking or storage due to travel restrictions are progressively being returned to service. The RTS is performed in accordance with aircraft Original Equipment Manufacturer (OEM) instructions. While OEM addresses RTS at aircraft level, the organisational aspect supporting the RTS activity should not be taken lightly especially when the organisation is expected to RTS a significant number of aircraft. Organisations performing the function of continuing airworthiness management (CAMO) and approved maintenance organisation (AMO) both play an important role in ensuring the safe return of aircraft to service and continued safety of the aircraft while in service.

1.3 Despite aircraft manufacturers providing very detailed maintenance instructions about how to store the aircraft but there have still been some reported problems and incidents when the aircraft are returned back to service. Common ones are unreliable airspeed and altitude readings during the first flight after the aircraft comes out from storage mainly due to insect nesting or dirt build up in the aircraft's pitot tube. In some instances, take-offs have had to be abandoned or the aircraft has had to return to base.

1.4 In supporting airlines to restart their operations, Malaysia has issued guidelines for operators to ensure aircraft continuing airworthiness and the level of safety is maintained and also the required level of readiness of the operators in developing control measures to mitigate the associated risks and thus in ensuring a safe return to service of all aircraft. One of the recommendations is for organisation to develop a dedicated RTS process and plan based on its safety risk assessment (SRA).

### **2. DISCUSSION**

#### **2.1 SAFETY RISK ASSESSMENT (SRA)**

2.1.1 CAMO in close coordination with AMO should evaluate in detail the plan and process to be followed to return to service a significant number of aircraft focusing on the identification of any novel hazards and related risks for which mitigating and control measures and strategies can be defined in advance.

2.1.2 During RTS process, the operator should consider the starting point and airworthiness status of each individual aircraft including fuel conditions, supply chain, human resources, information access and exchange.

2.1.3 Operators should perform a detailed SRA to identify hazards, evaluate and take appropriate action to mitigate unacceptable safety risks, paying particular attention to human factors and human performance risks.

2.1.4 Operators should continuously monitor the effectiveness of the safety risk mitigations and if deemed necessary, perform a re-assessment.

## 2.2 **NEED FOR MECHANISM TO EVALUATE ORGANISATION LEVEL OF READINESS FOR RTS**

2.2.1 To assist operators in their RTS activities, Malaysia developed a comprehensive questionnaire checklist based on various RTS guidelines from aircraft manufacturers, CAA and other aviation bodies including industry best practices.

2.2.2 The questionnaire includes the following significant elements:

a) **At organizational level –**

Operator’s continuing airworthiness responsibilities that includes role of Accountable Manager, CAMO, AMO and their coordination in the RTS activities. CAMO should work closely with AMO to ensure that the RTS is carefully coordinated taking into consideration of all possible risks/hazards/mitigation and control measures which the airline or operator captured in its SRA.

b) **At aircraft level –**

**Cyber security.** Review of maintenance tasks due should be conducted in detail not just at the hardware level of the aircraft but equally important at the software level i.e. configuration changes or updates. Check for integrity of software and that it is not tampered with during aircraft’s parking/storage especially airborne software that operate critical system of the aircraft.

**Maintenance records.** Another important aspect is review of the aircraft’s maintenance records (maintenance work packages, maintenance tasks previously carried forward, deferred defect status, AD, LLP records, logbooks etc.) to reflect its actual maintenance configuration status, taking into consideration the aspect on ‘part robbing’ during parking/storage period. Conformance of the aircraft to the latest continuing airworthiness documents issued by the aircraft’s OEM and its CAA responsible for type design.

**Illicit changes on aircraft.** Expect the possibility of illicit changes while the aircraft was in parking/storage mode. Check that no illicit action was carried out e.g. unauthorized modification to software.

**Maintenance check flight (MCF).** If deemed necessary by the operator as part of the process for RTS to conduct MCF, the intended flight profile and functional checks should be clearly established to satisfy the requirements. As part of reducing the risk, minimize the flight test tasks and maximize ground functional checks.

### 2.2.3 **Safety Benefits**

The questionnaire checklist is a tool that will help operators and provides the following benefits:

- Ensure a streamlined, structured and standardized process
- It covers items most frequently overlooked
- Ensure important points or items on RTS are not omitted
- Provides a consistency of delivery
- Increases efficiency and effectiveness in the RTS process
- Last but not least, it increases the safety confidence of Malaysian aircraft operating cross-boundaries and facilitate acceptance of the aircraft by the other States flying in their airspace and hence help operators in their effort to restore air network and connectivity in a efficient manner.

## 2.3 **CONCLUSION**

2.3.1 Aircraft RTS activity should consider readiness at both the organisational and aircraft level. Typical surveillance and certification activity such as certificate of airworthiness (CoA) renewal covers elements of RTS at aircraft level.

2.3.2 The evaluation of organisation readiness for RTS by means of a comprehensive checklist would ensure crucial airworthiness elements are covered.

## 3 **ACTION BY THE CONFERENCE**

3.1 The Conference is invited to:

- a) Note the information contained in this paper;
- b) Encourage member states to provide technical input to strengthen this checklist;
- c) Encourage member States to consider using similar questionnaire checklist to evaluate operator's readiness to aircraft RTS;
- d) Provide a strong basis and datum for States to consider for adoption; and
- e) Discuss any relevant matters as appropriate.

— END —

**OBJECTIVE**

As borders are opening and travel restrictions are being lifted, operators are preparing to resume their passenger flights and as travel demand increases, more aircraft will be returned to service from their parking/storage conditions.

The objective of this questionnaire checklist is to establish a common platform to assist airlines and operators to determine their level of readiness and preparation to ensure safe return to service (RTS) of aircraft.

<b>Organisation Level</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Remarks</b>
1. Does the organisation develop a process and plan for RTS of aircraft in their fleet to determine what is needed to prepare and ensure a safe return of aircraft to service?				
2. Does CAMO review and ensure the organisation's CAME (continuing airworthiness management exposition) is up to date and current?				
3. Does CAMO ensure revised CAME timely submitted to CAAM for approval during RTS?				
4. Is there any change to the organization's Accountable Manager and senior management including NPH throughout the COVID-19 period and also during RTS activities?				
5. Are the Accountable Manager, Continuing Airworthiness Manager and Quality Assurance Manager aware of their responsibilities to ensure the continuous compliance to regulations and in aspects pertaining to finance, operation and organization?				
6. Have the elements below been maintained during the aircraft parking and storage and later on return to service time? a. Financial sustainability b. Adequately resources including trained staff c. Implementation of quality, safety policies and promotion of safety				
7. Does the organisation actively promote communication of safety issue and implement the safety culture during COVID-19 period and RTS activities?				
8. Has safety risk assessment been conducted by CAMO prior to putting aircraft into parking/storage and later on return to service?				
9. Does the organisation check that its SMS is still effective and relevant during the RTS period as they may be changes during Covid-19 period?				
10. Does the organization SMS focus on human factors and human performance related risks?				
11. Does the organisation identify any new hazard that may exist during the RTS period?				

12. Does CAMO check when was the last internal quality audit carried out?				
13. Was there any finding not closed during the last quality audit?				
14. Does CAMO check when was the last quality review meeting (QRM) carried out?				
15. Any significant open items from last QRM that may affect RTS?				
16. Is the RTS activities conducted by approved AMO with the correct approval rating?				
17. Is there a process and procedures for AMO to provide feedback to CAMO on any significant defects and findings during maintenance of the aircraft to return it to service?				
18. Does CAMO determine spares and parts required and available for maintenance tasks during parking/storage and return to service?				
19. Has CAMO determine availability of tools and equipment at AMO facility for maintenance tasks during parking/storage and return to service?				
20. Has CAMO ensure calibration validity period on tools and equipment?				
21. Has CAMO ensure proper supply chain agreements in place and performed as agreed to support the aircraft operation?				
22. Does CAMO communicate with TCH (type certificate holder) regarding the RTS activities to ensure compliance to latest OEM requirements?				
23. Do all the line stations under the organization re-assessed to determine their adequacy and capability to support the aircraft operations?				
24. Does CAMO establish adequacy on the number of staff available, considering specific competences, qualifications and authorisations that are required to support the RTS activities?				
25. Does CAMO and AMO assess the possibility of degradation in the level of skill and knowledge of all personnel and certifying staff due to period of reduced work or no activity during the COVID-19 crisis?				
26. Is training provided to personnel who is identified as having degradation in skill and knowledge?				
27. Does CAMO submit the monthly reliability reports during COVID-19 and RTS period to CAAM?				

28. Have the staff been correctly briefed on the procedures required during the RTS work?				
29. Are all required information in regard to parking/storage/return to service been made available to staff?				
30. Does staff have access to Instructions for Continuing Airworthiness?				
31. Does combination of above elements been considered with the determination of level of risk for RTS?				
32. Does the organisation highlight any significant defect / finding to CAAM PMI during RTS period?				
<b>Aircraft Level</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Remarks</b>
1. Does CAMO carry out audit on the aircraft while it was parked/stored to ensure required maintenance tasks are planned and actually accomplished and parking/storage instructions have been complied with?				
2. Does CAMO check on the expiration of the individual aircraft airworthiness documents – CoR, CoA etc.				
3. Has CAMO determine the defect status and maintenance forecast of the aircraft prior to parking/storage?				
4. Were Type Certificate Holder (TCH) and other Design Holders (DH) storage procedures followed throughout the full parking/storage period?				
5. Has CAMO determine which schedule maintenance tasks became overdue during the parking/storage period?				
6. Does CAMO identify any maintenance task previously carried forward?				
7. Does the CAMO assess any requirement to perform additional maintenance tasks?				
8. Does the CAMO ensure the serviceability of operational and emergency equipment?				
9. Does the organization instruct any specific inspection to be performed on contamination of fuel and fuel system?				
10. Does the organization instruct any specific inspection to be performed on contamination of air data system including the pitot tube and static port system?				
11. Does the organization instruct any specific inspection to be performed on lavatory fire extinguishing bottles on in-service aircraft that were parked or stored for prolonged period in a high-temperature environment?				

12. Does the organization schedule any specific inspection perform on obsolete or expired airborne software and ensure software at the latest version?				
13. Does CAMO review the aircraft's special approvals (SPA) – EDTO/ETOPS, RVSM, RNP etc. to ensure their validity?				
14. Does CAMO check and ensure all aircraft manuals and technical documents are up to date, current and correctly reflecting the aircraft configuration – pax/cargo operations?				
15. Does CAMO ensure aircraft technical documents that required CAAM approval are submitted in timely manner during the RTS?				
16. Is the current Airworthiness Directive (AD) status up to date?				
17. Does the post storage check content consider any new recommendations from the TCH?				
18. Any parts been robbed from the aircraft while it was parked/stored and during RTS?				
19. Is any environmental or accidental damage occur to the aircraft during parking/storage?				
20. Does the aircraft match its damage chart?				
21. Does CAMO actively monitor the current aircraft deferred defects status (including MEL / CDL)?				
22. Does cybersecurity check been considered to ensure that no security breaches have occurred? (especially, in cases where staff have been working from home)				
23. Does the CAMO assess any requirement for supplemental physical aircraft inspection and ground test as per TCH recommendations?				
24. Does the CAMO assess any need for maintenance check flight (MCF) for the aircraft or fleet?				
25. Is there any process and procedures to manage and control MCF?				
26. Does CAMO ensure that the aircraft being RTS is subject to cleaning and disinfection process?				

Recorded by:	
Signed:  Name:	Date: