

**International Maintenance Review Board Policy Board (IMRBPB)
Issue Paper (IP)**

Initial Date: 27 Apr 18

IP Number: IP 177

Revision / Date: 0

Title: Use of Engine Condition Monitoring (ECM) Update

Submitter: FAA

Issue: Use of Engine Condition Monitoring (ECM)

Applies To:	
MSG-3 Vol 1	
MSG-3 Vol 2	
IMPS	X

IP 019 was incorporated into the IMRBPB in 1997. The ECTM was a system based program that required flight crew recording of certain flight parameters and recording the applicable parameters in a logbook. The data on logbook pages were entered in a computer program that plotted the points. Analysis was performed on the plots to determine engine trends for fuel flow, EGT temperature, and engine speeds. MSG-3 is a task based logic, and ECTM is consists of a system of steps to determine engine health.

Since 1997 technology has progressed in engines to automatically download flight parameters into a ground based program and engine condition monitoring (ECM) and notification of adverse trends are performed automatically. Also technology has expanded ECM into areas where additional parameters, i.e. fuel, oil, control valves are being monitored by the FADEC to determine adverse conditions.

Current ETOPS rule requires use of ECM to determine that the engine is capable of providing maximum continuous thrust, reference below:

Part 33, Section A33.1

(c) ETOPS Requirements. For an applicant seeking eligibility for an engine to be installed on an airplane approved for ETOPS, the Instructions for Continued Airworthiness must include procedures for engine condition monitoring. The engine condition monitoring procedures must be able to determine prior to flight, whether an engine is capable of providing, within approved engine operating limits, maximum continuous power or thrust, bleed air, and power extraction required for a relevant engine inoperative diversion. For an engine to be installed on a two-engine airplane approved for ETOPS, the engine condition monitoring procedures must be validated before ETOPS eligibility is granted.

The following sections of IP 019 and IMPS address the current ECTM or ECM in the guidance:

IP 019 IMRBPB Position

- a) Engine Condition Trend Monitoring (ECTM) is not a task derived from any MSG-3 analysis it is not a maintenance task as defined by MSG-3 no maintenance task are deferred in the analysis or MRB document because of ECTM.
- b) ECTM is a monitoring process that must be accomplished by the operator (flight crew) albeit that maintenance personnel in most cases do it (the plotting) but a maintenance person (A&P) cannot sign for it on a task card.

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c) ECTM is considered part of an operator's overall reliability program (data gathering) therefore the IMRBPB did not consider this part of the MRB policy mandate and process.

d) ECTM is recognized as a valuable aid in the operator monitoring engine performance and planning related maintenance actions

Current Revision of IMPS 4.7 Specific Considerations for System/Powerplant

4.7.2 The MRBR should reflect the understanding that credit may not be taken for the existence of an Engine Condition Monitoring (ECM) program when applying MSG-3 logic. It is a valuable part of any operator's reliability program and useful in monitoring engine performance and planning maintenance actions. However, ECM-driven tasks should not replace or extend those tasks driven by MSG-3 analysis. Any reference to ECM in the PPH or MRBR should reflect this.

Problem: The current MSG-3 guidance does not allow use of ECM in a task based logic system.

Recommendation (including Implementation):

Revise IMPS section **IMPS 4.7 Specific Considerations for System/Powerplant** as follows:

4.7.2 MSG-3 logic may take credit for Engine Condition Monitoring (ECM). This could include tasks for monitoring, for example, engine fuel, oil, controlling systems.

Also, add the following to the IMPS **Appendix 4, List of Abbreviations and Glossary of Terms:**

ECM	Engine Condition Monitoring
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IMRBPB Position:

Date: 27 Apr 18

Position: Agreed to in 2018 Meeting – Closed as IP 177

Status of Issue Paper and date:

IP Template Rev 5, dated 28/04/2017

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Active

Recommendation for implementation:

Retroactive: No

Important Note: The IMRBPB IPs are not policy. An IP only becomes policy when the IP is adopted into the processes of the appropriate National Aviation Authority. However, before formal adoption, the IP content may be incorporated by the MRB applicant on a voluntary basis with the agreement of all parties as detailed in the program PPH.