

# IMRBPB Annual Meeting (IAM) Action Item 2023-03



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# Action Item (AI) 2023-03

- TCCA to develop a new regulatory CIP to cover the FDR/CVR issue related to AI 2019-06 and AI 2019-07.
- Intent: to amend MSG-3 to accommodate safety related system to produce tasks to maintain integrity of such systems (e.g. FDR, CVR, DLR, ULB/D, and ELT).

# Flight Recorder Systems

## Review of:

- ICAO SARPs
- Industry Standards
- NAA regulatory frameworks
- MRBRs

# ICAO Annex 6 and Doc 10104

Equipment	Task	Interval
CVR	Operational	Prior to first flight
	Functional	N/A
	Recording Inspection	1 or 2 years (depending on system integrity)
	Overhaul	N/A
FDR	Operational	Prior to first flight
	Recording Inspection	1 or 2 years (depending on system integrity)
	Sensor inspection/calibration	ICAs or no ICAs - 2 or 5 years (depending on sensor)
	Overhaul	N/A
DLR	Operational	Prior to first flight
	Functional	N/A
	Recording Inspection	2 or 4 years (depending on system integrity)
	Overhaul	N/A

## Recording Inspection:

**CVR:** analysis and examination of recorded data from each aircraft source and relevant external sources shall be carried out by replay to verify that all required signals meet intelligibility standards.

**FDR:** analysis and examination of recorded data, in engineering units, to evaluate the validity of all recorded parameters.

**DLR:** analysis and examination of recorded messages shall be carried out by replay.

**ULB/ULD:** no SARP on maintenance. DOC 10104 recommends following manufacturer's recommendations.

# EUROCAE ED-112A and SAE 8045A

Equipment	Task	Interval
CVR	Operational	Daily
	Functional	6 months
	Recording Inspection	1 to 2 years (depending on system integrity)
	Overhaul	N/A
FDR	Operational	Pre-flight
	Recording Inspection	1 or 2 years (depending on system integrity)
	Sensor inspection/calibration	15000 HRS/ 60 months (or by analysis of system)
	Overhaul	Manufacturer's recommendations (MR)
DLR	Operational	N/A
	Functional	24 months
	Recording Inspection	2 or 4 year (depending on system integrity)
	Overhaul	MR
ULB/ULD	Operational	MR (voltage and operation)
	Battery Replacement	MR

# NAA Regulatory Framework

Equipment	Task	Interval – NAA #1	Interval – NAA #2	Interval NAA #3
CVR	Operational	Daily	ICA	Daily or every 7 days
	Functional	12 months or 3000hrs	ICA	1 or 2 years (system integrity)
	Recording Inspection	12 months or 3000hrs (Intelligibility)	ICA	1 or 2 years (system integrity)
	Overhaul	MR	N/A	
FDR	Operational	N/A	ICA	Daily or every 7 days
	Recording Inspection	12 months or 3000hrs	ICA	1 or 2 years (system integrity)
	Sensor inspection/calibration	MR	ICA	MR or every 5 years
	Overhaul	MR	N/A	N/A
DLR	Operational	Daily	ICA	
	Functional	N/A	ICA	
	Recording Inspection	12 months – 3000hrs	ICA	
	Overhaul	N/A	N/A	
ULB/ULD	Operational	12 months	ICA	
	Battery Replacement	MR	ICA	

# MRBR Tasks

Equipment	Task	MRBR #1	MRBR #2	MRBR #3
CVR	Operational (OPC)	3 years	12000 flight hours (FH)	6000 FH or 18 months
	Functional	N/A	N/A	N/A
	Recording Inspection	N/A	N/A	N/A
	Overhaul	N/A	N/A	N/A
FDR	Operational (OPC)	N/A	12000 FH	N/A
	Recording Inspection	24 months	N/A	6000 FH or 18 Months
	Sensor inspection/calibration	N/A	N/A	N/A
	Overhaul	N/A	N/A	N/A
DLR	Operational (OPC)	N/A	N/A	N/A
	Functional	N/A	N/A	N/A
	Recording Inspection	N/A	N/A	N/A
	Overhaul	N/A	N/A	N/A
ULB/ULD	Operational (OPC)	3 years	12000 FH	2 years
	Battery replacement (DIS)	MR	MR	MR

# Results of Review

- **Not all NAA's aligned to ICAO Annex 6 and/or industry standards:**
  - Some are aligned and some are not.
- **Different MSG-3 outcomes:**
  - Intervals different,
  - Types of tasks and procedures are different (e.g., intelligibility, reasonableness, correlation, inspection, etc.),
  - MSG-3 task terminology/criteria not aligned with industry standards.
- **MRBRs reviewed – tasks are FEC 9.**

Is it MRB process? Is it PPH procedures?

Is it MSG-3? Is it WG assumptions?

# Results of Review (cont'd)

## IMPS and MSG-3

- **Influence of National requirements (IP 169):**
  - IP trying to solve the problem of some safety/emergency equipment may not have been identified as an MSI.
  - IMPS (chapters 4 & 5) and MSG-3 (2-1-2.3 & 2-3-1) amended to state the development of scheduled maintenance shall not be unduly influenced by National Requirements, which was intended to mean the MSI selection process should not be influenced.
  - May have helped with the identification of an MSI but may have prevented task selection?

# Results of Review (cont'd)

## MSG-3 Analysis

- **Even if functional failures (evident or hidden) are identified, lack of direct adverse effect to safety:**
  - E.g., prevent the continued safe flight and landing.
- **Definition of safety/emergency systems or equipment:**
  - Flight data recorders do not enhance aircraft evacuation, and
  - When failed, does not have an adverse effect on safety.
- **Does not consider other functions of recorder or equipment:**
  - Such as, data integrity, data preservation, use for accident/incident investigation and associated recommendations, and SAR.
- **Current MSG-3 task selection is not aligned with typical tasks associated with recorder system maintenance.**

# Potential Options

- 1. NAA's have a responsibility to establish/maintain national requirements inline with ICAO and industry standards:**
  - Daily, Operational Check, and Recording inspection.
  - Not sure if all NAAs follow ICAO requirements or if they have filed a difference.
- 2. Amend MSG-3 to ensure systems/equipment used for accident/incident investigation and SAR purposes are analyzed:**
  - Impact on definitions such as safety (adverse effect), direct adverse effect on operating safety, safety/emergency systems or equipment and MSI.
  - Impact on logic diagram and analysis.
- 3. Develop new analysis to address systems/equipment used for accident/incident investigation and SAR purposes, which may include flight recorders (FDR/CVR/DLR), ULD, and distress transmitters such as ELT and GADSS.**

# Option 3 - New logic in MSG-3

- **New definitions required to address systems/equipment used for accident/incident investigation and search and rescue purposes.**
- **New logic analysis to consider:**
  - Recording, data accuracy, integrity/preservation, location transmissions, as part of the analysis procedure (Functions, functional failures, failure effects, failure causes),
  - International maintenance standards need to also be considered (type of task, intervals, how to perform).
- **Where would it fit into MSG-3?**
  - Part of current MSI selection?
  - New dedicated MSI item? [e.g., MSI-AI (accident-investigation)];
  - As part of 2.3 Aircraft Systems/Powerplant analysis procedure?
  - New 2.7 after L/HIRF?

# Option 3 – Road Map

- Gather examples of analysis for these systems (next 6 months),
- Review examples and draft CIP (March 2025),
- Send draft CIP out for review (April 2025),
- Review CIP during 2025 IAM,
- Revise CIP based on comments received following 2025 IAM,
- Prepare and submit final version of the CIP (February 2026),
- Review CIP during 2026 IAM.

# Questions?

