

Issued 1993-02
Revised 2000-07
Reaffirmed 2007-07

Superseding ARP4102/15

Electronic Data Management System (EDMS)

RATIONALE

This document has been reaffirmed to comply with the SAE 5-Year Review policy.

1. SCOPE:

This SAE Aerospace Recommended Practice (ARP) recommends criteria for an Electronic Data Management System (EDMS) for use on the flight deck of transport aircraft. The EDMS may be the primary, and in some cases sole, on board source of documentation and information for flight operations, engineering, aircraft maintenance, cabin services, and training. This document addresses flight operations applications only. It addresses the requirements for the flight deck characteristics of airborne equipment elements for an Electronic Data Management System (EDMS), but not the ground support system requirements. Development of ground support systems for EDMS will be a significant task, which must take account of the end-user information handling requirements specified here. An Electronic Library System (ELS) is a partial implementation of EDMS, which incorporates only the data storage, retrieval and display functions. The appropriate aspects of this document are applicable to Electronic Library Systems.

2. REFERENCES:

2.1 Applicable Documents:

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2007 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
<http://www.sae.org>

SAE WEB ADDRESS:

<http://www.sae.org>

SAE ARP4102/15 Revision A

2.1.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

ARP4101	Flight Deck Layout and Facilities
ARP4102	Flight Deck Controls and Displays
ARP4102/7	Electronic Displays
ARP4102/14	Full Format Printer
ARP4105	Abbreviations and Acronyms
ARP4032	Human Engineering Considerations in the Application of Color to Electronic Aircraft Displays
ARP4033	Pilot/System Integration

2.1.2 ARINC Publications: Available from Aeronautical Radio Inc., 2551 Riva Road, Annapolis, MD 21401.

ARINC 649 Electronic Library Systems

2.2 Definitions:

INFORMATION: Entire content, including alpha-numerics and graphics.

PAT (PILOTS ACCESS TERMINAL): A display unit and its associated control facilities, intended for use by crew members in the flight deck.

PAPERLESS OPERATION: "Paperless" operation will be achieved by a system which permits operation of an aircraft without the need for physical transportation of hard copy through the aircraft doors in either direction.

PERMANENT DATA: Data which is valid for more than one flight.

TEMPORARY DATA: Data which is valid for a single flight.

TRANSIENT DATA: Data which is valid for less than a complete flight.

3. SYSTEM OBJECTIVES:

3.1 EDMS shall be designed with the long-term vision of achieving "paperless" (fully digital) operation with at least the same total level of safety as is associated with hard copy operation.

3.2 EDMS should be capable of a very high degree of flexibility in accepting and presenting customer airline data. Ease of customization to operators' individual requirements shall be such as to permit interchange of aircraft between operators on a routine basis. Further information on the requirement for portability of system characteristics across multiple aircraft types and operators is contained in Appendix A.

3.3 There should be no significant extra training associated with the system.

- 3.4 The EDMS shall provide all the flexibility of current document based systems. The principles of classifying operational information described in this document shall be adopted to ensure that the system interface design does not inhibit this essential flexibility.

"Paperless" operation will be achieved by a system which permits operation of an aircraft without the need for physical transportation of hard copy documentation through the aircraft doors in either direction. The phrase "permits operation" recognizes that there may be functions for which paper copy is still either desired by the airline, or required by external agencies, notwithstanding the fact that the data may be created or stored in digital form. What specific functions these are shall be entirely determined by the operator and not be limitations imposed by the EDMS. The phrase "in either direction" recognizes that small but significant items of data are generated on the aircraft itself in the form of reports, logs, etc. The EDMS should accommodate such documents.

- 3.5 Due to the evolutionary nature of EDMS, an interim objective of operation with "Less Paper" is a necessity. In this evolving continuum, the EDMS should produce:

- a significant reduction in information support costs on aircraft types on which the system is implemented;
- no excessive temporary increase in overall information support cost for the airline while operating with a mixed EDMS/paper fleet;
- a clear upgrade path to paperless operation.

"Less Paper" operation is achieved by a system which requires only the minimum amount of information acceptable to the certification authorities concerned to be retained in non-EDMS form. However, operation with more than this minimum non-EDMS or hard copy information shall not be prevented by the system design. It shall be at the discretion of the operator of an EDMS-equipped aircraft to determine how much paper over and above the minimum is actually retained.

A "Less Paper" system should be capable of producing both electronic and paper output to meet the requirements of:

- the airline's Flight Operation Department;
- other airline departments;
- external agencies.

- 3.6 The definition of the "minimum information" shall be undertaken by collaboration between the airframe and equipment vendors, the operator, and the certification authorities. It should take the form of a statement of the information required to operate the aircraft at an adequate level of safety following the in-flight loss of information contained in the EDMS. This shall take into account the circumstances under which the loss of EDMS information might occur, including the operational environment in which the aircraft will be utilized.

3.7 The medium on which the minimum non-EDMS information is stored should not be restricted to paper. In considering the acceptability of other media, there should not be a higher requirement for redundancy, accuracy, and integrity than is achieved by current information supply methods.

3.8 For "paperless" operation as described previously, the EDMS shall provide the "minimum information" via either internal or associated external devices which have a reliability adequate to assure the required overall level of safety. The internal or external devices shall remain fully functional under all the circumstances in which the minimum information was determined to be applicable, e.g., including total loss of aircraft power supplies.

4. OPERATIONAL REQUIREMENTS:

4.1 General:

4.1.1 Whenever the EDMS replaces printed documentation, the information required for the safe conduct of the flight shall be available throughout the flight.

4.1.2 The EDMS information shall be accessible and usable on the aircraft both in flight and on the ground.

4.1.3 The EDMS should accommodate connection to ground networks for updating and exchange of data as needed.

4.1.4 The EDMS shall allow fast and easy access and shall display only the requested information. Information relative to emergency and abnormal procedures shall be available in a time frame not greater than that commensurate with current paper checklists.

4.1.5 Operation of the EDMS shall not require any special skills.

4.1.6 An EDMS terminal should be provided for each crew member. If a single unit is installed for the pilots, it shall be accessible to both pilots.

4.1.7 The system shall be capable of prioritizing user terminals, with the pilot's terminal having the highest priority.

4.1.8 The information shown on each pilot's EDMS display shall only change in response to action by that pilot. If other systems such as EFIS use information stored on the EDMS, these displays may change as appropriate for the requirements of such systems.