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Human Factor Considerations in the Design of Multifunction Display Systems for Civil Aircraft

FOREWORD

This Aerospace Recommended Practices (ARP) document contains information developed by the SAE G-10 Multifunction Display (MFD) Subcommittee that is intended to be used for guidance in the design of multifunction display systems to be installed in a civil aircraft flight deck.

Modern technology has made it possible to install electronic flight instruments, either head-down or head-up, that are capable of providing flight information previously displayed on electro-mechanical instruments. In addition, systems can be designed to provide a flight crew selectable display of information from several systems on the same unit, either individually, or in combinations of two or more sets of information. The integration of new systems, such as traffic information, navigation, terrain guidance, geographical mapping functions, data link and weather, among others, into the flight deck, where space is at a premium, has created the need to integrate these functions into multifunction flight deck display systems.

The additional information provided by the new systems is extremely valuable in improving flight crew situational awareness (to include single pilot operation), communications, and efficiency, and overall safety of modern flight. However, there is a danger of overloading flight crews and not gaining full benefit from the systems. To avoid this, it is important that guidelines and standards for the design and integration of MFDs be developed, particularly in areas related to human performance and limitations, perception, ergonomics, cognitive abilities, automation and information processing. These data should be applied in conjunction with a complete task analysis to ensure that system performance requirements are well defined prior to the actual integration and implementation of the functioning MFD system. The overall goal is to minimize flight crew task loading and enhance human performance consistent with the overall required performance and safety goals of the aircraft system.

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TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)