FAS Topic Paper (FTP)

TITLE	REVISION	REVISION DATE
FTP1042 Test Case Definition	3	21-Sep-2022

ABSTRACT/PURPOSE:

DO-178C/ED-12C and DO-278A/ED-109A define "Test Case" as "A set of test inputs, execution conditions, and expected results developed for a particular objective, such as to exercise a particular program path or to verify compliance with a specific requirement." This paper clarifies an industry raised issue concerning the current definition such that the text "exercise a particular program path" may seem to authorize structural testing.

RELATED DO/ED DOCUMENTS:

_**X**_ DO-178C/ED-12C: SW Airborne Sys & Equip
_**X**_ DO-278A/ED-109A: SW (CNS/ATM) Systems
____ DO-248C/ED-94C: Supporting Information
____ DO-330/ED-215: Software Tool Qualification Considerations
____ DO-331/ED-218: Model Based Development & Verification Supplement
____ DO-332/ED-217: OO Technology and Related Techniques Supplement
____ DO-333/ED-216: Formal Methods Supplement
____ Other

For internal use only—This paper is based on internal FAS FTP1042 Revision 8

Any FAS Topic Papers released by FAS have been coordinated among the members of the FAS group and have been approved by the FAS executive management committee for release.

These papers do not constitute official policy or position from RTCA / EUROCAE or any regulatory agency or authority. These documents are made available for educational and informational purposes only

The present document was jointly developed by the EUROCAE / RTCA User Group 'Forum for Aeronautical Software' (FAS) and as such remains the exclusive intellectual property of EUROCAE and RTCA.

In order to maximize the use of the document and the information contained, the material may be used without prior written permission in an unaltered form with proper acknowledgement of the source.

The text contained in this document is not to be construed as guidance, but is to be used for informational or educational purposes only.

FAS Team Definition and Goals:

The FAS user group monitors and exchanges information on the application of the following "software document suite" that was developed by joint RTCA/EUROCAE committee SC-205/WG-71:

- DO-178C/ED-12C - Software Considerations in Airborne Systems and Equipment Certification
- DO-278A/ED-109A - Software Integrity Assurance Considerations for Communication, Navigation, Surveillance and Air Traffic Management (CNS/ATM) Systems
- DO-248C/ED-94C - Supporting Information
- DO-330/ED-215 - Software Tool Qualification Considerations
- DO-331/ED-218 - Model Based Development & Verification Supplement
- DO-332/ED-217 - Object Oriented Technology and Related Techniques Supplement
- DO-333/ ED-216 - Formal Methods Supplement

The goals of the FAS user group are as follows:

1. To share lessons learned in the use of the RTCA/EUROCAE "software document suite" and to encourage good practices and promote the effective use of RTCA's and EUROCAE's publications.
2. To develop FAS Topics Papers (FTPs) relative to RTCA's and EUROCAE's publications or other related aeronautical software industry topics. These FTPs may include clarification to the "software document suite" or a discussion on a new topic.
3. To identify and record any issues or errata showing the need for clarifications or the need for modifications to the "software document suite".

The FAS user group <u>does not</u> have the authority to change the content of any approved RTCA/EUROCAE documents. Any publications of the FAS user group may be taken into consideration by a future RTCA/EUROCAE working group.

The text contained in this document is not to be construed as guidance, but is to be used for informational or educational purposes only.

Abstract / Purpose of the FAS Topic Paper:

DO-178C/ED-12C and DO-278A/ED-109A define "Test Case" as:

"A set of test inputs, execution conditions, and expected results developed for a particular objective, such as to exercise a particular program path or to verify compliance with a specific requirement."

This paper clarifies an industry raised issue concerning the current definition such that the text *"exercise a particular program path"* may seem to authorize structural testing.

FTP Discussion:

Issue from Industry:

The current definition of "Test Case" in the glossaries of DO-178C/ED-12C and DO-278A/ED-109A contains the text:

"... such as to exercise a particular program path ...",

which may infer the allowance of structural testing.

Response from FAS:

It is the opinion of FAS that, for all Levels A to D, software requirements-based test cases should be developed to assure specific software requirements are correctly implemented and robustly verified.

Level D software assurance involves high-level software requirements-based testing only including the definition of test cases, but does not require structural coverage which further supports that test cases are not structurally based.

DO-248C/ED-94C FAQ #44 explains the difference between structural coverage analysis and structural testing, and that structural testing is not a DO-178C/ED-12C and DO-278A/ED-12C/ED-109A requirement.

_____