

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions.....	7
4 Symbols.....	10
5 General.....	11
5.1 Fault tree description and structure.....	11
5.2 Objectives.....	12
5.3 Applications.....	12
5.4 Combinations with other reliability analysis techniques.....	13
6 Development and evaluation.....	15
6.1 General considerations.....	15
6.2 Required system information.....	18
6.3 Fault tree graphical description and structure.....	19
7 Fault tree development and evaluation.....	20
7.1 General.....	20
7.2 Scope of analysis.....	20
7.3 System familiarization.....	20
7.4 Fault tree development.....	20
7.5 Fault tree construction.....	21
7.6 Failure rates in fault tree analysis.....	38
8 Identification and labelling in a fault tree.....	38
9 Report.....	39
Annex A (informative) Symbols.....	41
Annex B (informative) Detailed procedure for disjointing.....	48
Bibliography.....	52
Figure 1 – Explanation of terms used in fault tree analyses.....	10
Figure 2 – Fault tree representation of a series structure.....	23
Figure 3 – Fault tree representation of parallel, active redundancy.....	24
Figure 4 – En example of fault tree showing different gate types.....	26
Figure 5 – Rectangular gate and events representation.....	27
Figure 6 – An example fault tree containing a repeated and a transfer event.....	28
Figure 7 – Example showing common cause considerations in rectangular gate representation.....	28
Figure 8 – Bridge circuit example to be analysed by a fault tree.....	32
Figure 9 – Fault tree representation of the bridge circuit.....	33
Figure 10 – Bridge system FTA, Esary-Proschan, no disjointing.....	35

Figure 11 – Bridge system probability of failure calculated with rare-event approximation 36

Figure 12 – Probability of occurrence of the top event with disjointing..... 37

Figure A.1 – Example of a PAND gate 47

Table A.1 – Frequently used symbols for a fault tree..... 41

Table A.2 – Common symbols for events and event description 44

Table A.3 – Static gates..... 45

Table A.4 – Dynamic gates 46