

Table of contents

| | |
|---|-----------|
| Foreword | 4 |
| Introduction | 4 |
| 1 Scope | 6 |
| 2 Normative references | 7 |
| 3 Terms, definitions and abbreviated terms | 8 |
| 3.1 Terms from other standards..... | 8 |
| 3.2 Terms specific to the present standard | 8 |
| 3.3 Abbreviated terms..... | 9 |
| 4 The OBCP concept | 11 |
| 4.1 Introduction..... | 11 |
| 4.2 Stakeholders and application areas for OBCPs | 11 |
| 4.2.1 Stakeholders | 11 |
| 4.2.2 Domains of OBCP application | 12 |
| 4.3 Types of OBCP | 13 |
| 4.4 The OBCP system | 14 |
| 5 OBCP system capabilities | 17 |
| 5.1 OBCP structure | 17 |
| 5.2 OBCP language capabilities | 18 |
| 5.2.1 Introduction | 18 |
| 5.2.2 General | 18 |
| 5.2.3 Data types..... | 18 |
| 5.2.4 Declarations | 19 |
| 5.2.5 Assignments | 19 |
| 5.2.6 Expressions | 19 |
| 5.2.7 Flow controls..... | 20 |
| 5.2.8 Waits..... | 20 |
| 5.2.9 External interactions..... | 21 |
| 5.2.10 Contingency handling..... | 22 |
| 5.3 The OBCP preparation environment..... | 22 |

| | | |
|----------------|--|-----------|
| 5.3.1 | OBCP script preparation | 22 |
| 5.3.2 | Syntax analysis, consistency, dependency and constraint checking | 23 |
| 5.3.3 | Report generation | 23 |
| 5.3.4 | Verification and validation | 23 |
| 5.3.5 | OBCP characterisation..... | 24 |
| 5.4 | The OBCP execution environment..... | 25 |
| 5.4.1 | Ground capabilities | 25 |
| 5.4.2 | OBCP monitoring and control..... | 25 |
| 5.4.3 | OBCP integrity | 28 |
| 5.4.4 | On-board capabilities | 28 |
| 6 | OBCP engineering processes | 33 |
| 6.1 | Introduction..... | 33 |
| 6.2 | Overall management process of the OBCP system | 34 |
| 6.2.1 | Management process..... | 34 |
| 6.2.2 | OBAP vs. OBSW: criteria and trade-off analysis | 37 |
| 6.2.3 | OBOP vs. ground-based operations..... | 38 |
| 6.2.4 | Trade-off between OBCP engine capability and engineering effort | 39 |
| 6.2.5 | Overall organization and management..... | 39 |
| 6.3 | OBCP engineering..... | 40 |
| | Bibliography..... | 41 |
| | | |
| Figures | | |
| | Figure 4-1 The OBCP system..... | 15 |
| | Figure 5-1: OBCP state diagram | 26 |
| | Figure 6-1: Lifecycles of OBCPs originating from the different domains | 34 |
| | Figure 6-2: OBCP management overview | 36 |
| | Figure 6-3: Synchronisation of OBAP lifecycles with system and OBSW lifecycles | 36 |