

Future flight systems – Operational design domain taxonomy – Specification

March 2025 Version 2



BSI Flex 1904 v2.0:2025-03

This report was commissioned by the Future Flight Challenge Fund



Delivered by
Innovate UK
and ESRC



Publishing and copyright information

The BSI copyright notice displayed in this document indicates when the document was last issued.

© The British Standards Institution 2025
Published by BSI Standards Limited 2025

ISBN 978 0 539 27196 6

ICS 03.220.50, 21.020, 49.020

No copying without BSI permission except as permitted by copyright law.

BSI's Flex standards provide a new, flexible way to develop consensus-based good practice that dynamically adapts to keep pace with fast-changing markets. For more information, go to: <https://www.bsigroup.com/en-GB/our-services/standards-services/flex>

Release history

First version September 2024
Second version March 2025

Contents

Foreword	ii
Introduction.....	iv
1 Scope.....	1
2 Normative references	2
3 Terms, definitions, symbols and abbreviated terms	3
3.1 Terms and definitions.....	3
3.2 Symbols.....	3
3.3 Abbreviated terms	3
4 ODD requirements and application	4
5 ODD taxonomy	5
5.1 Top level.....	5
5.2 Scenery.....	6
5.3 Environment.....	8
5.4 Dynamic elements	12
Annexes	
Annex A (informative)	
RPAS case study	13
Annex B (informative)	
ODD definition presentations.....	15
B.1 Overview.....	15
B.2 Checklist for an ODD definition.....	16
B.3 Textual description of an ODD definition	17
B.4 Pictorial representation of an ODD definition.....	18
B.5 ODD definition lifecycle	19
B.6 Design lifecycle	19
B.7 Operational lifecycle	19
B.8 Events.....	20
Bibliography	21
List of figures	
Figure 1 – Top-level taxonomy with ODD attributes	5
Figure B.1 – A pictorial representation of an ODD	18
List of tables	
Table B.1 – An example tabulated checklist	16

Foreword

This BSI Flex is part of BSI's Future of Flight Standards programme, sponsored by UK Research and Innovation (UKRI). Its development was facilitated by BSI Standards Limited and it was released under licence from The British Standards Institution. It came into effect on 31 March 2025.

Acknowledgement is given to Matt Osborne, University of York, as the technical author, and the following organizations that were involved in the development of this BSI Flex as members of the Advisory Group:

- ANRA Technologies
- Connected Places Catapult
- Coventry University
- Ericsson
- Met Office
- Skypointe
- UK Research and Innovation (UKRI)
- University of Warwick
- University of York

The British Standards Institution retains ownership and copyright of this BSI Flex. BSI Standards Limited, as the publisher of the BSI Flex, reserves the right to withdraw or amend this BSI Flex on receipt of authoritative advice that it is appropriate to do so.

This BSI Flex is not to be regarded as a PAS or British Standard.

The BSI Flex process enables a standard to be rapidly developed, on an iterative basis, in order to fulfil an immediate stakeholder need. A BSI Flex can be considered for further development as a PAS or British Standard, or constitute part of the UK input into the development of a European or international standard.

The content in this version is part of an iterative process. It is likely to change from time to time with subsequent iterations.

Supersession

This version of BSI Flex 1904 supersedes BSI Flex 1904 v1.0:2024-09, which is withdrawn.

Relationship with other publications

This BSI Flex is part of BSI's Future Flight Standards programme, which includes the following standards:

- BSI Flex 1903 v2.0:2024-06, *Future flight systems – Vocabulary*
- PAS 1905:2024, *Future flight systems – Regulatory principles, management systems and life cycle assurance processes – Guide*
- BSI Flex 1906 v1.0:2025-03, *Future flight systems – Acceptable means of compliance to specific operation risk assessment (SORA) for uncrewed aircraft systems (UAS) – Guide*

Information about this document

This is Version 2 of BSI Flex 1904, which is the last planned version of the document. All comments received will be reviewed to inform the future direction of this document. Interested parties are encouraged to check the BSI website for updates regarding any future plans.

This is a full update of the document, and introduces the following principal changes:

- the title has been amended to align the introductory element with other standards in BSI's Future Flight Standards programme;
- a note has been added to the Scope to clarify the use of this BSI Flex with safety cases;
- definition of "ODD developer" added to Clause 3;
- a note has been added to Clause 4 to clarify when an ODD is constructed within the design lifecycle;
- a requirement and note has been added to Clause 4 to clarify the extensibility of the ODD;
- a note has been added to 5.3.3 covering the assessment of weather attributes occurring concurrently;
- information has been added to B.1 about taking an inclusive approach to ODDs;
- B.5 has been added to add further context on the lifecycle of the ODD definition; and
- a link to the Radio Technical Commission for Aeronautics (RTCA) document DO-160G has been added for further reading.

This publication can be withdrawn, revised, partially superseded or superseded. Information regarding the status of this publication can be found in the Standards Catalogue on the BSI website at knowledge.bsigroup.com, or by contacting the Customer Services team.

Where websites and webpages have been cited, they are provided for ease of reference and are correct at the time of publication. The location of a webpage or website, or its contents, cannot be guaranteed.

Presentational conventions

The provisions of this document are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the *Shorter Oxford English Dictionary* is used (e.g. "organization" rather than "organisation").

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

Compliance with a BSI Flex cannot confer immunity from legal obligations.

In particular, attention is drawn to the Air Navigation Order 2016 [1].

Introduction

UK Research and Innovation (UKRI) is looking to create a common safety assurance framework for automated, semi-autonomous or remotely piloted system transport systems¹⁾. As part of this work, there is a desire to create standardized frameworks and taxonomies that can be applied across different modes of transport – an operational design domain (ODD) being one of the desired taxonomies.

This BSI Flex provides the taxonomical structure for an ODD to be developed within the future flight ecosystem. An ODD developer uses this ODD taxonomy and by establishing the description of the intended operating environment, an ODD definition is created.

This taxonomy for an ODD also aims to address the following challenges within the future flight ecosystem.

a) Consistency of concept of operations (ConOps)

There is currently no consistent way of describing the operating environment when writing ConOps to support an operational authorization application to the Civil Aviation Authority (CAA).

b) The use of pre-defined risk assessments (PDRA)

A key requirement within PDRA is the ability to define the operating environment in a way in which operators can clearly demonstrate compliance. An ODD provides a framework and taxonomy to support this.

c) Specific operating risk assessments (SORA)

Similarly to PDRA, the ODD provides a common reference for describing the operating environment, which is particularly relevant for ground and air risk mitigations.

This BSI Flex builds upon the work of PAS 1883:2020²⁾ and tailors its relevance for use with an automated, semi-autonomous or remotely piloted system on an aircraft operating in the future flight ecosystem.

BS ISO 34503:2023 provides the latest specification of a generic ODD taxonomy for testing, trialling and deployment environments for automated driving systems, and provides some insights into how the use of ODD taxonomies and ODD definitions in the future flight ecosystem could develop in the future.

¹⁾ See the *Cross domain safety assurance framework for automated transport systems* (available at https://warwick.ac.uk/fac/sci/wmg/safeautonomy/ukriflf/cross_domain_safety_assurance_framework_for_automated_systems.pdf) for further information.

²⁾ PAS 1883:2020 is withdrawn and has been superseded by PAS 1883:2025, which is now a guide to the implementation of BS ISO 34503:2023.

1 Scope

This BSI Flex specifies the ODD taxonomy for an automated, semi-autonomous or remotely piloted system on an aircraft operating in the future flight ecosystem; which could be flown by a decentralized flight crew, and which could be flying beyond visual line of sight (BVLOS).

This BSI Flex is limited to UK airspace.

This BSI Flex does not cover:

- a) how an ODD definition is created;
- b) how an ODD is safety assured;
- c) dedicated maritime operations; or
- d) the impact on, or the relationship between, the ODD and operational considerations, operating scenarios and the aircraft's capabilities.

NOTE 1 *Dedicated maritime operations are defined as take off/landing on a ship or a platform's flight deck at sea.*

This BSI Flex is intended for aircraft manufacturers and system developers, aircraft owners, aircraft operators, flight crew and safety-related systems practitioners.

This BSI Flex might also be of interest to regulators, safety assessors, emergency services, local authorities and other operators of aircraft systems in UK airspace.

NOTE 2 *This BSI Flex might be of use to those developing concepts of operation or other systems for aircraft operating in the future flight ecosystem.*

NOTE 3 *This BSI Flex might be of use to those operating an uncrewed aircraft system (UAS) operating BVLOS.*

NOTE 4 *An ODD definition created from this taxonomy might be useful for safety-related system practitioners developing system safety cases.*

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions, or limits the application, of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Standards publications

BSI Flex 1903 v2:2024-06, *Future flight systems – Vocabulary*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions in BSI Flex 1903 v2.0:2024-06 and the following apply.

3.1.1 airspace

three dimensional space (e.g. the x, y, and z axis) in which an aircraft fulfils a planned sortie

NOTE A sortie comprises take-off, flight and subsequent landing.

3.1.2 dynamic elements

all movable objects and actors both in the air and on the ground in the ODD in a given timeframe

3.1.3 environment

weather and other atmospheric conditions

[SOURCE: PAS 1883:2020, 3.1.6]

3.1.4 ODD developer

individual, or group of individuals who are responsible for the creation and maintenance of the ODD definition

3.1.5 scenery

non-movable objects in the future flight aircraft system's operating environment

3.2 Symbols

For the purpose of this document, the following symbols apply.

Symbol	Unit
kt	knots
lx	lux
mm/h	millimetres per hour

3.3 Abbreviated terms

For the purpose of this document, the following abbreviated terms apply.

Abbreviation	Unit
EDR	eddy dissipation rate
MSL	mean sea level