

SG-OBST-DPS

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abstract **This document describes the content and structure of the AIXM5.1 Obstacle Data Set.**

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## **1 Overview**

### **1.1 Names and Acronyms of the Data Product**

This Data Product Specification (DPS) describes the data product AIXM5.1 Obstacle Data Set.

### **1.2 Content**

#### **1.2.1 Aeronautical Data Items**

The data product is a collection of Swiss aeronautical data of the FeatureClass "VerticalStructure", known as obstacles. The data items are following the Aeronautical Information Exchange Model (AIXM5.1) of Eurocontrol and FAA.

#### **1.2.2 Temporality**

All data is valid for the designated effective date of the data product.

#### **1.2.3 Geospatial Data Items**

The Data Set is represented as an AIXM5.1 file version according the specification of Eurocontrol. (<http://www.aixm.aero>)

#### **1.2.4 Extent**

Following data items are contained in this data product, valid for the assigned AIRAC cycle:

- VerticalStructure
- ObstacleArea
- AirportHeliport

### **1.3 Purpose**

This Data Set contains all known obstacles of Switzerland. Data receiver can use this as a complete Data Set or for creating own subsets of obstacles.

### **1.4 Data Sources and Data Production Processes**

#### **1.4.1 Source of Data**

Accountable for the collection of the obstacle data items is the Bundesamt für Zivilluftfahrt (BAZL). The operation is carried out by the Data Collection Service (DCS) Unit of ITV, a private company.

#### **1.4.2 Data Production Process**

The Data Collection Service is responsible to pick-up all data items from the Originators and send them to the AIM Department of Skyguide, which is mandated to store it in the Aeronautical Database of Switzerland and making it available as Single Authoritative Datasource for all next intended users. Skyguide ensures to change the format into AIXM5.1 for further processing and distribution.

#### **1.4.3 Maintenance of the Data**

Updating the obstacle is carried out by DCS, which will send daily new obstacles or updates for obstacles. The updates will be regularly implemented into ADBS on a daily basis.

## 2 Scope

The scope of this DPS is to describe the content of the Data Set, e. g. how the Featuretypes are built, the structure of them and which Features are contained. For the technical description, the appropriate technical documents shall be consulted, listed in chapter "References".

### 3 Data Product Identification

Title	LS_OBS_DS_FULL_YYYYMMDD.xml
File Format	XML, AIXM5.1 Schema
Abstract	Originating information of Vertical Structure (Obstacle)
Geographic Description	Switzerland
Foreign Objects	NIL

## 4 Data Content and Structure

### 4.1 FeatureClasses and Attributes

#### 4.1.1 Vertical Structure Main Attributes/Associations

Attribute / Association	Description	Values	Provided by DCS
Name	The name of the vertical structure, if applicable.	Alphanumeric	yes
Type	A code indicating the type of vertical structure, such as building, tower, cable, etc.	<ul style="list-style-type: none"> <li>- AG_EQUIP -NO-</li> <li>- ANTENNA -NO-</li> <li>- ARCH -NO-</li> <li>- BRIDGE -<b>YES</b>-</li> <li>- BUILDING -<b>YES</b>-</li> <li>- CABLE_CAR -<b>YES</b>-</li> <li>- CATENARY -<b>YES</b>-</li> <li>- COMPRESSED_AIR_SYSEM -NO-</li> <li>- CONTROL_MONITROING_SYSEM -NO-</li> <li>- CONTROL_TOWER -NO-</li> <li>- COOLING_TOWER -NO-</li> <li>- CRANE -<b>YES</b>-</li> <li>- DAM -NO-</li> <li>- DOME -NO-</li> <li>- ELECTRICAL_EXIT_LIGHT -NO-</li> <li>- ELECTRICAL_SYSTEM -NO-</li> <li>- ELEVATOR -NO-</li> <li>- FENCE -NO-</li> <li>- FUEL_SYSTEM -NO-</li> <li>- GATE -NO-</li> <li>- GENERAL_UTILITY -NO-</li> <li>- GRAIN_ELEVATOR -NO-</li> <li>- HEAT_COOL_SYSTEM -NO-</li> <li>- INDUSTRIAL_SYSTEM -NO-</li> <li>- LIGHTHOUSE -NO-</li> <li>- MONUMENT -NO-</li> <li>- NATURAL_GAS_SYSTEM -NO-</li> <li>- NATURAL_HIGHPOINT -NO-</li> <li>- NAVAID -NO-</li> <li>- NUCLEAR_REACTOR -NO-</li> <li>- POLE -<b>YES</b>-</li> <li>- POWER_PLANT -NO-</li> <li>- REFINERY -NO-</li> <li>- RIG -NO-</li> <li>- SALTWATER_SYSTEM -NO-</li> <li>- SIGN -NO-</li> <li>- SPIRE -NO-</li> <li>- STACK -<b>YES</b>-</li> <li>- STADIUM -NO-</li> <li>- STORM_SYSTEM -NO-</li> <li>- TANK -NO-</li> <li>- TETHERED_BALLOON -NO-</li> <li>- TOWER -NO-</li> <li>- TRAMWAY -NO-</li> <li>- TRANSMISSION_LINE -<b>YES</b>-</li> <li>- TREE -NO-</li> <li>- URBAN -NO-</li> <li>- VEGETATION -<b>YES</b>-</li> <li>- WALL -NO-</li> <li>- WASTEWATER_SYSTEM -NO-</li> <li>- WATER_SYSTEM -NO-</li> <li>- WATER_TOWER -NO-</li> <li>- WINDMILL -<b>YES</b>-</li> <li>- WINDMILL_FARMS -NO-</li> </ul>	yes (for supported values, consult column "Values")

		- OTHER -YES-	
Lighted	A simple indication that the obstacle is lighted, when no further details are available.	- YES -YES- - NO -YES- - OTHER -NO-	yes (for supported values, consult column "Values")
Marking ICAO Standard	Indicates if the markings comply with the ICAO standard, as described in Annex 14.	- YES - NO - OTHER	no
Group	A flag indicating whether the vertical structure consists of a number of closely situated similar objects.	- YES -YES- - NO -YES- - OTHER -NO-	yes (for supported values, consult column "Values")
Length	Overall length of the obstruction.	Numeric + UOM	no
Width	Overall width of the obstruction.	Numeric + UOM	no
Radius	The overall radius of an obstacle that has a relatively circular shape.	Numeric + UOM	yes
Lighting ICAO Standard	Indicates, if the lighting is ICAO standard as described in Annex 14.	- YES - NO - OTHER	no
Synchronised Lighting	Indicates that the flashing light elements that compose the lighting of the vertical structure (could be a group) are synchronised (flash in unison).	- YES - NO - OTHER	no
Marker	The marker that marks the vertical structure.	Link to UUID	no
Hosted Passenger Service	The passenger service hosted by the vertical structure.	Link to UUID	no
Supported Ground Light	The ground light system supported by the vertical structure.	Link to UUID	no
Hosted Navaid Equipment	The Navigation Aid Equipment hosted by the Vertical Structure.	Link to UUID	no



Hosted Special Nav Station	The Special Navigation Station hosted by the vertical structure.	Link to UUID	no
Hosted Unit	The unit hosted by the vertical structure.	Link to UUID	no
Hosted Organisation	The OrganisationAuthority hosted by the vertical structure.	Link to UUID	no
Supported Service	The service supported by the vertical structure.	Link to UUID	no
VerticalStructureLightingStatus	The operational status of the vertical structure lighting.	<ul style="list-style-type: none"> <li>- Status</li> <li>- Timesheet</li> <li>- Note</li> <li>- OrganisationAuthority</li> </ul>	no
LinguisticNote	The note content expressed in a specific language. As a minimum, all Notes shall be expressed in English.	Alphanumeric	yes

#### 4.1.2 Vertical Structure Part-Object Attributes/Associations

Attribute / Association	Description	Values	Provided by DCS
VerticalExtent	The extent of the vertical structure part.	Numeric + UOM	yes
VerticalExtentAccuracy	Accuracy of the value of the declared vertical extent.	Numeric + UOM	no
Type	A code indicating the type of vertical structure, such as building, tower, cable, etc.	<ul style="list-style-type: none"> <li>- AG_EQUIP</li> <li>- ANTENNA</li> <li>- ARCH</li> <li>- BRIDGE</li> <li>- BUILDING</li> <li>- CABLE_CA</li> <li>- CATENARY</li> <li>- COMPRESSED_AIR_SYSEM</li> <li>- CONTROL_MONITROING_SYSE</li> <li>- CONTROL_TOWER</li> <li>- COOLING_TOWE</li> <li>- CRANE</li> <li>- DAM</li> <li>- DOME</li> <li>- ELECTRICAL_EXIT_LIGHT</li> <li>- ELECTRICAL_SYSTEM</li> <li>- ELEVATOR</li> <li>- FENCE</li> <li>- FUEL_SYSTEM</li> <li>- GATE</li> <li>- GENERAL_UTILITY</li> <li>- GRAIN_ELEVATOR</li> <li>- HEAT_COOL_SYSTE</li> <li>- INDUSTRIAL_SYSTEM</li> <li>- LIGHTHOUSE</li> <li>- MONUMENT</li> <li>- NATURAL_GAS_SYSTEM</li> <li>- NATURAL_HIGHPOINT</li> <li>- NAVAID</li> <li>- NUCLEAR_REACTOR</li> <li>- POLE</li> <li>- POWER_PLANT</li> <li>- REFINERY</li> <li>- RIG</li> <li>- SALTWATER_SYSTEM</li> <li>- SIGN</li> <li>- SPIRE</li> <li>- STACK</li> <li>- STADIUM</li> <li>- STORM_SYSTEM</li> <li>- TANK</li> <li>- TETHERED_BALLOON</li> <li>- TOWER</li> <li>- TRAMWAY</li> <li>- TRANSMISSION_LINE</li> <li>- TREE</li> <li>- URBAN</li> <li>- VEGETATION</li> <li>- WALL</li> <li>- WASTEWATER_SYSTEM</li> <li>- WATER_SYSTEM</li> <li>- WATER_TOWER</li> <li>- WINDMILL</li> <li>- WINDMILL_FARM</li> <li>- OTHER</li> </ul>	no

ConstructionStatus	This property enables the provision of information about the construction of the man-made object that constitutes the vertical structure.	<ul style="list-style-type: none"> <li>- IN_CONSTRUCTION</li> <li>- COMPLETED</li> <li>- DEMOLITION_PLANNED</li> <li>- IN_DEMOLITION</li> <li>- OTHER</li> </ul>	no
MarkingPattern	The general layout of the external paint or another marking element, intended to increase the visibility of the vertical structure.	<ul style="list-style-type: none"> <li>- MONOLOUR</li> <li>- CHEQUERED</li> <li>- HBANDS</li> <li>- VBANDS</li> <li>- FLAG</li> <li>- MARKERS</li> <li>- OTHER</li> </ul>	yes
MarkingFirstColour	The principal colour of the marking.	<ul style="list-style-type: none"> <li>- YELLOW</li> <li>- RED</li> <li>- WHITE</li> <li>- BLUE</li> <li>- GREEN</li> <li>- PURPLE</li> <li>- ORANGE</li> <li>- AMBER</li> <li>- BLACK</li> <li>- BROWN</li> <li>- CREY</li> <li>- LIGHT_GREY</li> <li>- MAGENTA</li> <li>- PINK</li> <li>- VIOLET</li> <li>- OTHER</li> </ul>	yes
MarkingSecondColour	The secondary colour for the marking,	<ul style="list-style-type: none"> <li>- YELLOW</li> <li>- RED</li> <li>- WHITE</li> <li>- BLUE</li> <li>- GREEN</li> <li>- PURPLE</li> <li>- ORANGE</li> <li>- AMBER</li> <li>- BLACK</li> <li>- BROWN</li> <li>- CREY</li> <li>- LIGHT_GREY</li> <li>- MAGENTA</li> <li>- PINK</li> <li>- VIOLET</li> <li>- OTHER</li> </ul>	yes
Mobile	A flag indicating whether the vertical structure is expected to move around its nominal location. The accuracy property of the related Point, Surface or Point can be used to provide the maximum displacement range.	<ul style="list-style-type: none"> <li>- YES</li> <li>- NO</li> <li>- OTHER</li> </ul>	yes
Frangible	Boolean indicating whether the obstruction is easily broken.	<ul style="list-style-type: none"> <li>- YES</li> <li>- NO</li> <li>- OTHER</li> </ul>	no

VisibleMaterial	The type(s) of material that compose the load-bearing structure and/or exterior facing of a vertical construction (for example: a building or non-building structure).	<ul style="list-style-type: none"> <li>- ADOBE_BRICK</li> <li>- ALUMINIUM</li> <li>- BRICK</li> <li>- CONCRETE</li> <li>- FIBREGLASS</li> <li>- GLASS</li> <li>- IRON</li> <li>- MASONRY</li> <li>- METAL</li> <li>- MUD</li> <li>- PLANT</li> <li>- PRESTRESSED_CONCRETE</li> <li>- REINFORCED_CONCRETE</li> <li>- SOD</li> <li>- STEEL</li> <li>- STONE</li> <li>- TREATED_TIMBER</li> <li>- WOOD</li> <li>- OTHER</li> </ul>	no
Designator	An alphanumeric code by which the structure is identified locally.	Alphanumeric	No
VerticalStructurePartGeometry	The three different possibilities for describing the horizontal projection of an obstacle: point, line or polygon	<ul style="list-style-type: none"> <li>- ElevatedPoint</li> <li>- ElevatedCurve</li> <li>- ElevatedSurface</li> </ul>	yes
LightElement	An element of the vertical structure part lighting.	<ul style="list-style-type: none"> <li>- Colour -NO-</li> <li>- IntensityLevel -YES-</li> <li>- Intensity -NO-</li> <li>- Type -NO-</li> </ul>	yes (for supported values, consult column "Values")
Timesheet	A compoment of the schedule.	<ul style="list-style-type: none"> <li>- TimeReference</li> <li>- DateMonthDayType</li> <li>- EndDate</li> <li>- Day</li> <li>- DayTil</li> <li>- StartTime</li> <li>- StartEvent</li> <li>- StartTimeRelativeEvent</li> <li>- StartEvenetInterpretation</li> <li>- EndTime</li> <li>- EndEvent</li> <li>- EndTimeRelativeEvent</li> <li>- EndEventInterpretation</li> <li>- DaylightSavingAdjust</li> <li>- Excluded</li> </ul>	no
OrganisationAuthority	Indicates that the SpecialDates associated with the related OrganisationAuthority are applicable to the schedule definition.	<ul style="list-style-type: none"> <li>- Name</li> <li>- Designator</li> <li>- CodeOrganisationType</li> <li>- Military</li> </ul>	no

#### 4.1.3 Obstacle Area

Attribute / Association	Description	Values	Provided by DCS
Type	Indicates the type of the obstacle coverage area. Examples: Area 1, 2, 3 or 4.	<ul style="list-style-type: none"> <li>- AREA1 -NO-</li> <li>- AREA2 -NO-</li> <li>- AREA3 -NO-</li> <li>- AREA4 -NO-</li> <li>- OLS -NO-</li> <li>- FAR77 -NO-</li> <li>- MANAGED -NO-</li> <li>- OTHER:HBK -YES-</li> </ul>	yes (for supported values, consult column "Values")
ObstructionIdSurfaceCondition	Obstruction Identification Surface that obstructing area represents.	<ul style="list-style-type: none"> <li>- 40_TO_1</li> <li>- 72_TO_1</li> <li>- MA</li> <li>- FINAL</li> <li>- PT_ENTRY_AREA</li> <li>- PRIMARY</li> <li>- SECONDARY</li> <li>- ZONE1</li> <li>- ZONE2</li> <li>- ZONE3</li> <li>- AREA1</li> <li>- AREA2</li> <li>- AREA3</li> <li>- TURN_INITIATION</li> <li>- TURN</li> <li>- DER</li> <li>- OTHER</li> </ul>	no
isDefinedFor	Reference for the obstacle area	Association to AirportHeliport Title carries the name of the obstacle.	yes
hasExtent	Extent of the obstacle area.	Coordinates	no
hasObstacle	Obstacle within the Obstacle Area.	Refer Chapter 4.4.2 Obstacle Areas	under clarification
has Annotation	Textual Remark	Alphanumeric	no

#### 4.1.4 Airport/Heliport

Following Attribute will be contained at a minimum:

Attribute / Association	Description	Values	Provided by DCS
Designator	A coded designator for an Aerodrome/Heliport.	Alphanumeric	yes
Name	The primary official name of an aerodrome as designated by an appropriate authority.	Alphanumeric	yes
Designator/ATA	The identifier that is assigned to a location in accordance with rules governed by the international Air Transport Association (ATA)	Alpha Type	yes
Type	A code specifying the type of aerodrome.	<ul style="list-style-type: none"><li>- AD</li><li>- AH</li><li>- HP</li><li>- LS</li><li>- OTHER</li></ul>	yes

#### 4.1.5 Linked Objects in Features

Attribute / Association	Description	Values	Provided by DCS
ElevatedPoint	An AIXM Point derived from GM_Point that includes properties for describing a point with elevation and vertical extent. Used in obstacles, navaids, etc	<ul style="list-style-type: none"> <li>- Elevation <b>-YES-</b></li> <li>- GeoidUndulation <b>-NO-</b></li> <li>- VerticalDatum <b>-YES-</b></li> <li>- VerticalAccuracy <b>-YES-</b></li> <li>- HorizontalAccuracy <b>-YES-</b></li> <li>- LinguisticNote <b>-YES-</b></li> </ul>	yes (for supported values, consult column "Values")
ElevatedCurve	An AIXM elevated curve derived from , which extends curve with properties that represent the vertical position (elevation, datum, accuracy).	<ul style="list-style-type: none"> <li>- Elevation <b>-YES-</b></li> <li>- GeoidUndulation <b>-NO-</b></li> <li>- VerticalDatum <b>-YES-</b></li> <li>- VerticalAccuracy <b>-YES-</b></li> <li>- HorizontalAccuracy <b>-YES-</b></li> <li>- LinguisticNote <b>-YES-</b></li> </ul>	yes (for supported values, consult column "Values")
ElevatedSurface	An AIXM elevated surface derived from, which extends Surface with properties that represent the vertical position (elevation, datum, accuracy).	<ul style="list-style-type: none"> <li>- Elevation <b>-YES-</b></li> <li>- GeoidUndulation <b>-NO-</b></li> <li>- VerticalDatum <b>-YES-</b></li> <li>- VerticalAccuracy <b>-YES-</b></li> <li>- HorizontalAccuracy <b>-YES-</b></li> <li>- LinguisticNote <b>-YES-</b></li> </ul>	yes (for supported values, consult column "Values")

## 4.2 Special Cases

### 4.2.1 Use of Annotations with Purpose "OTHER:PROCESSINGINFO"

DCS ChangeRequests do include information that is relevant for the internal processing of data. Where such information needs to be kept with AIXM features, an annotation with purpose "OTHER:PROCESSINGINFO" is used. Such information is for internal use only and can be disregarded by the data receiver.

### 4.2.2 Annotations with Purpose "OTHER:ADHBK" – Interim-solution

"inSurfacePerimeters" may occur several times at different nesting levels. Each includes a comma delimited list of 4-letter aerodrome location indicators, indicating the aerodrome HBK perimeters overlapping with the Obstacle's lateral extent. If the information is available for an Obstacle, it is stored as a feature annotation with purpose "OTHER:ADHBK" and the note text set to a comma delimited list of aerodrome location indicators of the HBKs the Obstacle is geographically overlapping with.

This solution is only an interim-solution until the Obstacle Areas including all associations to Obstacles and Aerodromes are available in the data set.

### 4.2.3 VerticalStructurePart Object Annotation for Topological Sorting of VerticalStructureParts

AIXM/XML does not keep a topologically sorted list of VerticalStructure:part objects. If parts need to be in a topologically sorted order, it is expected that user of an AIXM XML document do use tools to do so. Such topological sorting is achieved by using the spatial relationship between parts (e.g. for lines their matching endpoint coordinates). It has been decided to use the index of the original ObstacleChange:structure/LineStructure:points and ObstacleChange:structure/LineStructure:lines array items (where a DCS CR document received from DCS claims that the array items are sorted topologically). The array index is used with a VerticalStructurePart object annotation with purpose=OTHER:PART\_IDX. The composition is as follows, depending on the ObstacleChange:structure object type:

- PointStructure:point: null
- LineStructure:points: "P<index>". Examples: "L1", "L2", ..., "L13048". For a line with OTHER:PART\_IDX "L<index>" the start point is the part with OTHER:PART\_IDX "P<index>" and for the end point the part with OTHER:PART\_IDX "P<index + 1>"
- PolygonStructure:surface: null

Notes:

- The <index> is by intent (to not limit the maximum index value) not filled with leading zeroes (e.g. "00001"). Lexical sorting can therefore not be used. Instead, the <index> part of the value must be converted to an integer to use numerical sorting.
- If the original AIXM data is transformed (for instance by filtering points to simplify the geometry of the parts), the <index> part of a value may become useless.

### 4.2.4 Use of AIXM Extensions that are not accepted Community Extensions

The AIXM data may include AIXM extensions for internal processing information. Any AIXM extensions used for such purpose and not being an accepted community extensions can be ignored by the data receiver.



### 4.3 Additional Information about the Transformer from JSON to AIXM5.1

#### 4.3.1 UUIDs

The UUID of a DCS obstacle is identical with the UUID of an AIXM VerticalStructure instance. The UUID of new obstacles is determined by DCS.

#### 4.3.2 Decimal Values

The precision of decimal values (count of decimal places) are not kept during the mapping but the precision of supplied values is not reduced during the transformation.

### 4.4 Data Related Characteristics

#### 4.4.1 Maximum Elevation of Obstacles With Surface Geometry

TBD

*Although the elevation of a point indicates the top, it is a value calculated by DCS from the ground height entered by the originator and the corresponding structureHeight of the point. If the structureHeight = 0, the elevation is therefore the height of the ground point.*

*Basically, DCS uses the elevation of the highest ground point and adds the surface/structureHeight to it. However, this is not always correct ...*

*In future (DCS Rel. 3.1) DCS will therefore add the max. Elevation with the element "surface". Until then, nothing will be changed in the current (incorrect) transformation by Skyguide.*

#### 4.4.2 Obstacle Areas

TBD

*DCS does not want to pass on any obstacle areas. The following suggestion was made by ITV:*

*In addition to the LOCIs in the inSurfacePerimeter element, the UUID of an ObstacleArea is provided with an Obstacle. These ObstacleAreas are maintained by Skyguide and periodically delivered to DCS.*

*Problem with this solution:*

*In AIXM, the reference is not from Obstacle to ObstacleArea but vice versa from ObstacleArea to Obstacle. An ObstacleArea therefore contains a list of all obstacles that belong to the ObstacleArea. When the database is updated, the ObstacleArea (the list of referenced obstacles) must also be updated. This means that the ObstacleArea is first read from the DB (to obtain the current list of obstacle references), then flows as input into the DCS CR JSON-to-AIXM transformation (to update the list of obstacle references) and must then also be updated in the DB (update of the list of obstacle references). This can lead to a transaction problem (after reading the ObstacleArea, the ObstacleArea (including Obstacle references) can be changed by other processes before the list of Obstacle references is updated). A reliable solution to this problem must first be found with the system manufacturer (Comsoft) before Skyguide can agree to the solution proposed by ITV.*

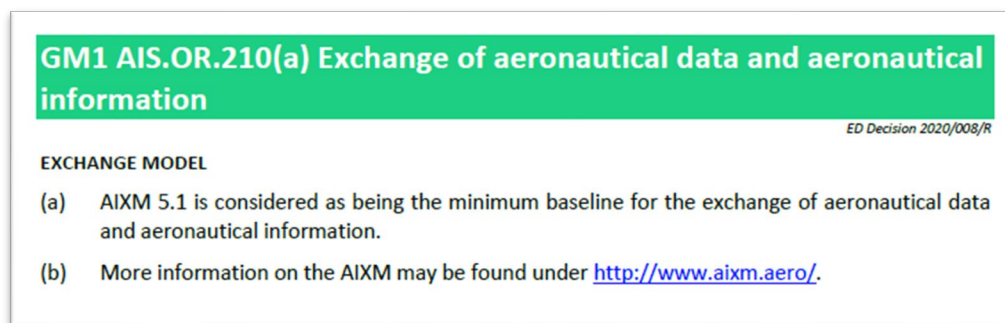
#### 4.5 No Deletion of Obstacles

The Data Collection Service does never delete an obstacle, although it can be that it will never be needed again in the future. DCS will send the obstacle as "Demolished". Such INACTIVE Obstacles in the AIXM Data Set can be detected by empty Part-Objects with NIL-Reason "INAPPLICABLE".

#### 4.6 Technical Structure

The Data Set is designed according to the AIXM5.1 data model and fulfils the Regulation EC 373/2017. All technical description can be found under following link, directly from an Eurocontrol hosted site:

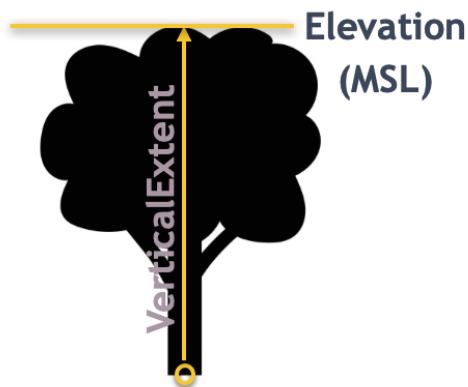
<http://www.aixm.aero>



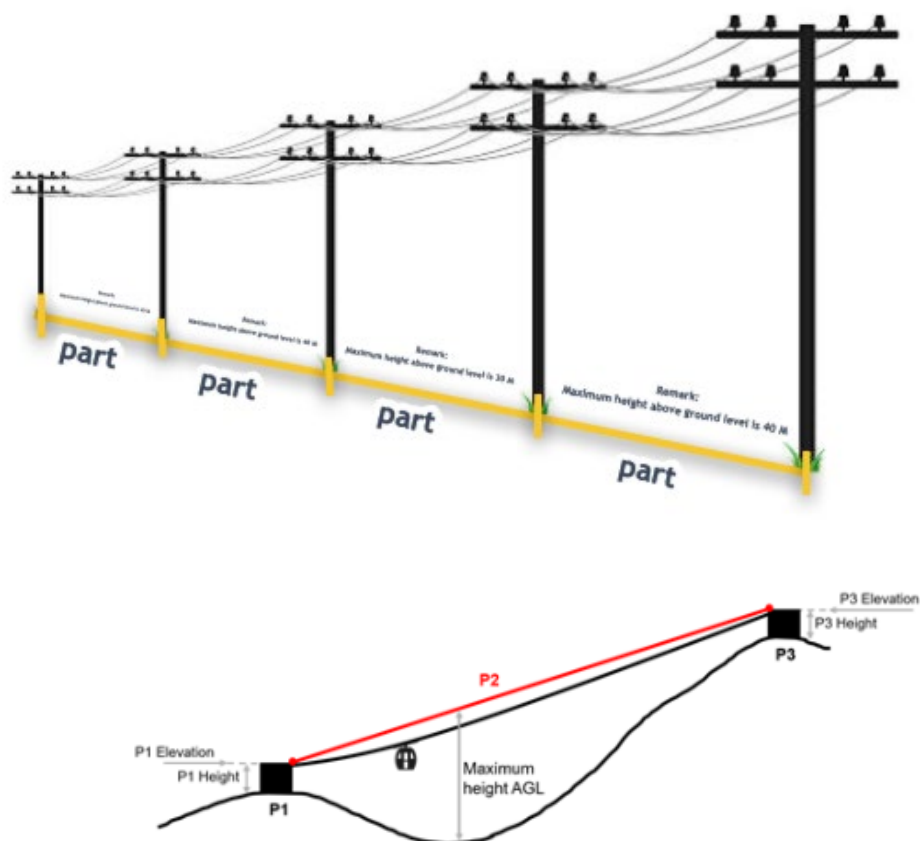
#### 4.7 Content Structure

As the data has to be transformed to AIXM5.1, the transformer follows the rules of the Eurocontrol's [Coding guidelines for VerticalStructure - \(ICAO\) Obstacle Data Sets - AIXM Confluence \(eurocontrol.int\)](http://eurocontrol.int)

#### 4.7.1 Sample Point Obstacle



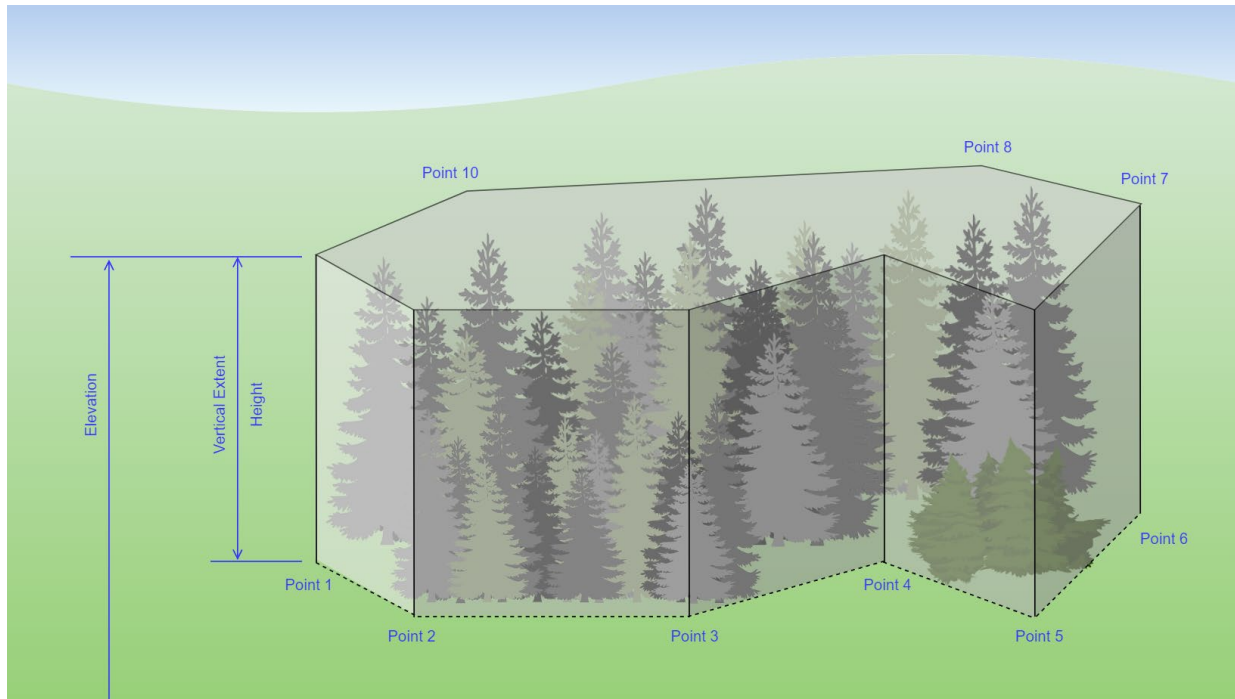
#### 4.7.2 Samples Line Obstacle



Cable car with different elevation of its parts (maximum height AGL)

The figure shows a case where the height of P2 is considered to be the maximum height above ground level. The elevation of the parts is different.

### 4.7.3 Sample ElevatedSurface Obstacle



## 5 Reference Systems

### 5.1 Horizontal Reference System: WGS-84

The International Civil Aviation Organization (ICAO) specifies the World Geodetic System 1984 (WGS-84) as the geodetic reference datum Standard for air navigation latitude/longitude coordinates.

The WGS-84 Manual can be downloaded directly from the ICAO under:

[World Geodetic System - 1984 \(WGS-84\) Manual](#)

### 5.2 Vertical Reference Systems

The vertical reference system can be different and is depicted in the appropriate attribute *VerticalDatum*. Following vertical reference system is mostly seen in the Data Set:

#### 5.2.1 Swiss National Levelling Network LN02

The Swiss national levelling network (LN02), dating back to the 19<sup>th</sup> century, was conceived in 1902 with the definition of the Swiss height system. The first measurement of the network took place between 1903 and 1933, and as of 1943 it was remeasured for the second time. The reference point for the height measurements in the "Repère Pierre du Niton" in Geneva, with a height of 373.6 metres.

## 6 Data Quality

### 6.1 Accuracy

All data items of this data product fulfil at least the requirements of ICAO Annex 15 and the AIM data Catalogue of the Federal Office of Civil Aviation Switzerland, based on ICAO PANS-AIM (Doc 10066).

### 6.2 Resolution

All data items of this data product fulfil at least the requirements of ICAO Annex 15 and the AIM Data Catalogue of the Federal Office of Civil Aviation Switzerland, based on ICAO PANS-AIM (Doc 10066)

### 6.3 Integrity

The Data Set contains data which is classified into following integrity levels:

- Routine
- Essential

The integrity of the data will be ensured by the application of the Quality Management System in force.

### 6.4 Quality Management

**AIS.OR.200 General**  
Commission Implementing Regulation (EU) 2020/469  
An AIS provider shall ensure that:  
(a) aeronautical data and aeronautical information are provided in accordance with the specifications laid down in the aeronautical data catalogue, specified in Appendix 1 to Annex III (Part-ATM/ANS.OR);  
(b) data quality is maintained; and  
(c) automation is applied to enable the processing and exchange of digital aeronautical data.

#### 6.4.1 Skyguide as Aeronautical Information Service Provider (AISP)

The ISO9001 Quality Management System is established in the business unit AIM and Skyguide company wide. The presence of the requirements will be regularly examined by internal and external audits.

All manual and technical procedures adhere the Regulation 373/2017 *Easy Access Rules for Air Traffic Management / Air Navigation Services* of the European Community. The presence of the requirements will be regularly examined by FOCA and EASA.

#### 6.4.2 ITV as Data Collection Service Provider

Obstacle data is recorded by the data originators (obstacle owners, surveyors, swisstopo) on the data collection portal [obstacleportal.ch](https://obstacleportal.ch) operated by ITV Consult AG on behalf of FOCA. The obstacle data is checked for completeness and whether it is in the required data quality according to the data catalogue and whether the proof of quality is available and plausible.

**7 Data Product Delivery**

**7.1 Delivery Format**

Units of Delivery	ZIP-Archive
Size	TBD
Data Medium	TBD
Other Information	The XML is contained in a single ZIP-Archive with the baseline of timeslices to the designated effective date.

## 8 Metadata

TBD

*There will be Metadata available with Skyguide's future system which will be delivered to Skyguide at the end of NOV 2024. A statement which can already be done is, that "bounding" will not be provided by the future system as this is an optional metadata item and the manufacturer does not intend to implement this.*



## 9 Data Capture

The capture of the obstacles is carried out via the [obstacleportal.ch](https://obstacleportal.ch), which is operated by the Data Collection Service (DCS).

New obstacles are reported by the obstacle owners or operators. The data is entered into a web-based mask. All documents and data will be collected. The DCS service team checks the data and recorded documents for completeness and plausibility. Obstacles that require approval according to the national regulation VIL are examined by experts of the obstacle division of the BAZL.

Obstacles that are surveyed on behalf of the airports or by swisstopo are digitally transferred into DCS and pass automated validation procedure before the geometry and metadata of the obstacle are updated.

All relevant data of obstacles that have been approved or modified is transferred to skyguide and stored within 1 day in the ADBS.

## 10 References

### Basis Document

*Related regulations, standards such as ISO standard; directives*

- SG-OBST-DPS Obstacle Data Set – Data Product Specification (This Document)

### Related Document

*Related documents of this standard*

- EC 373/2017 Easy Access Rules for Air Traffic Management / Air Navigation Service Regulation
- [www.aixm.aero](http://www.aixm.aero) Aeronautical Information Exchange Model
- [ext.eurocontrol.int](http://ext.eurocontrol.int) Coding Guidelines for Vertical Structure

## 11 Abbreviations, Terms and Definitions

### 11.1 Abbreviations

Abbreviation	Full expression
ADBS	Aeronautical Database of Switzerland
AIXM	Aeronautical Information Exchange Model
BAZL	Bundesamt für Zivilluftfahrt
DCS	Data Collection Service
NIL	Nothing in Line
UOM	Unit of Measurement

### 11.2 Terms and Definitions

*Fill in link to common glossary where the terms and definitions used in this standard are defined or define it when appropriate*

Term	Definition
ADBS	Aeronautical Database of Switzerland is the nominated and single data source of all Swiss aeronautical data under responsibility of Skyguide.
AIXM5.1	Aeronautical Information Exchange Model 5.1 is an agreed standard for aeronautical data exchange, established by the FAA and Eurocontrol.
ONDS	Static Data Division of AIM Skyguide
Vertical Structure	In AIXM5.1 the Obstacles are to find in FeatureClass "Vertical Structure".

## 12 Annexes

### 12.1 History of Change

Changes				
Version	Status	Date of issue	Author	Details
0.1	Draft	2024-07-01	Wolfgang Graf	1 <sup>st</sup> Draft

0.2	Draft	2024-07-03	Wolfgang Graf	Inputs incorporated from Andreas Dähler
0.3	Draft	2024-07-09	Wolfgang Graf	Revised Chapter 6.4.2 and Chapter 9 with Input from Ruedi Schneeberger
0.4	Draft	2024-07-12	Wolfgang Graf	Inputs from Meeting 12.07.2024
0.5	Draft	2024-08-26	Wolfgang Graf	Inputs from Andreas Dähler
0.6	Proposed	2024-08-26	Wolfgang Graf	Final Draft
1.0	Released	2024-08-27	Wolfgang Graf	Initial Release
1.1	Released	2024-11-05	Wolfgang Graf	New Chapter 4.2.2 introduced, Annotation with Purpose "OTHER:ADHBK" – Interim-solution
1.2	Released	2024-12-18	Wolfgang Graf	Deletion of DCS output format wherever mentioned. New Chapter 4.2.3 VerticalStructurePart Object Annotation for Topological Sorting of VerticalStructureParts

13 Approval

Contact Person, Data Management	Document Owner, Head of Data Management
Wolfgang Graf	Dominik Guler