



ICAO MID

Webinar on the provision of Terrain and Obstacle (TOD) and AIP Datasets

19 May 2022



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Boeing Global Services

Digital Datasets – a User Experience





ICAO Annex 15 – Aeronautical Information Services

5.3 Digital data sets

5.3.1 General

5.3.1.1 Digital data shall be in the form of the following data sets:

- a) AIP data set;
- b) terrain data sets;
- c) obstacle data sets;
- d) aerodrome mapping data sets; and
- e) instrument flight procedure data sets.



ICAO Annex 15 – Aeronautical Information Services

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Obstacle Datasets received

- Around 50 countries worldwide.
- Data formats:
 - mostly AIXM or Excel;
 - but also CRC, CSV, KML, SHP.



Obstacle Datasets – Data Processing

- We Get the Data.
- We Transform the Data.
- We Do Quality/Plausibility Checks.
- We Ingest/Load the Data in our Database.
- We Fuse eData with other Data.
- We Extract different formats depending on customer needs.



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Webinar on the provision of Terrain and Obstacle (TOD) and AIP Datasets



Obstacle Datasets – We Get the Data.

Excel spreadsheet showing obstacle data for Poland. The spreadsheet has columns for various attributes and a detailed description of each obstacle.

Line	Database;Workspace;Source	Effective Date;Author	Creation Date	Description
1	Database;Workspace;Source	Effective Date;Author	Creation Date	
2	AERODB	LIVE ;A250_OBSTACLE;21.04.2022;bartosz.rybak@KIK4271;14.03.2022 11:39;		
3				
4				Latitude;Longitude;Height;Height Uom;Elevation;Elevation Uom;Vertical accuracy;Vertical accuracy Uom;Horizontal accuracy;Horizontal accuracy Uom;Obstacle identifier;Location;Local language obstacle type;Lighting;Horizontal reference system;Marking;Obstacle type;Data source identifier;Horizontal confidence level;Horizontal confidence
5	N 49 18 29.60	E 019 56 11.60	339;FT;4007;FT;30;m;50;m;02302-2012-01;Zakopane/Guba'ówka;Wieża;YES;WGE;YES;Tower;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;20;m;90%;1;ft;Point;Routine;Kronstadt-86	
6	N 49 35 42.16	E 020 40 40.01	329;FT;1315;FT;30;m;50;m;01627-2011-01;Nowy S'cz;Komin;YES;WGE;YES;Chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;6;m;90%;1;ft;Point;Routine;Kronstadt-86	
7	N 49 40 38.36	E 021 10 56.98	529.86;FT;1441.01;FT;30;m;50;m;00750-2009-01;Gorlice;Komin elektrociep'owni;YES;WGE;YES;Power plant chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;10;m;90%;0.01;ft;Point;Routine;Kronstadt-86	
8	N 49 45 21.90	E 021 48 46.60	475.06;FT;2407.48;FT;30;m;50;m;02304-2012-01;Rzeszów/Sucha Góra;Wieża;YES;WGE;YES;Tower;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;4;m;90%;0.01;ft;Point;Routine;Kronstadt-86	
9	N 49 47 10.13	E 018 47 00.95	332;FT;1323;FT;30;m;50;m;00751-2009-01;Skoczów;Komin;YES;WGE;YES;Chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;6;m;90%;1;ft;Point;Routine;Kronstadt-86	
10	N 49 52 23.80	E 019 01 45.80	739;FT;1674;FT;30;m;50;m;02313-2012-01;Czechowice - Dziedziice;Komin elektrociep'owni;YES;WGE;YES;Power plant chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;14;m;90%;1;ft;Point;Routine;Kronstadt-86	
11	N 49 56 28.49	E 018 34 13.70	396.98;FT;1151.57;FT;30;m;50;m;00752-2009-01;Jastrzębie Zdrój/Moszczenica;Komin;YES;WGE;YES;Chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;4;m;90%;0.01;ft;Point;Routine;Kronstadt-86	
12	N 49 57 48.16	E 018 55 34.24	492;FT;1339;FT;30;m;50;m;00753-2009-01;Pszczyna;Komin;YES;WGE;YES;Chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;8;m;90%;1;ft;Point;Routine;Kronstadt-86	
13	N 50 02 24.00	E 019 16 22.30	525;FT;1322;FT;30;m;50;m;02316-2012-01;Oowicim;Komin;YES;WGE;YES;Chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;10;m;90%;1;ft;Point;Routine;Kronstadt-86	
14	N 50 01 35.15	E 019 57 07.01	328.08;FT;1062.99;FT;30;m;50;m;00735-2009-01;Kraków/Bonarka;Komin;YES;WGE;YES;Chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;6;m;90%;0.01;ft;Point;Routine;Kronstadt-86	
15	N 50 03 01.20	E 019 54 06.10	434.38;FT;1157.48;FT;30;m;50;m;02325-2012-01;Kraków/Maszt;YES;WGE;YES;Mast;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;72;m;90%;0.01;ft;Point;Routine;Kronstadt-86	
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18	N 50 06 13.29	E 019 15 24.33	419;FT;1213;FT;30;m;50;m;02329-2012-01;Che'mek;Komin;YES;WGE;YES;Chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;7;m;90%;1;ft;Point;Routine;Kronstadt-86	
19	N 50 06 20.26	E 019 01 02.02	591;FT;1446;FT;30;m;50;m;02330-2012-01;Tychy;Komin elektrociep'owni;YES;WGE;YES;Power plant chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;12;m;90%;1;ft;Point;Routine;Kronstadt-86	
20	N 50 06 24.66	E 020 53 59.06	328;FT;936;FT;30;m;50;m;01601-2011-01;Niedomice;Komin;YES;WGE;YES;Chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;6;m;90%;1;ft;Point;Routine;Kronstadt-86	
21	N 50 07 25.20	E 019 07 42.70	394;FT;1237;FT;30;m;50;m;01410-2010-01;Lędziny;Komin;YES;WGE;YES;Chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;6.5;m;90%;1;ft;Point;Routine;Kronstadt-86	
22	N 50 08 04.40	E 018 50 39.70	657;FT;1592;FT;30;m;50;m;02335-2012-02;Eazłiska;Komin elektrotronii;YES;WGE;YES;Power plant chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;14;m;90%;1;ft;Point;Routine;Kronstadt-86	
23	N 50 09 01.03	E 019 27 18.02	399;FT;1341;FT;30;m;50;m;02337-2012-01;Trzebnia;Komin;YES;WGE;YES;Chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;7;m;90%;1;ft;Point;Routine;Kronstadt-86	
24	N 50 10 52.30	E 019 06 19.90	329;FT;1191;FT;30;m;50;m;01237-2010-01;Mys'owice/Weso'la;Komin;YES;WGE;YES;Chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;6;m;90%;1;ft;Point;Routine;Kronstadt-86	
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29	N 50 14 39.39	E 018 59 22.44	331.36;FT;1312.66;FT;30;m;50;m;00762-2009-02;Katowice/Bryndz;Komin;YES;WGE;YES;Chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;7;m;90%;0.01;ft;Point;Routine;Kronstadt-86	
30	N 50 16 28.80	E 019 28 49.10	382;FT;1461;FT;30;m;50;m;02341-2012-01;Bukowo;Komin;YES;WGE;YES;Chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;20;m;90%;1;ft;Point;Routine;Kronstadt-86	
31	N 50 17 08.30	E 019 03 16.20	656;FT;1535;FT;30;m;50;m;01081-2010-01;Katowice;Komin elektrociep'owni;YES;WGE;YES;Power plant chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;16;m;90%;1;ft;Point;Routine;Kronstadt-86	
32	N 50 18 26.80	E 018 58 10.20	352;FT;1353;FT;30;m;50;m;02358-2012-01;Chorzów;Komin elektrociep'owni;YES;WGE;YES;Power plant chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;No data available;m;90%;1;ft;Point;Routine;Kronstadt-86	
33	N 50 17 44.10	E 019 00 19.50	368;FT;1403;FT;30;m;50;m;01862-2011-01;Katowice/Bytków;Wieża;YES;WGE;YES;Tower;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;10;m;90%;1;ft;Point;Routine;Kronstadt-86	
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43	N 50 31 24.30	E 023 23 50.80	502;FT;1542;FT;30;m;50;m;02402-2012-01;Zamo'oz;Tarnawatka;Maszt;YES;WGE;YES;Mast;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;142;m;90%;1;ft;Point;Routine;Kronstadt-86	
44	N 50 32 06.00	E 017 58 37.00	394;FT;939;FT;30;m;50;m;01116-2010-02;Chorula;Komin;YES;WGE;YES;Chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;6;m;90%;1;ft;Point;Routine;Kronstadt-86	
45	N 50 33 15.09	E 022 04 43.39	394;FT;908;FT;30;m;50;m;01611-2011-02;Stalowa Wola;Komin;YES;WGE;YES;Chimney;Civil Aviation Authority of the Republic of Poland;90%;0.01;s;7.5;m;90%;1;ft;Point;Routine;Kronstadt-86	





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Obstacle Datasets – We Get the Data.

Measured-Height-Survey-Data - 24 FEB 22 [Read-Only] [Compatibility Mode] - Excel

File Home Insert Page Layout Formulas Data Review View ACROBAT Tell me what you want to do... Anna Jaskolska Share

Clipboard Font Alignment Number Styles Cells Editing Webex

SITE NAME	TYPE OF FEATURE	IDENTIFICATION	WG 84		ORTHOMETRIC		RECORD ID
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EGUO	OBST	MAST	512529 43N	002202 99W	245.54	805.68	1021
EGUO	OBST	MAST	512741 44N	002206 86W	214.32	703.15	1022
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EGUO	OBST	PYLON	513106 81N	002192 53W	200.54	657.94	1033
EGUO	OBST	PYLON	512948 52N	002191 77W	212.79	698.13	1034
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EGUO	OBST	PYLON	513048 80N	002188 05W	200.94	659.25	1036
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EGUO	OBST	TREE	512816 00N	002174 02W	193.22	633.92	1060

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MIS Obstruction Data - Record Information	
ADHP	EGUO - Colerne
All Heights	AMS
Survey Date	Oct 19
Report Type	
Survey Company	
Latest MAIS Publication	ARAC Effective

Contents LCRA Akrotiri EGYE Barkston Heath EGBW Benson EGDM Boscombe Down EGVN Brize Norton Chetwynd EGUO Colerne EGXC Coningsby EGWC Cosford EGDW Cranwell - Cranwell North EGT ...





Obstacle Datasets – We Get the Data.

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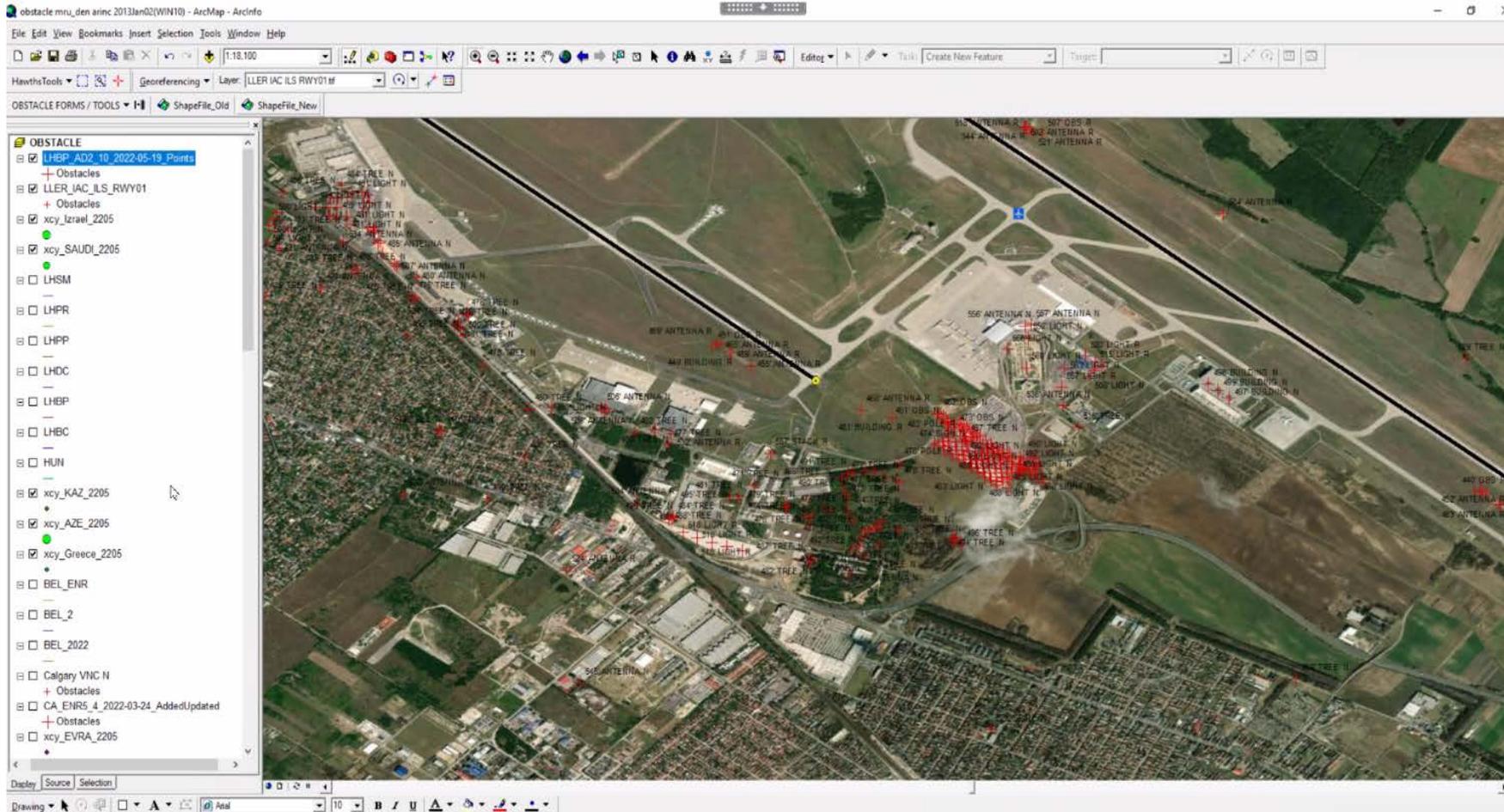
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                            <Date xmlns="http://www.isotc211.org/2005/gco">2022-01-06</Date>
                          </date>
                          <dateType>
                            <CI_DateTypeCode codeList="" codeListValue="">Creation</CI_DateTypeCode>
                          </dateType>
                        </CI_Date>
                      </date>
                      <edition/>
                      <editionDate/>
                      <otherCitationDetails/>
                      <collectiveTitle/>
                      <ISBN/>
                      <ISSN/>
                    </CI_Citation>
                  </citation>
                </MD_DataIdentification>
              </identificationInfo>
            </MD_Metadata>
          </aixm-5.1:timeSliceMetadata>
        </aixm-5.1:ObstacleAreaTimeSlice>
      </aixm-5.1:ObstacleArea>
    </aixm-message-5.1:hasMember>
  </aixm-message-5.1:AIMBasicMessage>

```





Obstacle Datasets – We Do Quality/Plausibility Checks.





Obstacle Datasets – We Ingest/Load the Data in our Database.

O - Obstacle

The screenshot displays a desktop environment with a Windows taskbar at the bottom. The main application window is titled 'Obstacle Import' and is part of the 'Jepesen Obstacles Database' software. The interface includes a menu bar with options like 'File', 'Home', 'Create', 'External Data', 'Database Tools', and 'Sign in'. Below the menu is a toolbar with various icons for file operations. The main area of the application is divided into sections for mandatory and optional fields.

The 'Obstacle Import' window shows the following details:

- Mandatory Fields:**
 - Source: AIP HUNGARY
 - Path and name of the file to be imported: S:\import\to\LH_ENR5_4_2022-05-19_Lines.b
 - Line 1: source_format, scale, h_acc, v_acc, base_ft, base_m, capture_date, country ...
 - Line 2: ENR 5.4 eTOD, 1, A, , 2022-04-27, HUN, A, WORLD GEODETIC SYSTEM 1984, A, MS ...
 - Line 3: ENR 5.4 eTOD, 1, A, , 2022-04-27, HUN, A, WORLD GEODETIC SYSTEM 1984, A, MS ...
 - Line 4: ENR 5.4 eTOD, 1, A, , 2022-04-27, HUN, A, WORLD GEODETIC SYSTEM 1984, A, MS ...
 - Line 5: ENR 5.4 eTOD, 1, A, , 2022-04-27, HUN, A, WORLD GEODETIC SYSTEM 1984, A, MS ...
 - Line 6: ENR 5.4 eTOD, 1, A, , 2022-04-27, HUN, A, WORLD GEODETIC SYSTEM 1984, A, MS ...
 - Line 7: ENR 5.4 eTOD, 1, A, , 2022-04-27, HUN, A, WORLD GEODETIC SYSTEM 1984, A, MS ...
- Optional Fields:**
 - Source date as yyyy-mm-dd (e.g. the AIP date):
 - MITS number:
 - Path and name of the file:
 - Select the country containing the data to be imported:
 - Select the data entry company (or leave blank):
 - Horizontal datum:

An 'Obstacle Import File' window is also open, showing a file explorer view of the 'import.txt' folder. The file list includes:

Name	Date modified	Type	Size
ETMN NVOC ADC	4/26/2022 4:26 PM	Text Document	5 KB
ETMN VOC 1	4/26/2022 12:20 PM	Text Document	2 KB
ETMN VOC 2	4/26/2022 11:25 AM	Text Document	2 KB
EVRA_AD2_10_area2_2022-05-19_Polys	4/22/2022 10:52 PM	Text Document	1,629 KB
FA_ENR5_4_2022-04-21_AddedUpdated	4/26/2022 9:40 AM	Text Document	19 KB
GVBA_IAC_RNAV_GNSS_RWY21	4/27/2022 4:15 PM	Text Document	1 KB
GVBA_IAC_RNAV_GNSS_RWY21_CORRIG...	4/27/2022 4:10 PM	Text Document	1 KB
GVSV ADC TYPE A RWY07	4/14/2022 9:44 AM	Text Document	1 KB
LFI MI MIL IAC SRE PAR RWY33	4/25/2022 4:16 PM	Text Document	1 KB
LFOT VLC	4/21/2022 9:43 AM	Text Document	3 KB
LFQP MIL ADC	4/25/2022 2:26 PM	Text Document	4 KB
LFRJ MIL ADC	4/25/2022 3:21 PM	Text Document	1 KB
LH_ENR5_4_2022-05-19_Lines	4/27/2022 1:57 PM	Text Document	16 KB
LH_ENR5_4_2022-05-19_Points	4/27/2022 1:57 PM	Text Document	63 KB
LH_ENR5_4_2022-05-19_Polys	4/27/2022 1:57 PM	Text Document	115 KB
LHBC_AD2_10_2022-05-19_Lines	4/27/2022 3:05 PM	Text Document	30 KB

The file explorer window shows the file name 'LH_ENR5_4_2022-05-19_Lines' selected, with 'All Files (*.*)' chosen in the file type dropdown. The 'Open' button is highlighted.

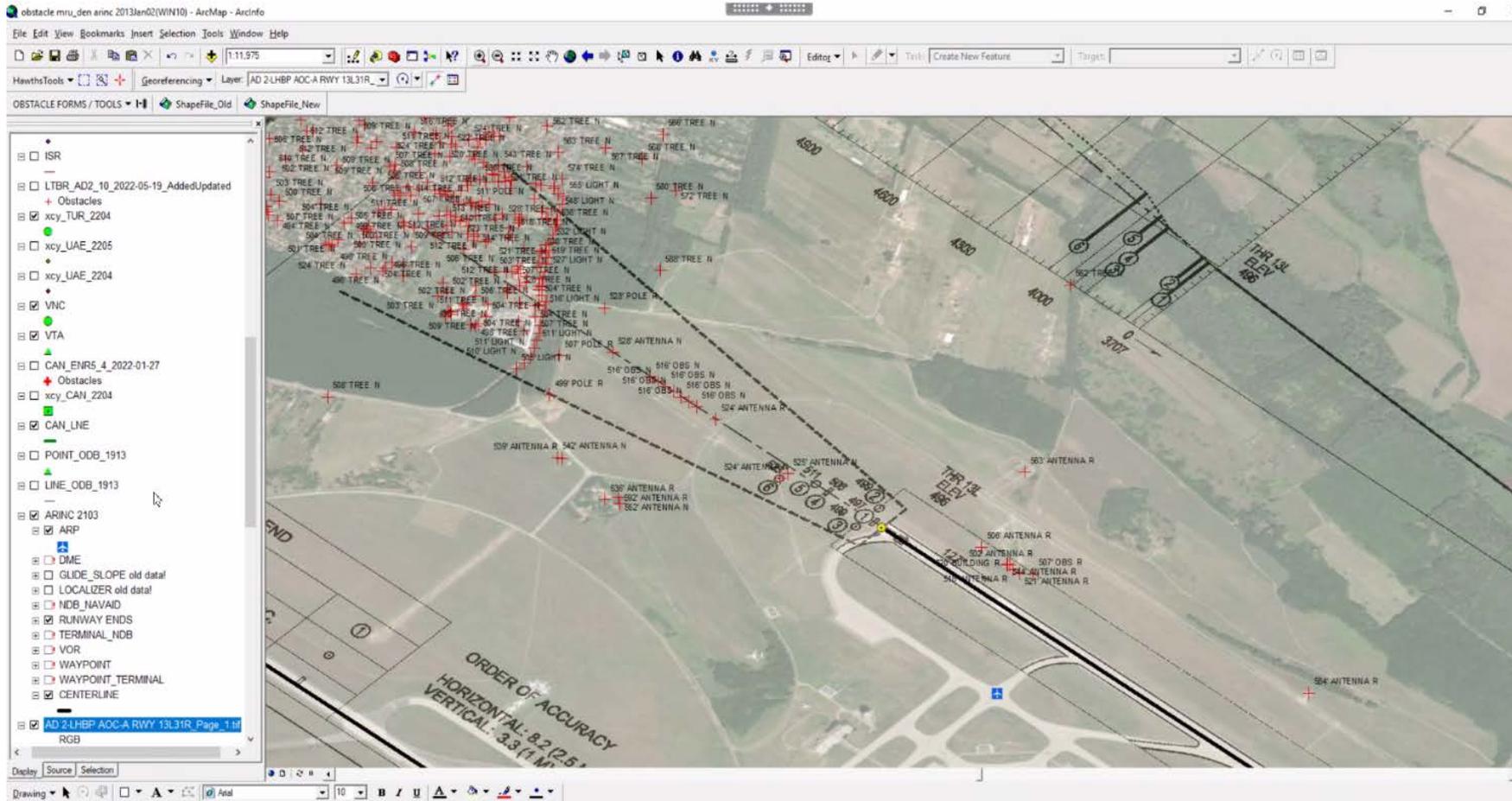


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Obstacle Datasets – We Fuse eData with other Data.





Obstacle Datasets – We Extract different formats.

- Used for:
 - Performance calculation;
 - Calculation of engine-out procedures;
 - TAWS (Terrain Avoidance and Warning Systems);
 - Procedure design;
 - Charting;
 - others



AIP Datasets received

- From one country in Europe.
- One country in Asia has announced its readiness.
- A few European countries will be ready soon and offer test data.

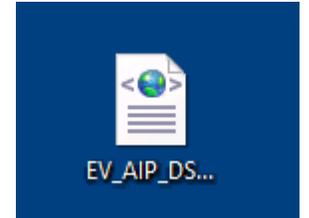


Processing of Latvia-AIP Data Set

Name Lateral limits Vertical limits Class of airspace	Unit providing service	Call sign Languages Area and conditions of use Hours of service	Frequency/ Purpose	Remarks
1	2	3	4	5
RIGA FIR 582448N 0203834E - 580700N 0212900E - 575342N 0213848E - 575124N 0213848E - 574712N 0214300E - 574547N 0215034E - 574458N 0215458E - 574645N 0220838E - 574930N 0221644E - 575539N 0223501E - 575627N 0224227E - 574850N 0225428E - 574208N 0225957E - 573511N 0231051E - 573538N 0232422E - 574011N 0233456E - 574858N 0233855E - 575357N 0233804E - 575357N 0241234E - 575602N 0241540E - 575228N 0242123E - Along the common Latvian/Estonian State boundary to 575112N 0255552E - Along the common Latvian/Estonian State boundary to 573103N 0272105E - Along the common Latvian/Russian existing administrative boundary to 564506N 0275408E - Along the common Latvian/Russian existing administrative boundary to 562843N 0280833E - Along the common Latvian/Russian existing administrative boundary to 561024N 0280848E - Along the common Latvian/Belarus existing administrative boundary to 554050N 0263750E - Along the common Latvian/Lithuanian State boundary to 555908N 0255851E - Along the common Latvian/Lithuanian State boundary to 562208N 0243749E - Along the common Latvian/Lithuanian State boundary to 562217N 0234520E - Along the common Latvian/Lithuanian State boundary to 562218N 0231222E - Along the common Latvian/Lithuanian State boundary to 560428N 0210537E - 560409N 0210352E - 560402N 0204452E - 560400N 0204000E - 560848N 0200456E - 561752N 0185354E - 562043N 0183023E - 565217N 0193400E - 570000N 0195000E - 571800N 0200000E - 581818N 0203443E - 582448N 0203834E UNL/GND Class of airspace: C - FL 660 / FL 095 G - FL 095 / GND and UNL / FL 660	Riga ACC	RIGA CONTROL English H24		

VS

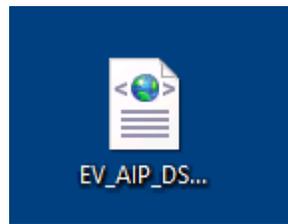
Name Lateral limits Vertical limits Class of airspace	Unit providing service	Call sign Languages Area and conditions of use Hours of service	Frequency/ Purpose	Remarks
1	2	3	4	5
FLIGHT INFORMATION REGION				
RIGA FIR Lateral limits are available in the AIP Data set, feature ID: e58add-fb-f5d4-40a6-9e45-00dd15148bc1 UNL/GND Class of airspace: C - FL 660 / FL 095 G - FL 095 / GND and UNL / FL 660	RIGA ACC	RIGA CONTROL English H24		



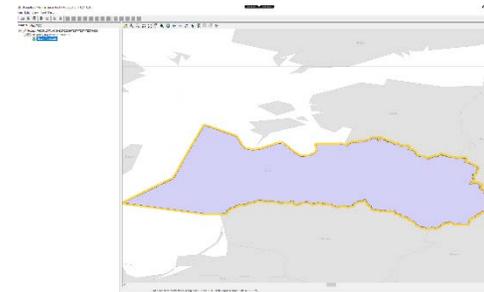
AIXM file



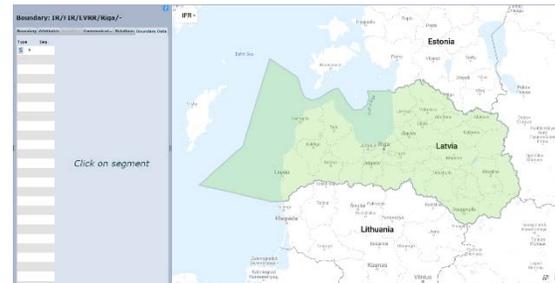
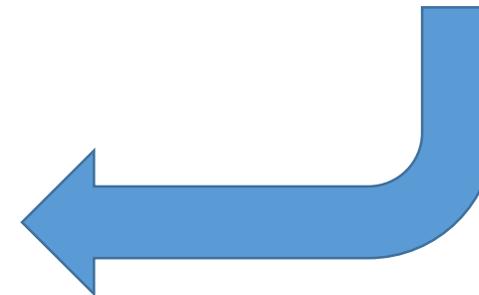
Processing of Latvia-AIP Data Set



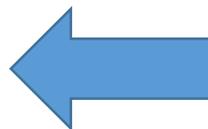
AIXM file



BMT



JAD



JAX

Seq.

127
128
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150
151

Riga FIR

from AIP Latvia

- 221 datapoints
- „then along the state boundary“
- Coded by datahouses
- With a tolerance
- Adjacent FIR boundaries identical

Click on segment





Challenges Seen with Obstacle Datasets

- Loss of Data (needs to be avoided in the Aeronautical Data Chain)
 - Availability of datasets was announced but they were not available.
 - AIRAC timelines were not followed. No time to incorporate changes.
- Data Quality and Verification
 - Quality of the content remains of utmost importance.
 - Discrepancies need to get clarified.
 - Users' trust needs to be built.
- Change Management and Certification
 - Changes to systems and processes have a certification impact.



Challenges Seen with Obstacle Datasets

- Interoperability
 - Digital data not always interoperable.
 - Transition phase. Data houses need to process it all, from paper to digital.
- Ownership and Liability
 - Ownership/data liability needs to be clear.
 - Digital data sets are to be considered “for operational use”.
 - Disclaimers like "for information purposes only" shall be avoided.
 - Restrictive copyright notes shall be avoided.
 - Data inconsistency between paper/PDF and dataset publication shall be avoided.



Challenges Seen with Obstacle Datasets

- No Filtering – Data Overflow/Confusion.
 - No filtering. (Obstacles on the Clearway (CWY)).
 - Data overflow. (10 million rooftops in a big city).
- Different file formats.



Challenges Seen with AIP Datasets

- Complexity, different dialects.
- Discrepancies between paper AIP and AIP dataset.
- A lot of testing is required.
- Intense communication between AIS and Data Houses is required.



ICAO Doc 10066 – PANS-AIM

5.2 AERONAUTICAL INFORMATION IN A STANDARDIZED PRESENTATION

5.2.1.1.3 As of 4 November 2021, when the AIP Data Set (as specified in 5.3.3.1) is provided, the following sections of the AIP may be omitted and a reference to the data set availability shall be provided:

- a) GEN 2.5 List of radio navigation aids;
- b) ENR 2.1 FIR, UIR, TMA and CTA;
- c) ENR 3.1 Conventional navigation routes;
- d) ENR 3.2 Area navigation routes;
- ...

5.2.1.1.4 When the Obstacle Data Set (as specified in 5.3.3.2.2) is provided, the following sections of the AIP may be omitted and a reference to the data set availability shall be provided:

- a) ENR 5.4 Air navigation obstacles;
- b) ****AD 2.10 Aerodrome obstacles; and
- c) ****AD 3.10 Heliport obstacles.



EUROCONTROL Data set provision checklist

- Requested by the European data houses.
- Will be published as part of the “**EUROCONTROL Guidelines for harmonised AIP publication and data set provision**”.
- Consists of two steps:
 - **Step 1** – checkpoints to be considered before releasing a *new digital AIS data set* as AIS Product.
 - **Step 2** – checkpoints before *removing the AIP tables*.
- Suggests:
 - Timely communication.
 - Awareness.
 - Testing.
 - Communication.
 - Working together.



Questions to the Meeting

- What are the plans for the publication of AIP datasets in the region?
- Digital data exchange between AIS, ATC and other stakeholders?
- Digital data exchange between adjacent countries?



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THANK YOU

