AFI Region AIXM-eAIP implementation workshop (Dakar, SENEGAL, 3-5 October 2016)

ASECNA DEVELOPMENT AND EXPERIENCES ON AIXM DATABASE AND eAIP PRODUCTION

(Athanase AHOUANGAN, ASECNA AIM head officer)

TOPICS

Introduction

I- Steps for AIXM-eAIP implementation

1- Software and hardware for AIXM database
2- Data collection and validation in AIXM database
3- eAIP software
4- Initial eAIP

II- ASECNA experiences

1-ASECNA AIXM database infrastructure
2- Database structuration
3- ASECNA eAIP software
4- AIP page migration to XML

Conclusion

INTRODUCTION

The roadmap for the transition from AIS to AIM has in its phases 2 and 3 some steps which lead us to implement database and eAIP:

Phase 2 :

- P06: Integrated aeronautical information database
- P07: Unique identifier
- P08 : Aeronautical conceptual model
- P11: Electronic AIP

Phase 3

P09 : aeronautical data exchange.

Start from having no database to reach eAIP production passing by AIXM data base implementation, is not a game and the road to reach the goal is not short.
It needs means, work, organisation and time.
Our presentation objective is to review how to go to AIXM-eAIP production and to share ASECNA experiences in that way.

I- Steps for AIXM-eAIP implementation

1- Hardware and software for AIXM database

- Have an eAIP based on AIXM begins with database settlement.
- For that, data provider has to acquire software and hardware with industrials specialized in AIXM database designing.
- The data provider has to give the designer the objectives and all specifications of the data base desired.
- It's important to take into account the interoperability necessary between the data base and others softwares to satisfy the outcomes of aeronautical information.

I- Steps for AIXM-eAIP implementation

2- Data collection and validation in AIXM database

- After Database Hardware and software installation, the following step is to collect data required, transform them in AIXM format to populate the database.
- There are many possibilities for that:
- 1) Country Data are available in ARINC 424 with data coding company: in this case, the procedure is to acquire data with the company, verify and transform them in AIXM format.
- 2) Country data are not available in coded format but are in AIP: in this case, the procedure is to verify data existing in AIP, validate and type them directly in AIXM through the HMI. This is to be done one by one for each data. It's take a long time.
- 3) Specific case of airspace border description : all airspace which descriptions are not done with geometric regular forms must be vectored and be transformed in a serial of points with geographical coordinates. TMAs UTAs and FIRs boundaries are in this case.
- AIXM Data completeness, consistency and integrity are a start up conditions to go towards AIXM-eAIP activities.

I- Steps for AIXM-eAIP implementation

3- eAIP software

For a coherent implementation of eAIP, it's very important to design AIXM database and eAIP tools in the same time in order to take into account the necessary interoperability between AIXM database and eAIP tools software.

eAIP software has to take data from database and to put them in corresponding sections in AIP structure.

eAIP software tools have also be designed to take into account the possibilities to built eAIP in two or more languages and also if the eAIP is for a lonely country or for multi-countries.

All changes in AIXM database from AIRAC date to AIRAC date must be captured by eAIP software in order to propose automatically an amendment sheet to publisher operators.

I- Steps for AIXM-eAIP implementation

4- Initial eAIP

- **AIXM-eAIP implementation needs two operations:**

- **1) Initial eAIP building**
- AIXM and eAIP software are used to migrate data in XML format with AIP page presentation (AIP structure in parts and sections).
- All pages of AIP must be created in XML to built initial eAIP.
- XML format is the base to publish eAIP on the WEB or on CDROM in HTML.
- From XML format, it's possible to have PDF format for paper publication.
- The initial AIP is released on AIRAC date.

- **2) Amendment production**
- From this initial eAIP, in accordance to the regular time of amendment publication, all changes in database are taken into account by eAIP software and then to generate a draft of amendment to AIP publisher operator for validation and release. This operation is renew for each amendment publication.

II- ASECNA experiences

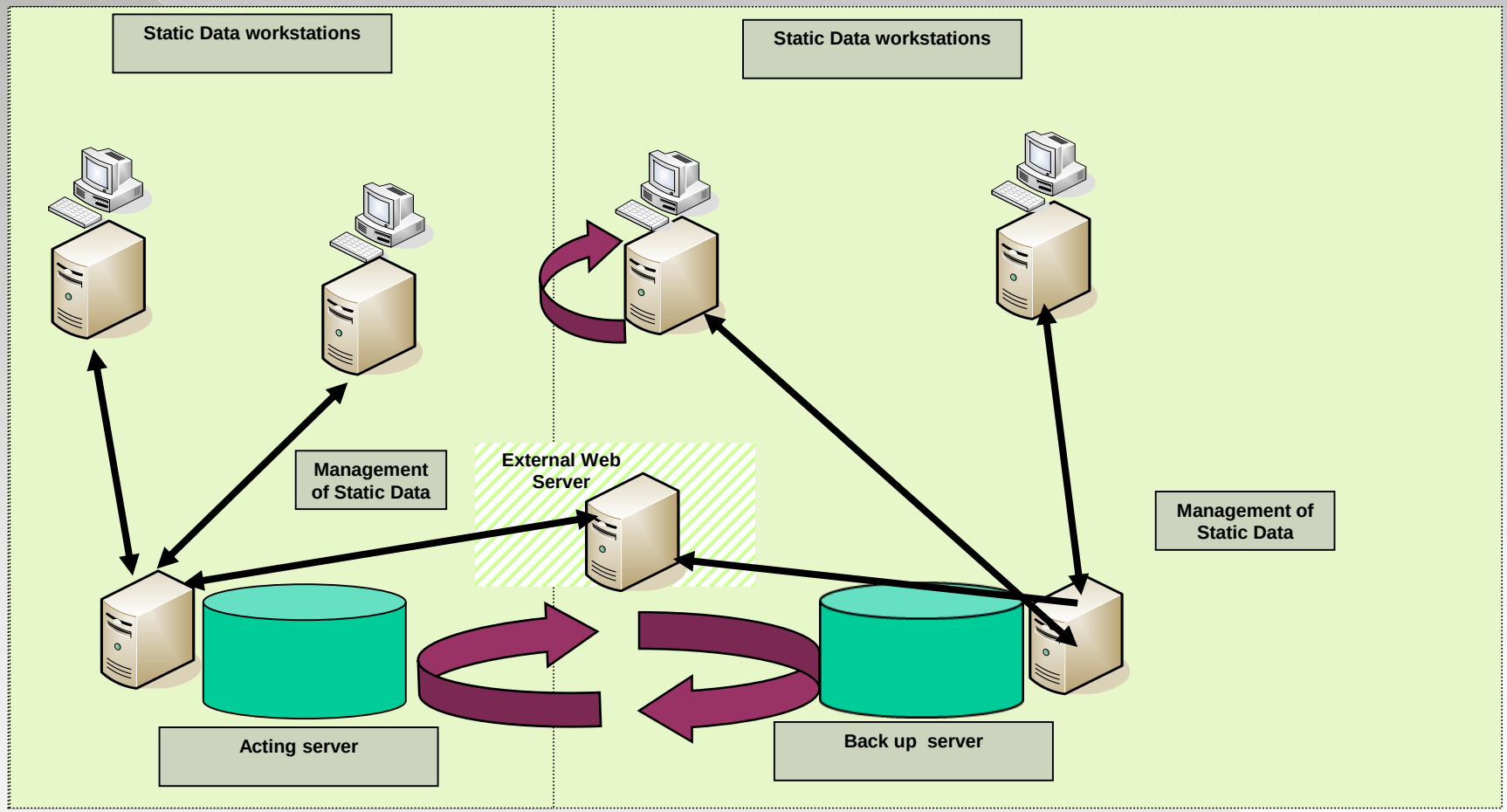
1-ASECNA AIXM database infrastructure

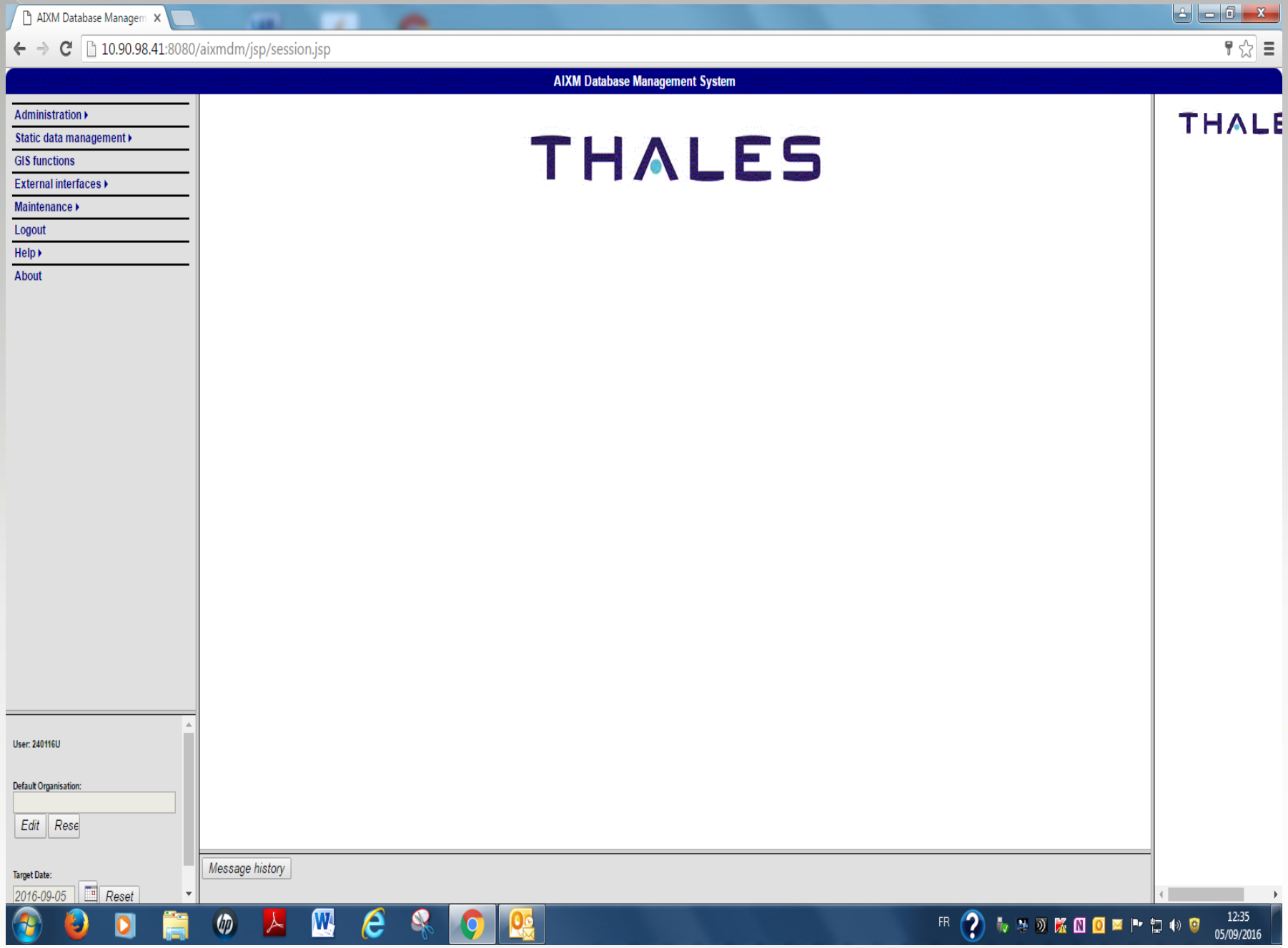
HARDWARE

- - 2 Static data (SDO) servers
- - SDO Workstations computers for data management and data operations (HMI)
- - IP network infrastructure
- **SOFWARE**
- - RedHat LINUX ES for server operations system ;
- - AIXM + THALES for aeronautical data exchange (AIXM 4.5),data storage and HMI providing for SDO operators;
- - ORACLE for relational data management
- **INTERFACES**
- - Textual Data management (TDM): create,modify,update, delete, import and export data;
- - Graphical Data management (GDM): data reporting in chart;
- - Checks : data format, intra-tables and dependencies, cross-table rules and inter-dependancies.

II- ASECNA experiences

1-ASECNA AIXM database infrastructure (a)




AIXM Database Manage
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External interfaces
Maintenance
Logout
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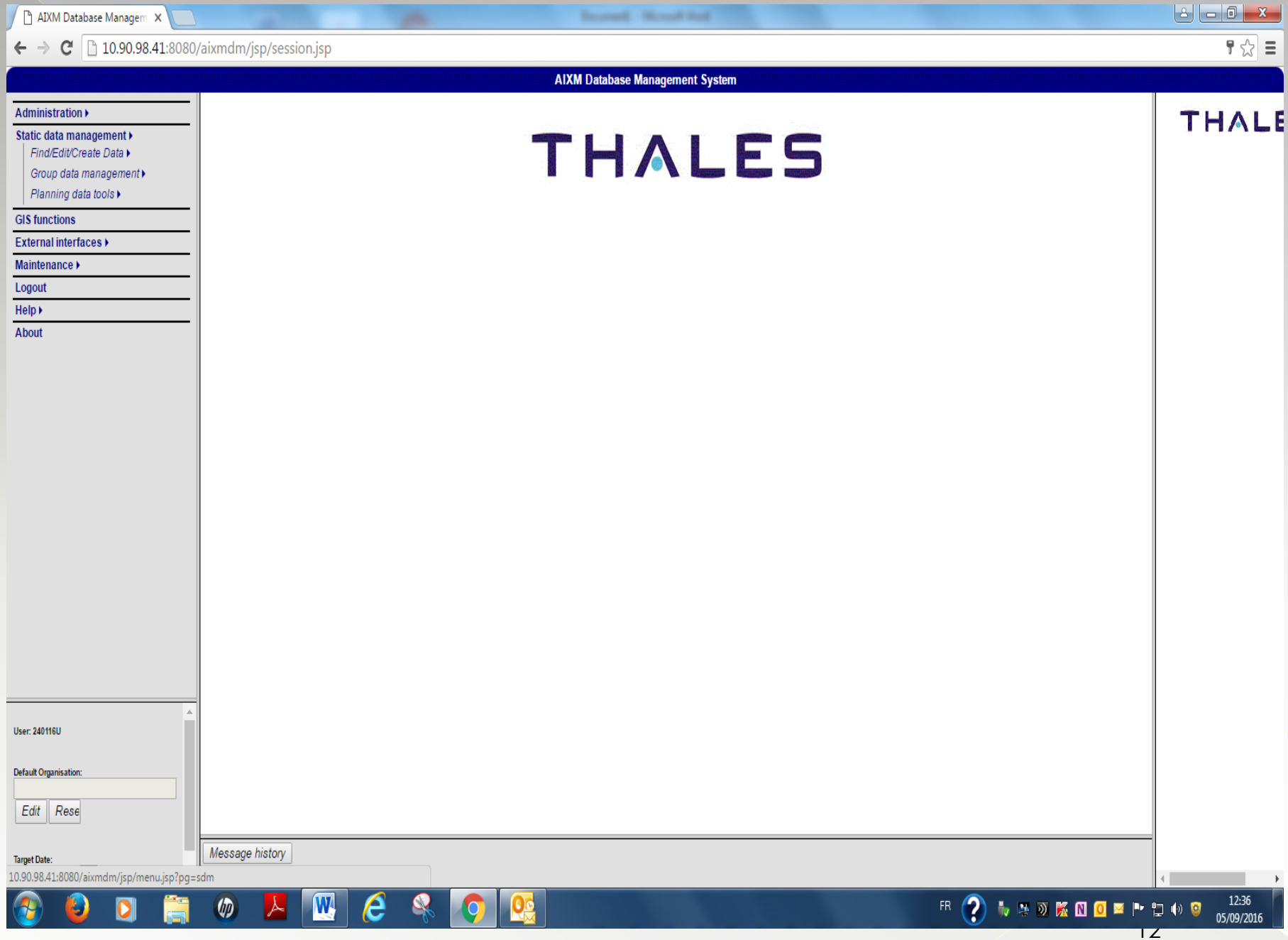
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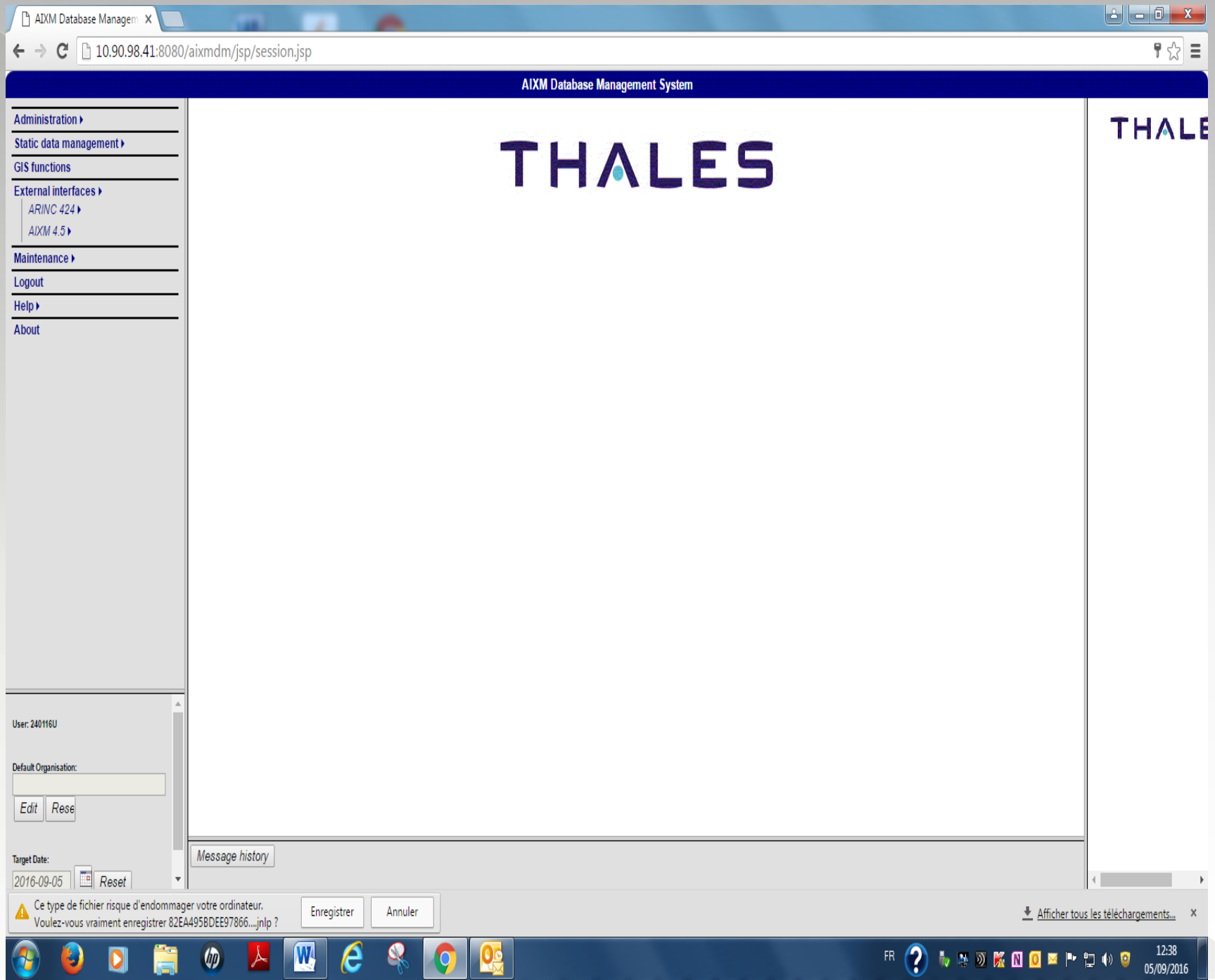
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Voulez-vous vraiment enregistrer 82EA495BDEE97866....jnlp ?
Enregistrer
Annuler
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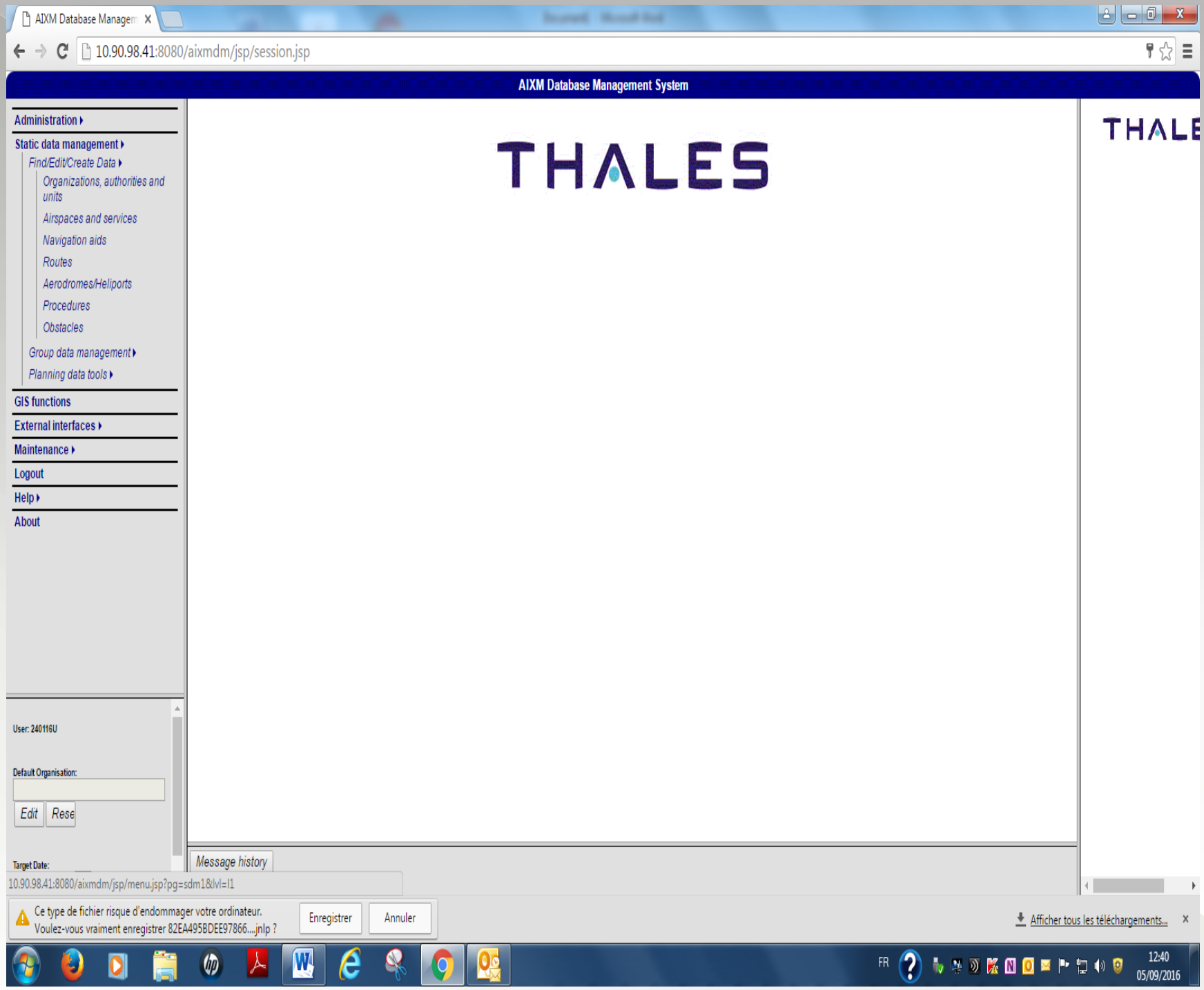
II- ASECNA experiences

2- Database structuration

- ASECNA AIXM database is designed to receive data belonguing to the seventeen countries. It's built with AICM structuration and include :
  - - organization, authorities and units;
  - - airspaces and services
  - - navigation aids;
  - - aerodromes and heliports;
  - - procedures;
  - - Obstacles.

Data migration status

Données migrées.xlsx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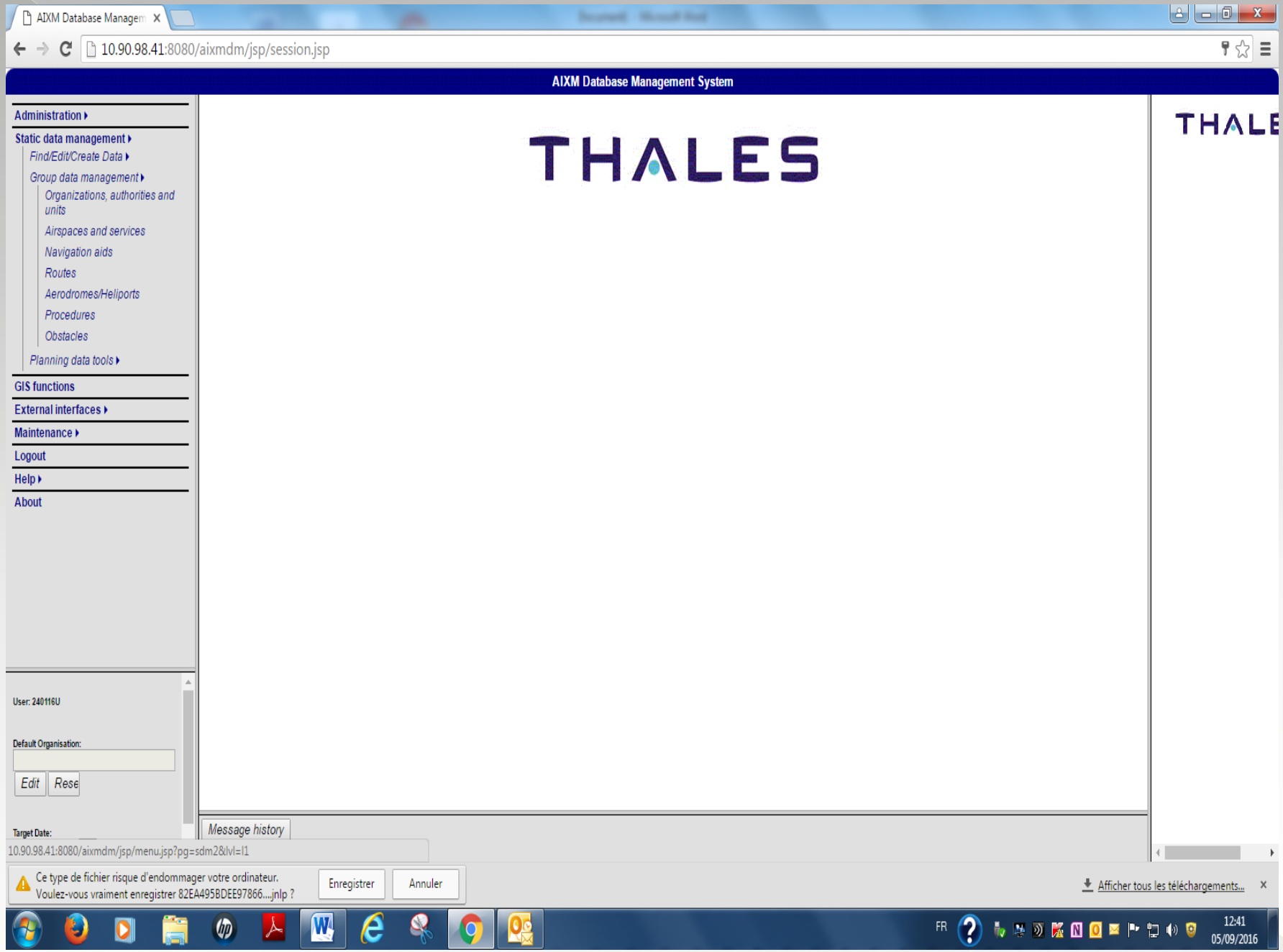
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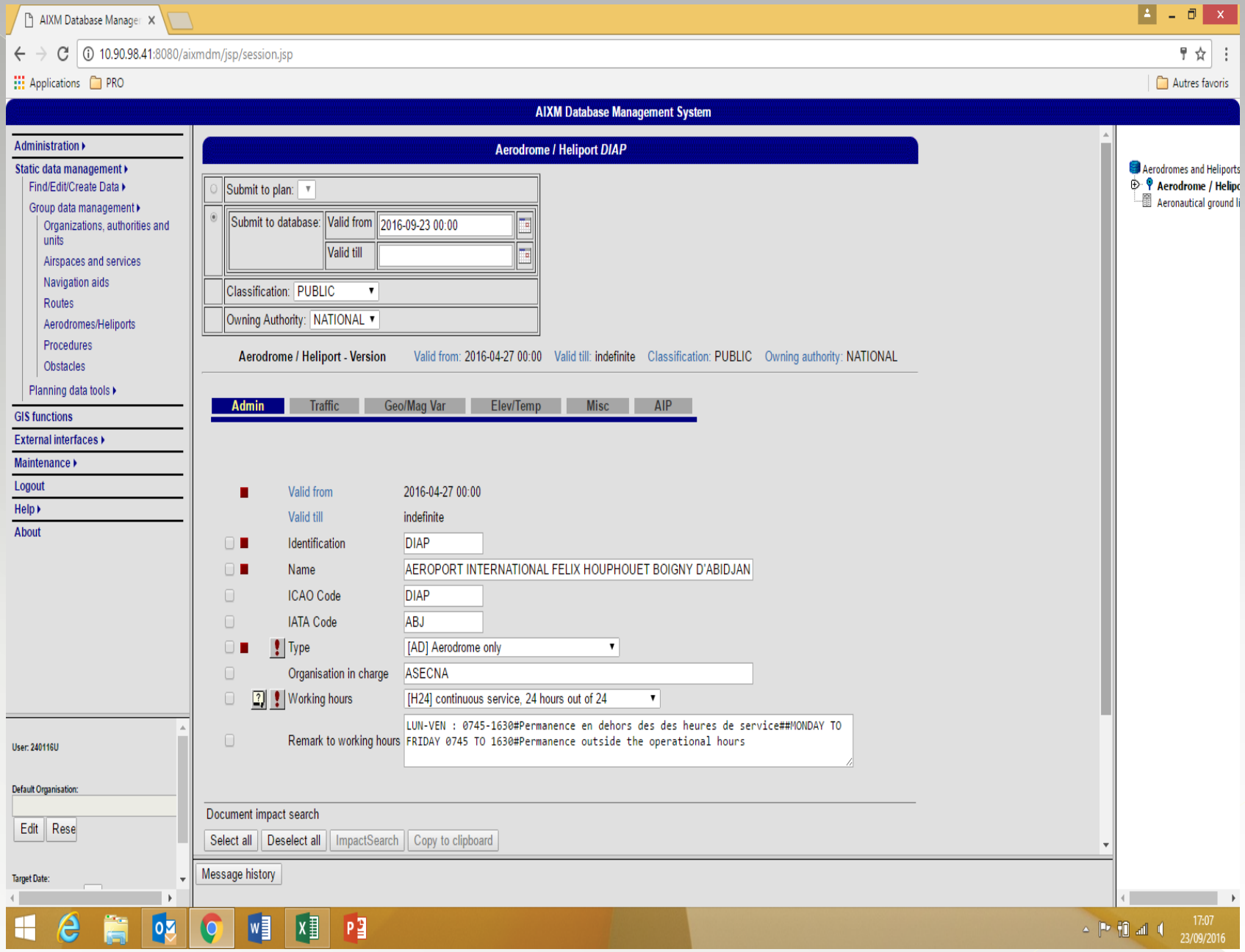
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Aerodrome / Heliport DIAP
Submit to plan:
Submit to database:
Valid from 2016-09-23 00:00
Valid till
Classification: PUBLIC
Owning Authority: NATIONAL
Aerodrome / Heliport - Version
Valid from: 2016-04-27 00:00
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Valid from 2016-04-27 00:00
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Identification DIAP
Name AEROPORT INTERNATIONAL FELIX HOUPHOUET BOIGNY D'ABIDJAN
ICAO Code DIAP
IATA Code ABJ
Type [AD] Aerodrome only
Organisation in charge ASECNA
Working hours [H24] continuous service, 24 hours out of 24
Remark to working hours LUN-VEN : 0745-1630#Permanence en dehors des des heures de service##MONDAY TO FRIDAY 0745 TO 1630#Permanence outside the operational hours
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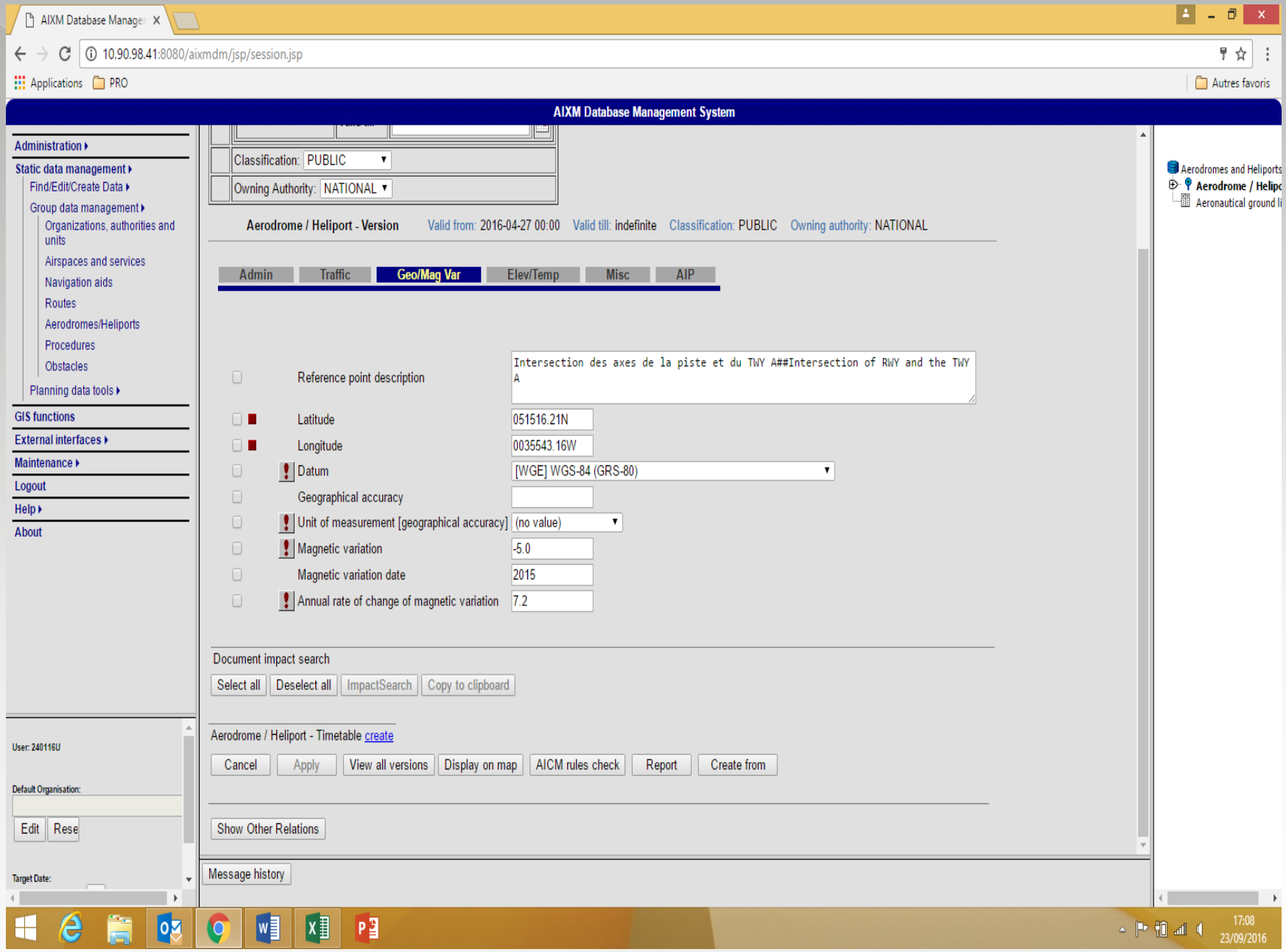
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Reference point description
Intersection des axes de la piste et du TWY A##Intersection of RWY and the TWY A
Latitude
051516.21N
Longitude
0035543.16W
Datum
[WGE] WGS-84 (GRS-80)
Geographical accuracy
Unit of measurement [geographical accuracy]
(no value)
Magnetic variation
-5.0
Magnetic variation date
2015
Annual rate of change of magnetic variation
7.2
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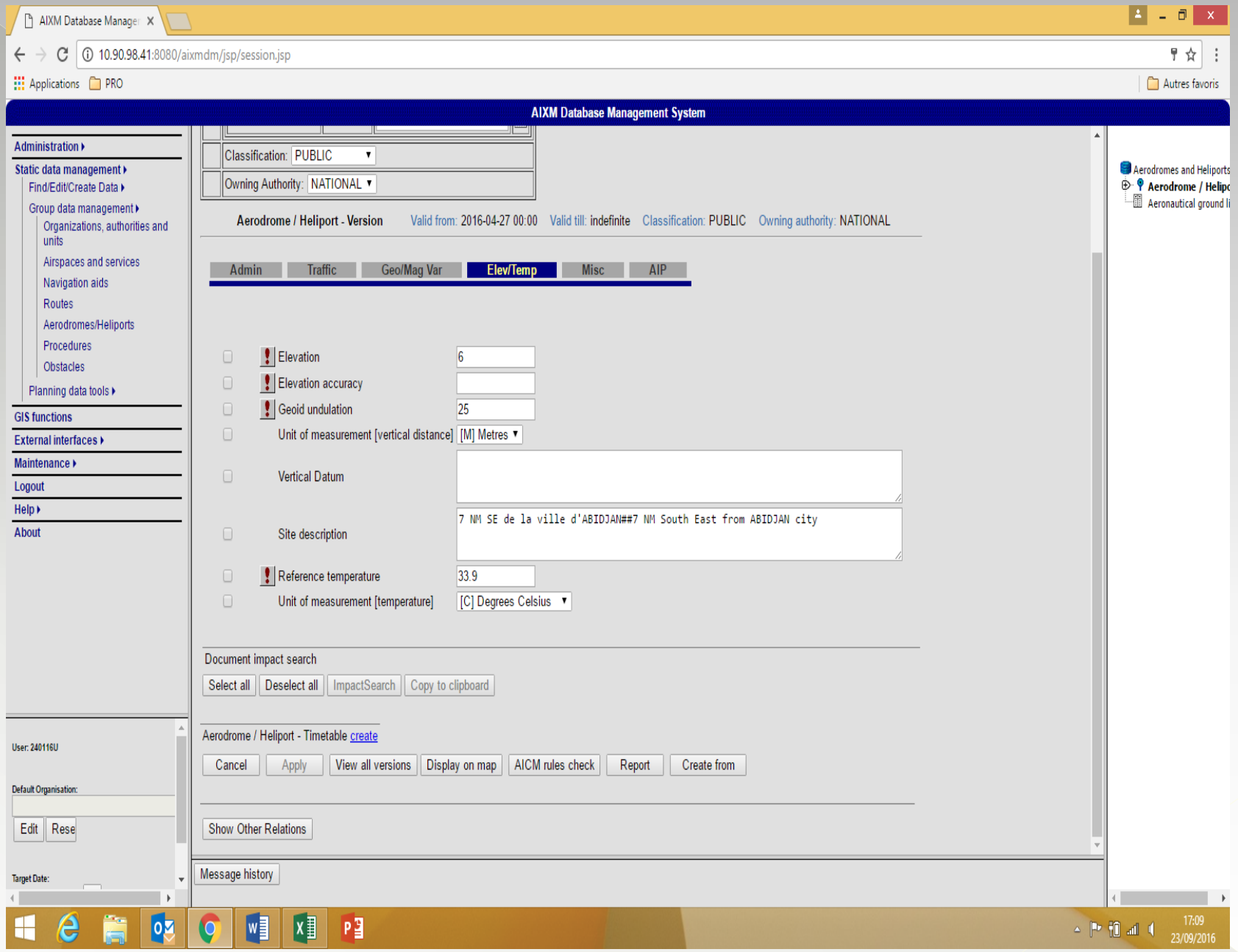
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25
Unit of measurement [vertical distance]
[M] Metres
Vertical Datum
Site description
7 NM SE de la ville d'ABIDJAN##7 NM South East from ABIDJAN city
Reference temperature
33.9
Unit of measurement [temperature]
[C] Degrees Celsius
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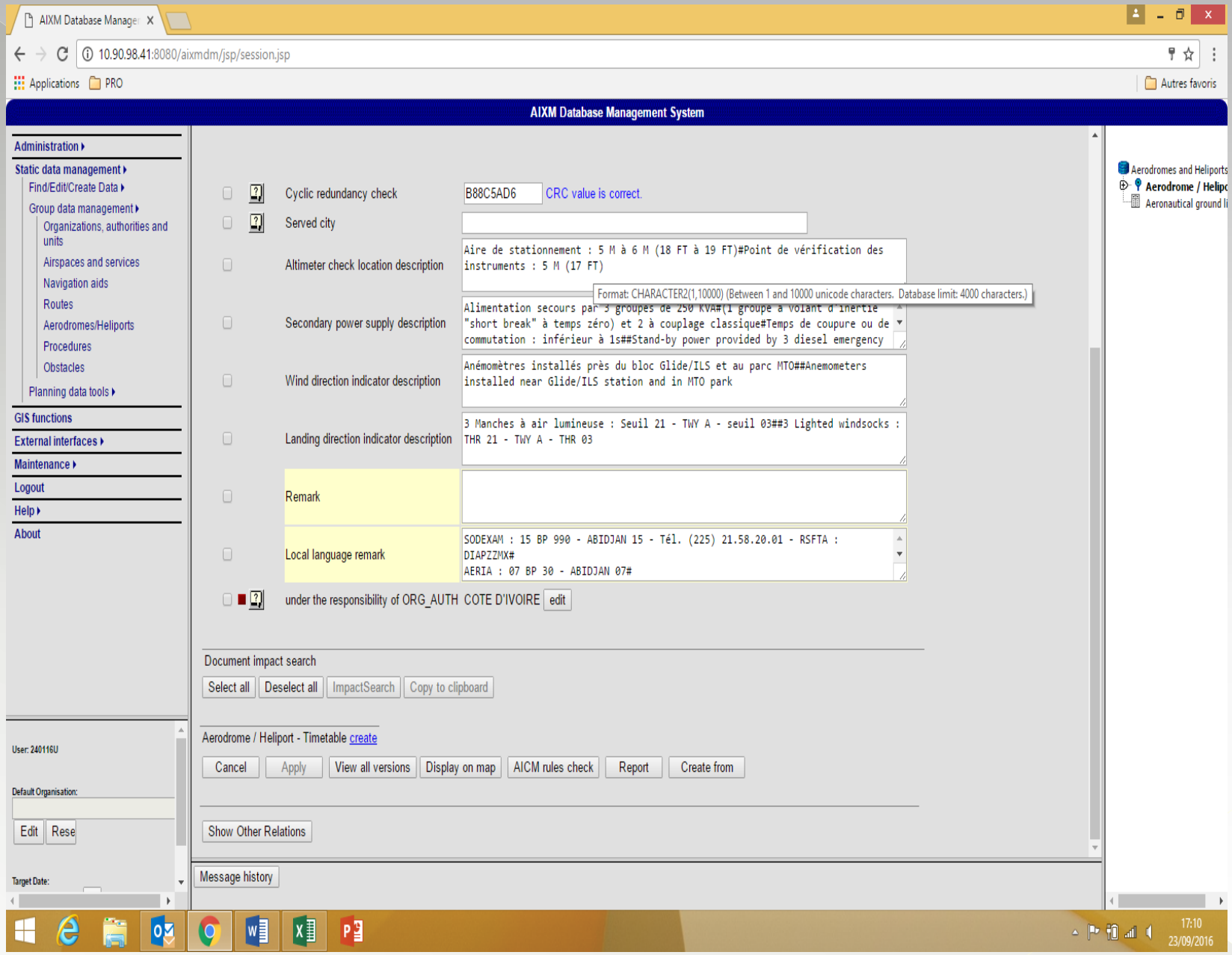
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About
Cyclic redundancy check
B88C5AD6
CRC value is correct.
Served city
Altimeter check location description
Aire de stationnement : 5 M à 6 M (18 FT à 19 FT)#Point de vérification des instruments : 5 M (17 FT)
Format: CHARACTER2(1,10000) (Between 1 and 10000 unicode characters. Database limit: 4000 characters.)
Secondary power supply description
Alimentation secours par 3 groupes de 250 kVA#(1 groupe à volant d'inertie "short break" à temps zéro) et 2 à couplage classique#Temps de coupure ou de commutation : inférieur à 1s##Stand-by power provided by 3 diesel emergency
Wind direction indicator description
Anémomètres installés près du bloc Glide/ILS et au parc MTO##Anemometers installed near Glide/ILS station and in MTO park
Landing direction indicator description
3 Manches à air lumineuse : Seuil 21 - TWY A - seuil 03##3 Lighted windsocks : THR 21 - TWY A - THR 03
Remark
Local language remark
SODEXAM : 15 BP 990 - ABIDJAN 15 - Tél. (225) 21.58.20.01 - RSFTA : DIAPZZMX#
AERIA : 07 BP 30 - ABIDJAN 07#
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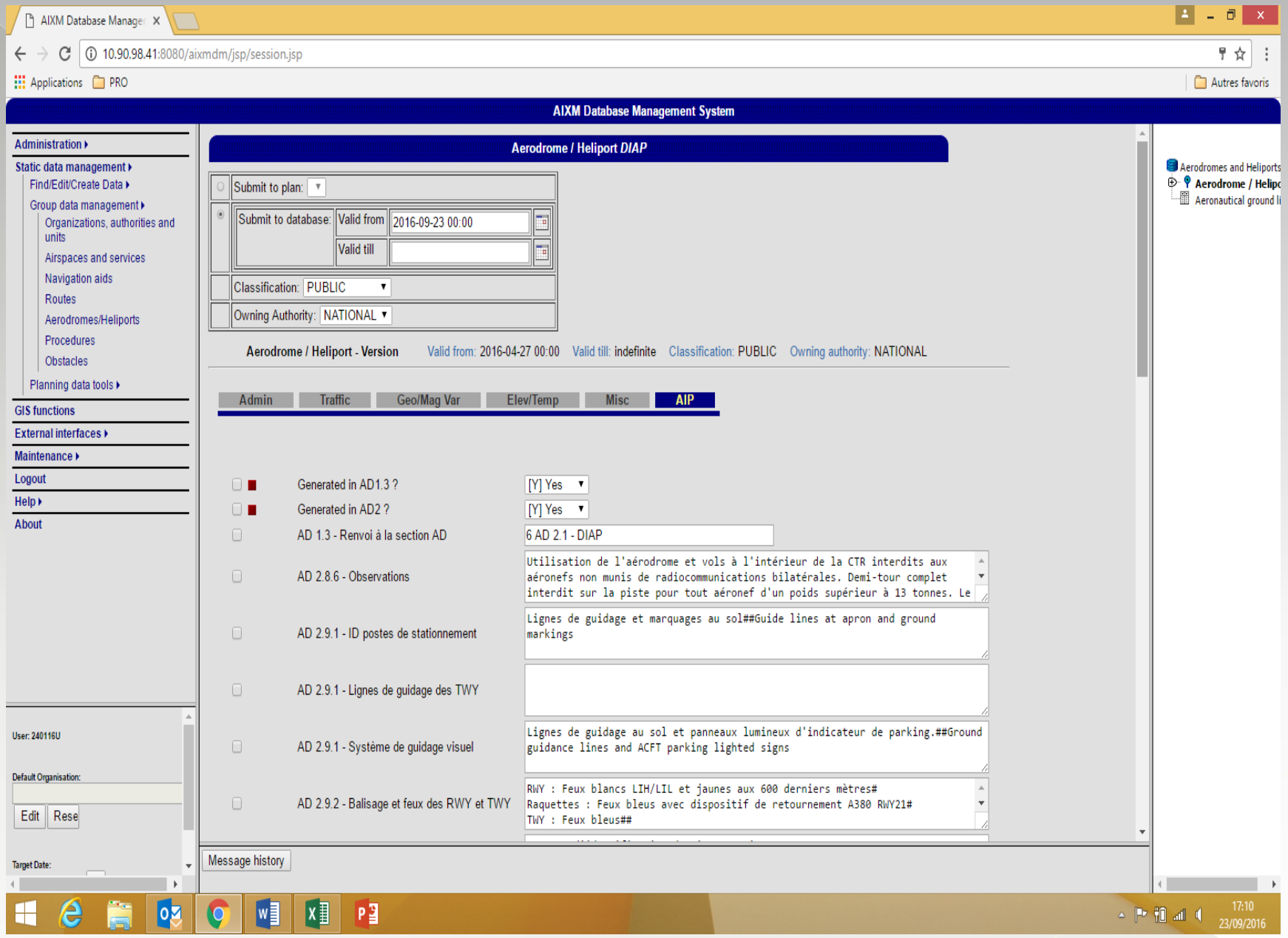
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Generated in AD1.3 ?
[Y] Yes
Generated in AD2 ?
[Y] Yes
AD 1.3 - Renvoi à la section AD
6 AD 2.1 - DIAP
AD 2.8.6 - Observations
Utilisation de l'aérodrome et vols à l'intérieur de la CTR interdits aux aéronefs non munis de radiocommunications bilatérales. Demi-tour complet interdit sur la piste pour tout aéronef d'un poids supérieur à 13 tonnes. Le
AD 2.9.1 - ID postes de stationnement
Lignes de guidage et marquages au sol##Guide lines at apron and ground markings
AD 2.9.1 - Lignes de guidage des TWY
AD 2.9.1 - Système de guidage visuel
Lignes de guidage au sol et panneaux lumineux d'indicateur de parking.##Ground guidance lines and ACFT parking lighted signs
AD 2.9.2 - Balisage et feux des RWY et TWY
RWY : Feux blancs LIH/LIL et jaunes aux 600 derniers mètres#
Raquettes : Feux bleus avec dispositif de retournement A380 RWY21#
TWY : Feux bleus##
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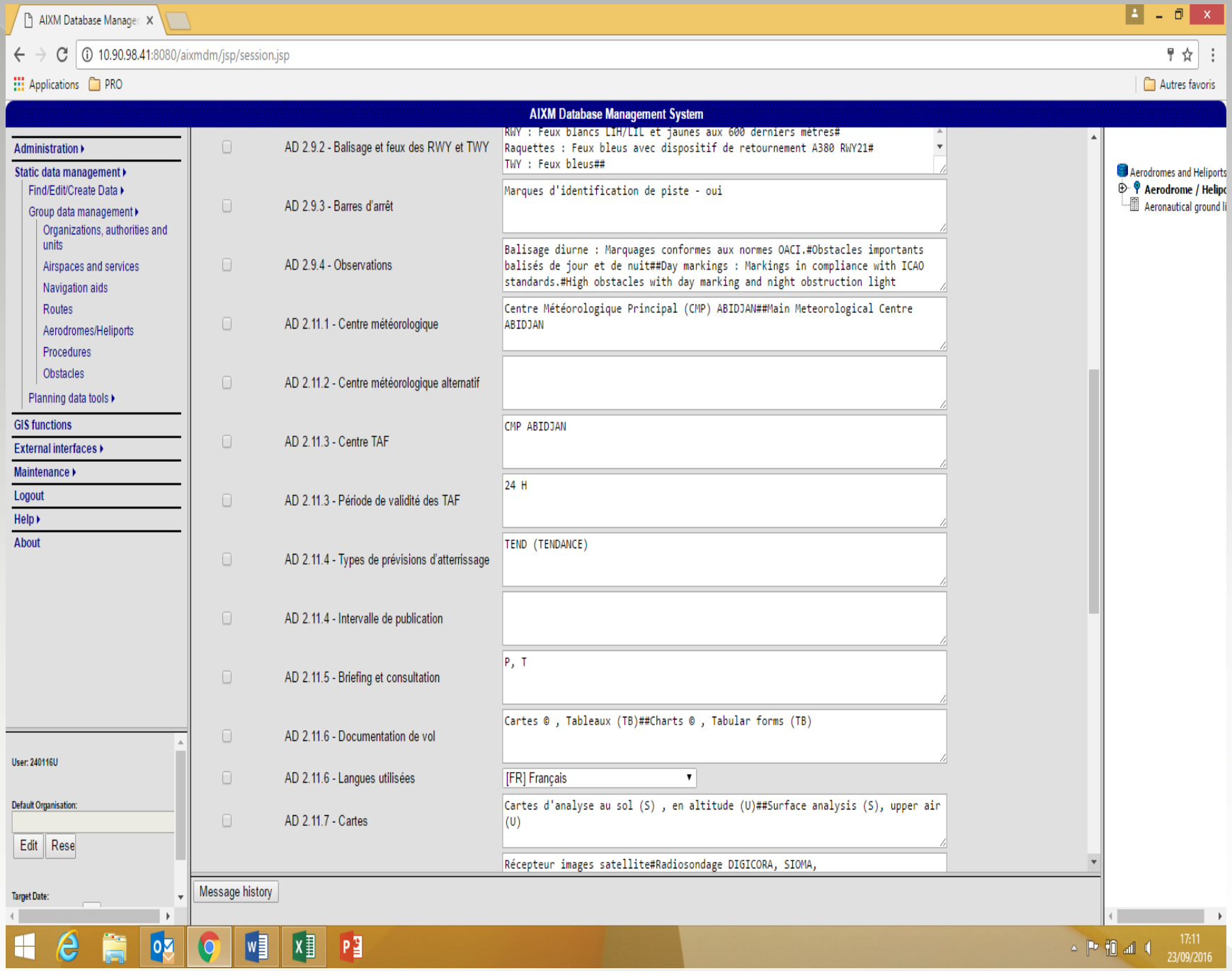
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AD 2.9.2 - Balisage et feux des RWY et TWY
RWY : Feux blancs LIH/LIL et jaunes aux 600 derniers mètres#
Raquettes : Feux bleus avec dispositif de retournement A380 RWY21#
TWY : Feux bleus##
AD 2.9.3 - Barres d'arrêt
Marques d'identification de piste - oui
AD 2.9.4 - Observations
Balisage diurne : Marquages conformes aux normes OACI.#Obstacles importants balisés de jour et de nuit##Day markings : Markings in compliance with ICAO standards.#High obstacles with day marking and night obstruction light
AD 2.11.1 - Centre météorologique
Centre Météorologique Principal (CMP) ABIDJAN##Main Meteorological Centre ABIDJAN
AD 2.11.2 - Centre météorologique alternatif
AD 2.11.3 - Centre TAF
CMP ABIDJAN
AD 2.11.3 - Période de validité des TAF
24 H
AD 2.11.4 - Types de prévisions d'atterrissage
TEND (TENDANCE)
AD 2.11.4 - Intervalle de publication
AD 2.11.5 - Briefing et consultation
P, T
AD 2.11.6 - Documentation de vol
Cartes © , Tableaux (TB)##Charts © , Tabular forms (TB)
AD 2.11.6 - Langues utilisées
[FR] Français
AD 2.11.7 - Cartes
Cartes d'analyse au sol (S) , en altitude (U)##Surface analysis (S), upper air (U)
Récepteur images satellite#Radiosondage DIGICORA, SIOMA,
Aerodromes and Heliports
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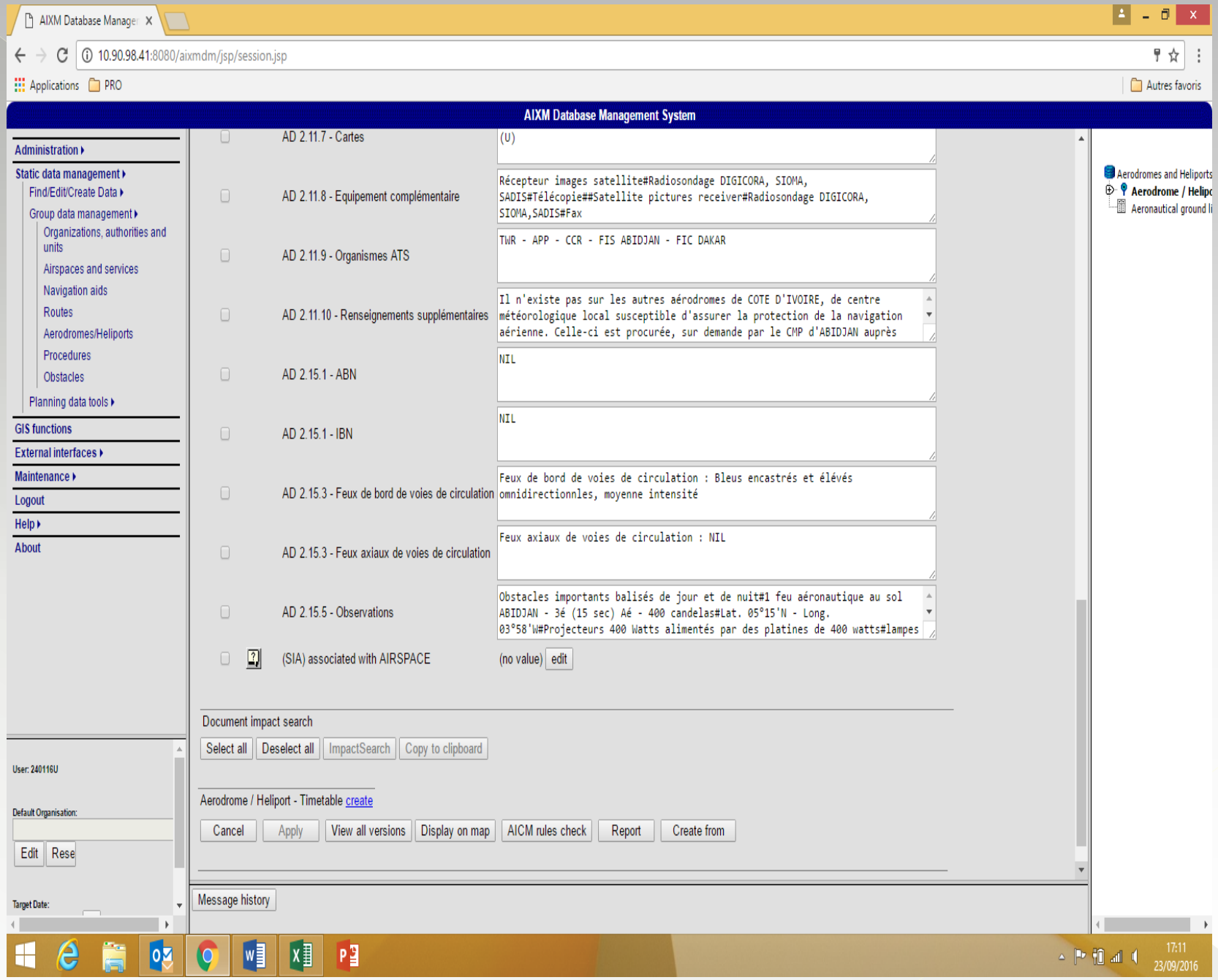
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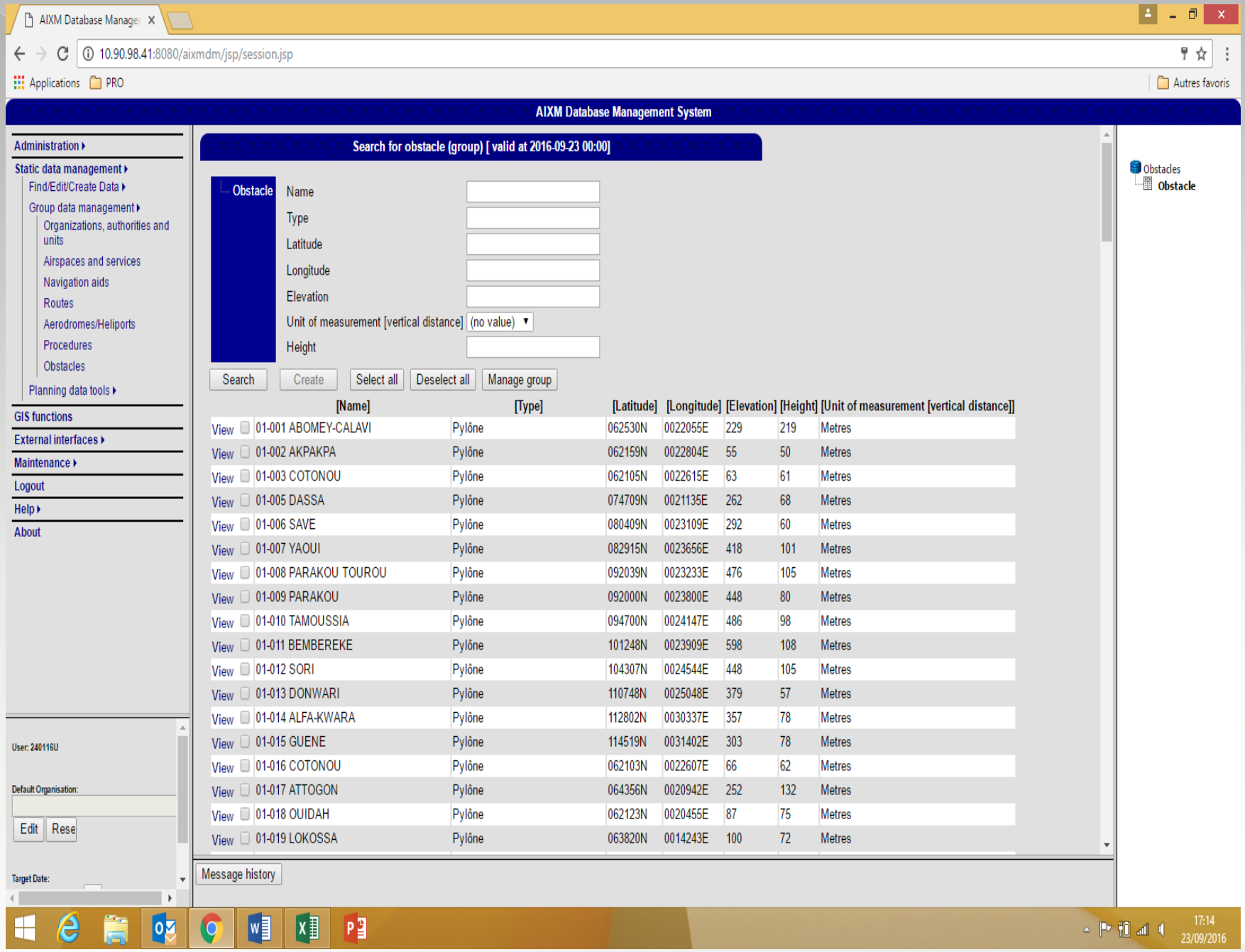
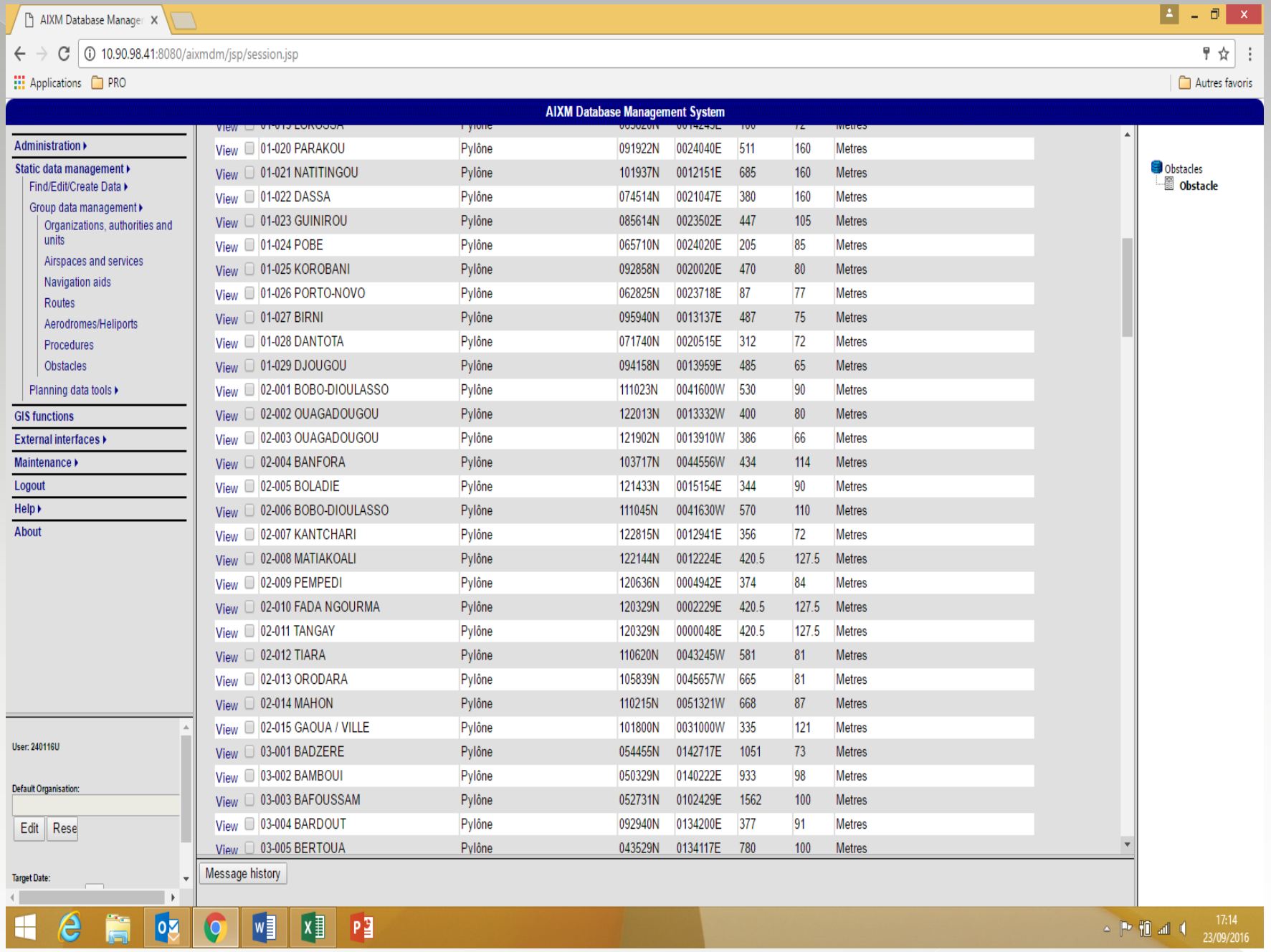
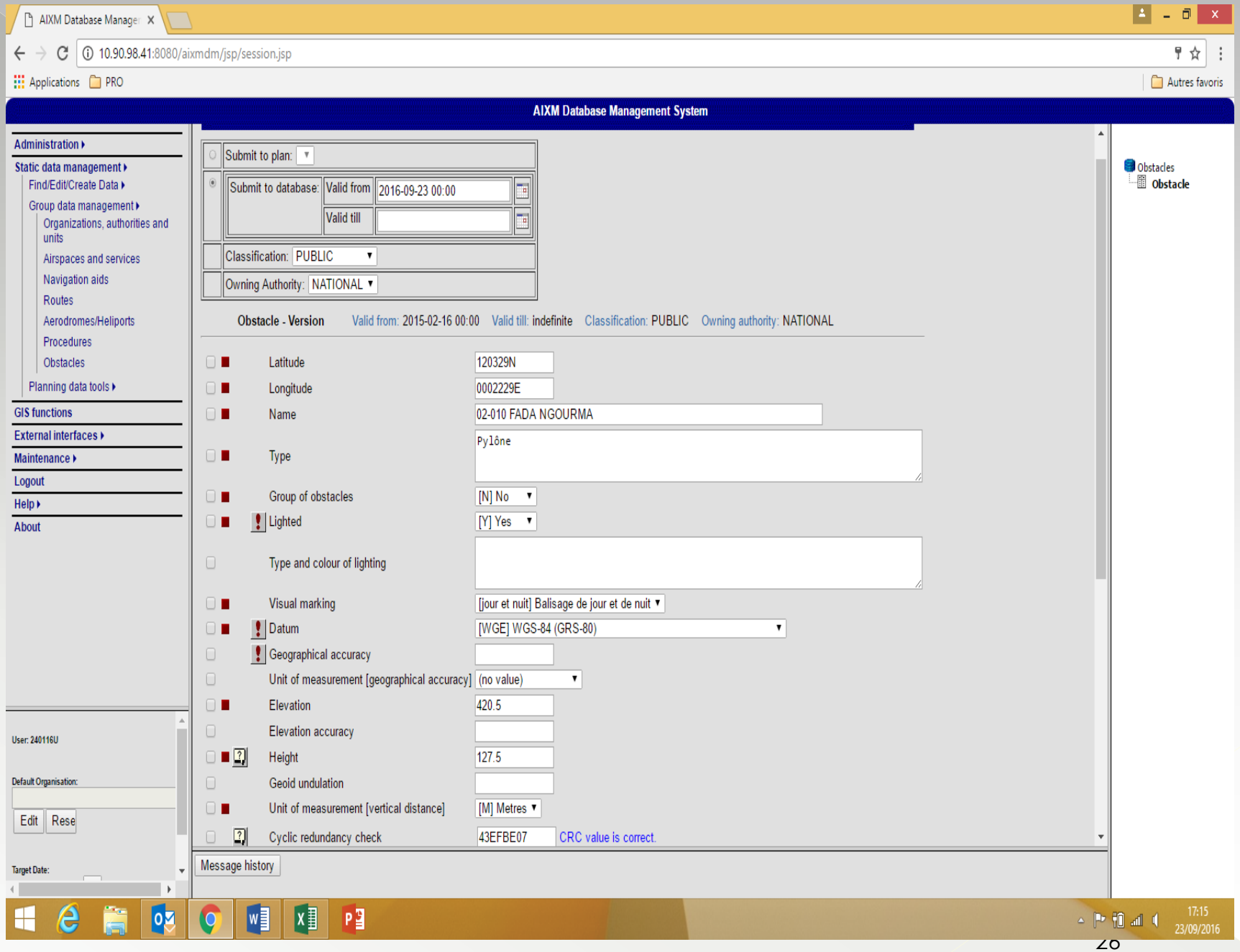
AD 2.11.7 - Cartes
(U)
AD 2.11.8 - Equipement complémentaire
Récepteur images satellite#Radiosondage DIGICORA, SIOMA, SADIS#Télécopie##Satellite pictures receiver#Radiosondage DIGICORA, SIOMA,SADIS#Fax
AD 2.11.9 - Organismes ATS
TWR - APP - CCR - FIS ABIDJAN - FIC DAKAR
AD 2.11.10 - Renseignements supplémentaires
Il n'existe pas sur les autres aérodromes de COTE D'IVOIRE, de centre météorologique local susceptible d'assurer la protection de la navigation aérienne. Celle-ci est procurée, sur demande par le CMP d'ABIDJAN auprès
AD 2.15.1 - ABN
NIL
AD 2.15.1 - IBN
NIL
AD 2.15.3 - Feux de bord de voies de circulation
Feux de bord de voies de circulation : Bleus encastrés et élévés omnidirectionnles, moyenne intensité
AD 2.15.3 - Feux axiaux de voies de circulation
Feux axiaux de voies de circulation : NIL
AD 2.15.5 - Observations
Obstacles importants balisés de jour et de nuit#1 feu aéronautique au sol ABIDJAN - 3é (15 sec) Aé - 400 candelas#Lat. 05°15'N - Long. 03°58'W#Projecteurs 400 Watts alimentés par des platines de 400 watts#lampes
(SIA) associated with AIRSPACE
(no value)
edit
Document impact search
Select all
Deselect all
ImpactSearch
Copy to clipboard
Aerodrome / Heliport - Timetable create
Cancel
Apply
View all versions
Display on map
AICM rules check
Report
Create from
Message history
Aerodromes and Heliports
Aerodrome / Helipo
Aeronautical ground li
User: 240116U
Default Organisation:
Edit
Rese
Target Date:
17:11
23/09/2016


AIXM Database Manage
10.90.98.41:8080/aixmdm/jsp/session.jsp
Applications
PRO
Autres favoris
AIXM Database Management System
Administration
Static data management
Find/Edit/Create Data
Group data management
Organizations, authorities and units
Airspaces and services
Navigation aids
Routes
Aerodromes/Heliports
Procedures
Obstacles
Planning data tools
GIS functions
External interfaces
Maintenance
Logout
Help
About
Search for obstacle (group) [valid at 2016-09-23 00:00]
Obstacle
Name
Type
Latitude
Longitude
Elevation
Unit of measurement [vertical distance]
(no value)
Height
Search
Create
Select all
Deselect all
Manage group
[Name] [Type] [Latitude] [Longitude] [Elevation] [Height] [Unit of measurement [vertical distance]]
View 01-001 ABOMEY-CALAVI Pylône 062530N 0022055E 229 219 Metres
View 01-002 AKPAKPA Pylône 062159N 0022804E 55 50 Metres
View 01-003 COTONOU Pylône 062105N 0022615E 63 61 Metres
View 01-005 DASSA Pylône 074709N 0021135E 262 68 Metres
View 01-006 SAVE Pylône 080409N 0023109E 292 60 Metres
View 01-007 YAOUI Pylône 082915N 0023656E 418 101 Metres
View 01-008 PARAKOU TOUROU Pylône 092039N 0023233E 476 105 Metres
View 01-009 PARAKOU Pylône 092000N 0023800E 448 80 Metres
View 01-010 TAMOUSSIA Pylône 094700N 0024147E 486 98 Metres
View 01-011 BEMBEREKE Pylône 101248N 0023909E 598 108 Metres
View 01-012 SORI Pylône 104307N 0024544E 448 105 Metres
View 01-013 DONWARI Pylône 110748N 0025048E 379 57 Metres
View 01-014 ALFA-KWARA Pylône 112802N 0030337E 357 78 Metres
View 01-015 GUENE Pylône 114519N 0031402E 303 78 Metres
View 01-016 COTONOU Pylône 062103N 0022607E 66 62 Metres
View 01-017 ATTOGON Pylône 064356N 0020942E 252 132 Metres
View 01-018 OUIDAH Pylône 062123N 0020455E 87 75 Metres
View 01-019 LOKOSSA Pylône 063820N 0014243E 100 72 Metres
Message history
Obstacles
Obstacle
User: 240116U
Default Organisation:
Edit
Rese
Target Date:
17:14
23/09/2016



View	01-020 PARAKOU	Pylône	091922N	0024040E	511	160	Metres
View	01-021 NATITINGOU	Pylône	101937N	0012151E	685	160	Metres
View	01-022 DASSA	Pylône	074514N	0021047E	380	160	Metres
View	01-023 GUINIROU	Pylône	085614N	0023502E	447	105	Metres
View	01-024 POBE	Pylône	065710N	0024020E	205	85	Metres
View	01-025 KOROBANI	Pylône	092858N	0020020E	470	80	Metres
View	01-026 PORTO-NOVO	Pylône	062825N	0023718E	87	77	Metres
View	01-027 BIRNI	Pylône	095940N	0013137E	487	75	Metres
View	01-028 DANTOTA	Pylône	071740N	0020515E	312	72	Metres
View	01-029 DJOUGOU	Pylône	094158N	0013959E	485	65	Metres
View	02-001 BOBO-DIOULASSO	Pylône	111023N	0041600W	530	90	Metres
View	02-002 OUAGADOUGOU	Pylône	122013N	0013332W	400	80	Metres
View	02-003 OUAGADOUGOU	Pylône	121902N	0013910W	386	66	Metres
View	02-004 BANFORA	Pylône	103717N	0044556W	434	114	Metres
View	02-005 BOLADIE	Pylône	121433N	0015154E	344	90	Metres
View	02-006 BOBO-DIOULASSO	Pylône	111045N	0041630W	570	110	Metres
View	02-007 KANTCHARI	Pylône	122815N	0012941E	356	72	Metres
View	02-008 MATIAKOALI	Pylône	122144N	0012224E	420.5	127.5	Metres
View	02-009 PEMPEDI	Pylône	120636N	0004942E	374	84	Metres
View	02-010 FADA NGOURMA	Pylône	120329N	0002229E	420.5	127.5	Metres
View	02-011 TANGAY	Pylône	120329N	0000048E	420.5	127.5	Metres
View	02-012 TIARA	Pylône	110620N	0043245W	581	81	Metres
View	02-013 ORODARA	Pylône	105839N	0045657W	665	81	Metres
View	02-014 MAHON	Pylône	110215N	0051321W	668	87	Metres
View	02-015 GAOUA / VILLE	Pylône	101800N	0031000W	335	121	Metres
View	03-001 BADZERE	Pylône	054455N	0142717E	1051	73	Metres
View	03-002 BAMBOUI	Pylône	050329N	0140222E	933	98	Metres
View	03-003 BAFOUSSAM	Pylône	052731N	0102429E	1562	100	Metres
View	03-004 BARDOUT	Pylône	092940N	0134200E	377	91	Metres
View	03-005 BERTOUA	Pylône	043529N	0134117E	780	100	Metres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Procedures
Obstacles
Planning data tools
GIS functions
External interfaces
Maintenance
Logout
Help
About
Submit to plan:
Submit to database:
Valid from 2016-09-23 00:00
Valid till
Classification: PUBLIC
Owning Authority: NATIONAL
Obstacle - Version
Valid from: 2015-02-16 00:00
Valid till: indefinite
Classification: PUBLIC
Owning authority: NATIONAL
Latitude 120329N
Longitude 0002229E
Name 02-010 FADA NGOURMA
Type Pylône
Group of obstacles [N] No
Lighted [Y] Yes
Type and colour of lighting
Visual marking [jour et nuit] Balisage de jour et de nuit
Datum [WGE] WGS-84 (GRS-80)
Geographical accuracy
Unit of measurement [geographical accuracy] (no value)
Elevation 420.5
Elevation accuracy
Height 127.5
Geoid undulation
Unit of measurement [vertical distance] [M] Metres
Cyclic redundancy check 43EFBE07 CRC value is correct.
Message history
Obstacles
Obstacle
User: 240116U
Default Organisation:
Edit
Rese
Target Date:
17:15
23/09/2016

II- ASECNA experiences

3- ASECNA eAIP software

- eAIP production software must be interoperable with AIXM data base.
- In ASECNA case, the following tools are used:
- - Java environment for Librairie;
- - OXYGEN editor for XML;
- - Internet Explorer;
- - Acrobat reader for PDF viewer.

A direct connection to the AIXM data base use these data without any replication and any file exchange. AIP document impacts report is generated by AIXM to eAIP software.

The eAIP module allows production, distribution, mantenance and storage of AIP, AIP amendment, AIP/SUP and AIC.

AIP files are exportable in PDF and HTML.

Two types of workstations are in the system : AIP operator and AIP administrator .

II- ASECNA experiences

4- AIP page migration to XML

- Migration from AIP to AIXM-eAIP needs three steps to be completed:
- - **STEP 1 : Static data migration in AIXM format**
- - **STEP 2 : AIP migration**
  - - STEP 2-a : free text AIP migration
  - - Step 2-b : AIP Tables migration
  - **STEP 3 : Charts migration**
  - - Step 3-a : Charts template creation
  - - Step 3-b : charts migration.
  - _00GEN-0.1-01.xml
  - _00ENR-1.13-01.xml
  - _00AD-1.4-01.xml
  - 4d52211d-73ab-4e8a-a7e8-d32cec649fa0.pdf
  - capture écran de la GED AIP.pdf

WORKFLOW FOR AMENDMENT PUBLICATION

Baseline AIP (Reference)

AIP Amendments Production

At the end of the process , it possible to have from unique source the AIP in three communication media :

1) in HTML for eAIP on the WEB;

2) in HTML for eAIP on CDROM;

3) in PDF for printed document.

section GEN-0_1.mht

CONCLUSION

- eAIP implementation is an important objective for the transition from AIS to AIM.
- Its completion depends on the full and consistent AIXM data base for which data quality is a must.
- For ANSP, AIXM data base operation and AIXM-eAIP need important financial means, human ressources and time.
- We have to be together and share our experiences for AFICAD implementation.

THANK YOU FOR YOUR ATTENTION