xNOTAM Trial Presentation

DNSWG

Washington, 05 December 2007

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Objective of the presentation

- Highlight trial objectives
- Explain application architecture
- Mention who will participate
- Present data provider interfaces
- Present data user interfaces

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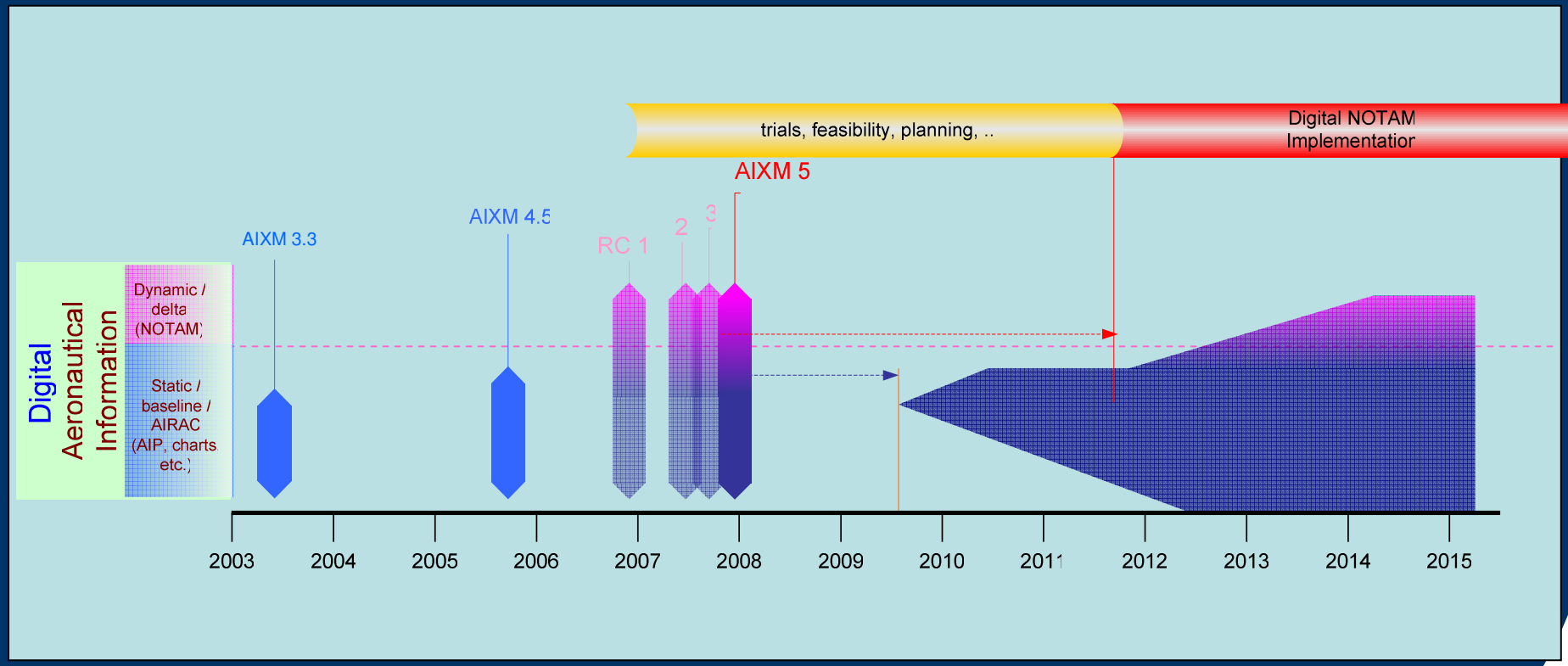
AIXM 5 - Implementation Plans Europe



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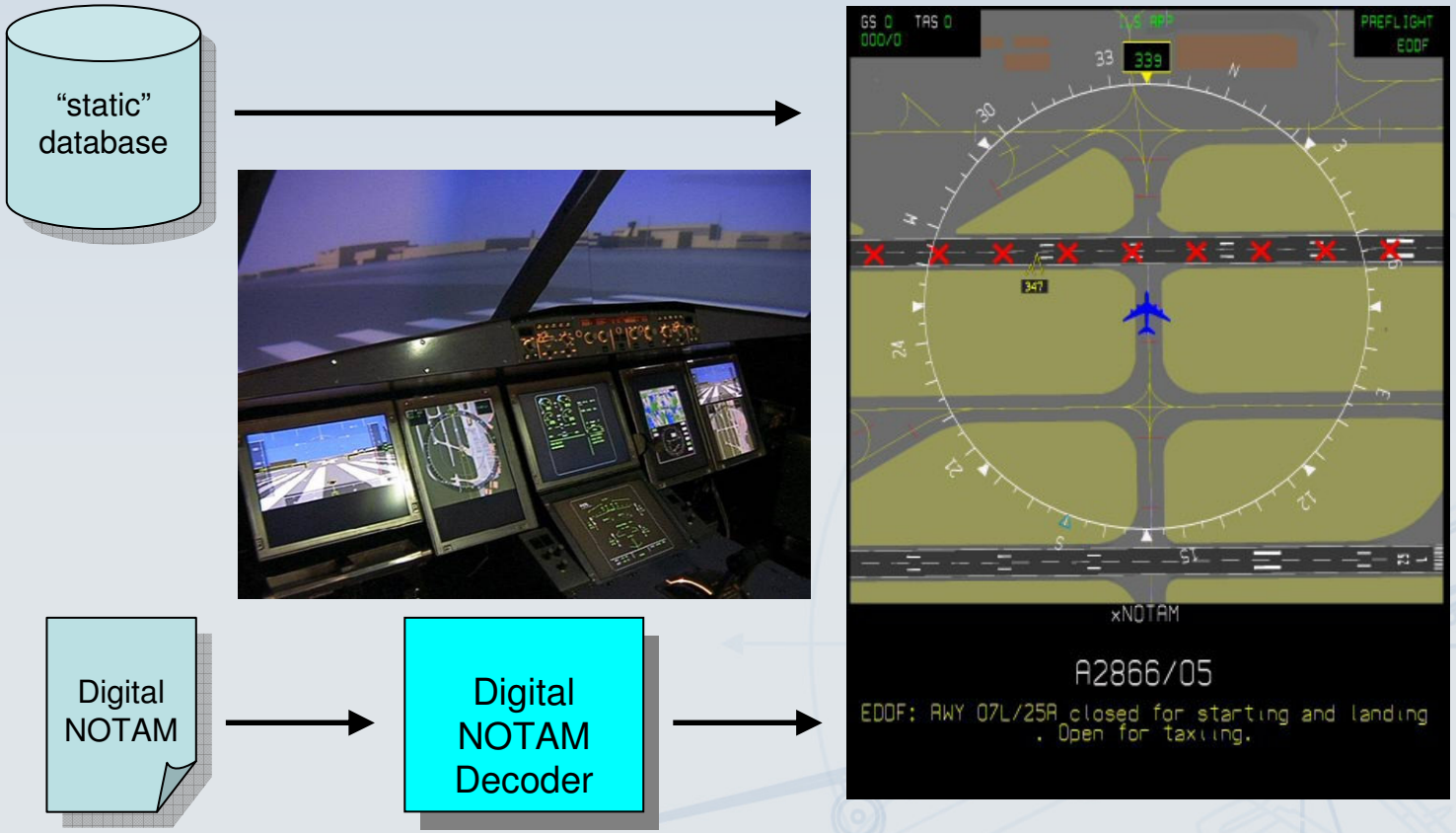
AMDB/xNOTAM Study

FSR

Institute of Flight Systems and Automatic Control

- Gap Analysis ED-99A – AIXM and Prototype AIXM 5 schema
- Validation of AIXM temporal model (xNOTAM)
- Validation of results in real scenario in flight simulator
  - Use AIXM 5 message to announce temporary change
  - Visualise change information on cockpit display



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Procedure-xNOTAM Study

FSR
Institute of Flight Systems and Automatic Control

Objective:

To demonstrate the technical possibilities of digital NOTAM for updating Terminal Procedure data in an onboard database

From:
2007-06-01T12:00:00Z
Until:
2007-06-22T23:59:00Z

Due to temporary obstacles, minimum altitude raised to 4500 ft between RID and DF271.

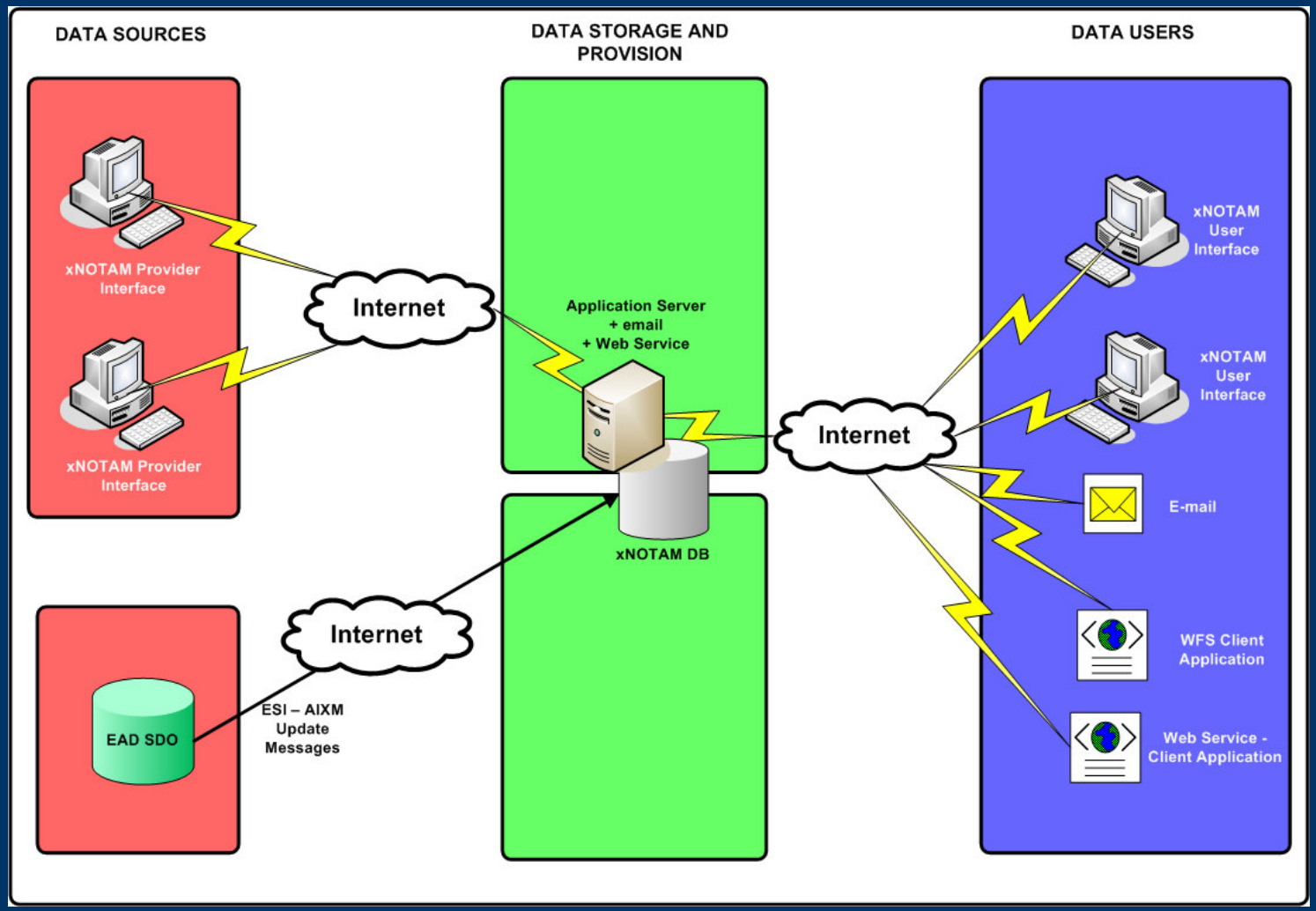
Operational Change

```
<AIXMMessage>
...
  <gml:TimePeriod>
    <gml:beginPosition>
      2007-06-01T12:00:00Z
    </gml:beginPosition>
    <gml:endPosition>
      2007-06-22T23:59:00Z
    </gml:endPosition>
  </gml:TimePeriod>
  <aixm:interpretation>TEMPDELTA</aixm:interpretation>
  <aixm:lowerLimitAltitude uom="FT">4500</aixm:lowerLimitAltitude>
...
</aixm:AIXMMessage>
```

digital NOTAM

Procedure DB

2008: Digital NOTAM Trial



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Trial objectives

- demonstrate the maturity of the “digital NOTAM” concept
  - use real NOTAM messages -> capture the information in AIXM
  - provide digital NOTAM data to test users
- validate the AIXM 5 timeslice model to managing permanent and temporary changes
  - discover business rules
- check the completeness of (selected) AIXM 5 feature definitions
  - identify missing attributes or associations
  - identify un-complete lists of values

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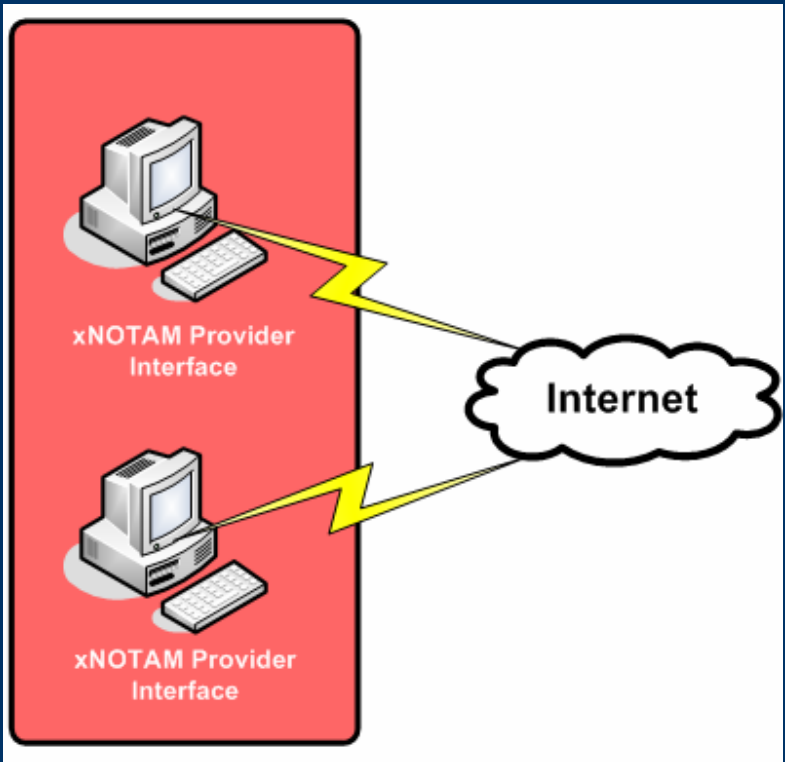
Trial objectives

- involve AIS Offices from ECAC State as test digital NOTAM data providers
  - understand the digital NOTAM concept
  - identify challenges to implementation
  - discover roadmap
- identify potential digital NOTAM users and applications
  - discover the digital NOTAM strengths
  - identify early benefits
  - confirm that digital NOTAM can improve safety and efficiency
- identify essential bottlenecks that could prevent early adoption of digital NOTAM

xNOTAM Provider Interface



- Test 'digital NOTAM providers' from NOTAM offices of ECAC States
  - plus a few other States
- equipment needed
  - fast Internet connection (not dial-up)
  - high-resolution computer screen (minimum 1280 x 1024)
  - Firefox / Internet Explorer
- Start point is an already published NOTAM.
  - The interface will not be used to create NOTAMs
  - It will help encode them in AIXM 5.

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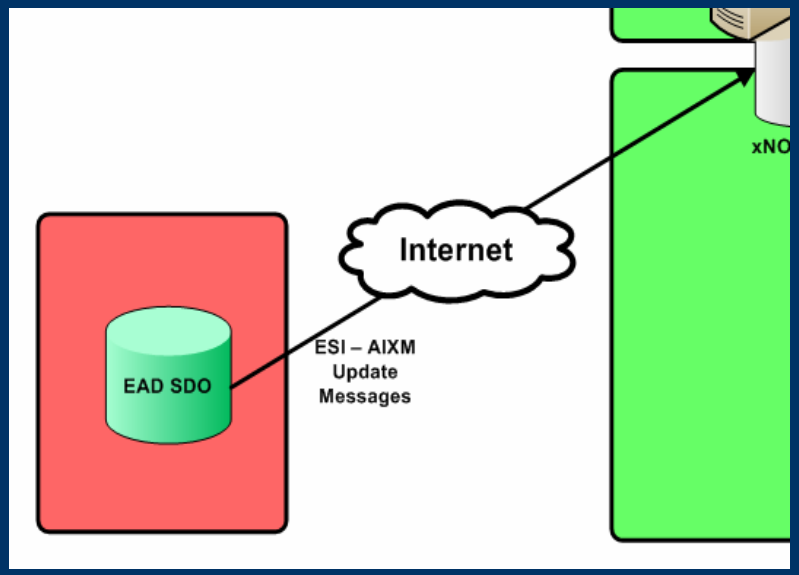
Baseline (Static) Data

- Providers will not have to maintain Baseline data
- Initial data exported from the EAD Static Database (SDO)
- Maintained by a constant feed of data from the SDO



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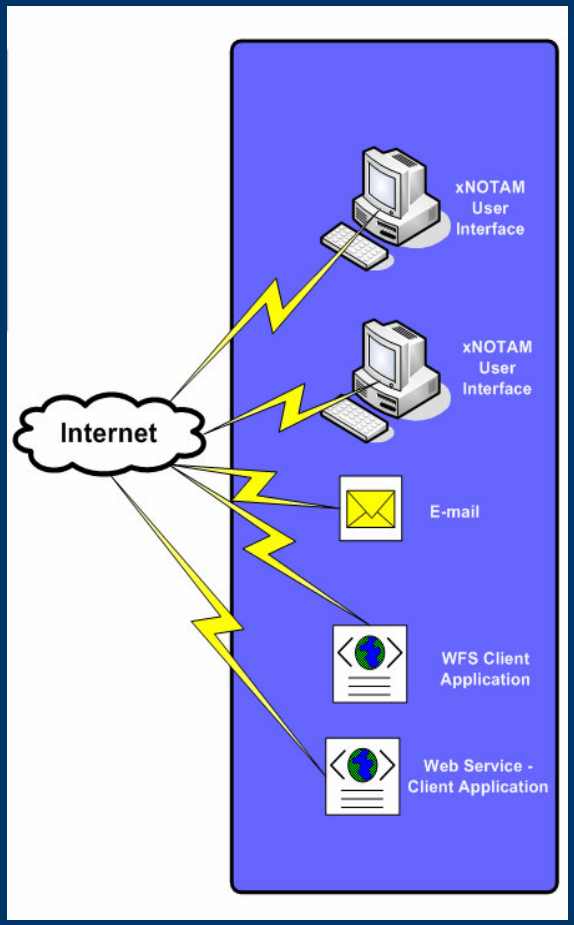
Getting Data



Test 'digital NOTAM users' – organisations who will exploit the AIXM 5 messages:

- advanced briefing concepts, using graphics and visual hints in addition or in replacement of the current NOTAM text;
- dynamic display of the current status of the airport surfaces and temporary obstacles on electronic flight bags;
- presentation to the pilot and to air traffic controllers of active restricted airspace and closed routes;
- etc.

Four ways for getting the data:

- xNOTAM User Interface
  - immediate report – result tables & AIXM 5 data
  - subscription - AIXM 5 messages
- Web Feature Service (WFS) – simplified AIXM
- Web Service (SOAP) – full AIXM

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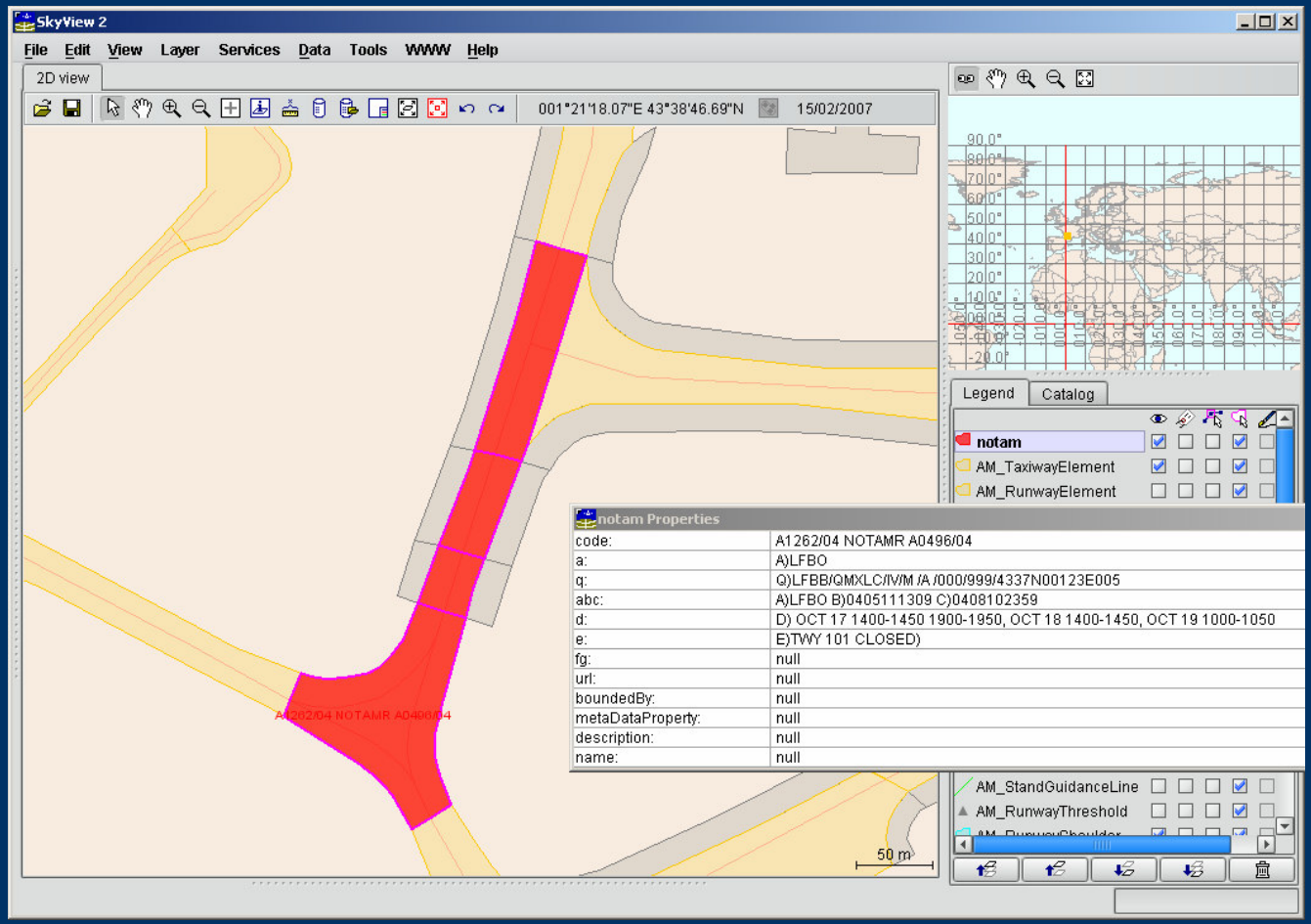
Web Feature Service (WFS)

- Enable the visualisation of the xNOTAM database content with SkyView2



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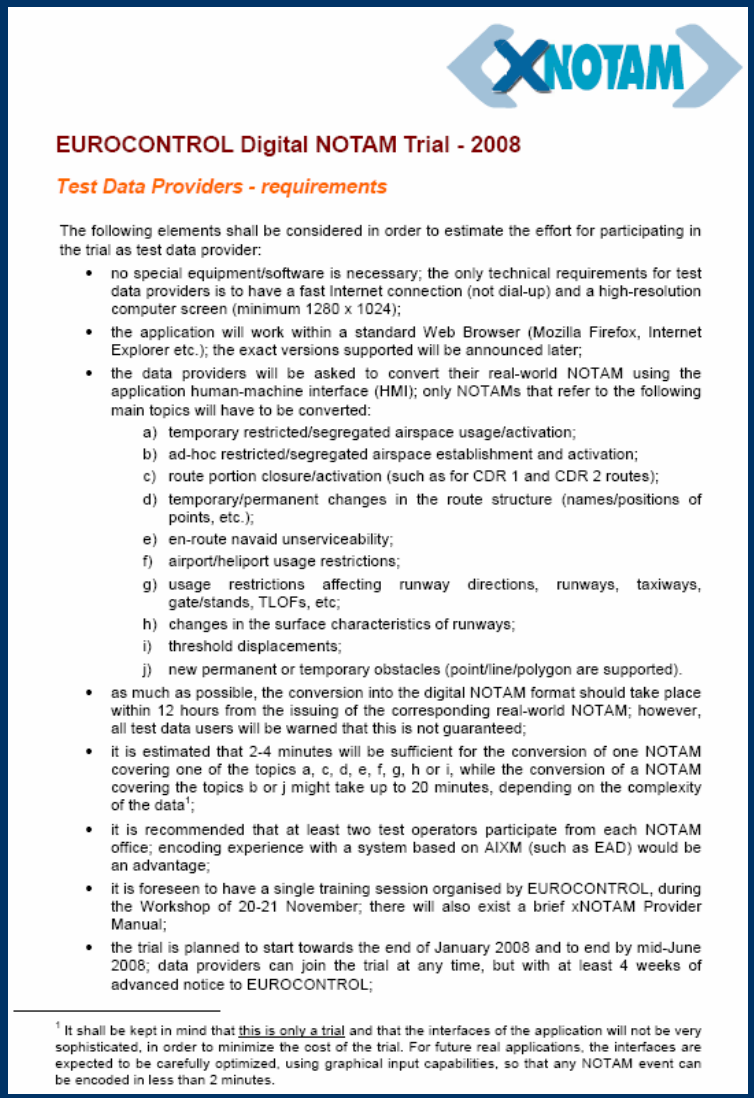
Test data providers



EUROCONTROL Digital NOTAM Trial - 2008

Test Data Providers - requirements

The following elements shall be considered in order to estimate the effort for participating in the trial as test data provider:

- no special equipment/software is necessary; the only technical requirements for test data providers is to have a fast Internet connection (not dial-up) and a high-resolution computer screen (minimum 1280 x 1024);
- the application will work within a standard Web Browser (Mozilla Firefox, Internet Explorer etc.); the exact versions supported will be announced later;
- the data providers will be asked to convert their real-world NOTAM using the application human-machine interface (HMI); only NOTAMs that refer to the following main topics will have to be converted:
  a) temporary restricted/segregated airspace usage/activation;
  b) ad-hoc restricted/segregated airspace establishment and activation;
  c) route portion closure/activation (such as for CDR 1 and CDR 2 routes);
  d) temporary/permanent changes in the route structure (names/positions of points, etc.);
  e) en-route navaid unserviceability;
  f) airport/heliport usage restrictions;
  g) usage restrictions affecting runway directions, runways, taxiways, gate/stands, TLOFs, etc;
  h) changes in the surface characteristics of runways;
  i) threshold displacements;
  j) new permanent or temporary obstacles (point/line/polygon are supported).
- as much as possible, the conversion into the digital NOTAM format should take place within 12 hours from the issuing of the corresponding real-world NOTAM; however, all test data users will be warned that this is not guaranteed;
- it is estimated that 2-4 minutes will be sufficient for the conversion of one NOTAM covering one of the topics a, c, d, e, f, g, h or i, while the conversion of a NOTAM covering the topics b or j might take up to 20 minutes, depending on the complexity of the data[1];
- it is recommended that at least two test operators participate from each NOTAM office; encoding experience with a system based on AIXM (such as EAD) would be an advantage;
- it is foreseen to have a single training session organised by EUROCONTROL, during the Workshop of 20-21 November; there will also exist a brief xNOTAM Provider Manual;
- the trial is planned to start towards the end of January 2008 and to end by mid-June 2008; data providers can join the trial at any time, but with at least 4 weeks of advanced notice to EUROCONTROL;

[1] It shall be kept in mind that this is only a trial and that the interfaces of the application will not be very sophisticated, in order to minimize the cost of the trial. For future real applications, the interfaces are expected to be carefully optimized, using graphical input capabilities, so that any NOTAM event can be encoded in less than 2 minutes.

- Confirmed
  - Belgium
  - Czech Republic
  - Iceland
  - Poland
  - Romania
  - Serbia & Montenegro
  - Slovenia
  - Switzerland
  - Egypt
  - South Africa
- Interested by the Trial
  - Albania
  - Austria
  - France
  - Spain

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Test data users

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Test Data Users - requirements

To qualify as test xNOTAM user, an Organisation/Company should have or be in the development of a software application that can do something useful with digital NOTAMs. For example:

- dynamically display the open/closed status of runways or taxiways on an an electronic airport map;
- dynamically display active restricted areas on an electronic airspace map, used by controllers or pilots;
- feed-back a graphical depiction of ad-hoc restricted areas to the (military) organisation that has originated it;
- enhanced pre-flight information bulletins (PIB), for example with graphics, text formatting, etc.
- enhanced flight planning, exploiting digital data for closed route portions, updated North Atlantic tracks, etc.
- etc.

In order to participate, the test data users will very likely have to develop a minimal AIXM 5 (RC2) parser, able to read and interpret the incoming digital NOTAMs. The simplest delivery solution supported by the trial will be to receive the AIXM 5 messages as e-mail attachments. More advanced access to the xNOTAM trial database will be possible through a Web Service (SOAP and WFS, exact specification still under discussion).

In order to receive the sample digital NOTAMs generated during the trial, test users will be requested to sign a "***Test xNOTAM user agreement***". This is necessary for two reasons:

- as an insurance for EUROCONTROL that the test data will not be used for operational[1] purpose;
- because the baseline information comes from the EAD and it is covered by non-disclosure agreement, this needs to be passed on the test users.

There is no form of payment involved by the test xNOTAM user agreements, but no sponsorship either.

At the end of the trial, the test data users will be requested to provide a "***Test Digital NOTAM User Report***", stating on the usefulness of the digital NOTAMs for their application and eventual suggestions for the improvement of the AIXM 5 specification and of the digital NOTAM concept of operations. All such Reports might be made publicly available on the www.aixm.aero Web site. The test users should feel free to not include in this report the exact description of their application. It is understood that this information might be commercially sensitive and that the test users Organisations/Companies might want to not disclose it to the Agency or to the public.

Organisations/Companies from Europe and from world-wide, which are interested to participate in the Trial as test digital NOTAM users, are invited to inform the EUROCONTROL Project Initiator (eduard.porosnicu@eurocontrol.int) before the end of October 2007, or as soon as possible.

[1] Being just a trial, it cannot be guaranteed that the information will be complet and/or accurate. Therefore, it is unsafe to use the test digital NOTAMs for real operations.

- Test data agreement signed by
  - Comsoft (Germany)
  - Frequentis (Austria)
  - Luciad (Belgium)
  - ROMATSA (Romania)
  - SkyJob Electronic Flight Bag (UK)
  - Servicios Aeronauticas Costa Azanar (Spain)
- Interested by the Trial
  - European Aeronautical Group – EAG (UK)
  - Jeppesen (USA)
  - Lufthansa Systems (Germany)
  - National Geospatial Agency – NGA (US

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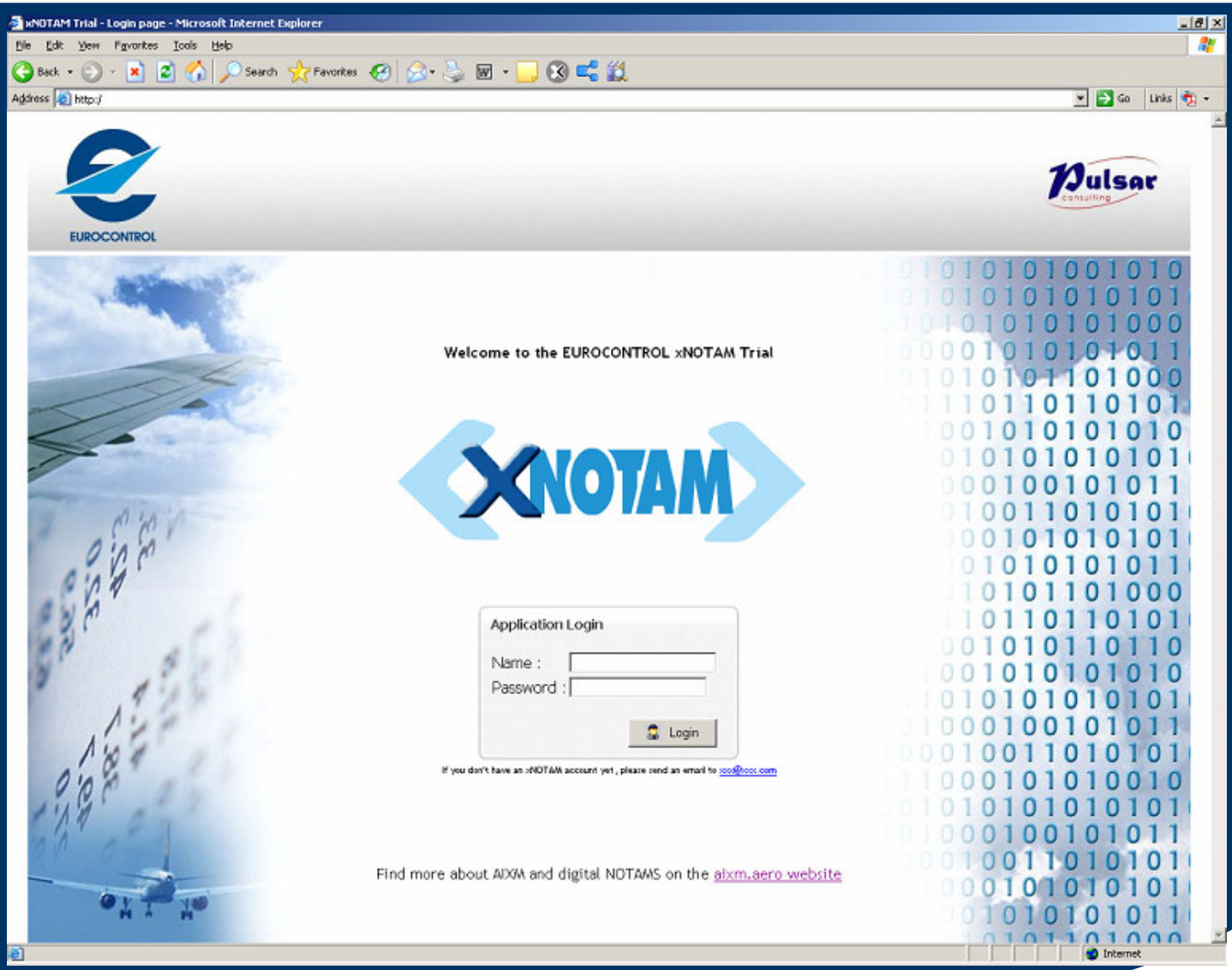
xNOTAM Trial Application



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xNOTAM Trial Application

- General considerations
  - Do not forget: it's a trial!
    - Operational use is excluded!
    - Relatively small budget
    - Focus on technical validation (AIXM)
    - In case of difficulties
      - Follow priorities
      - Record difficult aspects for later

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Trial – NOTAMs to be converted

- temporary restricted/segregated airspace usage/activation; Airspace Usage
- ad-hoc restricted/segregated airspace establishment and activation; Airspace
- route portion closure/activation (such as for CDR 1 and CDR 2 routes); Route Usage
- temporary/permanent changes in the route structure (names/positions of Route Segments
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- airport/heliport usage restrictions; Airport Usage
- usage restrictions affecting runway directions, runways, taxiways, gate/st Airport Usage ;
- changes in the surface characteristics of runways; Runway
- threshold displacements; Runway Centreline Point
- new permanent or temporary obstacles (point/line/polygon are supporte Vertical Structure

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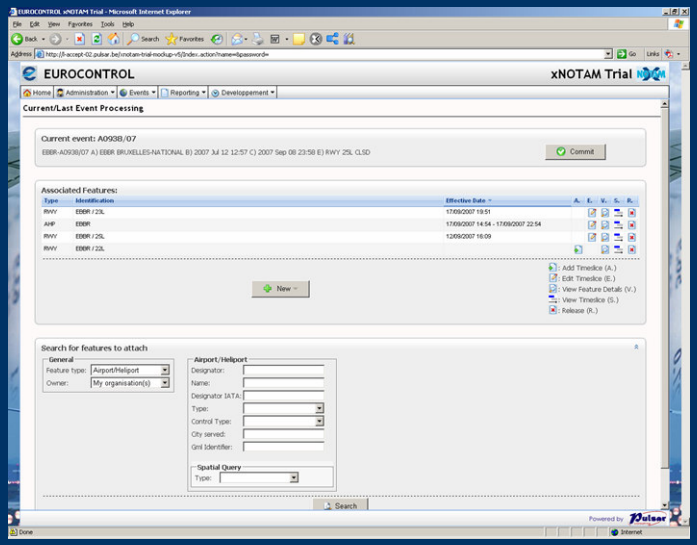
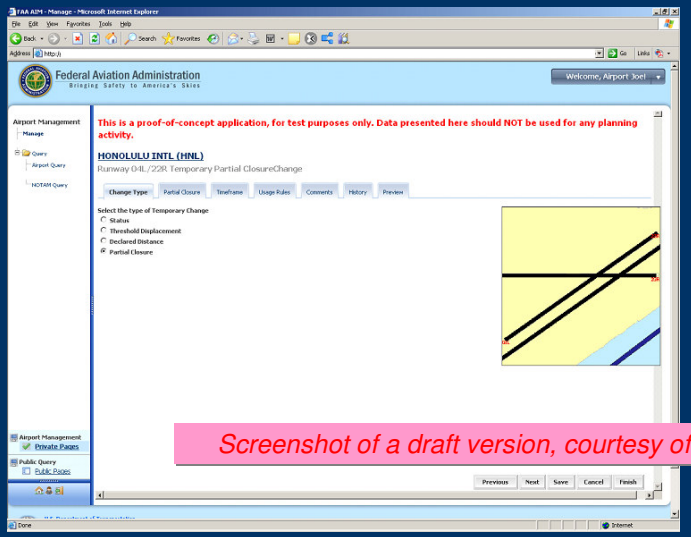
xNOTAM Trial Application

- HMI
  - Options
    - Text forms versus graphics
    - Generic versus tailored for types of event





Screenshot of a draft version, courtesy of FAA

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xNOTAM Trial Application

- Because of constraints (time and budget)
  - Relatively non-sophisticated
    - text forms, generic
    - Limited business rules
  - Data providers need to understand the AIXM model in detail
    - A real operational application is expected hide some of the AIXM complexity
- Given the constraints, result is very good
  - Clean “Event” based workflow
  - Smooth navigation
  - Very interesting: Timeline Viewer

Data Provider and Data User Interfaces

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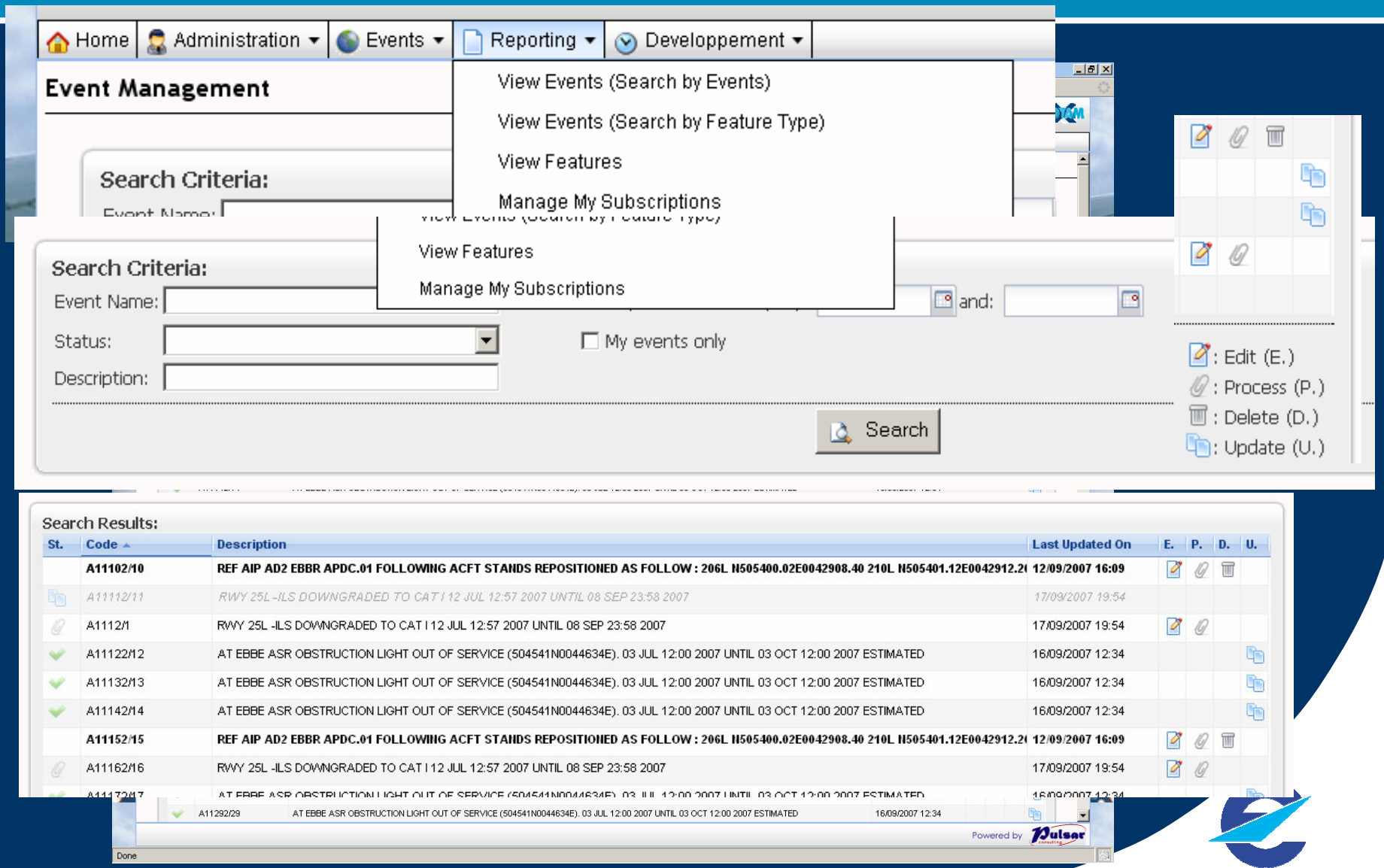
Basics



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User dependent

- The menu items a user sees is dependent on his role:
  - A data user will see: Home and Reporting
  - A data provider will see: Home, Events and Reporting
  - An administrator will see all of the menus

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- Providing data

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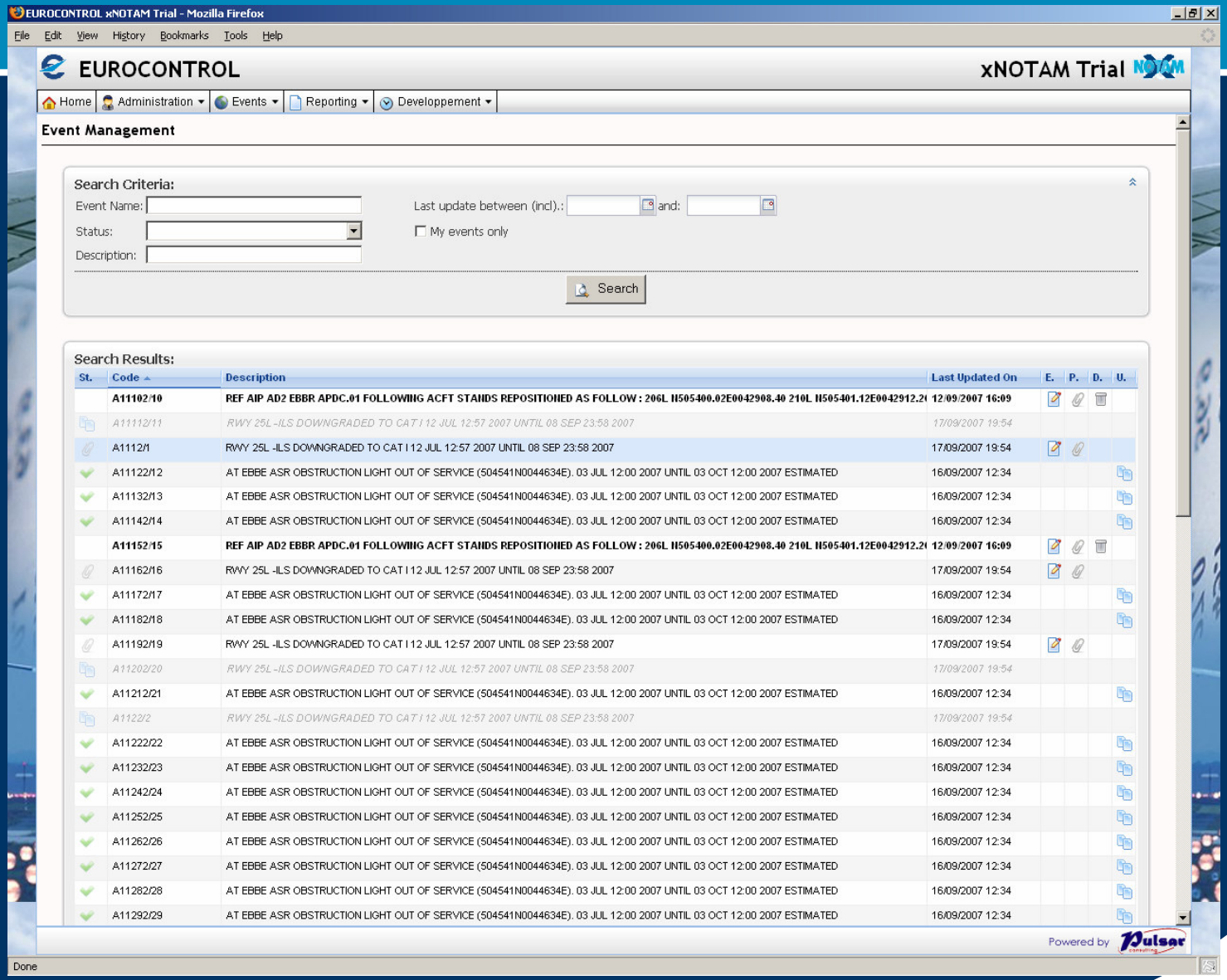
Providing data: Event management



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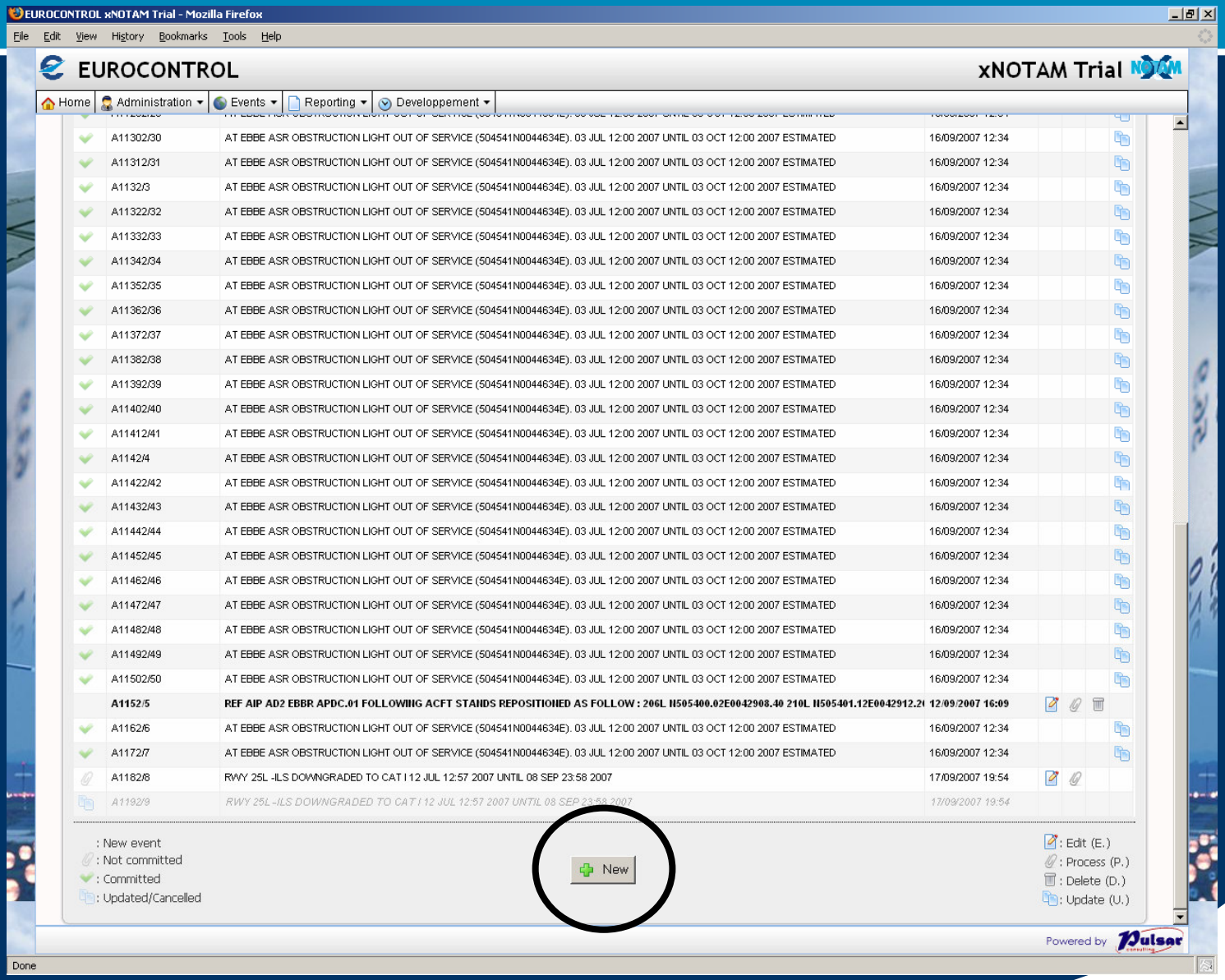
Providing data: Event management



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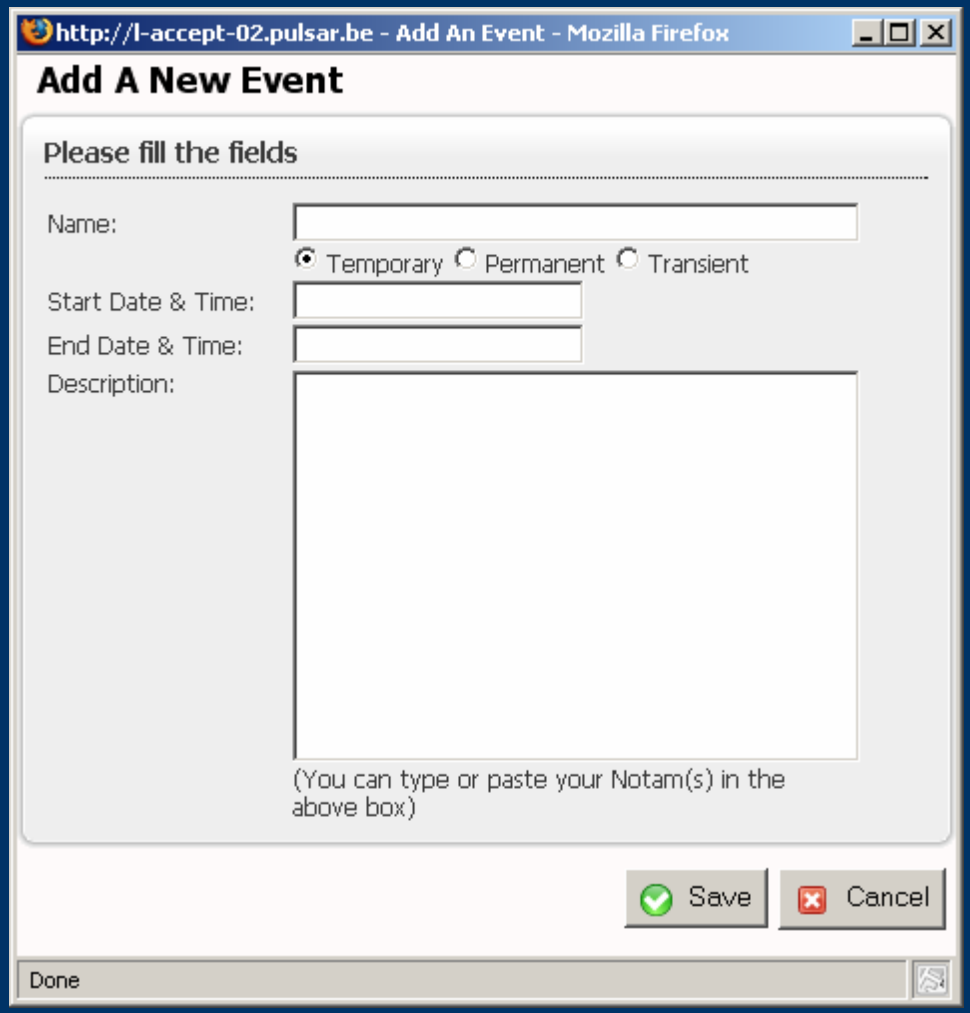
Providing data: New event



- 3 types of event
  - Temporary
  - Permanent
  - Transient

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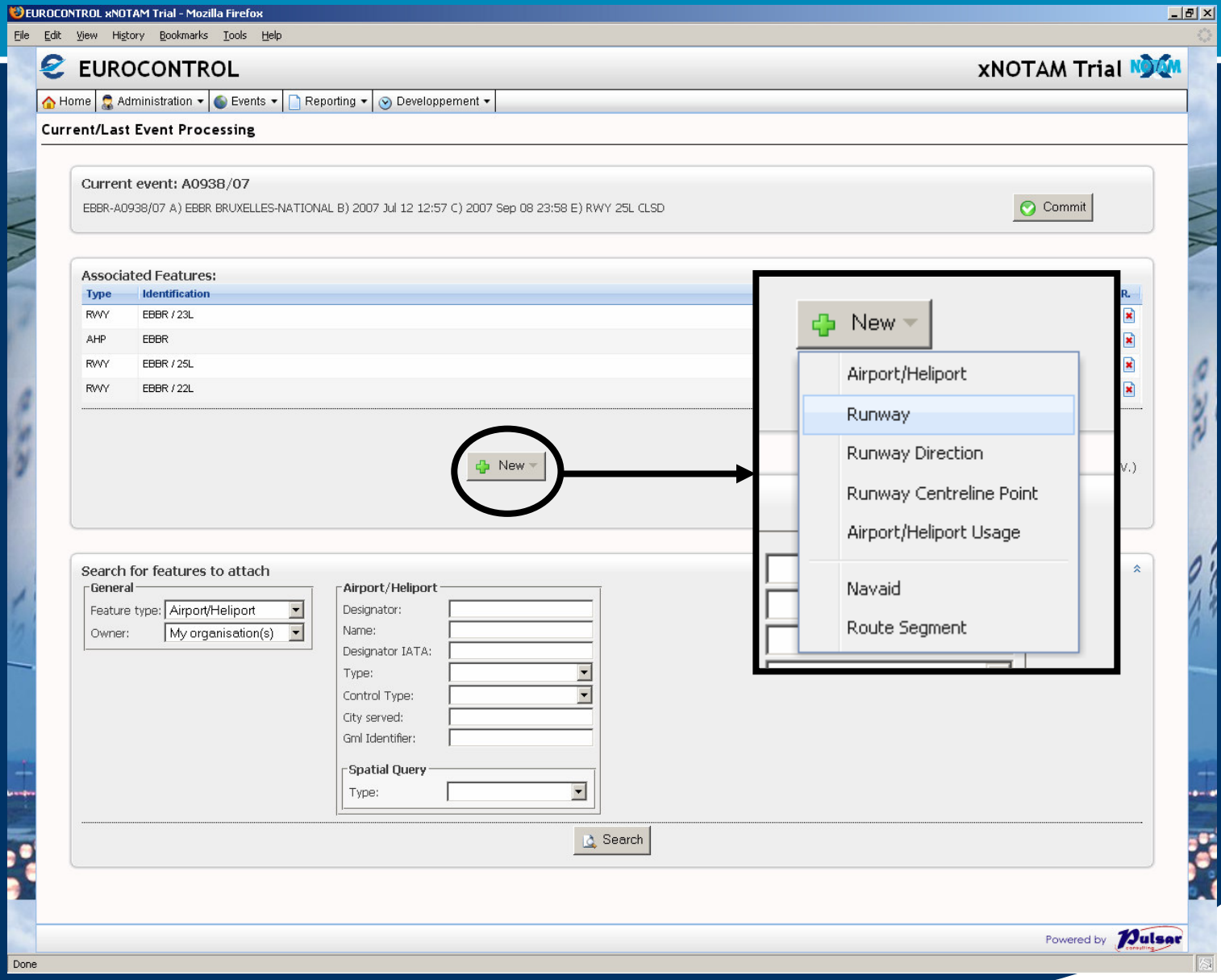
Providing data: Processing an event



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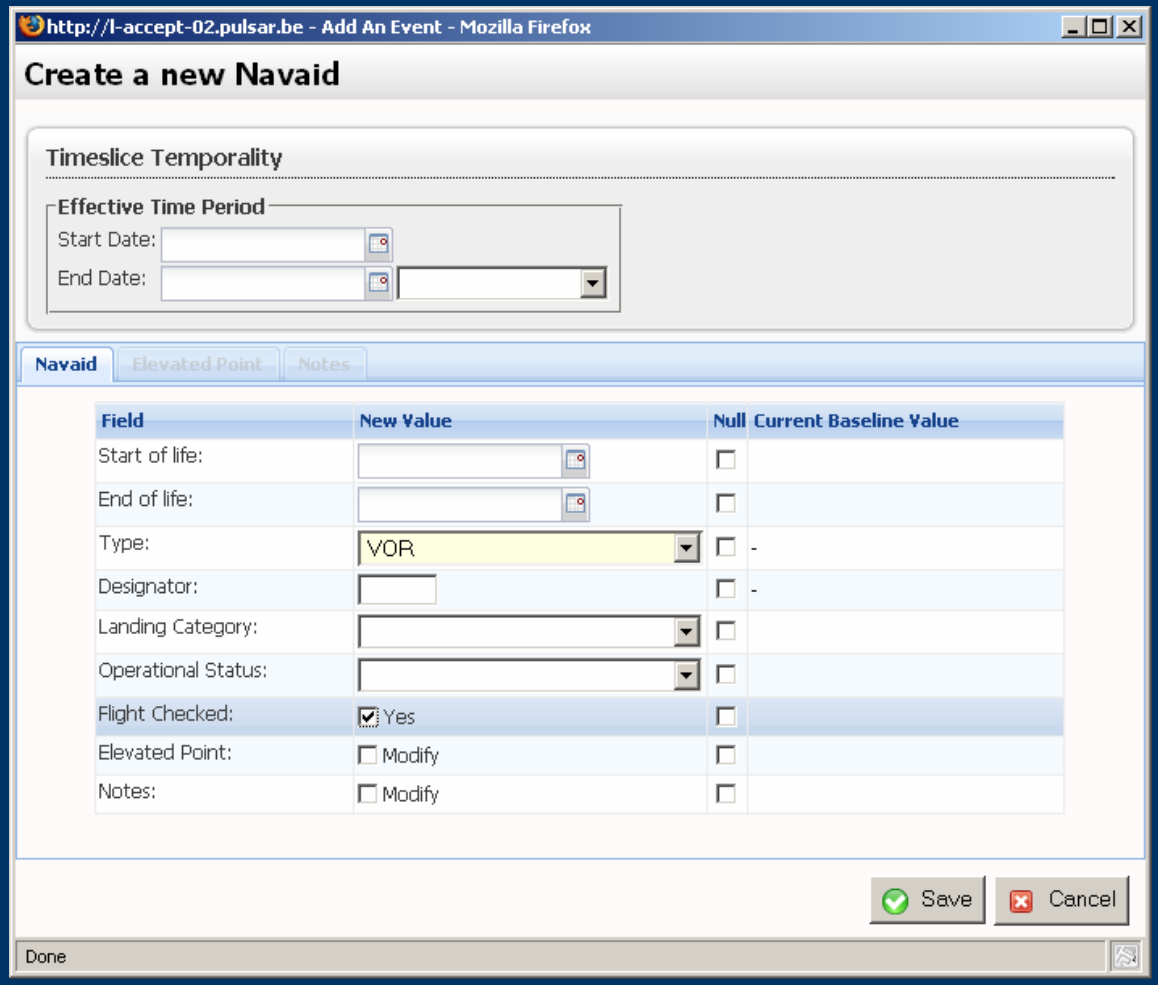
Providing data: Attaching new feature



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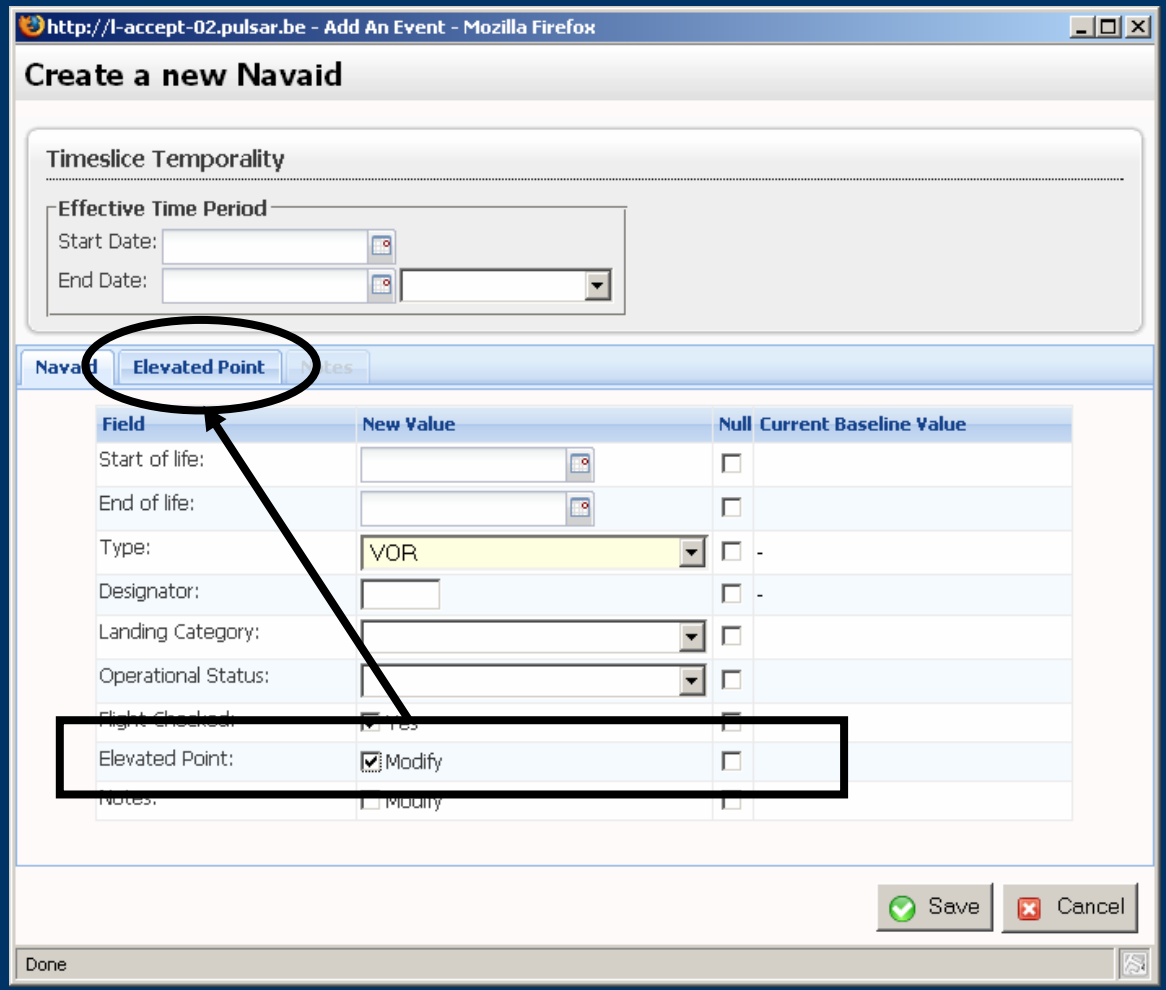
Providing data: Attaching new feature



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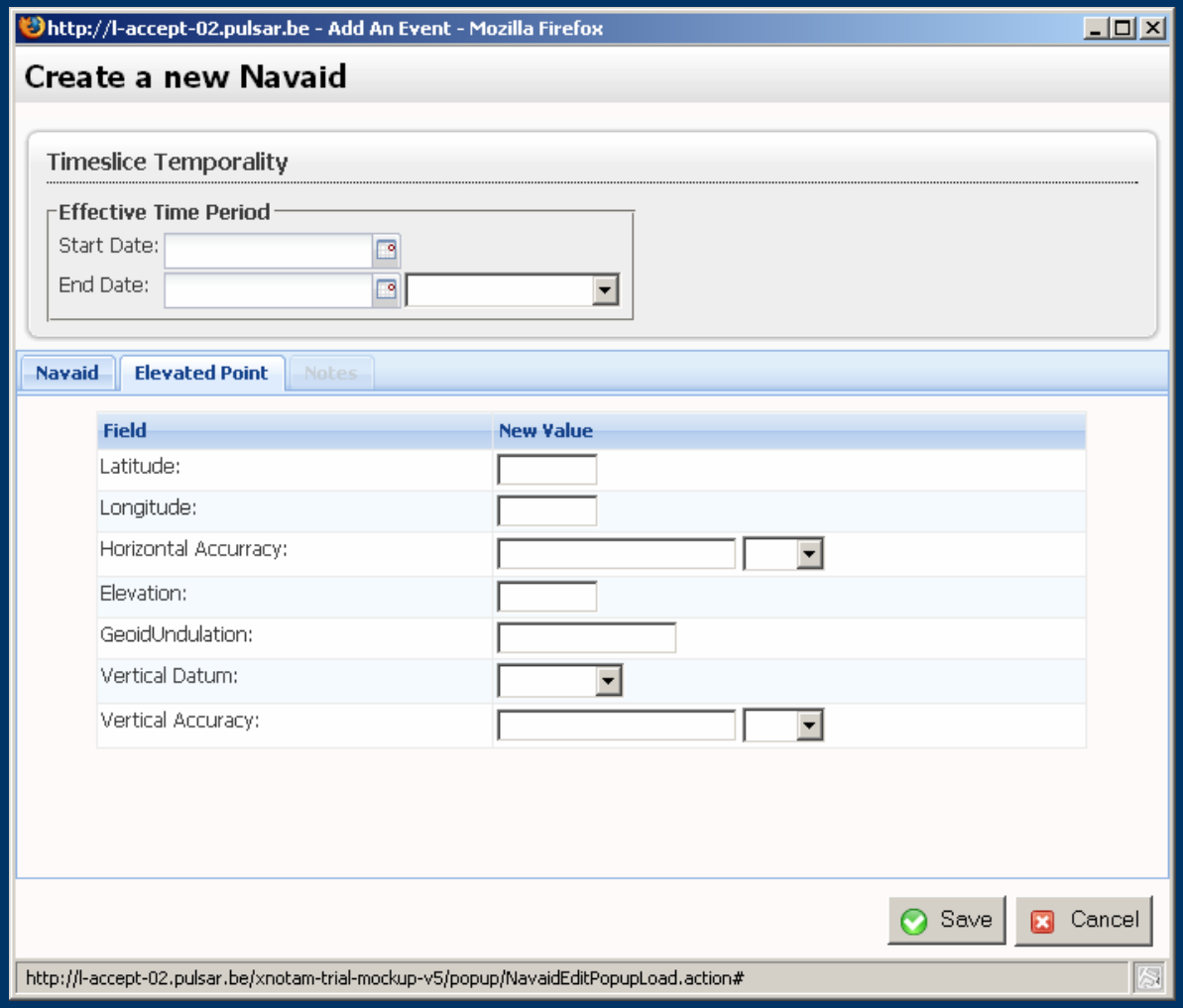
Providing data: Attaching new feature



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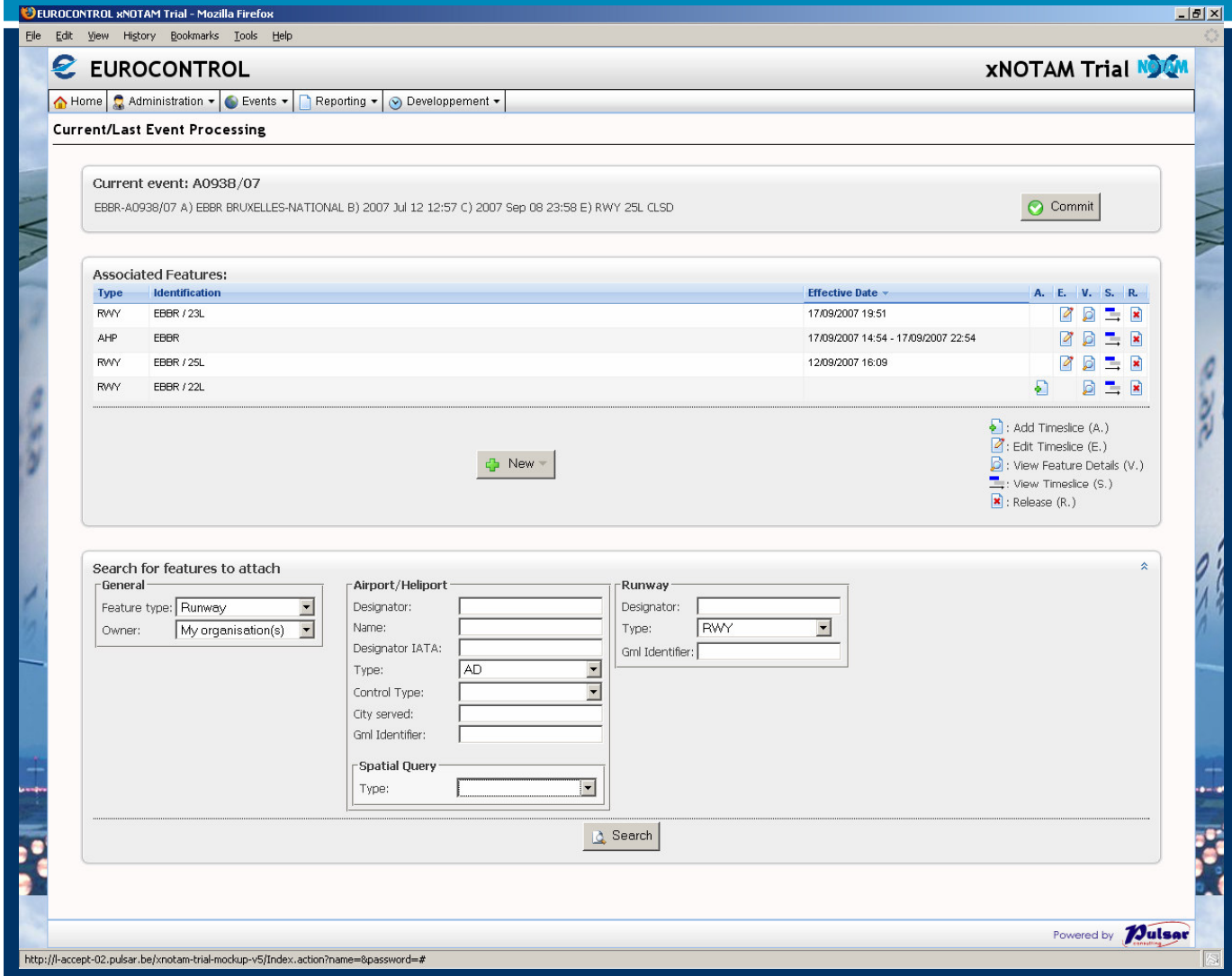
Providing data: Attaching existing feature



- Use search criteria to find the feature required

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- Using data

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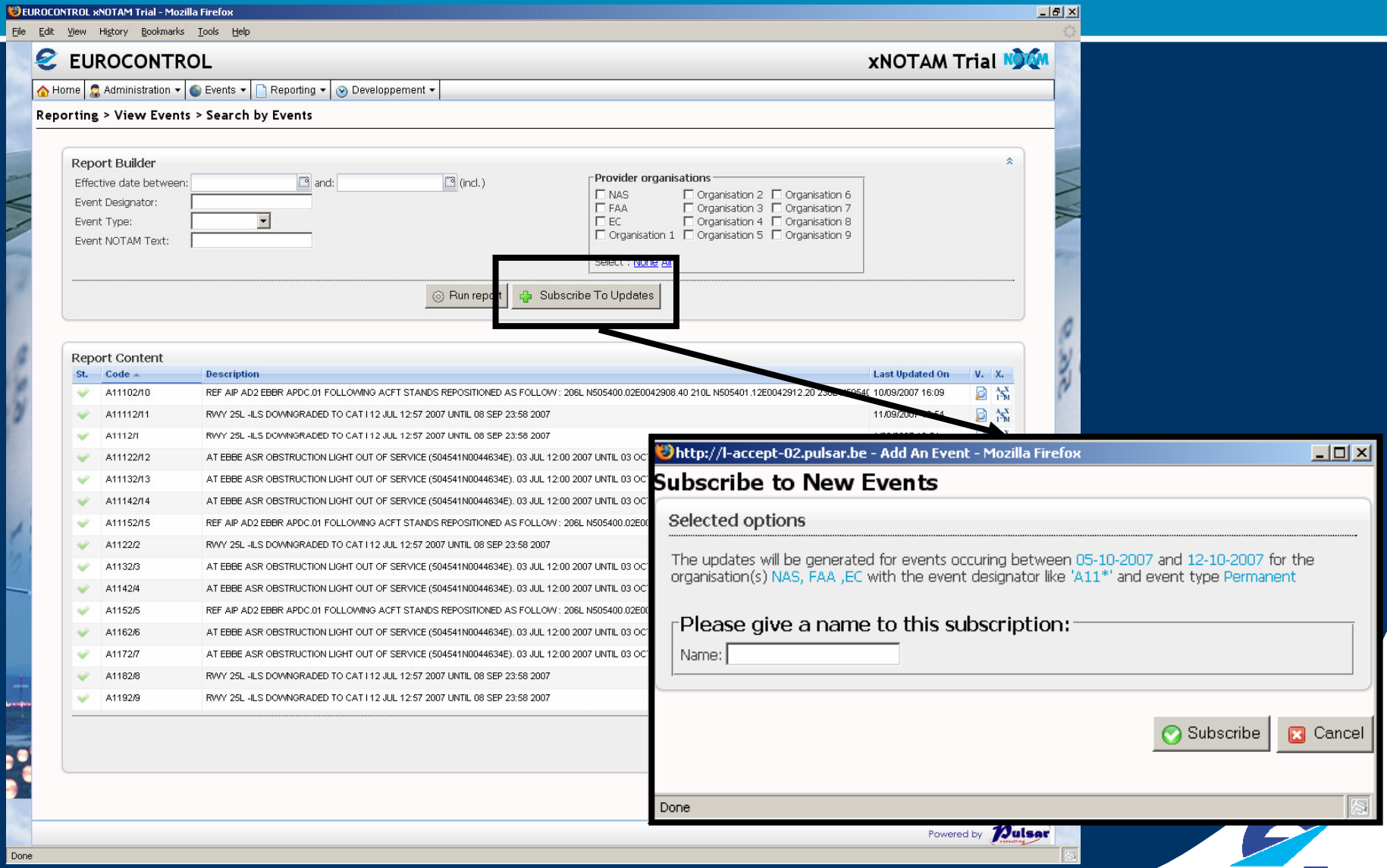
Using data: Viewing events



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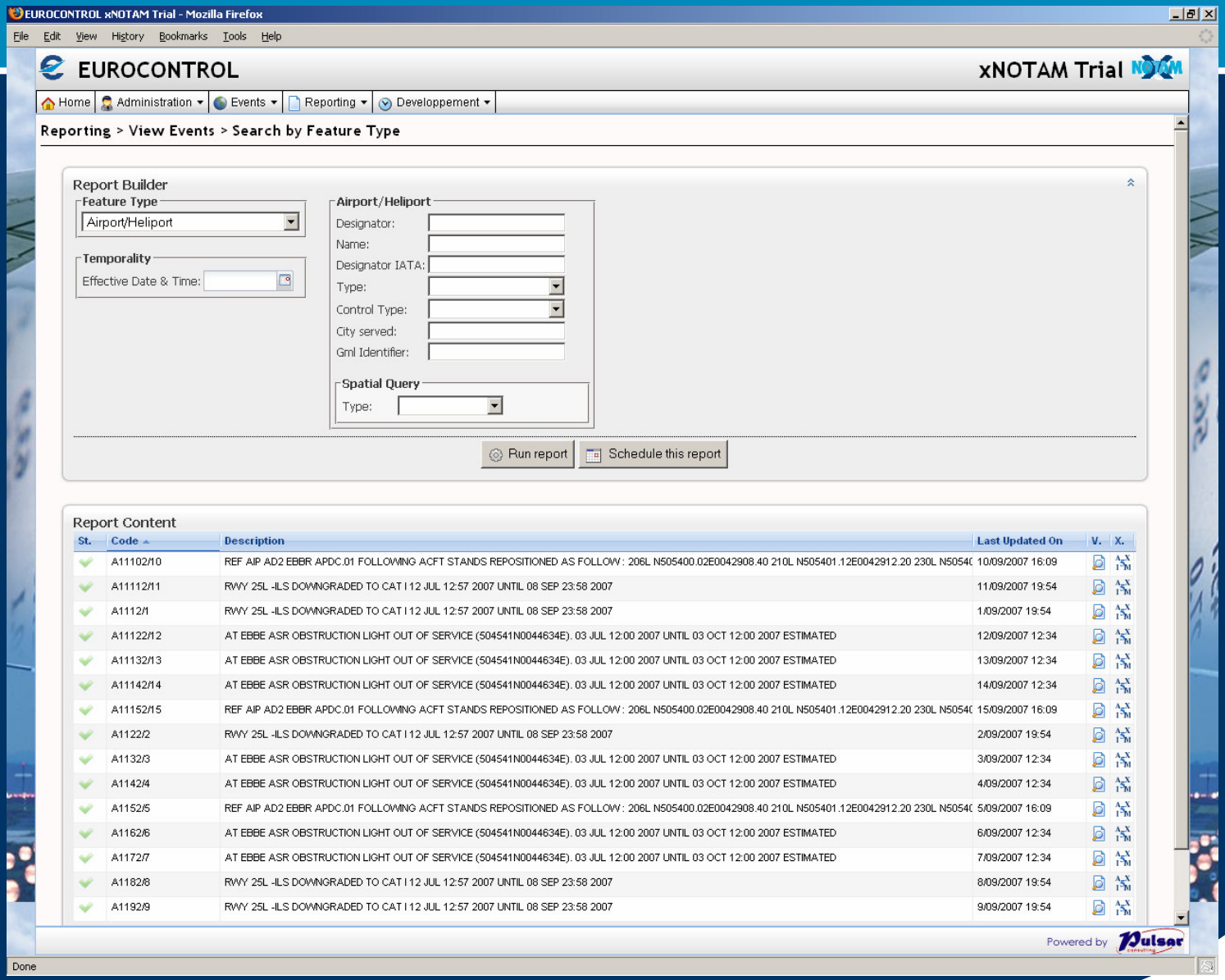
Using data: Viewing events



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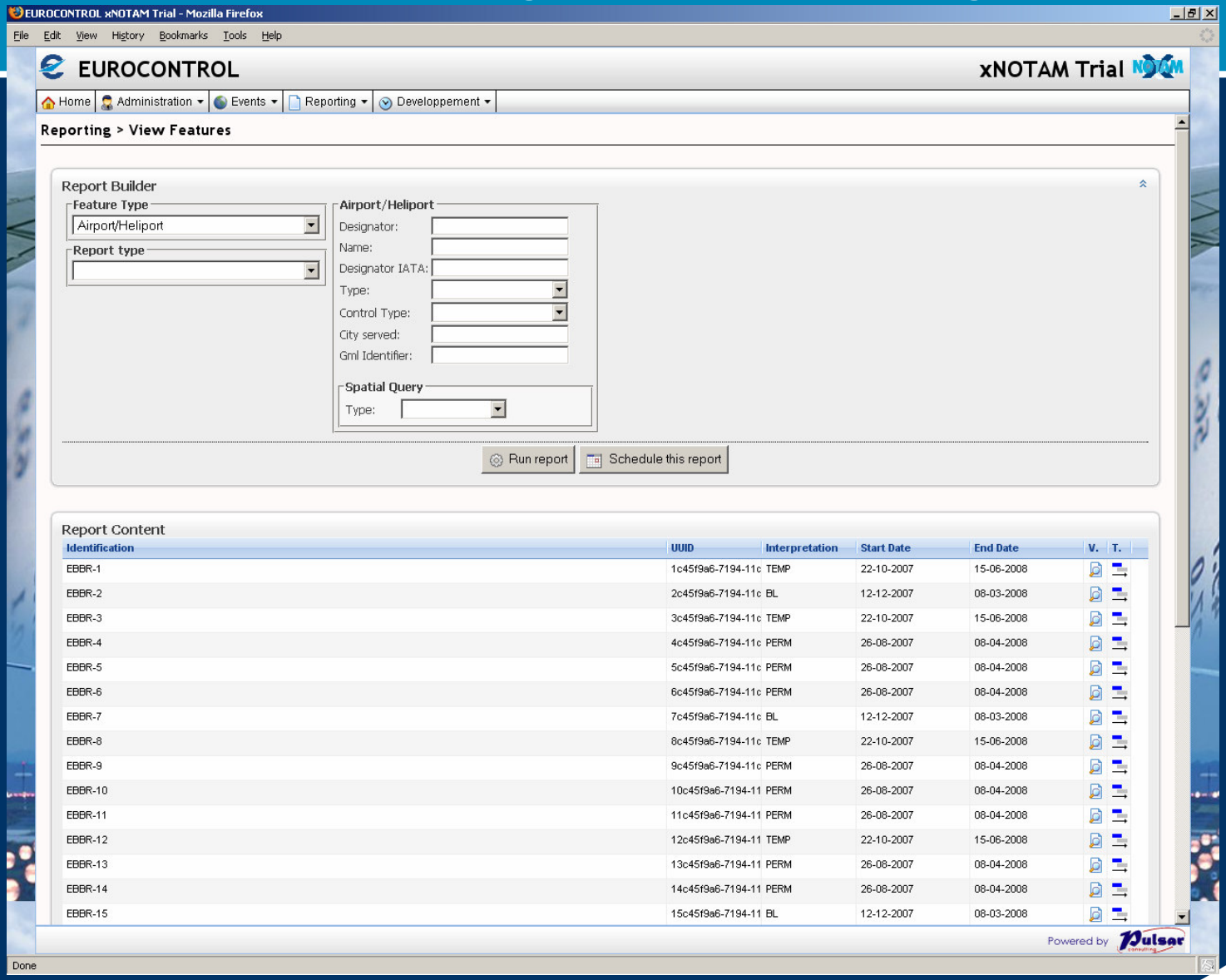
Using data: Viewing features



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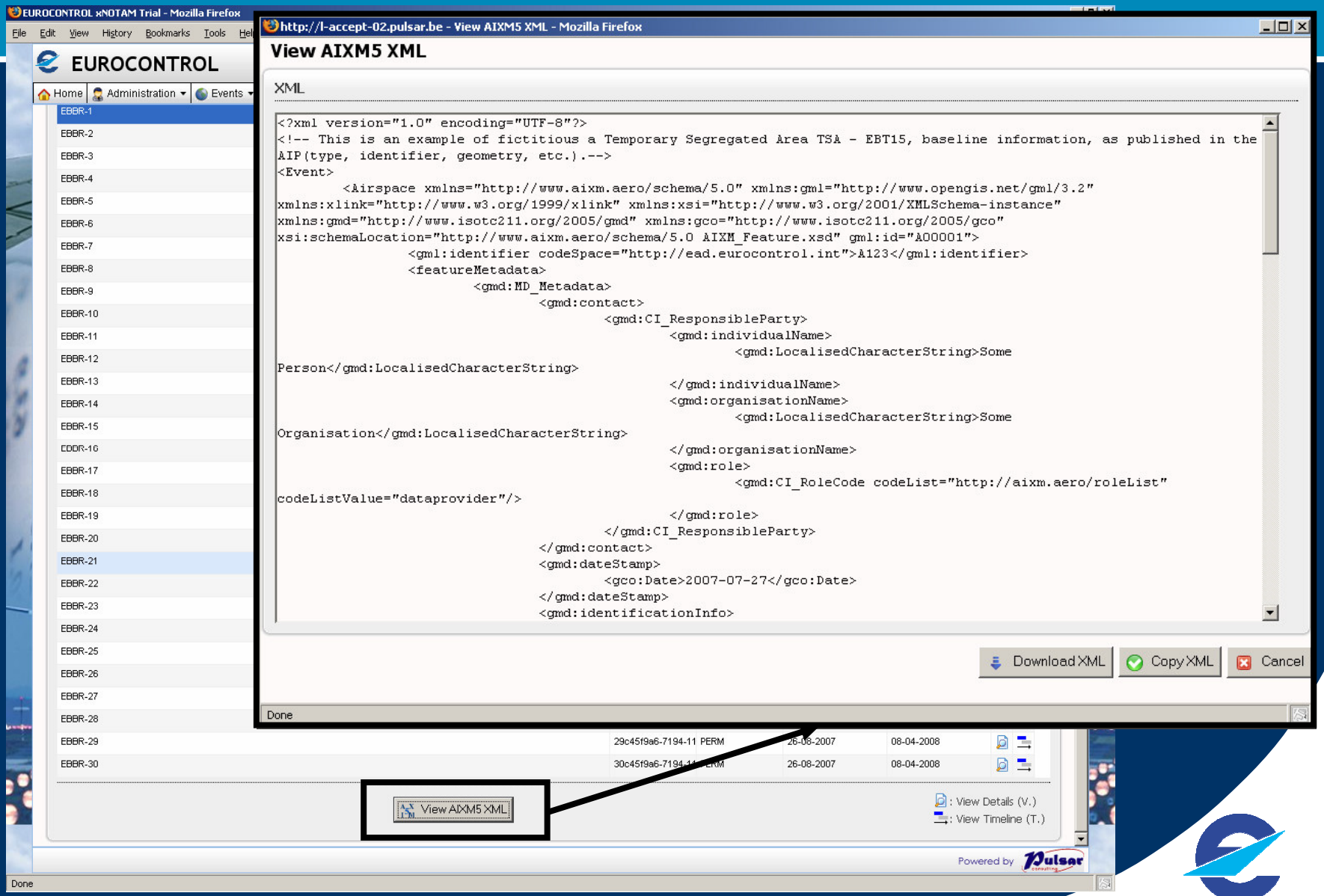
Using data: Viewing features



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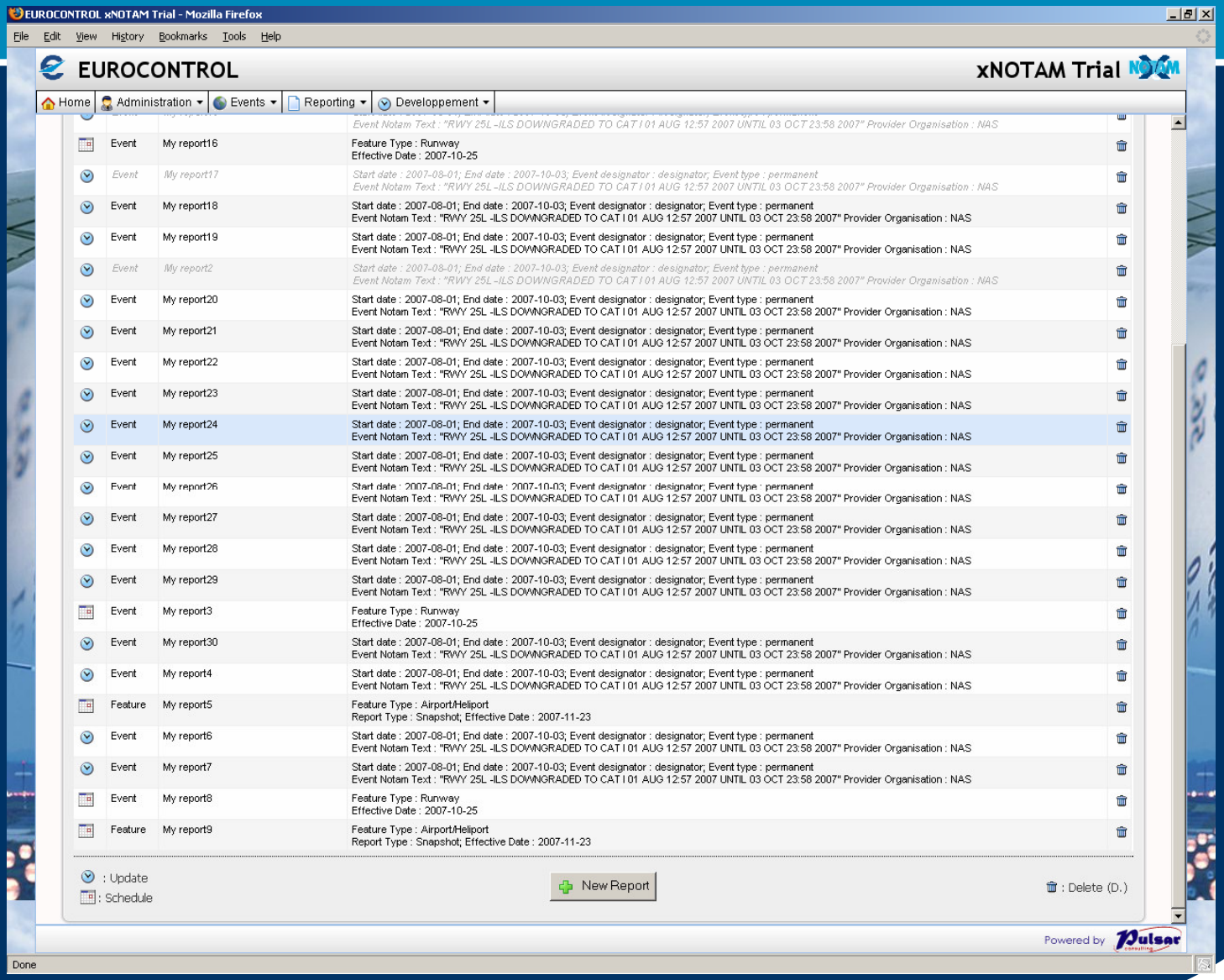
Using data: Manage subscriptions



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- Administration

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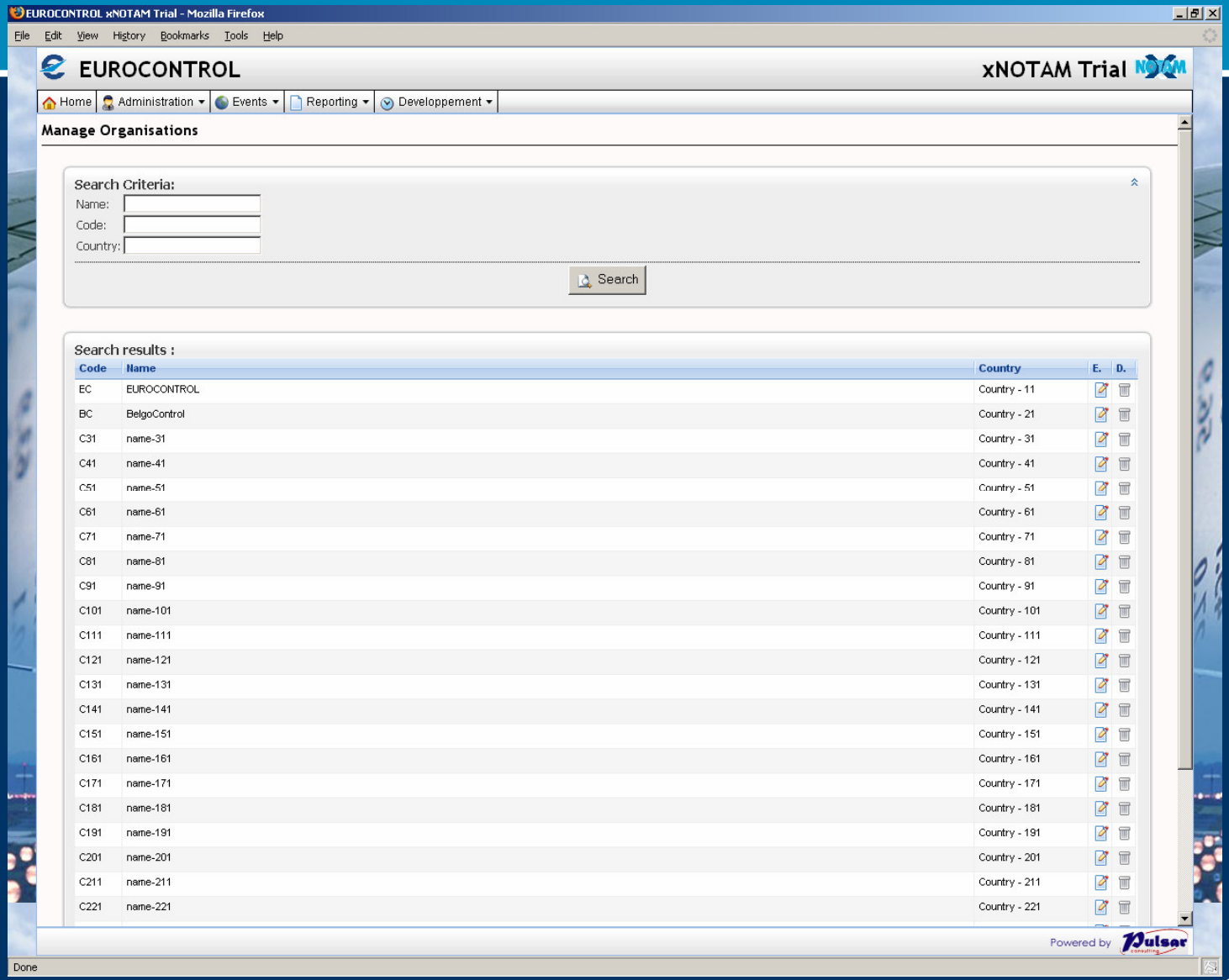
Administration: Organisations



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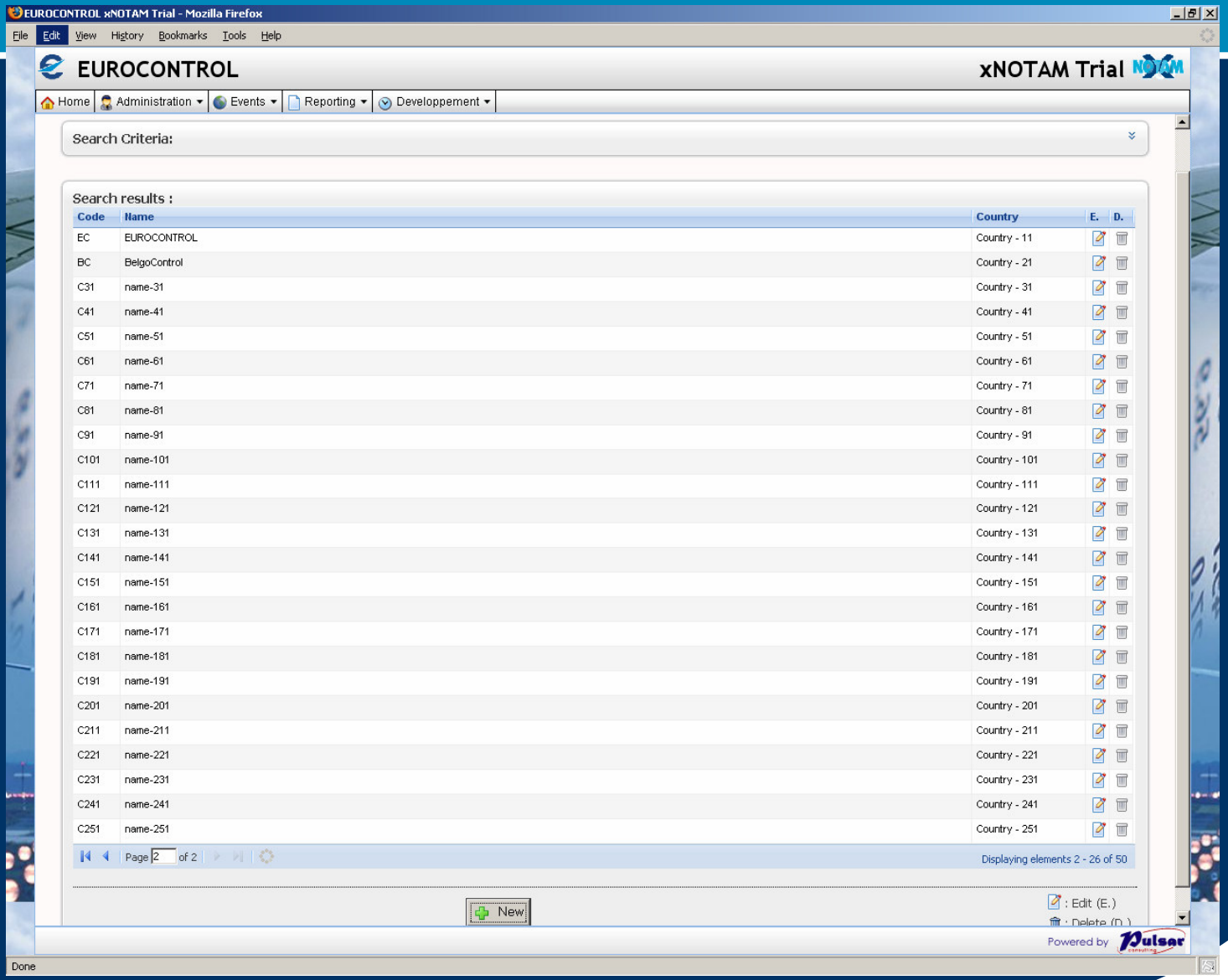
Administration: Organisations



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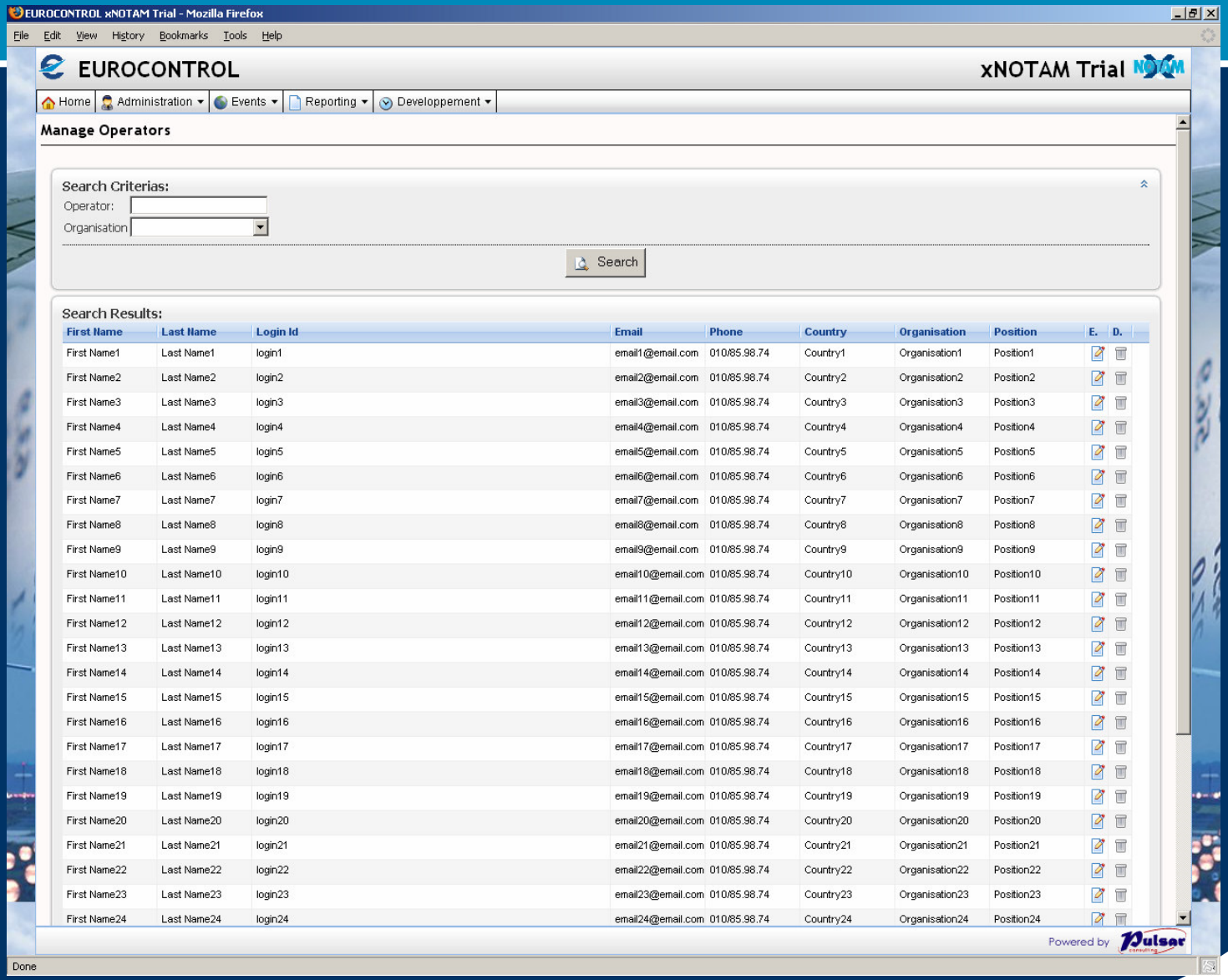
Administration: Operators



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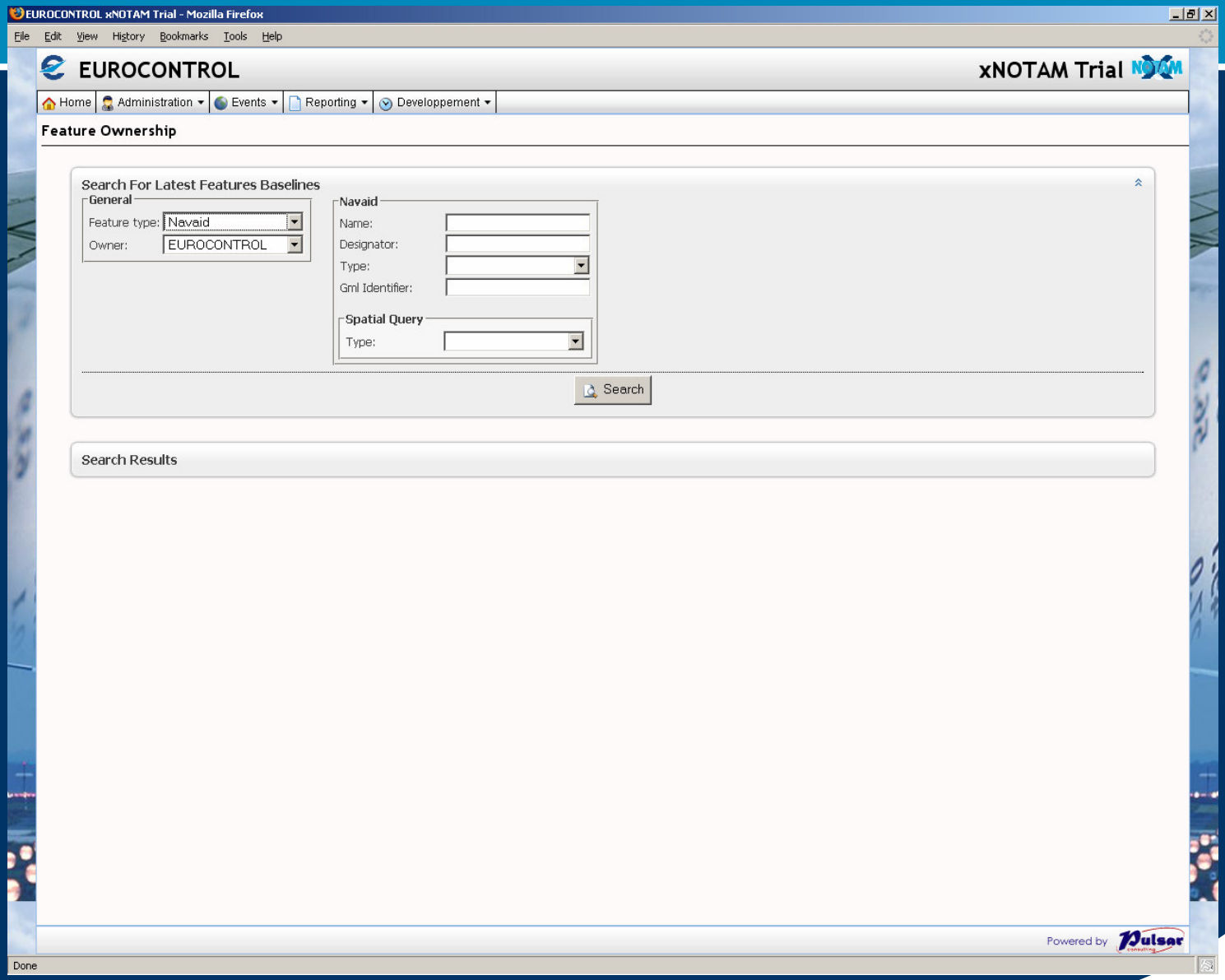
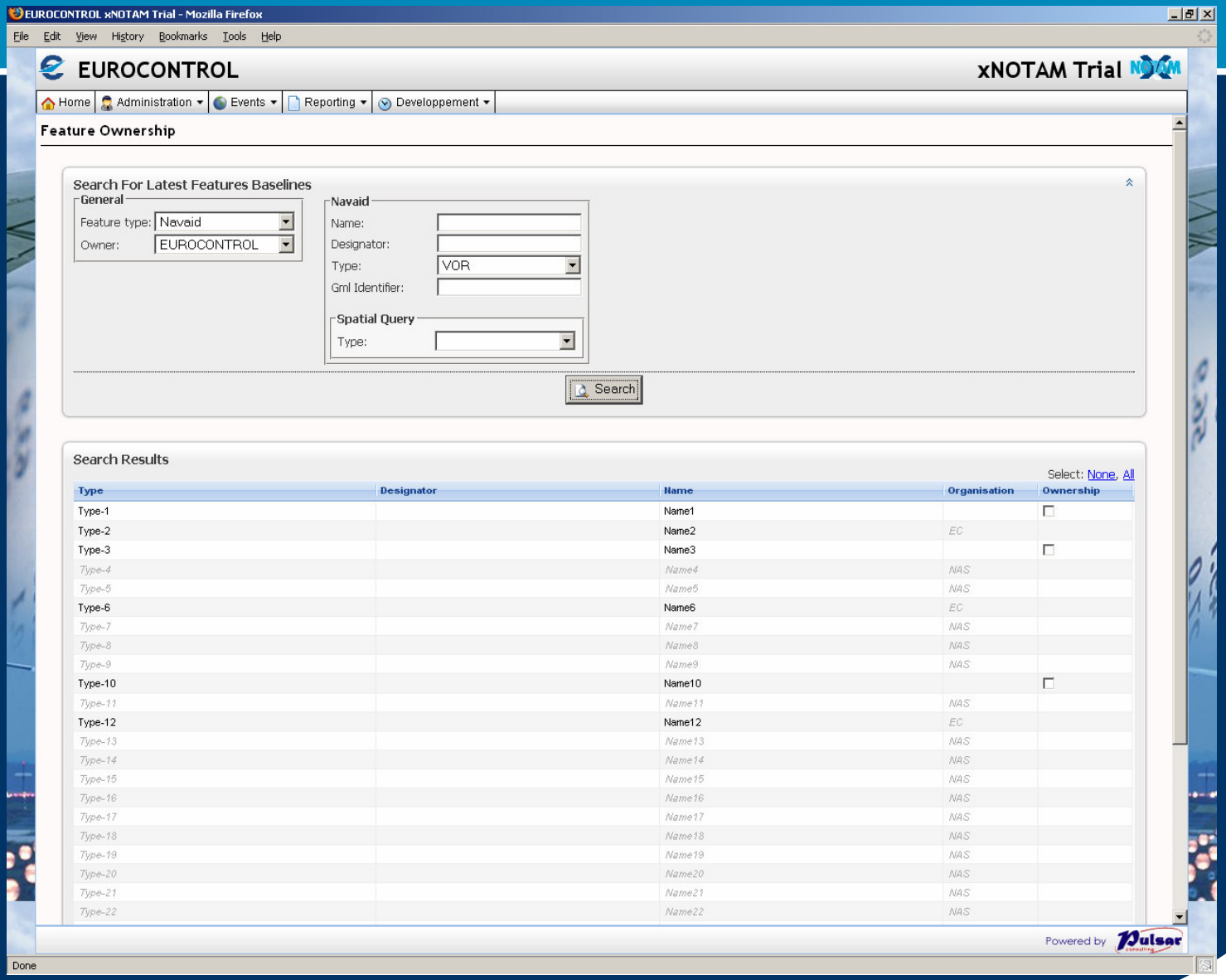
Administration: Feature ownership



Administration: Feature ownership



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Questions?