
WMO: Aircraft Based Observation - Metadata Repository

USER MANUAL

Issue 2

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Document Control

Title:	WMO: Aircraft Based Observation - Metadata Repository – user Manual
Issue:	Issue 2
Date:	05-03-2024
Language:	English
Author:	Devang Parekh

Document Change Record

Date	Version	Author	Change Details
28-11-2023	1.0	Devang Parekh	
05-03-2024	2.0	Devang Parekh	Login functionality

Document Sign Off

Nature of Signoff	Person	Date	Role
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1. Introduction

The User Manual contains all essential information for the user to make full use of the ABOMR system. This manual includes a description of the system functions and capabilities, contingencies and alternate screens of all modules, and step-by-step procedures for system access and use.

2. Getting Started

This section provides a brief overview of the accessibility of the system.

2.1 User Access Considerations

Wishtree will provide access rights according table I.

<u>ABOMR Attributes</u>	<u>Administrator</u>	<u>Programme Manager</u>	<u>Public User</u>	<u>Remote API User</u>
User Management	√			
Programmes Module	√	√		
Systems Module	√	√		
DOC	√	√		
Sensors	√	√		
Airport	√	√		
Aircraft	√	√		
Fleet	√	√		
Historization of Fleet	√	√		
Historization of Aircraft	√	√		
Reporting	√	√	√	
Remote APIs				√

Table I. User access and ABO-MR attributes

2.2 Accessing the system

2.2.1 Login into System

- Users will have to use WMO account identities from Azure portal to sign into the application.
- To login into the system, users must use the below URL and provide their registered email address.
<https://app-wmo-abo-mr-uat.azurewebsites.net>
- From Azure group, two types of users will be able to access the system;
 - 1) WMO staff members (containing WMO domain in their username) will be added as “guest members” in Azure group.
 - 2) External users (having a domain other than WMO) will be added as
- For External users, they need to click on the “External login user” button, which would redirect them to the Microsoft login page they need to provide their credentials to access the ABO-MR application.
- For WMO Staff members users, they need to click on the “WMO Staff Login” button which would redirect them to the Microsoft login page where they would be asked to provide a verification code. Microsoft online services will send a verification code over their registered email address and with the help of the verification code users will be able to login into the ABO-MR application.
- The sign-in to the ABOMR application will be done through Azure AD



Figure 1. Login into the system WMO ABOMR | Sign In (app-wmo-abo-mr-uat.azurewebsites.net)

3. Using the System

This section provides detailed, step-by-step system operating instructions. Figure 2 shows home of ABOMR.

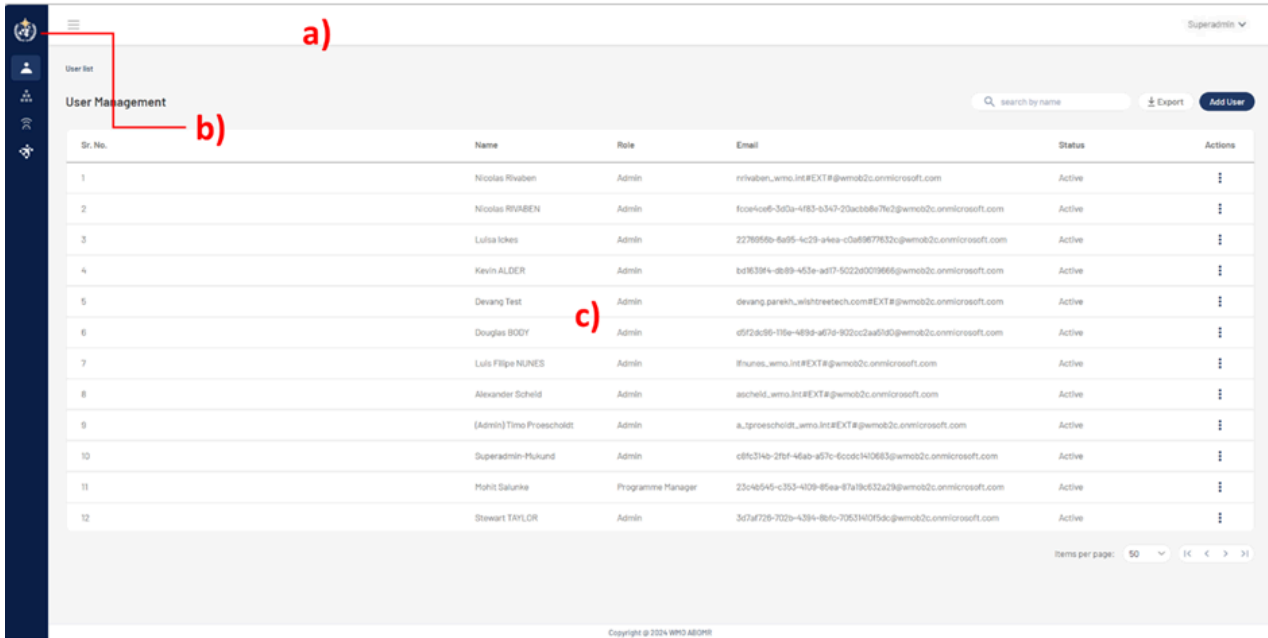


Figure 2. a) Header; b) Navigation Menu and; c) User Management.

3.1 Header

There are 2 components to header (figure 3):

- 1.) User account option:** By clicking on the user account option, there is a drop down which provides 3 options; Admin panel, Reporting, Remote API user and Logout.
- 2.) Left slider menu:** By clicking on the slider menu, a slider navigation menu is displayed which helps users to navigate through different modules.

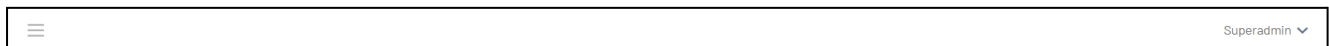


Figure 3. Details of header.

3.2 Navigation Menu

Figure 4 shows the slider navigation menu which helps users navigate through various modules of the system.

1) WMO Logo: At the top, we have the logo of the WMO and ABO-MR.

2) User Management: Firstly, we have the link to User Management module. By clicking on it, user will be redirected to User Management module.

3) Programmes: After User Management, we have the link to Programmes module. By clicking on it, user will be redirected to Programmes module.

4) Systems: After Programmes, we have the link to Systems module. By clicking on it, the user will be redirected to Systems module.

5) Fleets: Lastly Fleets, which has sub-modules of Data Origination Center, Airports, Aircrafts and Sensors. By clicking on any of these links and user will redirected to the respective module/submodule.

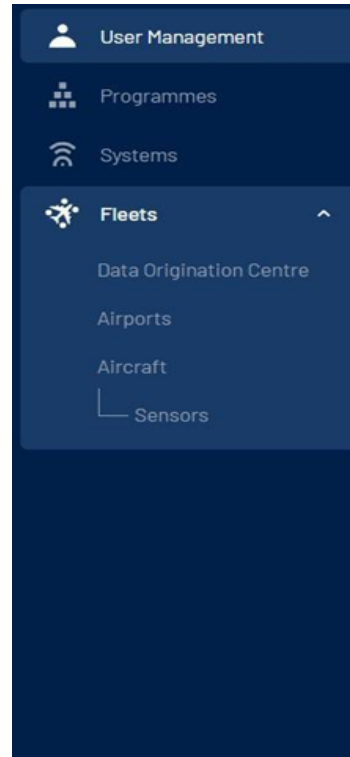


Figure 4. Navigation Menu

3.3 User Management

3.1.1 The User Management contains the following features

- 1) The user management module helps users to add, edit or remove users from the ABO-MR system as shown in figure 5.
- 2) There is search functionality provided where users can search already registered users into the system with keyword-based search.
- 3) Export functionality is provided by the system where users can export registered users details in CSV or JSON format and details of the users will be exported.

3.1.2 How to add users into ABO-MR system

- 1) By clicking on the Add user button on top right of the screenshot highlighted with a red circle. User will be redirected to the new page where he/she can add users into the ABO-MR system (figure 5).
- 2) Figure 5 shows the other screen where user need to select a user from the drop down list of “Select user”.
- 3) The drop down list has all the user which are already registered in the Azure AD group.

- Once the user is selected from the drop down list then we need to assign the role to the user as either “Admin” or “Programme Manager” and then click on “Submit” button to add the user in the ABO-MR system.

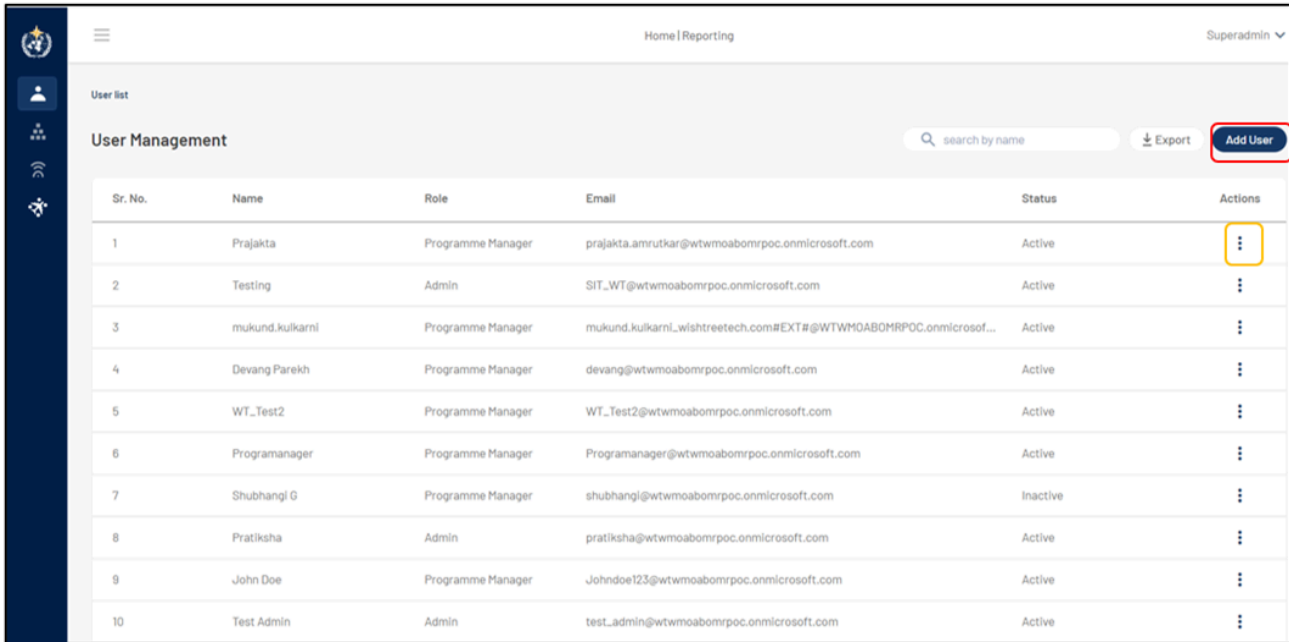


Figure 5. Adding users in User Management menu.

- By clicking on “Cancel”, all the details will be discarded and user will be redirected to the user management landing page (figure 6).

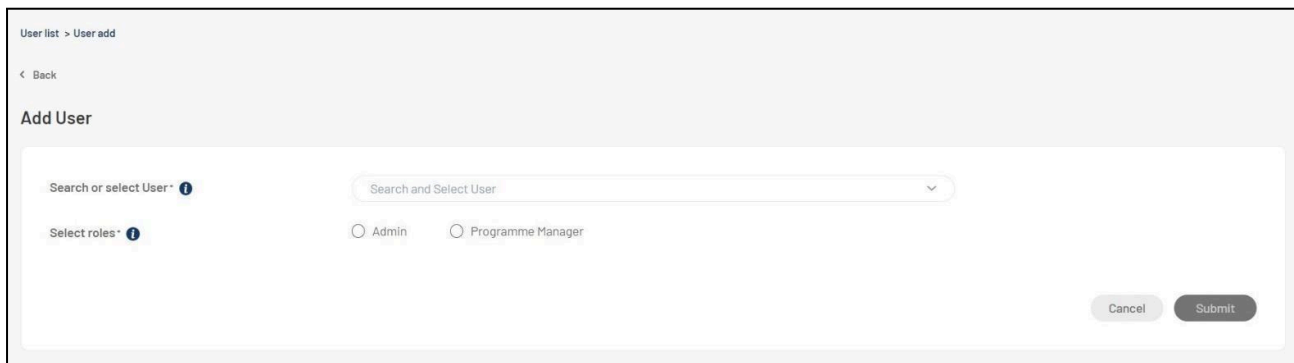


Figure 6. Adding users in ABOMR.

3.1.3 How to view users details into ABO-MR system

- By clicking on the 3 dots at end of the line of any selected user as highlighted in the orange in the figure 5, it will ask for 3 options “view”, “edit” and “deactivate”.
- By clicking on “view” option, user will be redirected to the details of the specific user.
- As shown in the snapshot below, this is how all user details will be displayed to the user which consists of Name, Role, Email, Contact Number and Programmes (if Programme Manager)

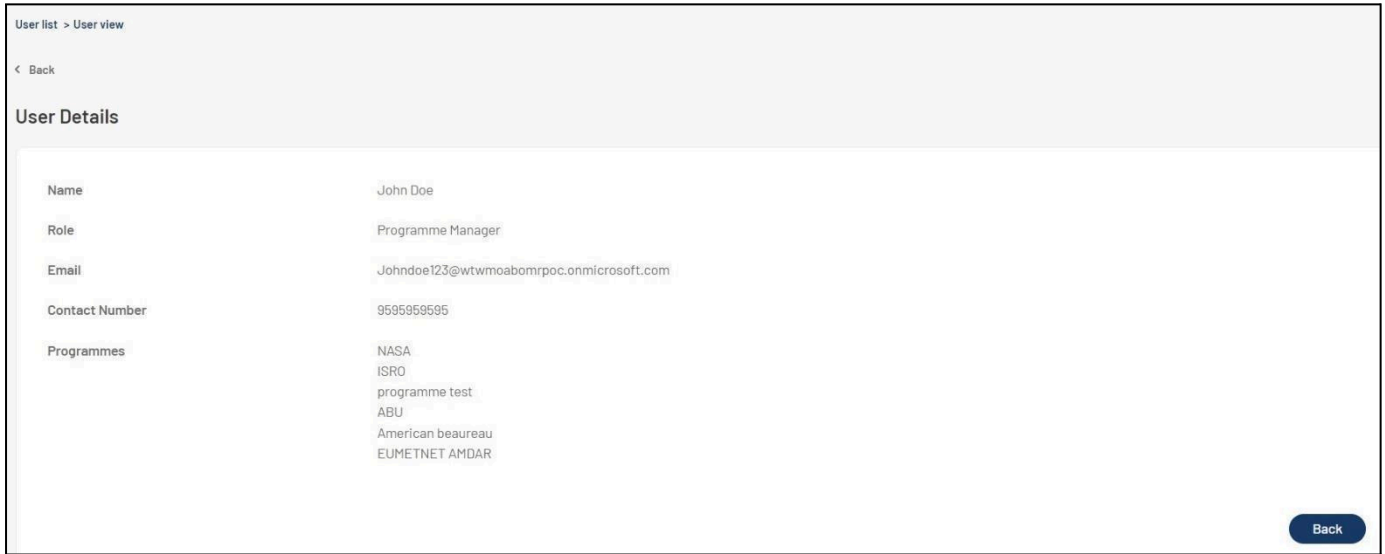


Figure 7. User details in ABOMR

4) By clicking on “Back” button (figure 7), user will be redirected to User Management role.

3.1.4 How to edit users details into ABO-MR system

- 1) By clicking on the 3 dots at end of the line of any selected user as highlighted in the orange in the figure 5, it will ask for 3 options “view”, “edit” and “deactivate”.
- 2) By clicking on “edit” option, user will be jumped to the details of the specific user where he/she will have rights to edit the details.
- 3) User is only allowed to change the role of the user and add/remove programmes (if programme manager) is selected via multiple checkbox dropdown.

3.1.5 How to deactivate users into ABO-MR system

- 1) By clicking on the 3 dots at end of the line of any selected user as highlighted in the orange in the figure 5, it will ask for 3 options “view”, “edit” and “deactivate”.
- 2) By clicking on “Deactivate” option, a pop will be displayed as shown below and the user will be asked to confirm the deactivation.
- 3) By clicking on “Deactivate” button, the selected user will be deactivated in the ABO-MR system and by clicking on “Cancel” button (figure 8), user will not be deactivated, and pop-up will be vanished.

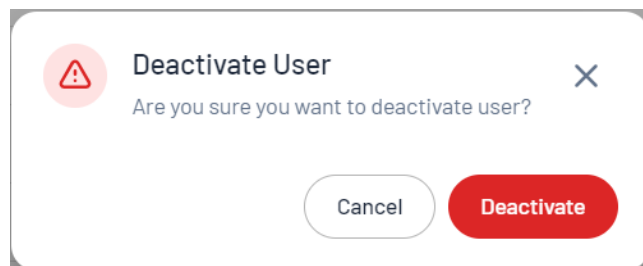


Figure 8. ‘Deactivated User’ dialog box.

3.4 Programmes

3.4.1 The Programmes contains the following features

- 1) The programmes module helps users to add or edit programmes into the ABO-MR system (figure 9).
- 2) In this module, admin users are allowed to assign registered programme managers to specific programmes.
- 3) There is search functionality provided where users can search already registered programmes into the system with keyword-based search.
- 4) Export functionality is provided by the system where users can export registered programmes details in CSV or JSON format and details of the programmes will be exported.

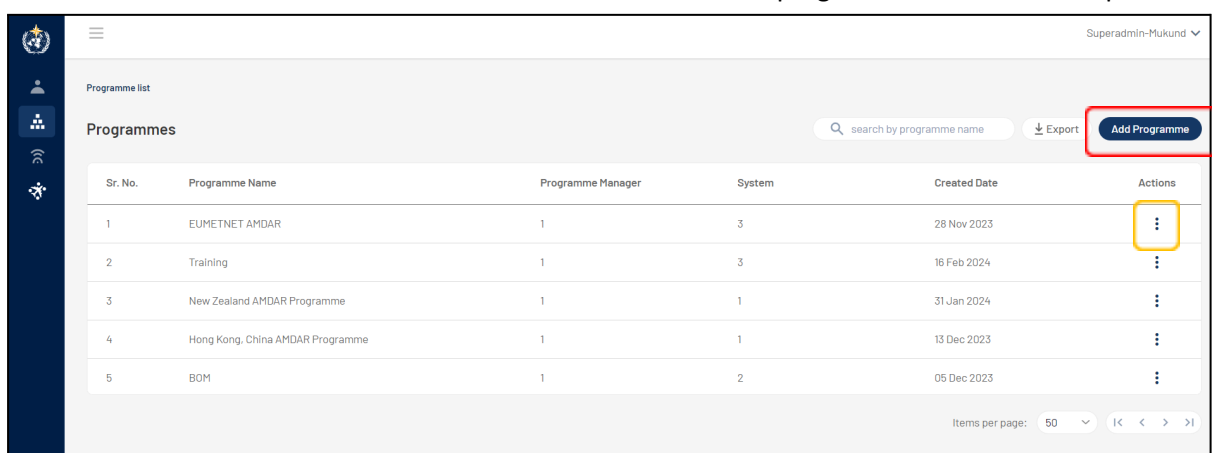


Figure 9. Adding programmes

3.4.2 How to add programmes into ABO-MR system

- 1) By clicking on “Add Programme” button on top right corner highlighted in red, admin user will be redirected to a new screen where he/she needs to add details to add a new programme (figure 9).
- 2) To add a new programme, admin user has to provide below details as shown in figure 10:
 - a. Programme Name (Mandatory)
 - b. Country/Territory (Mandatory) – drop down list
 - c. Programme URL
 - d. Systems (Mandatory) – drop down list
 - e. WMO ABO FOCAL POINT CONTACT Name
 - f. WMO ABO FOCAL POINT CONTACT Email
 - g. Country/Territory
 - h. Phone No.
 - i. Programme Operator
 - j. Assign a Programme Manager (Mandatory) - drop down list
- 3) After providing all the above details, admin user needs to click on “Submit” button and the programme will be saved (figure 11).

- 4) By clicking on “Cancel” button all the details provided will be discarded and user will be redirected to the programmes landing page.

Figure 10. Adding details to a programme

Figure 11. Adding details to a programme (part two).

3.4.3 How to view programmes into ABO-MR system

- 1) By clicking on the 3 dots at end of the line of any selected programme as highlighted in the orange in the snapshot, it will ask for 2 options “view”, “edit” (figure 9).
- 2) By clicking on “view” option, user will be redirected to the details of the specific programme.
- 3) As shown below in figure 12, this is how programme details are displayed to the user. Programme details are displayed in two tabs; i) Details and ii) System & Fleets.
- 4) The first tab “Details”, show the programme details like Programme Name, Country/Territory, Programme URL, Systems assigned, WMO ABO Focal Point Contact details.

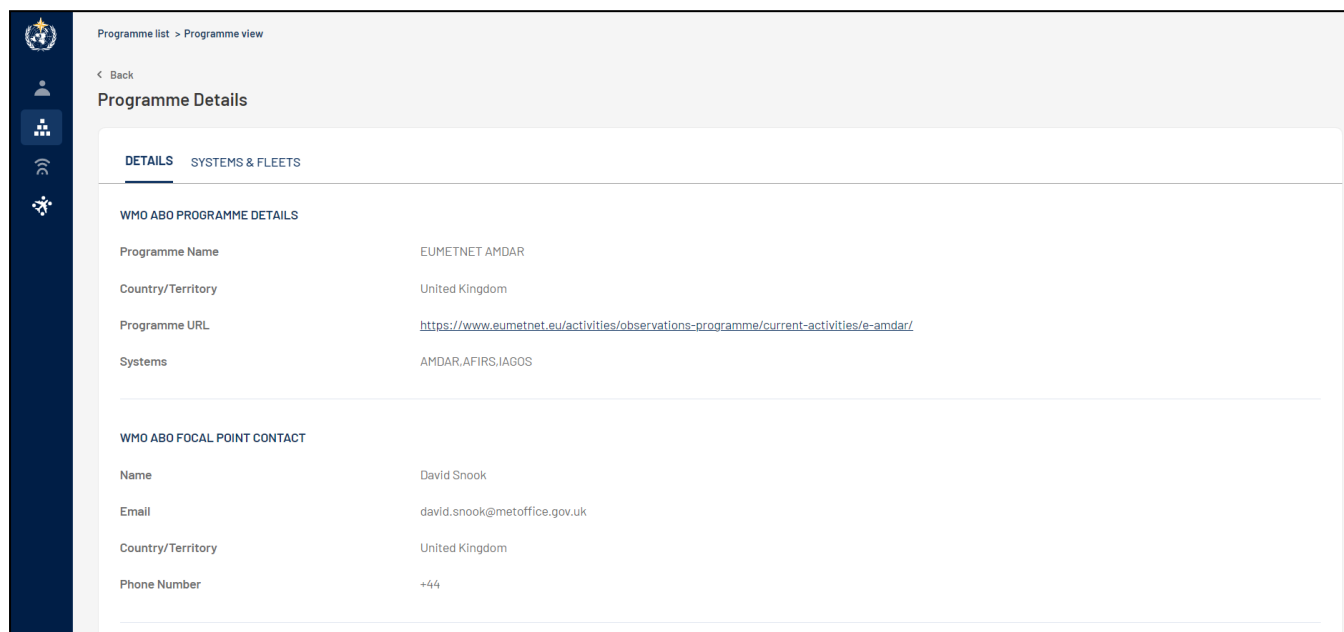


Figure 12. Details of the programme selected - part 1.



Figure 13. Details of the programme selected - parte 2.

- 5) The second tab ‘System and Fleets’ will display all the fleets and systems assigned to this specific programme. By clicking on the system name, fleets assigned to it will be displayed in a concertina view (figure 14)

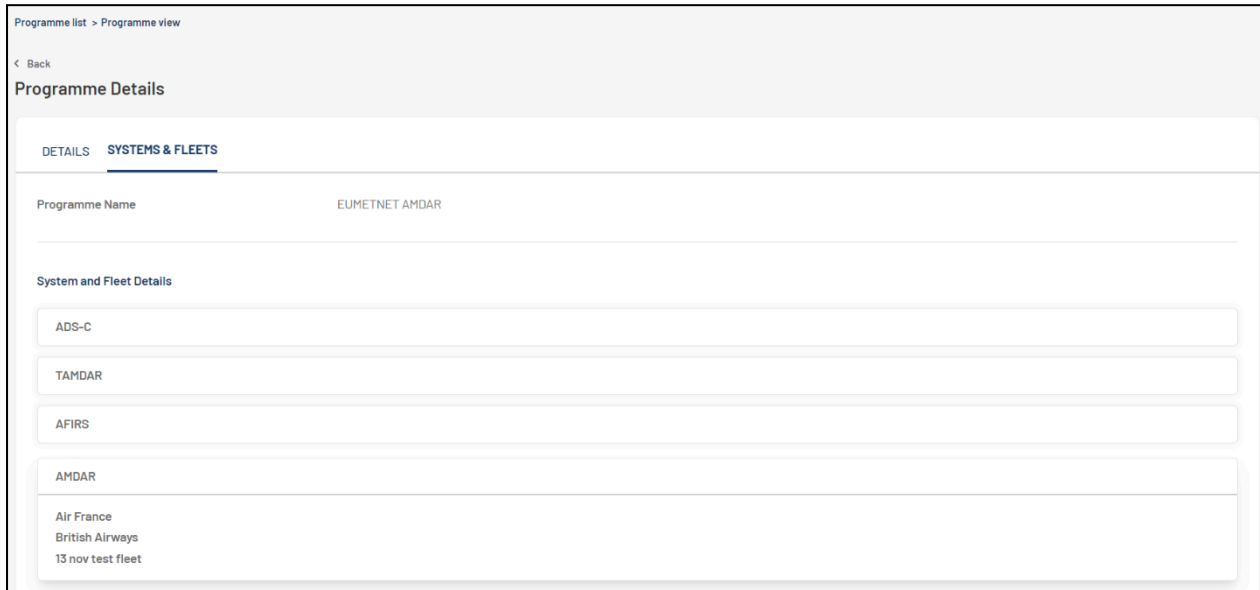


Figure 14. Details of the programme selected

3.4.4 How to edit programmes into ABO-MR system

- 1) By clicking on the 3 dots at end of the line of any selected programme as highlighted in the orange in figure 9, it will ask for 2 options “view”, “edit”.
- 2) By clicking on “edit” option, user will be redirected to the details of the specific programme page where user can edit any details of the programme as required.
- 3) After making changes in the programme details, by clicking on “Update” button will make those changes in the programme.
- 4) By clicking on “Cancel” button, all the changes made by the user will be discarded and user will be redirected to the programmes landing page.

3.5 Systems

4. The Systems contains the following features

- 1) The systems module helps users to view or edit 6 pre-defined systems into the ABO-MR system. (AMDAR, AFIRS, TAMDAR, Mode-S, IAGOS, ADS-C) as shown in figure 15.
- 2) In this module, admin users are allowed to assign System Operator Contact details to specific systems.
- 3) There is search functionality provided where users can search predefined systems with keyword-based search.
- 4) Export functionality is provided by the system where users can export system details in CSV or JSON format.

Sr. No.	System Name	Programme Name	System Operator	Actions
1	Mode-S	Training	N/A	⋮
2	ADS-C	Training	N/A	⋮
3	TAMDAR	N/A	N/A	⋮
4	IAGOS	EUMETNET AMDAR	N/A	⋮
5	AFIRS	BOM Training EUMETNET AMDAR	N/A	⋮
6	AMDAR	BOM Hong Kong, China AMDAR Programme New Zealand AMDAR Programme EUMETNET AMDAR	N/A	⋮

Figure 15. Display of the systems available.

4.1.1 How to view systems into ABO-MR system

- 1) By clicking on the 3 dots at end of the line of any selected system as highlighted in the orange in the figure 15 it will ask for 2 options “view”, “edit”.
- 2) By clicking on “view” option, user will be redirected to the details of the specific system (figure 16).
- 3) As shown in the snapshot below, System details will be displayed which includes, System Name, URL, System Operator Name, System Operator Contact details and Programme & Fleet details.

System Details	
System Name	TAMDAR
System URL	N/A
System Operator	
Name	FLYHT Aerospace Solutions Ltd.
System Operator Contact	
Name	HULL-89
Email	Test@abomr.com
Country/Territory	Canada
Phone Number	N/A

Figure 16. System details.

- 4) List of programmes assigned to the system I also displayed and when the user clicks on any of the displayed programmes then assigned fleet will be displayed in concertina view (figure 17).

Figure 17. Programme and Fleet details

- 5) By clicking on “Back” button, user will be redirected to the landing page of Systems module (figure 15).

4.1.2 How to edit systems into ABO-MR system

- 1) By clicking on the 3 dots at end of the line of any selected system as highlighted in the orange in the figure 15, it will ask for 2 options “view”, “edit”.
- 2) By clicking on “edit” option, user will be redirected to the details of the specific system.
- 3) System name will remain hard coded, so user wont be able to change the name of the system. But user will be allowed to change System URL, System Operator Name, System Operator Contact details.
- 4) After making changes in the system details, clicking on “Update” button will make those changes in the system.
- 5) By clicking on “Cancel” button, all the changes made by the user will be discarded and user will be redirected to the systems landing page.

4.2 Fleets

4.2.1 Data Origination Center (DOC)

DOC list

Data Origination Centre

search by name, email, country | Export | Add DOC

Sr. No.	DOC Name	Email	Country	Actions
1	RJTD, Toyko	xyz@gmail.com	Algeria	⋮
2	FAJS, Johannesburg	stewart.taylor@metoffice.gov.uk	South Africa	⋮
3	WT_SIT	beia123@yopmail.com	Isle of Man	⋮
4	test doc	test@testmail.com	France	⋮
5	TERS, Mumbal	pp@dm.com	Algeria	⋮
6	EGRR, Exeter	stewart.taylor@metoffice.gov.uk	United Kingdom	⋮
7	EDZW, Offenbach	carmen.emmel@dwd.de	Germany	⋮
8	jhbhh	prajakta@gmail.com	Albania	⋮
9	DOC test 6	jeelang@jsp.com	Colombia	⋮
10	DOC_PM	OO@gmail.com	Fiji	⋮

Figure 18. List of Data Origination Centre

3.6.1.1 The DOC contains the following features

- 1) The DOC module helps users to add, view or edit DOC into the ABO-MR system (figure 18).
- 2) There is search functionality provided where users can search already added DOCs into the system with keyword-based search.
- 3) Export functionality is provided by the system where users can export added DOCs details in CSV or JSON format and details of the DOCs will be exported.

3.6.1.2 How to add DOC into ABO-MR system

- 1) By clicking on “Add DOC” button on top right corner highlighted in red, admin user will be redirected to a new screen where he/she needs to add details to add a new DOC.
- 2) To add a new DOC, user has to provide below details
 - a. DOC Name (Mandatory)
 - b. Organization or Agency (Mandatory) – drop down list
 - c. Name of the Contact (Mandatory)
 - d. Country/Territory (Mandatory) – drop down list
 - e. Email (Mandatory)
 - f. Phone No. (Country/Territory Code) – Drop down list for selecting Country/Territory Code
 - g. Phone No.
- 3) After providing all the above details, user needs to click on “Submit” button and the DOC will be saved (figure 19).
- 4) By clicking on “Cancel” button all the details provided will be discarded and user will be redirected to the DOC landing page.

DOC list > DOC Add

< Back

Add Data Origination Centre

Data Origination Centre

Organization or Agency

Name of the Contact

Country/Territory

Email

Phone Number

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Figure 19. Adding Data Origination Centres details.

3.6.1.3 How to view DOC details into ABO-MR system

- 1) By clicking on the 3 dots at end of the line of any selected DOC as highlighted in the orange in the figure 18, it will ask for 2 options “view”, “edit”.
- 2) By clicking on “view” option, user will be redirected to the details of the specific DOC.
- 3) As shown below in the snapshot, this is how DOC details are displayed to the user. DOC details are displayed in two tabs; i) Details and ii) System & Fleets.
- 4) The first tab “Details”, show the DOC details like DOC Name, Organization/Agency, Name of the Contact, Country/Territory, Email, Phone No (figure 20)

DOC list > DOC view

< Back

Data Origination Centre Details

DETAILS SYSTEMS & FLEETS

Data Origination Centre	AMMC, Melbourne
Organization or Agency	Agency
Name of the Contact	mohammad
Country/Territory	India
Email	mohammad.bohari+1@wishtretech.com
Phone Number	+91 4512545878

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Figure 20. Data Origination Center – tab ‘details’.

- 5) The second tab ‘System and Fleets’ will display all the fleets and systems assigned to this specific DOC. By clicking on the system name, fleets assigned to it will be displayed in a concertina view (figure 21).



Figure 21. Data Origination Center – tab ‘Systems and Fleets’.

3.6.1.4 How to edit DOC details into ABO-MR system

- 1) By clicking on the 3 dots at end of the line of any selected DOC as highlighted in the orange in the figure 18, it will ask for 2 options “view”, “edit”.
- 2) By clicking on “edit” option, user will be redirected to the details of the specific DOC page where user can edit any details of the DOC as required.
- 3) After making changes in the DOC details, by clicking on “Update” button will make those changes in the DOC.
- 4) By clicking on “Cancel” button, all the changes made by the user will be discarded and user will be redirected to the DOC landing page.

4.2.2 Airports

4.2.2.1 The Airports features

- 1) The Airports module helps users to view a list 7698 airports and their details.
- 2) Search functionality is provided where users can search airports with keyword-based search.
- 3) Export functionality is provided by the system where users can export system details in CSV or JSON format.

Sr. No.	Airport Name	Country/Territory	City	Actions
1	Melitopol Air Base	Ukraine	Melitopol	⋮
2	Desierto de Atacama Airport	Chile	Copiapó	⋮
3	Krechevitsy Air Base	Russia	Novgorod	⋮
4	Ulan-Ude East Airport	Russia	Ulan Ude	⋮
5	Rogachyovo Air Base	Russia	Belaya	⋮
6	Kubinka Air Base	Russia	Kubinka	⋮
7	Privolzhskiy Air Base	Russia	Astrakhan	⋮
8	Kostomuksha Airport	Russia	Kostomuksha	⋮
9	Laguindingan Airport	Philippines	Cagayan de Oro City	⋮

Figure 22. Airports listed in the ABOMR.

4.2.2.2 How to view Airport details into ABO-MR system

- 1) By clicking on the 3 dots at end of the line of any selected Airport as highlighted in the orange in the figure 22, it will ask for “view” option.
- 2) By clicking on “view” option, user will be redirected to the details of the specific Airport.
- 3) As shown below in the figure 23, this is how Airport details are displayed to the user. Airport details are displayed in two tabs; i) Airport Details and ii) System & Fleets.
- 4) The first tab “Details”, show the Airport details like Airport Name, Country/Territory, City, Latitude, Longitude, Altitude, IATA Code, ICAO Code, Timezone.
- 5) The second tab ‘System and Fleets’ will display all the fleets and systems assigned to this specific Airport. By clicking on the system name, fleets assigned to it will be displayed in a concertina view.

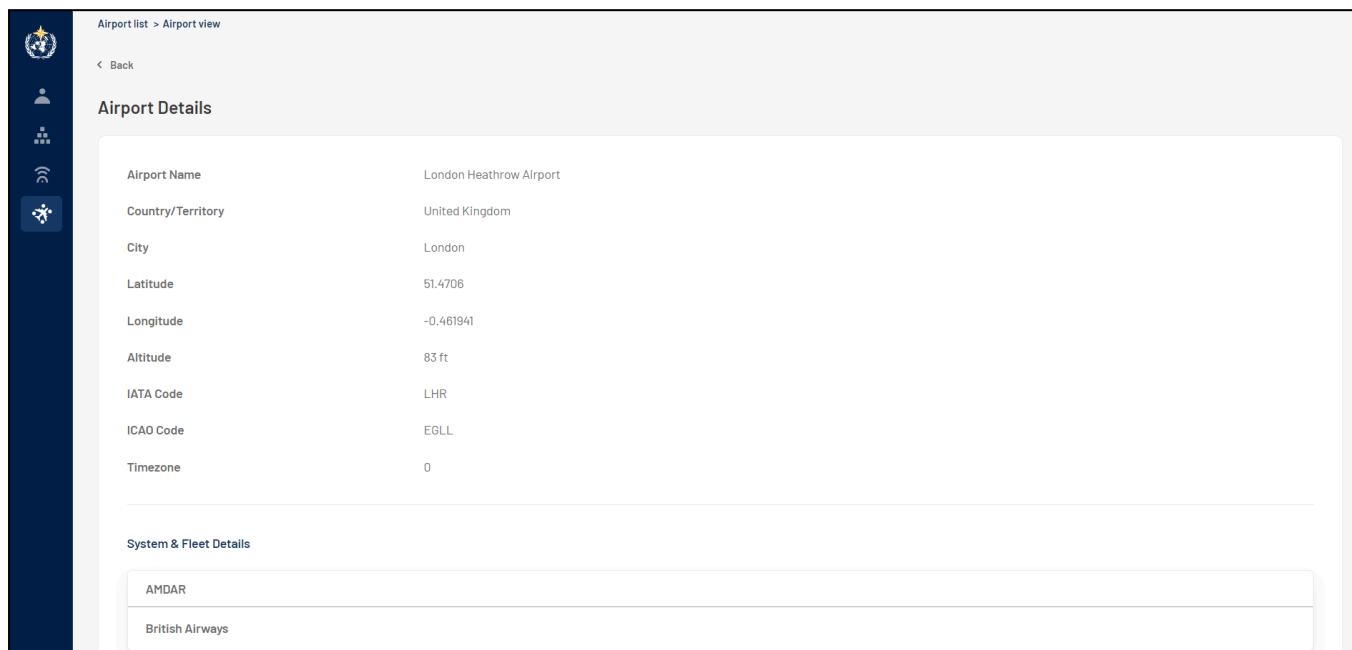


Figure 23. Airports detail list.

4.2.2.3 How to refresh Airport details into ABO-MR system

- 1) All the Airport details are fetched through ICAO database available at - <https://openflights.org/data.html>
- 2) If there is any change in the ICAO database and the user wants to see those updated details in the ABO-MR system then the user needs to refresh the Airports module.
- 3) By clicking on the “Refresh Airports” button on the top right corner highlighted in red (figure 23), users will be able to refresh the ICAO database link and updated data will be fetched for each airport.

4.2.3 Sensors

Sr. No.	Manufacturer	Sensor Type	Measurement Variable	Measurement Unit	Actions
1	Wishtree_2	Wind	Horizontal Wind Direction	Degree (°)	⋮
2	Wishtree	Temperature	Air Temperature	Degree Celsius (°C)	⋮
3	Rosemount	heading	Aircraft Heading	Degrees (°)	⋮
4	CBD	Total Air Temperature	Air Temperature	Kelvin (K)	⋮
5	ABC	Total Air Temperature	Air Temperature	Degree Celsius (°C)	⋮
6	FLYHT	WVSS-II	Mass Mixing Ratio	Kilograms per cubic metre	⋮
7	Rosemount	Total Air Temperature	Air Temperature	Kelvin (K)	⋮
8	Unknown	Icing	Ice Indication	Unknown	⋮
9	NA	Total air temperature	Air Temperature	Degree Celsius (°C)	⋮

Figure 24. List of sensors uploaded in the database.

4.2.3.1 The Sensors contains the following features

- 1) The sensors module helps users to add, view or edit sensors into the ABO-MR system (figure 24).
- 2) There is search functionality provided where users can search already added sensors into the system with keyword-based search.
- 3) Export functionality is provided by the system where users can export added sensors details in CSV or JSON format and details of the sensors will be exported.

4.2.3.2 How to add Sensors into the ABO-MR system

- 1) By clicking on “Add Sensor” button on the top right corner highlighted in red (figure 24), user will be redirected to a new screen where he/she needs to add details to add a new sensor.
- 2) To add a new sensor, user has to provide below details as shown in figure 25:
 - a. Manufacturer Name (Mandatory)
 - b. Sensor Type
 - c. Measurement variable (Mandatory) – drop down list
 - d. Measurement unit (Mandatory) – drop down list
- 3) After providing all the above details, user needs to click on “Submit” button and the sensor will be saved.
- 4) By clicking on “Cancel” button all the details provided will be discarded and user will be redirected to the Sensors landing page.

Sensor list > Sensor add

< Back

Add Sensor

Manufacturer*

Sensor Type

Measurement Variable*

Measurement Unit*

Cancel Submit

Figure 25. Adding sensors in the ABOMR.

4.2.3.3 How to view sensor details into ABO-MR system

- 1) By clicking on the 3 dots at end of the line of any selected sensor as highlighted in the orange in the figure 24, it will ask for 2 options “view”, “edit”.
- 2) By clicking on “view” option, user will be redirected to the details of the specific sensor.
- 3) As shown below in figure 26, this is how sensor details are displayed to the user. sensor details are displayed in two tabs; i) Details and ii) Fleets & Aircrafts.
- 4) The first tab “Details”, show the sensor details like Sensor Type, Measurement Unit, Measurement Variable, Manufacturer.

Sensor Details

DETAILS FLEETS & AIRCRAFTS

Sensor Type Distance

Measurement Unit Degree

Measurement Variable Horizontal Wind Direction

Manufacturer Epitode

Back

Figure 26. Adding sensors in the ABOMR.

- 5) The second tab ‘Fleets and Aircrafts’ will display all the fleets and aircraft with which the sensor is assigned to. By clicking on the fleet name, aircraft assigned to it will be displayed in a concertina view (figure 27).



Figure 27. Sensors details sorted by Fleets and Aircrafts

4.2.3.4 How to edit sensor details into ABO-MR system

- 1) By clicking on the 3 dots at end of the line of any selected sensor as highlighted in the orange in the figure 24, it will ask for 2 options “view”, “edit”.
- 2) By clicking on “edit” option, user will be redirected to the details of the specific sensor page where user can edit any details of the sensor as required.
- 3) After making changes in the sensor details, by clicking on “Update” button will make those changes in the sensor.
- 4) By clicking on “Cancel” button, all the changes made by the user will be discarded and user will be redirected to the Sensors landing page.

4.2.4 Aircraft

Sr. No.	Aircraft Owner	Airline Name	Country/Territory	Reporting Status	Aircraft Type	WIGOS Id	Actions
1	Lufthansa	Lufthansa	Germany	Reporting Optimized	A-340	0.21011.0.14	⋮
2	Wishtree	Air India	Bermuda	Reporting Optimized	Training	0.21011.0.13	⋮
3	Air New Zealand	Air New Zealand	New Zealand	Reporting	A-320	0.21011.0.12	⋮
4	Lufthansa	Lufthansa	Germany	Reporting	A-321	0.21011.0.8	⋮
5	Air Hong Kong	Air Hong Kong	Hong Kong	Reporting	A-330	0.21011.0.10	⋮
6	Qantas Airways Limited	Qantas airways	Australia	Reporting Optimized	A-330	0.21011.0.7	⋮
7	Cathay Pacific	Cathay Pacific	Hong Kong	Reporting	A-330	0.21011.0.11	⋮
8	Lufthansa	Euroings Discover	Germany	Reporting Optimized	A-320	0.21011.0.9	⋮
9	Qantas Airways Limited	Qantas airways	Australia	Ceased Reporting	B747	0.21011.0.4	⋮
10	DUMMY DATA - Qantas...	Qantas airways	Australia	Reporting	Boeing	0.21011.0.1	⋮

Figure 28. Aircrafts list in ABOMR

4.2.4.1 The Aircraft contains the following features

- 1) The aircraft module helps users to add, view or edit aircraft into the ABO-MR system.
- 2) There is search functionality provided where users can search already added aircraft into the system with keyword-based search.
- 3) Export functionality is provided by the system where users can export added aircraft details in CSV or JSON format and details of the aircraft will be exported.
- 4) The aircraft module has the change history feature, where any changes in the information to any aircraft are made, it has been logged and user can view the changes in detail.
- 5) The aircraft module has a historization feature where for selected child entities, if user makes any changes, then the system creates a new version of the same aircraft.

4.2.4.2 How to add Aircraft into the ABO-MR system

- 1) By clicking on “Add Aircraft” button on top right corner highlighted in red (figure 28), user will be redirected to a new screen where he/she needs to add details to add a new aircraft.
- 2) For adding an aircraft, user has to provide below details in a 2-step form (figure 29 and 30).
- 3) In Step 1, user has to provide below details
 - a. Aircraft Owner
 - b. Aircraft Registration (Mandatory)
 - c. Model Serial Number (Mandatory)
 - d. Series (Mandatory)
 - e. Engine
 - f. Structure
 - g. Reporting Status (Mandatory) – Drop down list
 - h. Country/Territory Registered (Mandatory) - Drop down list
 - i. Aircraft Manufacturer (Mandatory)
 - j. Type (Mandatory)
 - k. Model
 - l. Navigation System
 - m. EASA Category
 - n. ADS Hex Identifier (Mandatory)
 - o. Validity date from (Mandatory) – Calendar drop down
 - p. Validity date to – Calendar drop down

Figure 29. Adding aircrafts form in ABOMR - part one.

Figure 30. Adding aircrafts form in ABOMR - part one.

- 4) After filling all the details on step 1, user needs to click on “Next” button to jump into step 2 of the aircraft details form (figure 30).
- 5) If user clicks on “Cancel” button then all the details filled by the user will be discarded and user will be redirected to the Aircraft landing page.
- 6) In step 2, user needs to provide below details (figure 31):
 - a. Airline Name (Mandatory)
 - b. Parent Airline
 - c. Airline Country/Territory (Mandatory) – Drop down list
 - d. Airline Contact Name
 - e. Airline Contact Country/Territory - Drop down list
 - f. Airline Contact email address
 - g. Airline Contact Phone No. Country/Territory Code - Drop down list
 - h. Airline Contact Phone No.

- i. Assign Sensor - Drop down list – here user will select the sensor which were previously added in the sensors module
- j. Add sensor – If user wants to add a new sensor directly from the aircraft module then they have the provision of adding the sensor directly by clicking on “Add Sensor” button (figure 29) and adding the details such as:
 - i) Manufacturer (Mandatory)
 - ii) Sensor Type
 - iii) Measurement variable (Mandatory) – Drop down list
 - iv) Measurement Unit (Mandatory)
- k. After clicking on “Save” button, new sensor will be added (figure 31)
 - v) Serial Number
 - vi) Part Number
 - vii) Validity date from (Mandatory) – Calendar drop down
 - viii) Validity date to – Calendar drop down

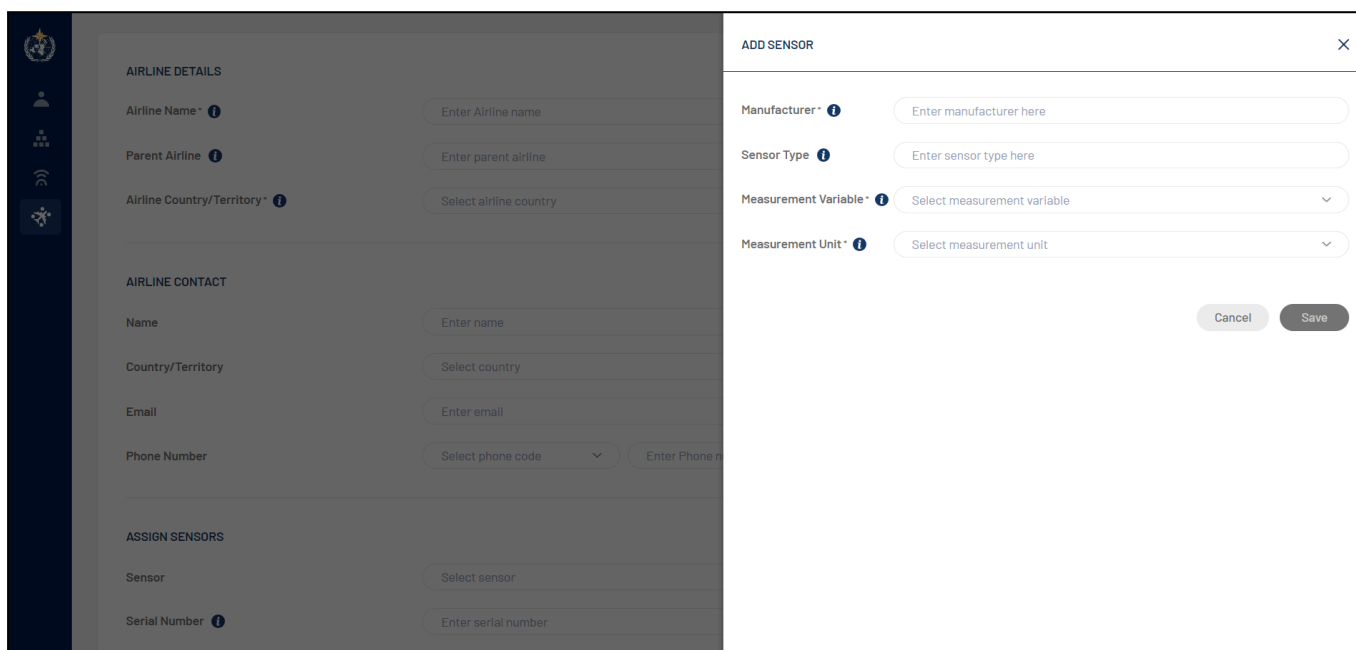


Figure 31. Adding a sensor from airline module.

Figure 30. Adding aircraft details in ABOMR-

Figure 31. Adding sensors in the section ‘add aircraft’.

- 7) After providing sensor details, user needs to click on “Assign” button to assign a sensor into the aircraft.
- 8) When a sensor is assigned to an aircraft, then a sensor card is created and displayed to user at the bottom of the screen.
- 9) If user wants to remove any sensor which was already assigned to an aircraft, then user can click on ‘x’ button in sensor card to remove that particular sensor.
- 10) If user wants to make any changes in the sensor details, then user can click on ‘⚙️’ button in the sensor card and can edit sensor details (figure 31)



Figure 31. Adding a new sensor in a selected aircraft.

- 11) After providing all the above details, user needs to click on “Submit” button and a pop-up window will be displayed to the user to provide any comments for the aircraft.
- 12) User can either ignore the pop-up window by clicking on “Cancel” button or can provide their comments by adding text in the text box and then click on “Submit” button (figure 32).

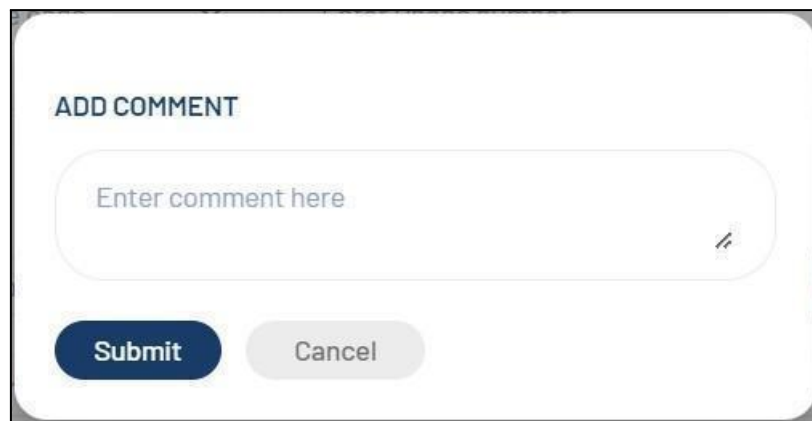


Figure 32. Adding comments for a new sensor.

- 13) After providing comment, user needs to click on “Submit” button and the aircraft will be saved.
- 14) By clicking on “Cancel” button all the details provided will be discarded and user will be redirected to the Aircraft landing page.
- 15) After providing all the above details, user needs to click on “Submit” button and the sensor will be saved.
- 16) By clicking on “Cancel” button all the details provided will be discarded and user will be redirected to the Sensors landing page.

4.2.4.3 How to view Aircraft into the ABO-MR system

- 1) By clicking on the 3 dots at end of the line of any selected aircraft as highlighted in the orange in the figure 26, it will ask for 3 options “view”, “edit” and “change history”.
- 2) By clicking on “view” option, user will be redirected to the details of the specific aircraft.
- 3) As shown below in the snapshot, this is how aircraft details are displayed to the user. Aircraft details are displayed in two tabs; i) Details and ii) System & Fleets iii) Sensor Details (figure 32 and 33)
- 4) The first tab “Details”, show the aircraft details like Aircraft owner, Aircraft registration, Model Serial Number, Series, Engine, Structure, Reporting Status, Country/Territory registered, Aircraft Manufacturer, Type, Model, Navigation System, EASA Category, ADS Hex Identifier, Aircraft Validity dates, Airline Details, Airline Contact Details.

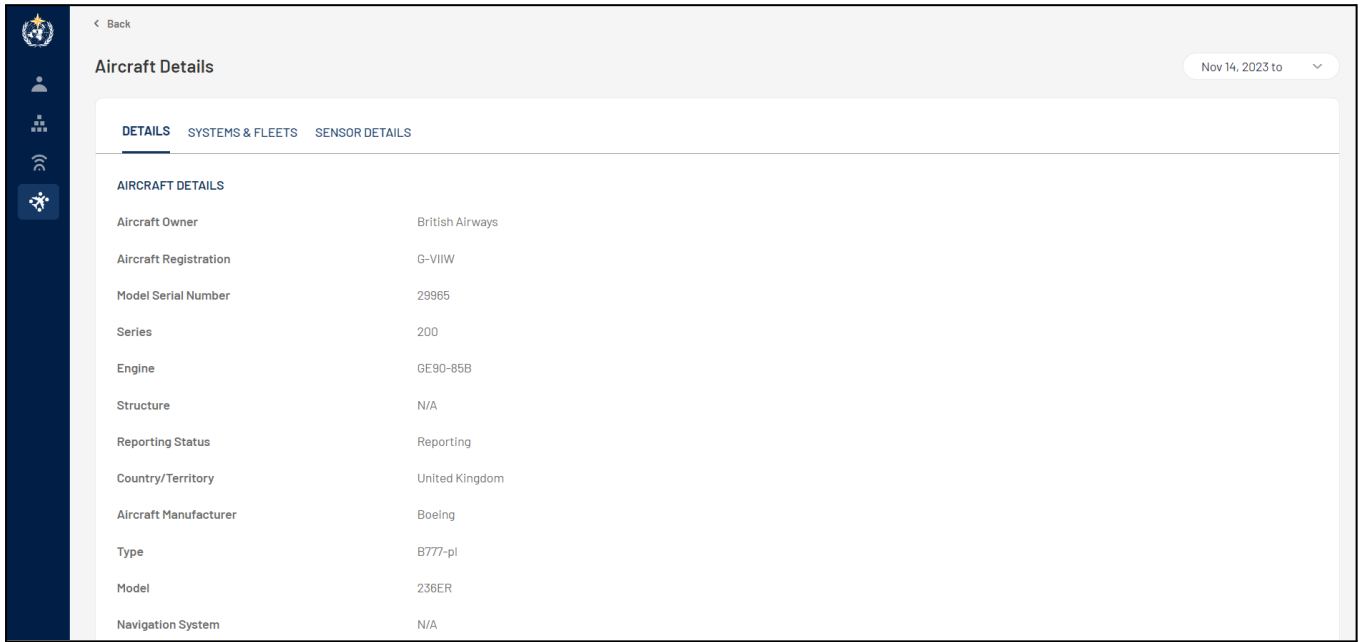


Figure 33. Aircraft details loaded into ABOMR - part 1.

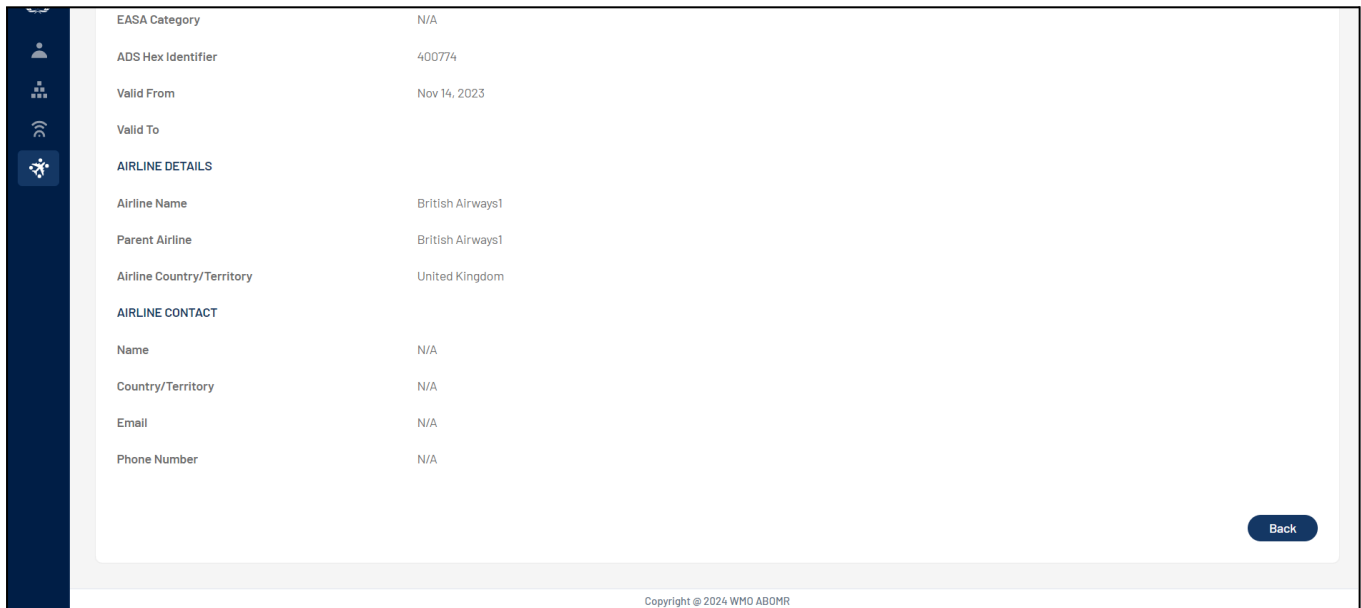


Figure 34. Aircraft details loaded into ABOMR - part 2.

- The second tab 'Systems & Fleets' will display all the system and fleets with which the aircraft is assigned to. By clicking on the system name, fleet assigned to will be displayed in a concertina view (figure 34).

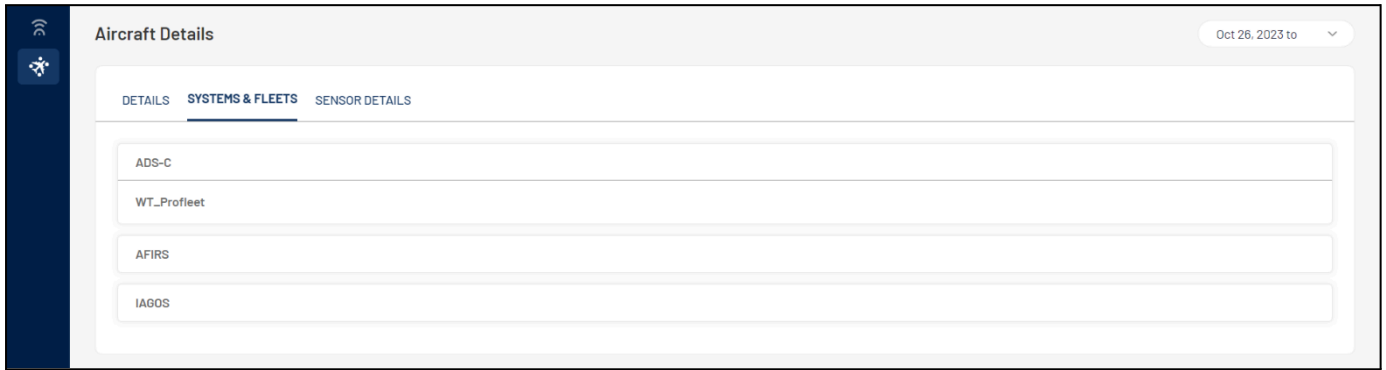


Figure 34. Aircraft details - ‘System and Fleets’ tab.

- 6) The third tab ‘Sensor Details’ will display all the sensor details with which the sensor is assigned to. By clicking on the sensor name, sensor details will be displayed in a concertina view.

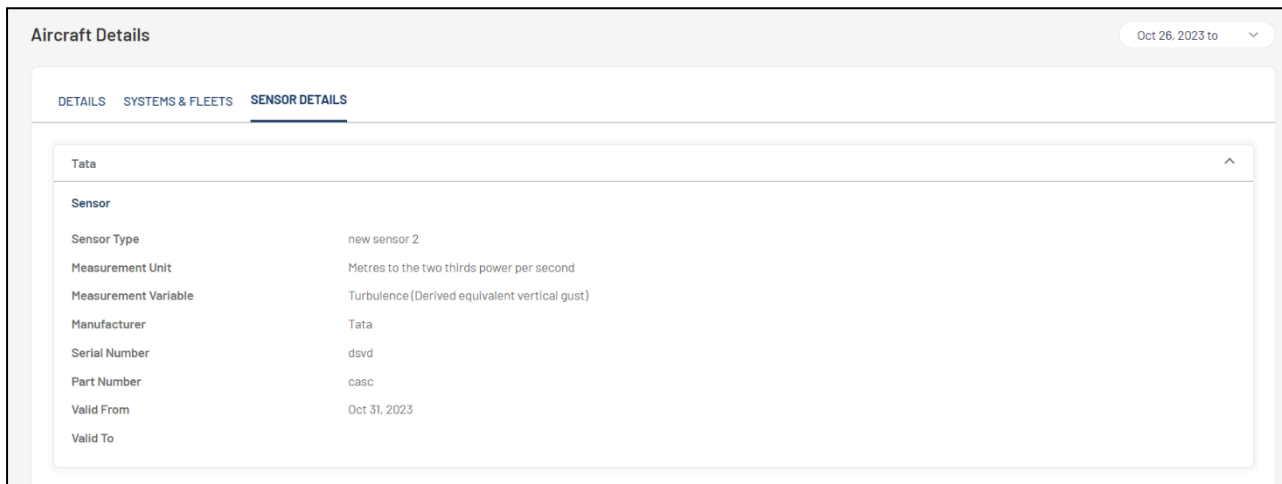


Figure 35. Aircraft details - ‘Sensor details’ tab.

4.2.4.4 How to edit aircraft details into ABO-MR system

- 1) By clicking on the 3 dots at end of the line of any selected aircraft as highlighted in the orange in the figure 26, it will ask for 3 options “view”, “edit” and “change history”
- 2) By clicking on “edit” option, user will be redirected to the details of the specific aircraft page where user can edit any details of the aircraft as required.
- 3) When the user is making changes in the child entities other than sensors then system will consider it as a “correction” and new version of the aircraft wont be created.
- 4) Once all the changes are made, the user needs to click on the “Update” button, and a pop-up window will be displayed to the user to provide any comments for the aircraft (figure 36).



Figure 36. Pop-up windows asking about change of sensor version.

- 5) After providing comment, user needs to click on “yes” button and the aircraft details will be changed.
- 6) By clicking on “Cancel” button, the pop-up window will be removed and user will stay on the step 2 of the aircraft form.
- 7) By clicking on “Cancel” button, all the changes made by the user will be discarded and user will be redirected to the Aircraft landing page.
- 8) Regarding changes in the sensor details, when the user is making changes in sensor (like adding or removing sensor, changing the dates of the existing sensor) then system will consider it as a “update” and new version of the aircraft will be created. Also, user needs to change the validity dates of the aircraft as system validates the date of the aircraft validity.
- 9) Once all the changes are made in the sensor, the user needs to click on the “Update” button, and a pop-up window will be displayed to the user to provide any comments for the aircraft similar fleet case (figure 36)..



- 10) After providing comment, user needs to click on “yes” button and the aircraft details will be changed.
- 11) By clicking on “No” button, the pop-up window will be removed, and user will stay on the step 2 of the aircraft form.
- 12) By clicking on “Cancel” button, all the changes made by the user will be discarded and user will be redirected to the Aircraft landing page.
- 13) All the changes made by the user, whether it is “correction” or “update” will be logged and user can view the details in the “change history” window”.

4.2.4.5 How to view different versions of aircraft and change history

- 1) If user wants to see all changes made to an existing aircraft, he/she needs to click on 3 dots at end of the line of any selected aircraft, it will ask for 2 options “view”, “edit” and “change history” (figure 26)
- 2) By clicking on “change history” option, a pop-up window will be displayed where all the details of previous changes made in that specific aircraft by the user can be viewed (figure 37)

CHANGE HISTORY										
Changed Date	Changed By	Entity	Child Entity	Action	Changed Type	Change From	Change To	Valid From	Valid To	Comment
Sep 27, 2023	Superadmin	Aircraft	N/A	Add	Version Added	N/A	N/A	Sep 1, 2023	N/A	N/A
Sep 27, 2023	Superadmin	Aircraft	N/A	Edit	Version Added	N/A	N/A	Sep 5, 2023	N/A	N/A
Sep 27, 2023	Superadmin	Sensor	sensor type test	Add	Update	N/A	N/A	Sep 5, 2023	N/A	N/A

Figure 37. Aircraft list history

- 3) In the change history window, user has rights to apply filters to search any specific change made by the user. Filters are at entity, child entity and changed type level.
- 4) Users are also allowed to export the change history details in CSV or JSON format.
- 5) To view different versions of the aircraft, user needs to click on 3 dots and select “view” option (figure 38).

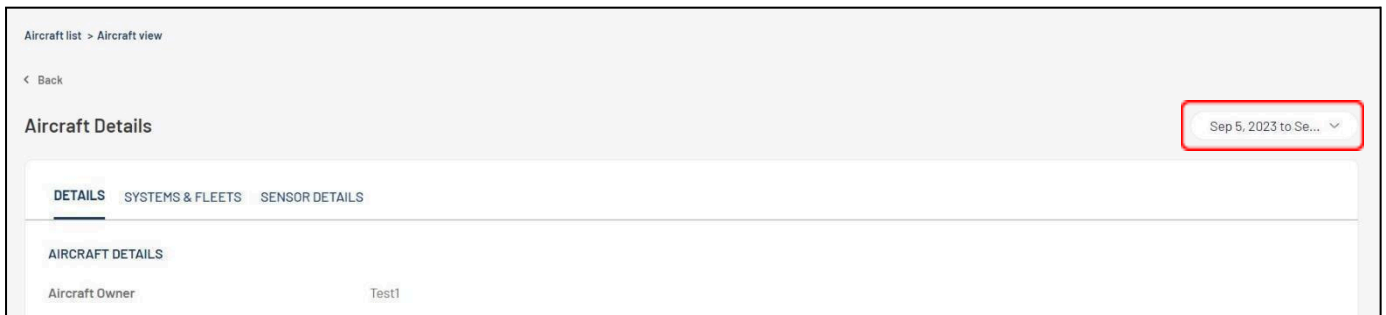


Figure 38. Aircraft details.

- 6) To view different versions of the aircraft, user needs to click on the drop down provided at the upper right corner as highlighted in the snapshot in red.
- 7) By clicking on the drop-down list, user can select any previous versions of the aircraft and can view the aircraft details of the selected version.

4.2.5 Fleets

Sr. No.	Fleet Name	Programme Name	Actions
1	Lufthansa	EUMETNET AMDAR	⋮
2	Training Fleet_2	BOM	⋮
3	Air New Zealand	New Zealand AMDAR Programme	⋮
4	Lufthansa	EUMETNET AMDAR	⋮
5	Air Hong Kong	Hong Kong, China AMDAR Programme	⋮
6	Eurowings Discover	EUMETNET AMDAR	⋮
7	Qantas Airways	BOM	⋮
8	British Airways	EUMETNET AMDAR	⋮
9	Air France	EUMETNET AMDAR	⋮

Figure 39. Fleet list

4.2.5.1 The Fleet contains the following features

- 1) The Fleet module helps users to add, view or edit fleet into the ABO-MR system.
- 2) There is search functionality provided where users can search already added fleet into the system with keyword-based search.
- 3) Export functionality is provided by the system where users can export added fleet details in CSV or JSON format and details of the fleet will be exported.
- 4) The fleet module has the change history feature, where any changes in the information to any fleet are made, it has been logged and user can view the changes in detail.
- 5) The fleet module has a historization feature where for selected child entities, if user makes any changes, then the system creates a new version of the same fleet.

4.2.5.2 How to add Fleet into the ABO-MR system

- 1) By clicking on “Add Fleet” button on top right corner highlighted in red (figure 39), user will be redirected to a new screen where he/she needs to add details to add a new fleet.
- 2) For adding a fleet, user has to provide below details in a 3-step form.
- 3) In Step 1, user has to provide below details (figure 40)
 - a. Programme Name (Mandatory) – Drop down list
 - b. ABO System Name (Mandatory) – Drop Down list
 - c. Fleet Name (Mandatory)

- d. IATA Code
- e. ICAO Code
- f. Operating Authority
- g. Operating Authority Name
- h. Operating Authority Email
- i. Operating Authority Phone Number (Country/Territory Code) – Drop Down list
- j. Operating Authority Phone Number
- k. Country/Territory - Drop Down list
- l. Uplink Controlled (Mandatory) – Drop Down list
- m. Fleet Reporting Status (Mandatory) – Drop down list
- n. Validity Date From (Mandatory) – Calendar Drop down
- o. Validity Date To – Calendar Drop down

The screenshot shows a web form titled "WMO ABO PROGRAMME". It is divided into three main sections:

- WMO ABO PROGRAMME:** Contains a dropdown menu for "Programme Name" with the placeholder "Select programme name".
- ABO SYSTEM:** Contains a dropdown menu for "System Name" with the placeholder "Select system", and text input fields for "Fleet Name", "IATA Code", and "ICAO Code", each with a placeholder "Enter [field name] here".
- OPERATING AUTHORITY CONTACT:** Contains text input fields for "Operating Authority", "Name", and "Email", each with a placeholder "Enter [field name] here". It also includes a "Phone Number" section with a dropdown for "Select phone code" and a text input for "Enter phone number here", and a "Country/Territory" dropdown with the placeholder "Select country".

Figure 40. Adding fleet in ABOMR -- part 1.

The screenshot shows the continuation of the form, focusing on two sections:

- UPLINK CONTROLLED:** Contains a dropdown menu for "Uplink Controlled" with the placeholder "Select uplink controlled".
- FLEET REPORTING STATUS:** Contains a dropdown menu for "Fleet Reporting Status" with the placeholder "Select fleet reporting status".
- Validity:** Contains two date input fields labeled "From" and "To", each with a placeholder "Enter Date" and a calendar icon.

At the bottom right of the form, there are two buttons: "Cancel" and "Next".

Figure 41. Adding fleet in ABOMR -- part 2.

- 4) After filling all the details on step 1, user needs to click on “Next” button to jump into step 2 of the fleet details form (figure 41)
- 5) If user clicks on “Cancel” button then all the details filled in by the user will be discarded and user will be redirected to the Fleet landing page (figure 39).
- 6) In step 2, user needs to provide below details:
 - a. WSI Data Representation Format
 - b. URL
 - c. WSI Header (Mandatory)
 - d. Validity Date From – Calendar drop down
 - e. Validity Date To – Calendar drop down
 - f. System Aircraft Identifier
 - g. SAI Header (Mandatory)
 - h. SAI Data Representation Format
 - i. URL
 - j. Validity Date From – Calendar drop down
 - k. Validity Date To – Calendar drop down
 - l. Assign DOC Centre – Mandatory – Drop Down list
- 7) After filling all the details on step 2, user needs to click on “Next” button to jump into step 3 of the fleet details form.
- 8) If user clicks on “Cancel” button then all the details filled in by the user will be discarded and user will be redirected to the Fleet landing page.
- 9) In step 3, user needs to provide below details:
 - a. Add System Software – figure 33
 - i) If user wants to add an existing system software then user needs to click on “Add a System Software” button, a side panel will be displayed to user where he/she needs to select a pre-defined system software and needs to select the assigned fleet from the drop down.
 - ii) After clicking on “Populate” button, user will be redirected to a form where all the information will be pre-populated and user needs to select the validity dates (figure 44).
 - iii) If user wants to add a new system software then user needs to click on “Add a System Software” button, in the side panel, user needs to provide system software name and needs to select “new form” in Fleet drop down list.

The screenshot shows a side panel with the title "SELECT OR ADD A NEW SYSTEM SOFTWARE" and a close button (X) in the top right corner. Below the title, there are two input fields. The first is labeled "System Software*" and contains the text "Select system software". The second is labeled "Fleet*" and contains the text "Select fleet" with a downward arrow indicating a dropdown menu. At the bottom right of the panel, there are two buttons: "Cancel" and "Populate".

Figure 43. Aircraft

iv) After clicking on “Populate”, user will be redirected to a form where he/she needs to provide all the details as shown below in the snapshot.

Figure 44. Adding System Software settings - part one.

Figure 45. Adding System Software settings - part two.

v) After clicking on “Save” button, a new system software will be added into fleet (figure 45)b. *Add Measured Variable*

i) If user wants to add a new measured variable then user needs to click on “Add a Measured Variable” button, a side panel will be displayed to user where he/she needs to select a measured variable from the drop down list and then select “new form” in the fleet drop down list.

ii) After clicking on “Populate”, user will be redirected to a 2 step form where he/she needs to provide all the details as shown below in the snapshot.

A dialog box titled "SELECT OR ADD A NEW MEASURED VARIABLE" with a close button (X) in the top right corner. It contains two dropdown menus: "Measured Variable*" with the placeholder text "Select Measured Variable" and "Fleet*" with the placeholder text "Select fleet". At the bottom right, there are two buttons: "Cancel" and "Populate".

Figure 46. Adding measured variables

A form titled "ADD | CONFIGURE MEASURED VARIABLES" with a progress indicator showing step 1 of 2 and a close button (X). The form contains the following fields:

- Variable Name* (dropdown): Horizontal Wind Speed
- Reported Unit* (dropdown): Select reported unit; (text input): Enter reported unit
- Quality Status* (dropdown): Select quality status
- Measurement Resolution* (dropdown): Select measurement resol.; (text input): Enter measurement resolutic
- Algorithm* (dropdown): Select Algorithm; (text input): Enter algorithm
- Sampling Method Lower* (dropdown): Select sampling method lov; (text input): Enter sampling method lower
- Measurement Unit* (dropdown): Select measurement unit; (text input): Enter measurement unit here
- Reporting Status(Instrument Operating Status)* (dropdown): Select reporting status
- Reported Resolution* (dropdown): Select reported resolution; (text input): Enter reported resolution
- Smoothing* (dropdown): Select smoothing
- Sampling Method Upper* (dropdown): Select sampling method up; (text input): Enter sampling method uppe
- Sampling Method Enroute* (dropdown): Select sampling method en; (text input): Enter sampling method enrou

Figure 46. Adding measured variables form - part 1.

iii) Once the user fills in all the details at step 1, user will click on “Next” button and he/she will be redirected to the step 2 of the form and need to provide details as shown in the snapshot below.

Figure 47. Adding measured variables form - part 1.

Figure 48. Adding measured variables form - part 2.

iv) After clicking on “Save” button, a new measured variable will be added into fleet.

c. Assign Aircraft

User needs to select an aircraft from the pre-existing aircrafts which were added in the aircraft module. User will get drop down list from which he/she needs to select an aircraft (figure 49).

Figure 49. Assign aircraft for a specific fleet.

d. Validity dates of the aircraft

e. Select an airport

f. Add Winter profiles – When user clicks on “Add Profiles” in front of Winter section, there will be a drop down of all the days of the week and user needs to add “From” and “To” time to each day wherever they want to add winter profiles (figure 50)

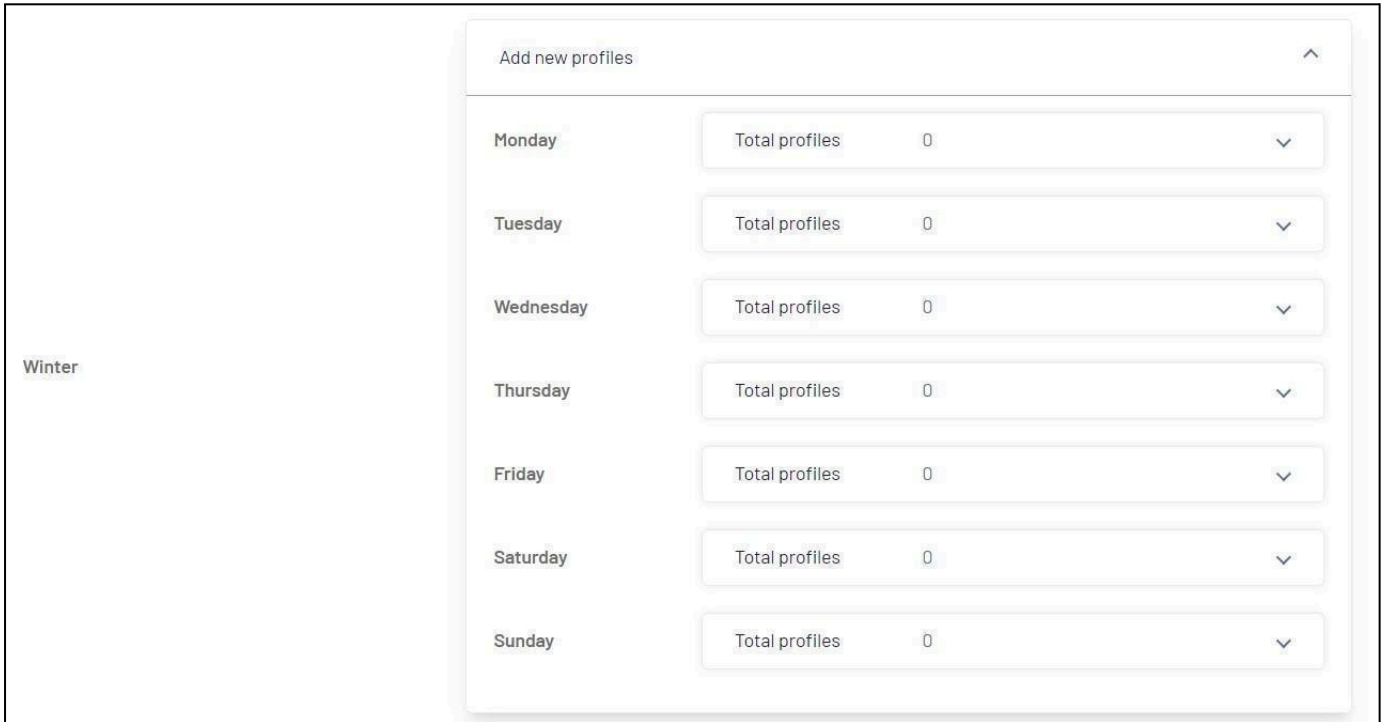


Figure 50. Adding Winter profiles

g. Add Summer profiles – Similar to Winter profiles, user needs to add summer profiles for the days of the week wherever it is applicable.

h. Validity Date From – need to add a date from the calendar drop down.

i. h. Validity Date To – need to add a date from the calendar drop down.

10) After providing airport details, user needs to click on “Add” button to assign an airport into fleet.

11) When an airport is assigned to a fleet, then an airport card is created and displayed to user at the bottom of the screen (figure 51)



Figure 51. Airport card created.

12) If user wants to remove any airport which was already assigned to the fleet, then user can click on ‘x’ button in airport card to remove that particular airport.

13) If user wants to make any changes in the airport details, then user can click on '⚙️' button in the airport card and can edit airport details (figure 51).

14) After providing all the above details, user needs to click on "Submit" button and a pop-up window will be displayed to the user to provide any comments for the fleet.

15) User can either ignore the pop-up window by clicking on "Cancel" button or can provide their comments by adding text in the text box and then click on "Submit" button (figure 52)

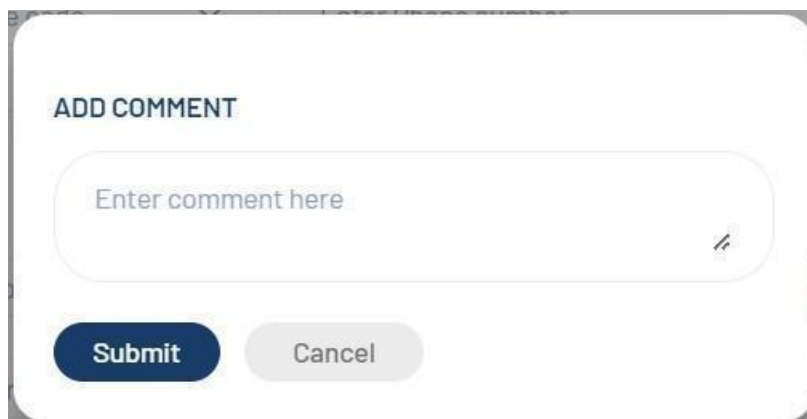


Figure 52. Adding comments regarding airport created.

17) After providing comment, user needs to click on "Submit" button and the fleet will be saved.

18) By clicking on "Cancel" button all the details provided will be discarded and user will be redirected to the Fleet landing page (figure 39)

4.2.5.3 How to view fleet details into ABO-MR system

1) By clicking on the 3 dots at end of the line of any selected fleet as highlighted in the orange in the figure 39 it will ask for 3 options "view", "edit" and "change history".

2) By clicking on "view" option, user will be redirected to the details of the specific fleet.

3) As shown below in the figure 53, this is how fleet details are displayed to the user. Fleet details are displayed at the top and remaining child entities of fleet will be displayed in in six tabs; i) WSI Data ii) SAI Data iii) Measured Variable iv) System Software v) Aircraft and, vi) Airports.

4) The fleet details at the top shows details like Programme Name, ABO System Name, Fleet Name, IATA Code, ICAO Code, Operating Authority, Operating Authority Name, Operating Authority Email, Operating Authority Phone Number, Operating Authority Country/Territory, Uplink Controlled, DOC, Fleet Reporting Status and, Fleet Validity Dates.

Fleet Details Oct 16, 2023 to ▾

WMO ABO PROGRAMME

Programme Name*	EUMETNET AMDAR
-----------------	----------------

ABO System

System Name*	AMDAR
Fleet Name*	Air France
IATA Code	DP
ICAO Code	AFR

Operating Authority Contact

Operating Authority	N/A
Name	N/A
Email	N/A
Phone Number	N/A
Country/Territory	N/A

Figure 53. Fleet details - part 1.

Uplink Controlled

Uplink Controlled	Yes
-------------------	-----

Data Origination Centre

Data Origination Centre	DOC test
-------------------------	----------

Fleet Reporting Status

Fleet Reporting Status	Reporting Optimized
Valid From	Oct 16, 2023
Valid To	

WSI DATA | SAI DATA | MEASURED VARIABLE | SYSTEM SOFTWARE | AIRCRAFT | AIRPORTS

IUAx01 ▾

Figure 54. Fleet details - part 2.

- 7) The below tab ‘WSI Data’ - figure 55- will display all the WSI Data details with which the fleet is assigned to. By clicking on the WSI Header, WSI data will be displayed in a concertina view.

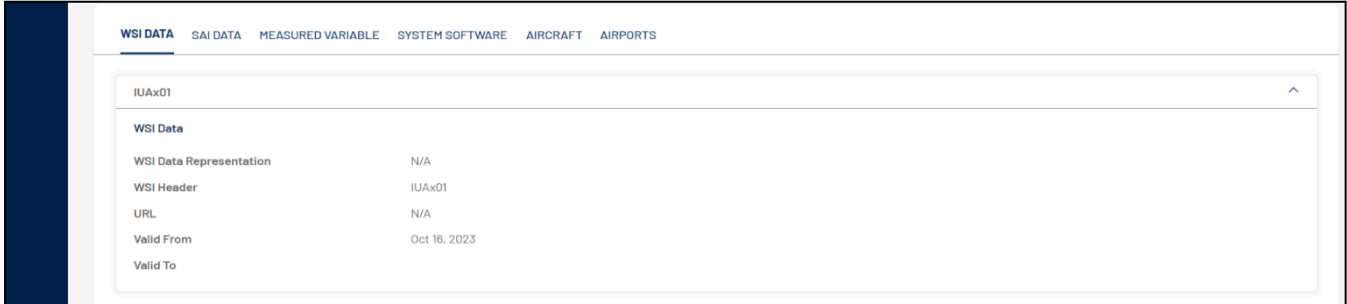


Figure 55. Details of WIGOS Station Index (WSI) selected.

- 8) Similar to WSI Data tab, other tabs like SAI Data, Measured Variable, System Software, Aircraft, Airports all the relevant details with fleet selected. By clicking on the respective card details will be displayed in a concertina view.

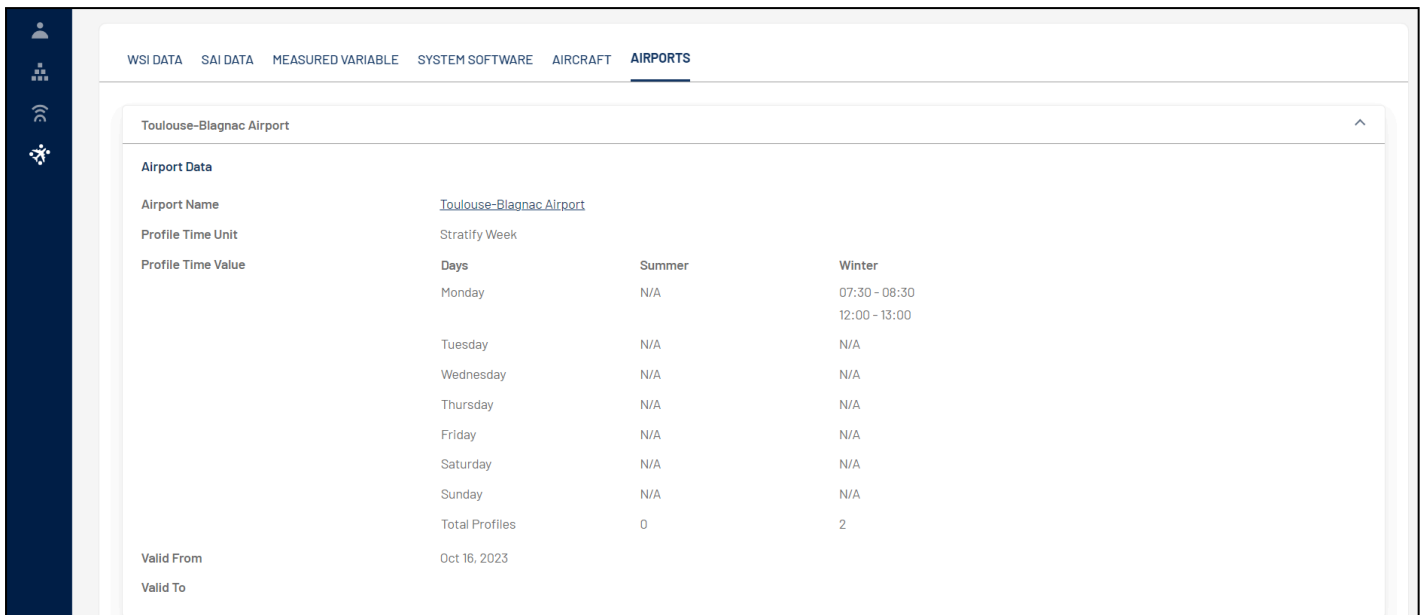


Figure 56. Details of Airports for a Fleet selected.

4.2.5.4 How to edit fleet details into ABO-MR system

- 1) By clicking on the 3 dots at end of the line of any selected fleet as highlighted in the orange in the figure 39, it will ask for 3 options “view”, “edit” and “change history”
- 2) By clicking on “edit” option, user will be redirected to the details of the specific fleet page where user can edit any details of the fleet as required.

3) When the user is making changes in the child entities other than aircraft then the system will consider it as a “correction” and a new version of the fleet won't be created.

4) Once all the changes are made, the user needs to click on the “Update” button, and a pop-up window will be displayed to the user to provide any comments for the fleet (figure 57).



Figure 57. Dialog box about change version and comments regarding fleet.

5) After providing a comment, user needs to click on “yes” button and the fleet details will be changed.

6) By clicking on “No” button, the pop-up window will be removed and user will stay on the step 3 of the fleet form (figure 40)

7) By clicking on “Cancel” button, all the changes made by the user will be discarded and user will be redirected to the Fleet landing page (figure 39).

8) Regarding changes in the aircraft details, when the user is making changes in aircraft (e.g adding or removing aircraft or changing the dates of the existing aircraft) then system will consider it as an “update” and a new version of the fleet will be created. Also, user needs to change the validity dates of the fleet as the system validates the date of the fleet validity.

9) Once all the changes are made in the aircraft, the user needs to click on the “Update” button, and a pop-up window will be displayed to the user to provide any comments for the fleet (figure 58).



Figure 58. Dialog box about change version and comments regarding aircrafts.

- 10) After providing comment, user needs to click on “yes” button and the fleet details will be changed.
- 11) By clicking on “No” button, the pop-up window will be removed, and user will stay on the step 3 of the fleet form (figure 39)
- 12) By clicking on “Cancel” button, all the changes made by the user will be discarded and user will be redirected to the Fleet landing page (figure 40).
- 13) All the changes made by the user, whether it is “correction” or “update” will be logged and user can view the details in the “change history” window”.

4.2.5.5 How to view different versions of fleet and change history

- 1) If user wants to see all changes made to an existing fleet, he/she needs to click on 3 dots at end of the line of any selected fleet, it will ask for 3 options “view”, “edit” and “change history” (figure 39).
- 2) By clicking on “change history” option, a pop-up window will be displayed where all the details of previous changes made in that specific fleet by the user can be viewed (figure 60)

Changed Date	Changed By	Entity	Child Entity	Action	Changed Type	Change From	Change To	Valid From	Valid To	Comment
Oct 16, 2023	Superadmin	Fleet	N/A	Add	Version Added	N/A	EUMETNET AMDAR/AMDAR/...	Oct 16, 2023	N/A	Morning profile...
Oct 17, 2023	Superadmin	ABO SYSTEM	IATA Code	Edit	Correction	AF	DP	Oct 16, 2023	N/A	N/A
Oct 17, 2023	Superadmin	AIRPORT	9 de Maio - Teixeira de...	Add	Correction	N/A	N/A	Oct 18, 2023	N/A	N/A
Oct 17, 2023	Superadmin	Toulouse e...	Winter Profile Time Value	Edit	Correction	Monday:07:30-08:30, Tuesday:...	Monday:07:30-08:30, 12:00-...	Oct 16, 2023	N/A	N/A
Oct 18, 2023	Superadmin	System	Time SRRSS	Add	Correction	N/A	N/A	Oct 17,	Oct 23,	system

Figure 60. ‘Change history’ option.

- 3) In the change history window (figure 60), user has rights to apply filters to search any specific change made by the user. Filters are at entity, child entity and changed type level.
- 4) Users are also allowed to export the change history details in CSV or JSON format.
- 5) To view different versions of the fleet, user needs to click on 3 dots and select “view” option as shown in figure 39.



Figure 61. Fleet details version.

6) To view different versions of the fleet, user needs to click on the drop down provided at the upper right corner as highlighted in the snapshot in red (figure 61).

7) By clicking on the drop-down list, user can select any previous versions of the fleet and can view the fleet details of the selected version.

4.3 Reporting



Figure 62. Map available in the reporting module. Red box shows details of the airport selected.

3.7.1 The Reporting module contains the following features

- 1) The reporting module helps users to view airport, programmes, systems, fleets, aircraft, and system software details (figure 62).
- 2) Any user can access this module as this is for public users. No credentials are required to access these details in the reporting module.

3) There is a global search functionality provided where users can search already added airport, programmes, systems, fleets, aircraft, and system software details into the system with keyword-based search. In global search, results are shown in the drop down list categorized as per the keywords as shown in figure 63.(e.g. If the user types “British” in the search box then drop down list will display various parameters which contains the word “British” but categorized like British Airways fleet under fleet category)

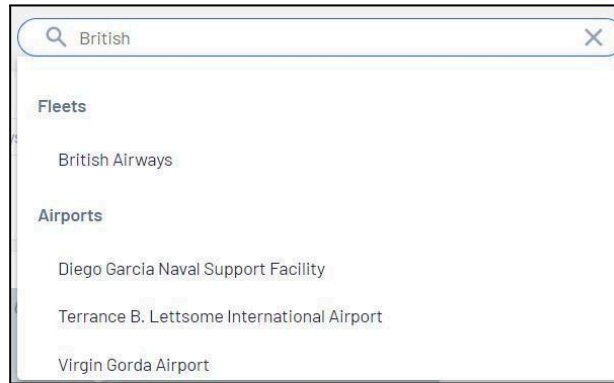


Figure 63. Result of global search using ‘british’ as an input.

4) Various filters like Date, Programmes, systems, and fleets are provided to users to search various metadata.

5) Landing page of the Reporting module has a map with all the airport details where airport details are displayed when user hover over the airport location.

3.7.2 How to view Vertical Profile Map and Programme Map report: -

The Vertical profile map has a landing page where all the airports have been plotted in the map.

1) At the bottom of the map there is a legend which gives us the parameters of the coloring scheme of the airports (figure 64).



Figure 64. Color bar used to show availability of weekly profiles in the worldwide reporting map.

2) If an airport has no profiles, then it will be plotted as yellow color, green color spot means an airport has profiles between 1 to 8, dark blue color means an airport has more than 8 profiles but less than 24 profiles and purple color means an airport has more than 24 profiles (figure 64).

3) Users can focus on profile specific airports. If the user needs to see airports which have profiles more than 24 then the user needs to disable the other colors by clicking on them. Users can follow the same process for focusing on other colors airports by disabling the other colors.

- 4) There are two ways through which users can view Vertical Profile map reports:
 - a) Firstly, at the landing page, when user hovers over any airport spot, airport details along with profile details are displayed to the user.
 - i) By clicking on the airport spot, user will be redirected to the airport page where airport details are displayed along with programme details specific to the airport.

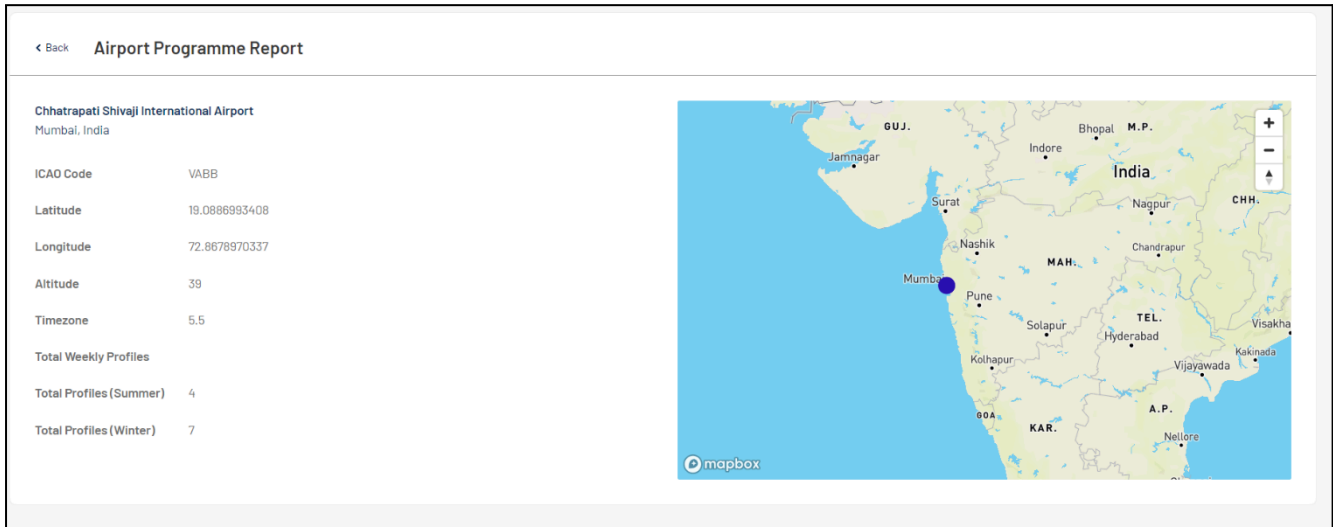


Figure 65. Airport report for a selected programme.

- ii) At the bottom of the airport details page, programme details of the airport will be displayed to the user in concertina view. When a user clicks on any programme, all the metadata details will be displayed in a concertina view.

PROGRAMMES LIST

Programme	Focal Point	Operator	Programme Manager	Systems								
EUMETNET AMDAR	Stewart Taylor	Met Office	WT_Test_PM1 John Doe John Doe WT_Test2 Devang Parekh Prajakta	AMДАР AFIRS								
<table border="1"> <thead> <tr> <th>Systems</th> <th>System Operator</th> <th>System Contact</th> <th>Fleet Count</th> </tr> </thead> <tbody> <tr> <td>AMДАР</td> <td>N/A</td> <td>N/A</td> <td>1</td> </tr> </tbody> </table>					Systems	System Operator	System Contact	Fleet Count	AMДАР	N/A	N/A	1
Systems	System Operator	System Contact	Fleet Count									
AMДАР	N/A	N/A	1									
<table border="1"> <thead> <tr> <th>Fleet Name</th> <th>Total Profiles (Summer)</th> <th>Total Profiles (Winter)</th> <th>Total Profiles</th> </tr> </thead> <tbody> <tr> <td>13 nov test fleet</td> <td>N/A</td> <td>1</td> <td>1</td> </tr> </tbody> </table>					Fleet Name	Total Profiles (Summer)	Total Profiles (Winter)	Total Profiles	13 nov test fleet	N/A	1	1
Fleet Name	Total Profiles (Summer)	Total Profiles (Winter)	Total Profiles									
13 nov test fleet	N/A	1	1									
<table border="1"> <thead> <tr> <th>Systems</th> <th>System Operator</th> <th>System Contact</th> <th>Fleet Count</th> </tr> </thead> <tbody> <tr> <td>AFIRS</td> <td>system test 1</td> <td>John doe</td> <td>1</td> </tr> </tbody> </table>					Systems	System Operator	System Contact	Fleet Count	AFIRS	system test 1	John doe	1
Systems	System Operator	System Contact	Fleet Count									
AFIRS	system test 1	John doe	1									

Figure 66. Details of a list of programmes for a selected airport.

- b) Secondly, when user clicks on “Type of Report” field, there is a drop down from which user can select on “Vertical Profile Map” to view Vertical Profile Reports.
- 5) To view Programmes Map Report, user need to click on “Type of Report” field, and select “Programmes Map” from the drop down list (figure 67).

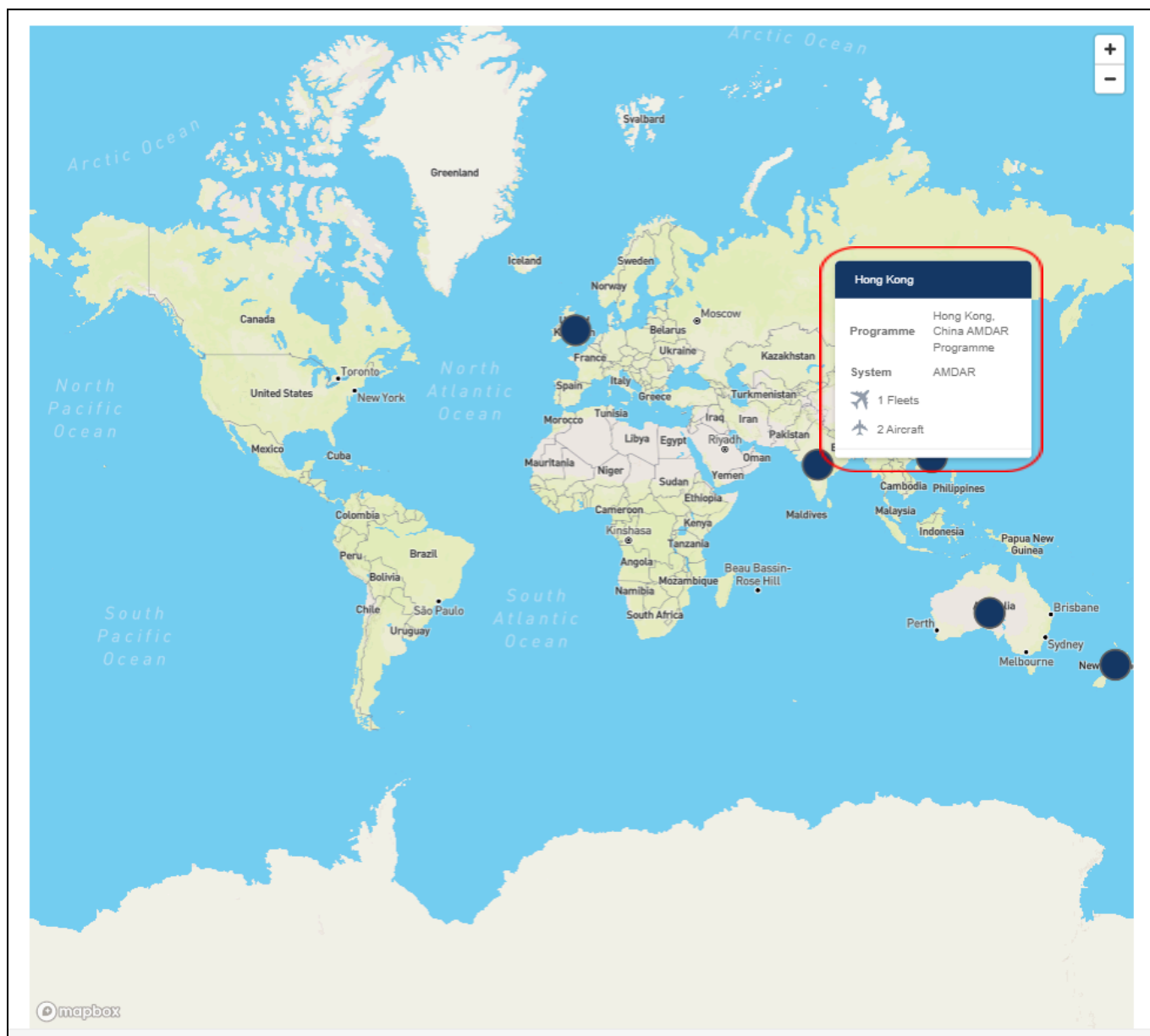


Figure 67. Details of a list of programmes for a selected airport.

7) At the landing page, when user hovers over any country/territory spot, programme details along with metadata are displayed to the user (figure 67).

8) By clicking on the country/territory spot, user will be redirected to the programme page where programme details are displayed along with metadata in concertina view (figure 68).

PROGRAMMES LIST - United Kingdom								Export
Programme	Focal Point	Operator	Programme Manager	Fleet Count	Systems	Airport Count	Aircraft Count	
EUMETNET AMDAR	Stewart Taylor	Met Office	WT_Test_PM1 John Doe John Doe WT_Test2 Devang Parekh Prajakta	3	TAMDAR AFIRS ADS-C AMDAR ADS-C	4	4	^
System	System Operator	System Contact	Fleet Count	Airport Count				
TAMDAR	FLYHT Aerospace Solutions Ltd.	HULL-89	0	0				
Fleet Name	Measured Variables	Reporting Status	Airports Count	Aircraft Count	No Records Found			
System	System Operator	System Contact	Fleet Count	Airport Count				
AFIRS	system test 1	John doe	0	0				

Figure 68. Details of a list of programmes for a selected airport.

3.7.3 How to view various reports in ABO-MR system

- 1) User can view Programmes, Systems, Fleets, Aircraft, Airport, and System Software report through reporting module (figure 62).
- 2) To view Programmes Report, user need to click on “Type of Report” field, and select “Programmes” from the drop down list.
- 3) Once Programmes is selected from the drop down list, user is allowed to apply filters for date (calendar drop down), programmes, systems and fleets – all those filters are drop down list with multiple select option.
- 4) After applying filters, user needs to click on “Submit” button to get the desired report.
- 5) User will be displayed with Programme List, where by clicking on specific programme, metadata will be displayed in concertina view (figure 69).

PROGRAMMES LIST								Export
Programme	Focal Point	Operator	Programme Manager	Fleet Count	Systems	Airport Count	Aircraft Count	
programme test	xyz	programme opt test	Mohit Salunke John Doe Devang Parekh	4	AMDAR ADS-C	2	10	^
System	System Operator	System Contact	Fleet Count	Airport Count				
AMDAR	N/A	N/A	3	1				
Fleet Name	Measured Variables	Reporting Status	Airports Count	Aircraft Count				
fleet new test	Horizontal Wind Direction	Reporting Optimized	0	1				
Fleet-123	Turbulence(Derived Equivalent Ver...	Reporting	0	3				
WMO-ABOMR	N/A	Reporting	1	5				
System	System Operator	System Contact	Fleet Count	Airport Count				
ADS-C	George Blake	STFPU	1	1				
Programme	Focal Point	Operator	Programme Manager	Fleet Count	Systems	Airport Count	Aircraft Count	
ISRO	N/A	N/A	Mohit Salunke John Doe Programanager WT_Test2 Devang Parekh Prajakta	0	IAGOS ADS-C	0	0	^

Figure 69. Details of a list of programmes with the metadata uploaded.

6) To view Systems Report, user need to click on “Type of Report” field, and select “Systems” from the drop down list (figure 62).

7) Once Systems is selected from the drop down list, user is allowed to apply filters for date (calendar drop down), programmes, systems and fleets – all those filters are drop down list with multiple select option.

8) After applying filters, user needs to click on “Submit” button to get the desired report.

9) User will be displayed with System List, where by clicking on specific system, metadata will be displayed in concertina view (figure 70).

SYSTEMS LIST							Export
System	Programme	System Operator	System Contact	Fleet Count	Airport Count	Aircraft Count	
ADS-C	CNM	George Blake	STPPU	0	0	0	▼
ADS-C	NASA	George Blake	STPPU	0	0	0	▼
ADS-C	ISRO	George Blake	STPPU	0	0	0	▼
ADS-C	programme test	George Blake	STPPU	1	1	1	▲
Fleet Name	Measured Variables	Reporting Status	Airports Count	Aircraft Count			
WT_Profleet	Turbulence(Eddy Dissipation Rate)	Potential Future	1	1			
ADS-C	Final Demo	George Blake	STPPU	0	0	0	▼
ADS-C	American beaureau	George Blake	STPPU	0	0	0	▼
ADS-C	Lorem ipsum dolor sit a...	George Blake	STPPU	0	0	0	▼

Figure 70. Details of system list and programmes uploaded.

10) To view Fleets Report, user need to click on “Type of Report” field, and select “Fleets” from the drop down list.

11) Once Fleets is selected from the drop down list, user is allowed to apply filters for date (calendar drop down), programmes, systems and fleets – all those filters are drop down list with multiple select option.

12) After applying filters, user needs to click on “Submit” button to get the desired report.

13) User will be displayed with Fleets List, where by clicking on specific system, metadata will be displayed in concertina view (figure 71).

Fleets List					Export	
Fleet Name Fleet-123	Measured Variables Turbulence(Derived Equi...	Reporting Status Reporting	Airports Count 0	Aircraft Count 3	▼	
Fleet Name Retestfleet	Measured Variables N/A	Reporting Status Reporting	Airports Count 1	Aircraft Count 2	▼	
Fleet Name Final Demo	Measured Variables Horizontal Wind Direction	Reporting Status Reporting Optimized	Airports Count 1	Aircraft Count 1	▲	
AIRCRAFT						
Airline	Status	Country	OEM	Type	Model	WIGOS ID
ANI	Potential Future	American Samoa	AM	T12	N/A	0.21011.0.2
AIRPORTS						
Airport Name	City	Country	ICAO Code	Profiles	Vertical Profiles	
Ada Regional Airport	Ada	United States	KADH	4	4	
Fleet Name fleet_new_test	Measured Variables Horizontal Wind Direction	Reporting Status Reporting Optimized	Airports Count 0	Aircraft Count 1	▼	
Fleet Name fleet_101	Measured Variables Turbulence(Derived Equi...	Reporting Status Reporting Optimized	Airports Count 0	Aircraft Count 2	▼	

Figure 71. Details of feet list and its metadata uploaded.

14) In the concertina view, Airport and aircraft details assigned to fleet are displayed, Airline name and Airport name are hyperlinked, if user clicks on them then he/she will be redirected to the aircraft or airport details page.

15) To view Aircraft Report, user need to click on “Type of Report” field, and select “Aircraft” from the drop down list.

16) Once Aircraft is selected from the drop down list, user is allowed to apply filters for date (calendar drop down), programmes, systems and fleets – all those filters are drop down list with multiple select option.

17) After applying filters, user needs to click on “Submit” button to get the desired report.

18) User will be displayed with Aircraft List, where by clicking on Airline name, user will be displayed with aircraft and sensor details (figure 72).

< Back **Aircraft List** Export

Airline	Programme	Systems	Status	Country/Territory	OEM	Type Model	WIGOS ID
airline test	New Progr... programm... programm... ABU ISRO NASA ISRO programm... SAWS AMD...	AFIRS AMDAR AMDAR IAGOS IAGOS Mode-S IAGOS AMDAR AMDAR	Planned Fu...	India	manufactu...	type test	0.21011.0.1
Airways	EUMETNE... ISRO ISRO NASA NASA	AFIRS IAGOS IAGOS AMDAR Mode-S	Reporting	Afghanistan	AM67885	T678	0.21011.0.3
nbn	NASA	Mode-S	Planned Fu...	Afghanistan	dfd	cbc	0.21011.0.6
Jetstar	EUMETNE... ISRO programm...	AFIRS IAGOS ADS-C	Planned Fu...	India	Lufhtansa	5693	0.21011.0.4
airindia	CNM	TAMDAR	Planned Fu...	Morocco	Manufacture	I type	0.21011.0.7

Figure 72. Details of feet list and its metadata uploaded.

19) To view Airport Report, user need to click on “Type of Report” field, and select “Airport” from the drop down list.

20) Once Airport is selected from the drop down list, user is allowed to apply filters for date (calendar drop down), programmes, systems and fleets – all those filters are drop down list with multiple select option.

21) After applying filters, user needs to click on “Submit” button to get the desired report.

22) User will be displayed with Airport List, where by clicking on Airport name, user will be displayed with Airport details (figure 73).

< Back **Airport List** Export

Airport Name	City	Country/Territory	ICAO Code	Profiles
Berlin-Tempelhof Intern...	Berlin	Germany	EDDI	5
London Heathrow Airport	London	United Kingdom	EGLL	9
Cape Town International...	Cape Town	South Africa	FACT	6
Toulouse-Magnac Airport	Toulouse	France	LFBO	2
Abadan Airport	Abadan	Iran	OIAA	1
Dubai International Airp...	Dubai	United Arab Emirates	OMDB	11
A 511 Airport	Pyongtaek	South Korea	RKSG	5
Kalibo International Airp...	Kalibo	Philippines	RPVK	5
Chhatrapati Shivaji Inter...	Mumbai	India	VABB	8
Pune Airport	Pune	India	VAPO	6

Figure 73. Details of airport list and its metadata uploaded.

6) To view Systems Software Report, user need to click on “Type of Report” field, and select “System Software” from the drop down list.

7) Once System Software is selected from the drop down list, user is allowed to apply filters for date (calendar drop down), programmes, systems and fleets – all those filters are drop down list with multiple select option.

8) After applying filters, user needs to click on “Submit” button to get the desired report.

9) User will be displayed with System software list, where by clicking on specific system software list, metadata along with fleet details will be displayed in concertina view (figure 74).

Software	Version	Avionics	Communications	Uplink	Airports	Boxes
wefwgf	wefqf4	wefqwef	wefvwe	Yes	1	1
Avionic Software Number		weffe				
Avionic Serial Number		32543t				
Communication Serial Number		234f				
Communication System		wefvwe				
Uplink Configurable		Yes				
Communication Software Number		efvw4				
Number of Configurable Boxes		Yes 1				
Number of Configurable Airports		Yes 1				
Valid From		Oct 18, 2023				
Valid To		Oct 24, 2023				
FLEETS ASSOCIATED						
CNMI AFIRS Final Demo						

Figure 74. Details of avionics list and its metadata uploaded.

4.4 Using the system as Remote API

In the ABO-MR application, Remote API users can edit, view, extract metadata within the application with the help of APIs.

3.8.1 How to access the ABO-MR system as a Remote API user:

To access the ABO-MR system as a remote API user, the user needs to get the access token from the system which can be used to access the APIs for updating and adding metadata.

- 1) To get the access token from the system, user needs to login into the ABO-MR system and click on the User account option and select Remote API user as highlighted in figure 75.

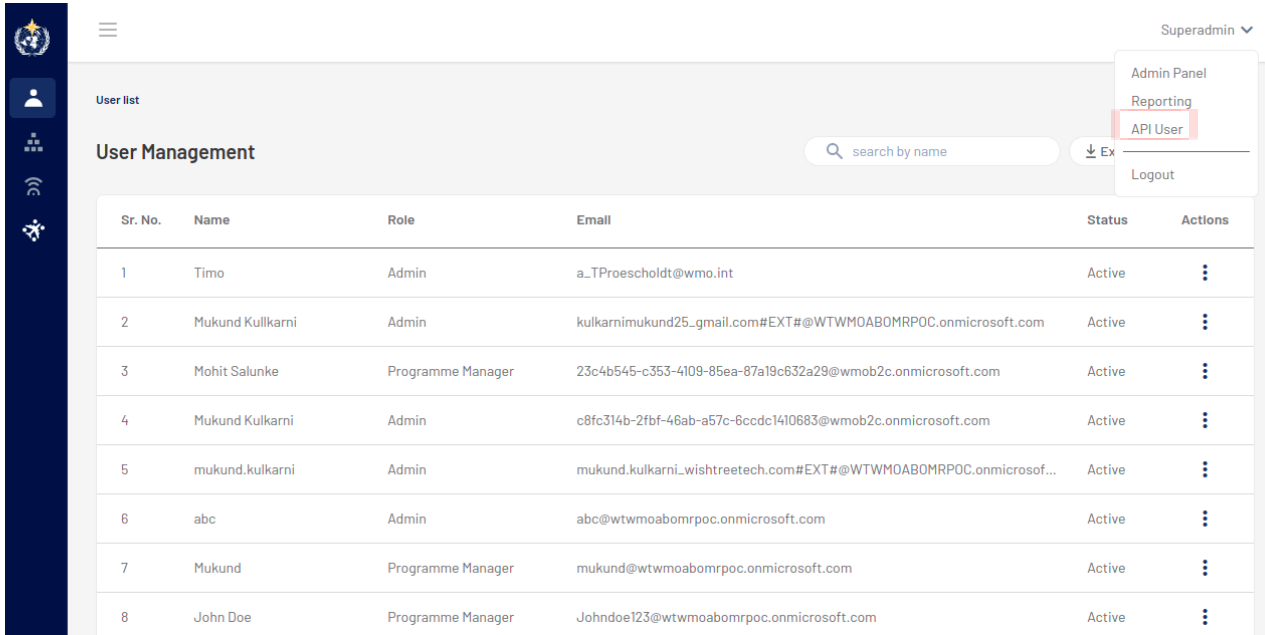


Figure 75. 'API user' menu in the User Management branch.

- Once the user clicks on the API user option, user will be redirected to the API user module where it can get the access token to validate themselves as Remote API user (figure 75).

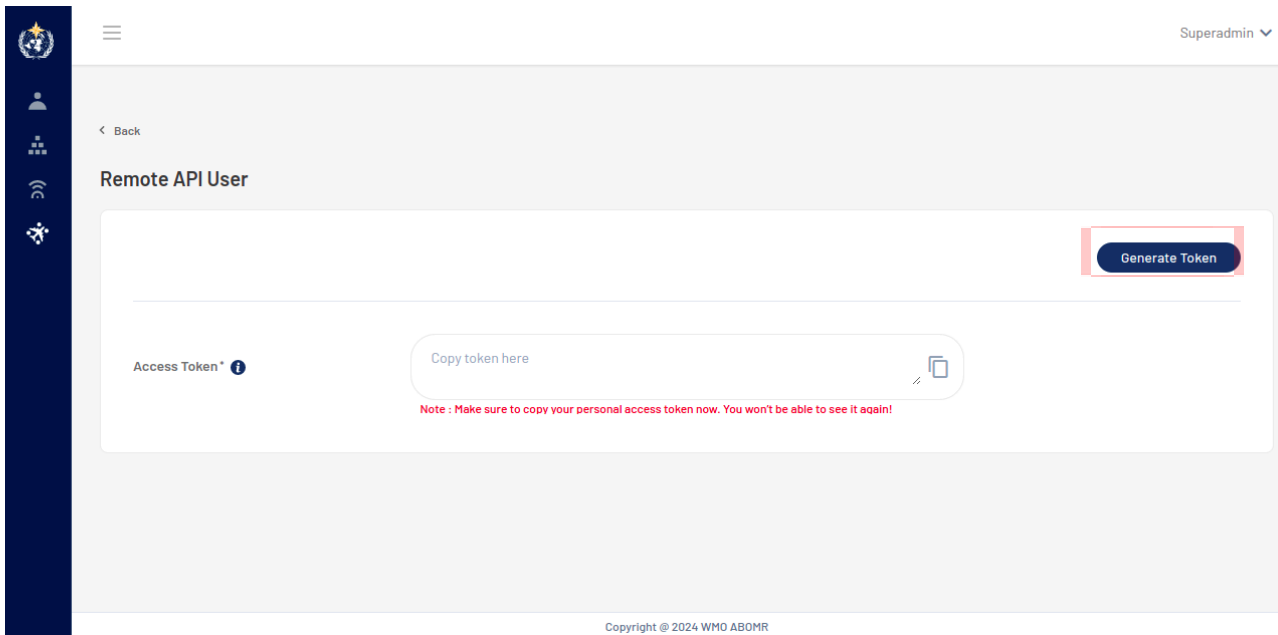


Figure 75. Remote API user - token generator branch.

- To generate the access token, user needs to click on the "Generate Token" button as highlighted above and then the system will generate an access token which will be valid for 6 months within the ABO-MR system.
- After clicking on the "Generate Token" button, system will generate the token and will be displayed in the text field (figure 76).

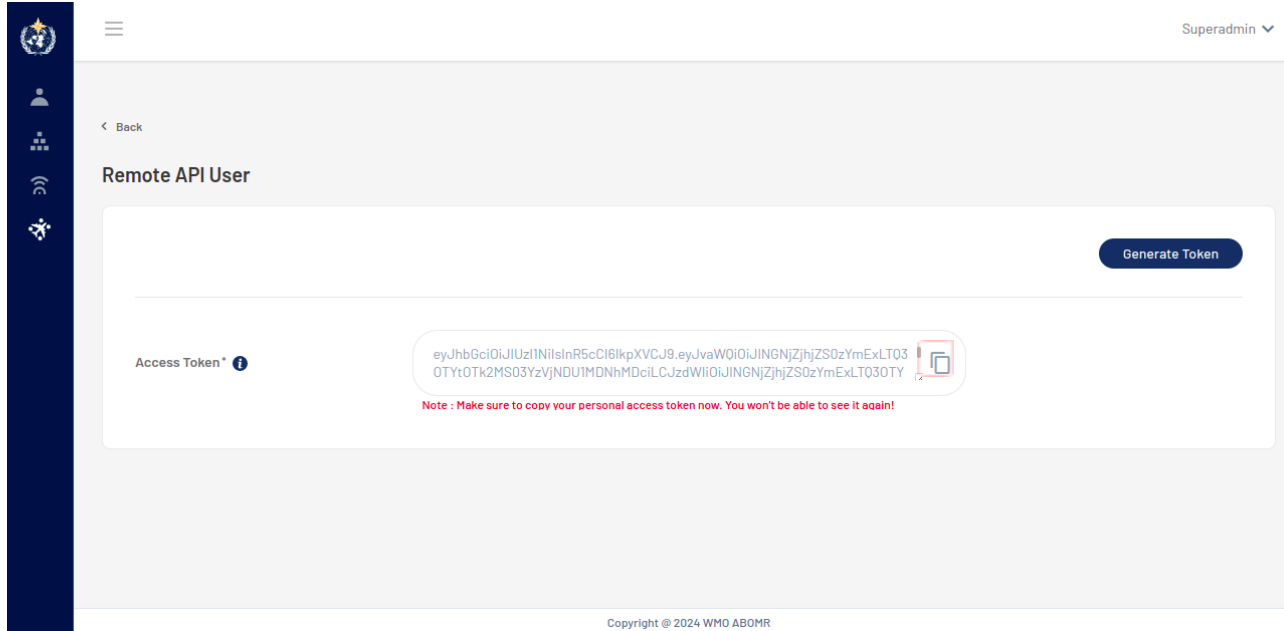


Figure 76. Token generated automatically by the system.

- 5) Users will have the option to to copy the token into the clipboard by clicking on the copy icon in the text field.
- 6) Once clicking on the copy icon, access token displayed in the text field will be copied to the clipboard and then user will be able to use the token to verify and validate themselves as Remote API user and can access the APIs and will have access to add, edit the metadata into the system.