



DPI & FUM Implementation Road Map

Edition No.	:	2.001
Edition Issue Date	:	13 Mar 2019
Author	:	Hans Koolen/Ioana Suciu
Reference	:	URB/USD/DPI_FUM_Impl_RM
Copy No.	:	← stamp here

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

Document Control

Copyright Notice

© 2019 European Organisation for the Safety of Air Navigation (EUROCONTROL).
 All rights reserved.
 No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of EUROCONTROL.

Approval Table

AUTHORITY	DATE	SIGNATURE
Authors		
Hans Koolen/Ioana Suci		
Head of NMD/NOM/APT		
Matthis Birenheide		

Document Identification

Full Title:	DPI & FUM Implementation Road Map
Total Number of Pages:	37

NMOC	EUROCONTROL
Document Title: DPI & FUM Implementation Road Map	Document Reference: URB/USD/DPI_FUM_Impl_RM

Edition History

Edition No.	Edition Issue Date	Author	Reason
1.000	03/10/2008	H. Koolen/J. Gonzalez	Final version
1.100	28/02/2009	H. Koolen	Update document references only to refer to CFMU 13 release documents. Officialize version 1.100
1.200	09/03/2009	H. Koolen	Start version 1.200 for CFMU 14 Update AFTN address (from EBBD to EUCH)
1.200	05/01/2009	H. Koolen	Official release
1.210	20/01/2009	H. Koolen	Start version for CFMU 15 release. Review CDM Ops Eval Criteria
1.300	22/11/2010	H. Koolen	Official release
1.310	17/12/2010	H. Koolen	Start version for next release
1.350	12/07/2011	H. Koolen	Intermediate release
1.351	13/09/2011	H. Koolen	Add more details about the planning requirements
1.400	01/02/2012	H. Koolen	Official release for CFMU 16.0
1.410	02/02/2012	H. Koolen	Start version for next release
1.600	19/03/2015	H. Koolen	Update for NM Release 19.0
1.700	25/01/2016	H. Koolen	Update for NM Release 19.5
1.800	25/11/2016	H. Koolen/I. Suci	Updates for NM Releases 20.0&20.5
1.900	01/08/2017	H. Koolen	NM Support during the OPS Evaluation Process
2.000	01/03/2019	H.Koolen/I. Suci	Inclusion of extended DPI concept and updates for the NM 23.0 release
2.001	13/03/2019	H. Koolen	Editorial changes

Review Table

Edition No.	Review type, scope, depth & focus	Reviewers	Date	Conclusion

Amendment Registration

Location (Old)	Add / Del / Mod	CR	Remark

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

System Release

System Release:	Edition No.:
-----------------	--------------

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

Table Of Contents

Review Table	2
Amendment Registration	3
1 Introduction	7
1.1 Identification	7
1.2 Purpose	7
1.3 Scope	7
2 References	8
2.1 External	8
2.2 NM.....	8
3 Terminology	9
3.1 Concepts	9
3.2 Acronyms and Abbreviations	9
4 Summary	10
4.1 DPI Evaluations	10
4.2 DPI OPS Evaluation Criteria	12
4.3 FUM Evaluations	12
4.4 NM Support during the OPS Evaluation Process	12
4.4.1 AFTN.....	12
4.4.2 B2B implementation.....	13
5 DPI OPS Evaluation Phases.....	14
5.1 Communication and Message Syntax.....	14
5.1.1 Purpose.....	14
5.1.2 How	14
5.1.2.1 For AFTN	14
5.1.2.2 For B2B web services.....	14
5.1.3 How long	14
5.1.4 Report	14
5.1.5 Next steps	14
5.2 Evaluation of Live Data	15
5.2.1 Purpose.....	15
5.2.2 How	15
5.2.2.1 For AFTN	15
5.2.2.2 For B2B web services.....	15
5.2.3 How long	15
5.2.4 Report	15
5.2.5 Next steps	16
5.3 ATFCM Impact Assessment	17
5.3.1 Purpose.....	17
5.3.2 How	17
5.3.2.1 For AFTN	17
5.3.2.1 For B2B web services.....	17

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

5.3.3	How long	17
5.3.4	Report	17
5.3.5	Next Steps.....	18
5.4	Operational Trial	19
5.4.1	Purpose	19
5.4.2	How	19
5.4.2.2	For AFTN	19
5.4.2.3	For B2B web services.....	19
5.4.3	How long	19
5.4.4	Report	19
5.4.5	Next steps	20
5.5	Operations	21
5.5.1	Purpose	21
5.5.2	How	21
5.5.3	How long	21
5.5.4	Report	21
5.5.5	Next steps	22
5.6	Post Operations Support.....	23
5.6.1	Purpose	23
5.6.2	How	23
5.6.3	How long	23
5.6.4	Reporting.....	23
5.6.5	Next steps	23
6	DPI OPS Evaluation Criteria.....	24
6.1	Introduction	24
6.2	Sanity Checks.....	24
6.2.1	General.....	24
6.2.2	DPI Syntax Error Indicator	24
6.2.3	UnCorrelated DPI Messages Indicators.....	25
6.2.4	Rejected & Ignored DPI messages Indicators.....	25
6.2.5	DPI messages Not Fully Processed Indicators	25
6.2.6	DPI Completeness Indicators	26
6.3	Quality of Data	26
6.3.1	DPI Update Rate Indicators	26
6.3.2	IFPS Inconsistency Indicators.....	27
6.4	Predictability	27
6.4.1	Filing Time Behaviour Indicators.....	27
6.4.2	Take-Off-Time (TOT) Predictability Accuracy Indicators - 1	28
6.4.3	Take-Off-Time (TOT) Predictability Accuracy Indicators - 2	28
6.5	ATFCM Behaviour	29
6.5.1	Adherence to ATFM Slot Tolerance Window Indicators.....	29
6.5.2	Adherence to Departure Tolerance Window Indicators.....	29
6.6	Operations Readiness	30
6.7	TOBT and TSAT quality.....	30
7	FUM Evaluations.....	32
7.1	Communication and Message Syntax.....	32
7.1.1	Purpose	32
7.1.2	How	32
7.1.3	How long	32
7.1.4	Report	32

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

7.1.5	Follow-up.....	32
7.2	Evaluation of Live Data	33
7.2.1	Purpose	33
7.2.2	How	33
7.2.3	How long	33
7.2.4	What.....	33
7.2.5	Follow-up.....	33
7.3	Operational Trial	33
8	Contacts	34

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

1 Introduction

1.1 Identification

- (1) This document forms part of the "ETFMS" documentation.
- (2) This document has a document reference of "URB/USD/DPI_FUM_Impl_RM".
- (3) This document has the Title of "DPI & FUM Implementation Road Map".

1.2 Purpose

- (1) The purpose of this document is to describe the implementation Road Map for DPI and FUM messages.
- (2) It describes the steps that need to be taken to validate the DPI and FUM messages before these can be taken into operations. The final step is taking the DPI/FUM into operations.
- (3) It applies to AOP-NOP Airports, CDM Airports and Advanced ATC TWR Airports. For AOP-NOP Airports and CDM Airports the full process is applicable and for Advanced ATC TWR only the relevant parts (i.e. the parts related to A-DPI and C-DPI messages).
- (4) The NMOC and the Airport will have to plan and execute the DPI and FUM Operational evaluations in accordance with the steps that are described in this document.
- (5) This document also describes the DPI Validation Criteria. This is a set of measurable parameters that will determine if DPIs are ready to be put into operations.
- (6) The implementation details can be found in the DPI Implementation Guide (Doc Ref 3), the Flight Progress Messages document (Doc Ref 2) and the Advanced ATC TWR Implementation Guide (Doc Ref 4).

1.3 Scope

- (1) The intended audience of this document is all staff at AOP-NOP Airports, CDM airports and ATC Staff at Advanced ATC TWR Airports, which are or will be involved in message exchange between the airport system(s) and NMOC//ETFMS. Staff with both a technical background and an operational background will be involved.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

2 References

2.1 External

- (1) This document makes reference to the following external documents, an external document being defined as a document not produced by the NM:
None

2.2 NM

- (1) NM referenced documents **shall** take precedence over any referenced external documents wherever conflict arises between them. The following documents are referenced within this document:
- [1] Airport CDM Implementation Manual – Edition 5.0, dated July 2017.
 - [2] Flight Progress messages document, ref URB/USD/MSG_INTF, version 2.501, author Hans Koolen, dated 13/03/2019.
 - [3] DPI Implementation Guide, ref URB/USD/DPI_Impl_Guide, version 2.201, author Hans Koolen, dated 13/03/2019.
 - [4] Advanced ATC TWR Implementation Guide, ref URB/USD/AdvAtcTwrImplGuide, version 1.501, author Hans Koolen, dated 13/03/2019.
 - [5] NM B2B Web Services reference manuals
The NM B2B web services reference manuals are published in the NM B2B OneSky Team shared space on the EUROCONTROL website which is accessible to the NM B2B Web Services users only.
However, access to the technical documentation can be requested to NM.customersupport@eurocontrol.int. The first info can also be found on “www.eurocontrol.int/services/nm-b2b-web-services”

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

3 Terminology

3.1 Concepts

- (1) The following are the definitions of the main concepts that are particular to this Document and not of a more general nature:

AOP NOP Airports:

AOP_NOP Airport are airports that have implemented the Collaborative Decision Making process as it is specified in the Airport CDM Implementation Manual (see Doc ref 1) and provide the full set of DPI messages to NMOC.

In addition to the E-DPI, T-DPI-t, T-DPI-s, A-DPI and C-DPI, these airports also provide the P-DPI messages as an output of its Demand Capacity Balancing (DCB) process.

CDM Airports:

CDM Airport are airports that have implemented the Collaborative Decision Making process as it is specified in the Airport CDM Implementation Manual (see Doc ref 1) and provide the full set of DPI messages for CDM Airports (i.e. E-DPI, T-DPI-t, T-DPI-s, A-DPI and C-DPI) to NMOC.

Advanced ATC TWR Airports

Advanced ATC TWR Airports are airports that have not implemented or not fully implemented the Airport CDM process but still would like to integrate into the ATM Network using a limited set of DPI messages (i.e. the A-DPI and C-DPI).

3.2 Acronyms and Abbreviations

- (1) The following are the definitions of the Acronyms and Abbreviations that are particular to this Document and not of a more general nature:

ANSP	- Air Navigation Service Provider
ATFCM	- Air Traffic Flow & Capacity Management
ATFM	- Air Traffic Flow Management
CDM	- Collaborative Decision Making
CFMU	- Central Flow Management Unit
DPI	- Departure Planning Information
EFD	- ETFMS Flight Data (message)
ETFMS	- Enhanced Tactical Flow Management System
FUM	- Flight Update Message
FMD	- (CFMU) Flow Management Division
ICD	- Interface Control Document
IFPS	- Initial Flight plan Processing System
OPS	- Operational
NM	- Network Manager
NMOC	- Network Manager Operations Centre
QC	- Quality Control

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

4 Summary

4.1 DPI Evaluations

- (1) The DPI Operational Evaluations will be executed in several steps starting with a simple test of communications and ending with an evaluation of data that is provided from operational systems.
- (2) The DPI Evaluation can be split into 6 major steps, including the last step, i.e. taking DPIs into operations:
 1. Communication and Message Syntax verification
For DPI via AFTN, this step consists of testing if all the network communication links are in place and verification of the message syntax and global semantics.
For DPI via B2B web services this step consists of testing the syntax and semantics of the B2B web services using the NM B2B_PREOPS platform.
 2. Evaluation of Live Data
This step consists of the evaluation of live data. It is performed by the transmission of DPI messages for Live/Operational traffic to the ETFMS Operational Evaluation system which contains copies of live data, i.e. it is shadow system of the Operational System.
 3. ATFCM Impact Assessment
The purpose of the ATFCM Impact Assessment is to determine what the impact of the provided DPIs in the ATFCM process managed by ETFMS.
The ATFCM Impact assessment is executed by NMOC Operations, i.e. NMOC Flow Controllers.
 4. Operational Trial
The purpose of this step is to verify the correct working of DPI message exchange with the Operational Airport system and the ETFMS Operational system.
 5. Operations
After all previous steps have been completed successfully the DPI messages can be put into operations on a permanent basis.
 6. Post Operations Support
It is important that Post Operations support is properly organised and guaranteed.
- (3) A detailed overview of all the phases including estimated durations of the DPI Operational Evaluation can be found in Annex 1.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

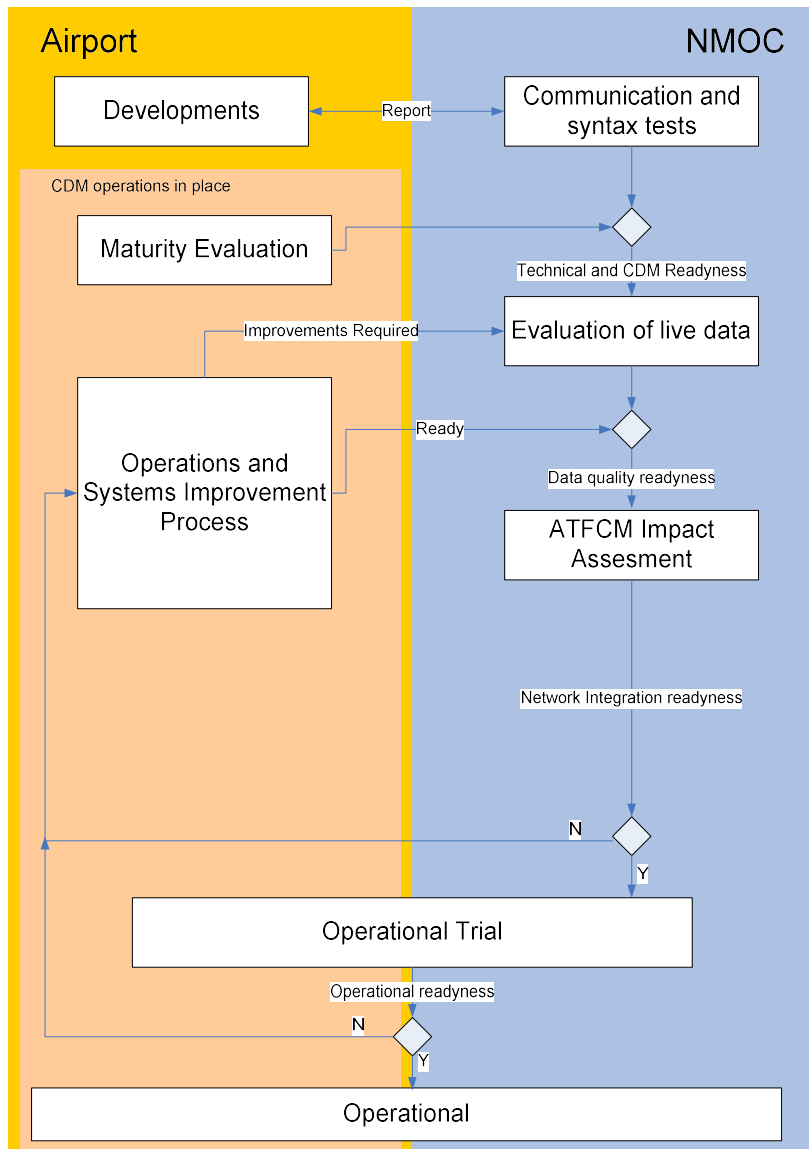


fig 1: DPI Evaluation schema

- (4) Each step will take place during an agreed period, items to be tested will be agreed and an evaluation report will be provided.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

4.2 DPI OPS Evaluation Criteria

- (1) The DPI Validation Criteria is set of criteria that need to be fulfilled in order to put the DPI messages into Operations.
- (2) The criteria have been split into 2 groups: “DPI Quality Indicators” and “DPI Performance Indicators”.
- (3) The “DPI Quality Indicators” show the completeness and the reliability and the DPI messages and the data in these messages.
- (4) The “DPI Performance Indicators” compare the DPI data with data of other sources such as flight plan data.
- (5) The described quality indicators are applicable to normal circumstances and shall be achieved for 95% of the flights or DPI messages.

4.3 FUM Evaluations

- (1) The FUM Operational Evaluations will be executed in several steps starting with a simple test of communications and ending with an evaluation of data that is provided from operational systems.
- (2) The FUM Evaluation can be split into 3 major steps:
 1. Communication and Message Syntax
This step consists of testing the AFTN or B2B communication links and verification of the message syntax and global semantics.
 2. Evaluation of Live Data
This step consists of the evaluation of live data. It is performed by the transmission of FUM messages for Live/Operational traffic by the ETFMS Operational system to an airport system.
 3. Operational Trial
The purpose of this step is to verify the correct working of FUM message exchange with the Operational Airport system and the ETFMS Operational system.
- (3) The Airport may do several FUM evaluations and NMOC will support the evaluation process by answering questions and queries for investigations.

4.4 NM Support during the OPS Evaluation Process

4.4.1 AFTN

- (1) The implementation process for provision of DPI via AFTN is fully supported by the NM Airport Unit.
- (2) For contact details, please refer to section 8 Contacts.

4.4.2 B2B implementation

- (1) Airports have to request access to the B2B services and documentation by sending a request to: NM.servicerequests@eurocontrol.int.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

- (2) The NM B2B web services reference manuals are published in the Eurocontrol One-SKY teams B2B library. More information can also be found on:
<https://www.eurocontrol.int/service/network-manager-business-business-b2b-web-services>
- (3) During the Registration Process, NM Services is the main point of contact and will direct any questions to the appropriate Technical and/or Business Specialists in NM. Please note that the registration process may take up to 2-3 months.
- (4) During the Software Development and Testing phases, using the NM PREOPS certificate and system, questions can best be posted in the Discussion Forum on the B2B One-SKY teams. Please note that answers may already be available in previous discussions or amongst the answers to Frequently Asked Questions (FAQ).
- (5) NM will do its best to respond within one day but it may take longer, especially for cases for which multiple specialists are required.
- (6) For technical B2B support during operations, i.e. once the Operational Certificate is being used, the NM System Operators should be contacted on nm.cso@eurocontrol.int or on +32 2 745 19 97
- (7) For questions related to DPI & FUM functional specifications, you may always contact your contacts at the NM Airports unit. For contact details, please refer to section 8 Contacts.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

5 DPI OPS Evaluation Phases

5.1 Communication and Message Syntax

5.1.1 Purpose

- (1) The purpose of the “Communication and Message Syntax” test is to verify if the messages are addressed to the correct AFTN address or correct URL and if the connection is in place.
- (2) An initial and quick verification of message syntax will save time during testing with live data.

5.1.2 How

5.1.2.1 For AFTN

- (1) Step 1: Transmission of off-line copies of messages using E-mail for initial validation of syntax.
- (2) Step 2: Transmission of several simple test messages via AFTN to the ETFMS test address, which is EUCHZMTT.
- (3) The messages may contain test data. It is not necessary to provide data for live traffic for this test(s). It is important to have several examples of several different events and of each DPI type.

5.1.2.2 For B2B web services

- (1) This test consists of the provision of DPI messages to the NM B2B_PREOPS platform.
- (2) The NM B2B_PREOPS platform is used for B2B tests in general and allows for verifying of the correctness of the interface in both directions, i.e. the provision of DPI messages and the reception of replies to the DPI messages.
- (3) The DPI messages must be provided via the appropriate URL, using “B2B_PREOPS” as the platform_name (see Doc Ref 5 for more details).

5.1.3 How long

- (1) One or several e-mails may be provided for AFTN tests.
- (2) For B2B web services test, the test shall continue until all software problems have been solved.
- (3) The connection test can be very short, one or two days should be planned.

5.1.4 Report

- (1) The NMOC will provide comments to the provided off-line copies via e-mail.
- (2) The results of the connection test will be provided via phone or e-mail.
- (3) The AOP-NOP Airport, CDM Airport or the Advanced ATC TWR Airport is expected to implement improvements if necessary.

5.1.5 Next steps

- (1) If the report identifies significant problems it will be necessary to find solutions and repeat the test. In all other cases the “Evaluation of Live Data” will be planned.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

5.2 Evaluation of Live Data

5.2.1 Purpose

- (1) The purpose of the Evaluation of Live Data is to determine the accuracy and consistency of the provided data and the suitability of the data for ATFCM purposes.

5.2.2 How

- (1) The test consists of the transmission of DPI messages for Live/Operational traffic to the ETFMS (test) Ops Evaluation system. The ETFMS Ops Evaluation system is a non-operational ETFMS system but it receives a copy of the operational flight plans and regulations.
- (2) The incoming messages will be processed, logged and analysed. ETFMS also provides additional log messages during the processing of the received messages.
- (3) The analysis will be based upon the logged messages.
- (4) During this phase the airport system can be provided with FUM messages from the ETFMS Operational system if so required.

5.2.2.1 For AFTN

- (1) The DPI messages shall be transmitted via AFTN to the ETFMS test address which is EUCHZMTT.

5.2.2.2 For B2B web services

- (1) The DPI messages must be provided via the appropriate URL, using "B2B_OPEVAL" as the platform_name (see Doc Ref 5 for more details).

5.2.3 How long

- (1) During the first hour of the trial, addressing, format and common understanding by applications will be verified.
- (2) This provision of data for one test session should be at least 24 hours without interruption. If possible several test sessions should take place during several days on several different days of a week.
- (3) For planning purposes, 4 weeks must be reserved for one "Evaluation of Live Data". It includes, one week for execution, data analysis and report writing by the NMOC, one week for analysis of the report by the Airport and two weeks for possible adjustments of the software and procedures by the airport.
- (4) In order to test the availability of systems and all the network connections involved, it is required to provide DPI messages for a period of at least 7-14 days continuously. In fact, the airport is recommended to provide the DPI messages from the first test onwards and continue transmission during the whole evaluation period without interrupting it.
- (5) At a later stage of DPI trials it could also be envisaged to repeat the trials during special circumstances such as strike, runway closure, de-icing,...

5.2.4 Report

- (1) The received DPI messages and the generated ERRor messages and also the additional log messages generated by ETFMS will be analysed by NMOC with appropriate tools.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

- (2) The tools will generate statistics reports and other reports which will be used to investigate the history of flights (i.e. all the incoming and outgoing messages for a flight).
- (3) The statistics report will be analysed by NMOC and airport specialists and a final evaluation report will be produced.

5.2.5 Next steps

- (1) If the report identifies significant problems it will be necessary to find solutions and repeat the test. The solutions could consist of system adaptations or improving AOP-NOP, CDM or Advanced ATC TWR operations.
- (2) From experience, we have learned that the “Evaluation of Live Data” has to be planned for at least 3 times, so approximately a total of 3 months in duration.
- (3) This step may be concluded with a DPI Operational Evaluation Review meeting between NMOC and Airport Project Implementation team in order to summarize the outstanding issues, to conclude and to decide on the next steps.
- (4) In all other cases the “ATFCM Impact Assessment” will be planned.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

5.3 ATFCM Impact Assessment

5.3.1 Purpose

- (1) The purpose of the ATFCM Impact Assessment is to determine the impact of the provided DPIs on the ATFCM process managed by ETFMS.
- (2) The ATFCM Impact assessment will be executed by NMOC Operations staff, i.e. NMOC Flow Controllers.

5.3.2 How

- (1) The test consists of the transmission of DPI messages for Live/Operational traffic to the ETFMS (test) Ops Evaluation system. The ETFMS Ops Evaluation system is a non-operational ETFMS system but it receives a copy of the Operational Flight plans, Airborne Data updates (FSA, CPR,...) and regulations.
- (2) The incoming messages will be processed by ETFMS and result in flight profile updates and updates of the counts of the airspaces concerned.
- (3) The impact on regulations will be verified. Wasted capacity and bunching will be verified. Any short term fluctuations in counts and traffic will be identified.
- (4) The test will be executed by comparing counts on an ETFMS Ops evaluation system which receives DPI messages and the ETFMS Operational system (which does not receive DPI messages for the airport under test yet).
- (5) During this phase the airport system can be provided with FUM messages from the ETFMS Operational system if required.

5.3.2.1 For AFTN

- (1) The DPI messages shall be transmitted via AFTN to the ETFMS test address which is EUCHZMTT.

5.3.2.1 For B2B web services

- (1) The DPI messages must be provided via the appropriate URL, using "B2B_OPEVAL" as the platform_name (see Doc Ref 5 for more details).

5.3.3 How long

- (1) This provision of data should be at least 24 hours without interruption. If necessary the test will take place during several days on several different days of a week.
- (2) For planning purposes, 3 days have to be reserved. It includes one day for execution of the test, one day for data analysis and report writing by NMOC and one day for review by the AOP-NOP Airport, CDM Airport or Advanced ATC TWR Airport.
- (3) If feasible, it could also be envisaged to repeat the trials during special circumstances such as strike, runway closure, de-icing,...

5.3.4 Report

- (1) The analysis will be based upon the graphs and count displays that will be opened via the ETFMS HMI.
- (2) If necessary special test regulations will be created. Special cases for special flights will be investigated using the ETFMS oplog query facility.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

- (3) The NMOC will produce an “ATFCM Impact Assessment” Report.

5.3.5 Next Steps

- (1) If the report identifies significant problems it will be necessary to find solutions and repeat the test. The solutions could consist of system adaptations or improving AOP-NOP, CDM or Advanced ATC TWR Operations.
- (2) In all other cases the “Evaluation with OPS users” will be planned.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

5.4 Operational Trial

5.4.1 Purpose

- (1) The impact of DPI messages on ATFCM operations has been analysed in the “Evaluation of LIVE data” phase.
- (2) However to verify the impact of the DPI messages on a complete Operational Environment, DPI Operational Trials will be organised.
- (3) The purpose of the DPI Operational Trials is to verify the correct working of DPI message exchange with the airport Operational system and its impact on the airport Operations.
- (4) It is a final test before taking the DPI messages into operations on a permanent basis.

5.4.2 How

- (1) The test consists of the transmission of DPI messages for Live/Operational traffic to the ETFMS Operational system.
- (2) At least one TWR controller and one flow controller should be on duty for the whole duration of the trial.
- (3) The incoming messages will be logged and analysed. ETFMS also provides log messages during the processing of the received messages.
- (4) The analysis will be based upon the logged messages.
- (5) During this phase the airport system can be provided with FUM from the ETFMS Operational system.
- (6) Before the start of the Operational Trial, the airport should publish a NOTAM.
- (7) NMOC will publish an (internal) Operational Instruction (OI) as soon as the NOTAM is available.

5.4.2.2 For AFTN

- (1) The DPI messages shall be transmitted via AFTN to the ETFMS OPS address which is EUCHZMTA.

5.4.2.3 For B2B web services

- (1) The DPI messages must be provided via the appropriate URL, using “B2B_OPS” as the platform_name (see Doc Ref 5 for more details).

5.4.3 How long

- (1) The DPI operational trials will be organised on 2 different days during a period of approximately 5 hours each day. The dates and times will be agreed with all concerned.
- (2) For planning purposes one week should be reserved for this activity. It includes 2 days for the tests, 2 days for report writing and review by NMOC and 1 day for analysis of the report by the Airport Implementation Project Team.

5.4.4 Report

- (1) The airport will have the opportunity to analyse the data exchange based upon its own tools.
- (2) The received DPI messages and the generated ERRor messages and also the additional log messages generated by ETFMS will be analysed by appropriate tools.
- (3) The ETFMS tools will generate statistics reports and other reports which will be used to investigate the history of flights (i.e. all the incoming and outgoing messages for a flight).

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

- (4) The report will be interpreted by NMOC and airport specialists and a final evaluation report will be produced.

5.4.5 Next steps

- (1) If the report identifies significant problems it will be necessary to find solutions and repeat the test. The solutions could consist of system adaptations, improving AOP-NOP, CDM or Advanced ATC TWR operations, informing the user community.
- (2) In all other cases the “Operations” will be planned

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

5.5 Operations

5.5.1 Purpose

- (1) After all previous steps have been successfully completed, the DPI messages can be put into operations on a permanent basis.

5.5.2 How

- (1) Before the DPI messages can be sent to the ETFMS Operational System, it must be ensured that the following Action List is completed:

Action Nr	Description
APT.1	Agree date with NMOC to go Operational
APT.2	Provide Functional & Post Operations Contact Details These contact details will be included in the DPI-ICD.
APT.3	Provide TWR Contact Details These contact details will be included in the DPI-ICD.
APT.4	Provide System Monitoring contact details These contact details will be included in the DPI-ICD.
APT.5	Ensure that the System Technical Supervisors know the procedure to interrupt DPIs in case of unexpected problems
APT.6	Draft NOTAM and review the ATFM part with NMOC
APT.7	Draft AIP/AIC update and review the ATFM part with NMOC
APT.8	Publish AIP/AIC before start of operations
APT.9	Change AFTN address from EUCHZMTT to EUCHZMTA on agreed date and time or change URL from the B2B_OPEVAL platform to the B2B_OPS platform.
APT.10	Ensure close operational monitoring and support during the first two weeks of operation
APT.11	Ensure sufficient post-operational support also after the first weeks of operations

- (2) During the first hours of operations the DPI message exchange shall be carefully monitored both by NMOC Operations Staff and Airport operations staff (i.e. TWR, Airport operations center, AOs, handlers,...).

5.5.3 How long

- (1) If DPI messages had not been provided on a continuous basis before, the Operational Reliability and stability has to be proven by transmission of continuous operational DPI messages for 2 weeks. This will also ensure that the impact of the "learning curve" at the airport for the network is reduced to the absolute minimum.
- (2) For preparations of the Operations, approximately 1-2 weeks must be reserved.
- (3) Operations start at the agreed date and time and will continue until further notice.

5.5.4 Report

- (1) Any special case shall be reported to NMOC and AOP-NOP, CDM or Advanced ATC TWR Airport specialist for further investigation.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

5.5.5 Next steps

- (1) Ensure Post Operations Support.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

5.6 Post Operations Support

5.6.1 Purpose

- (1) It is essential to guarantee Post Operations Support after DPIs of a new Airport have been taken into operations.
- (2) During the first weeks of operations of DPI messages, all types of users such as Aircraft Operators, ATC TWR controllers, Ground Handlers, Flow managers,.... will have questions. A quick analysis of the reported cases will ensure that the new users will get more confidence in the DPI messages.
- (3) It may also happen that during first operations some unidentified software problems appear and these need to be analysed asap.

5.6.2 How

- (1) Ensure that during the first 2-4 weeks after the first day of operations, DPI specialists and AOP-NOP Airport, Airport CDM or Advanced ATC TWR system experts are available to answer to queries for the Airport Users and from NMOC on very short notice, preferably within 24 hrs.
- (2) After this 2-4 weeks period it is important that such a Function remains available but the response time may be longer. The recommendation is to respond within 5 working days to User's and NMOC's requests.
- (3) Post Operations Support is normally only available during Office Hours.

5.6.3 How long

- (1) During the first 2-4 weeks after first operations, a short response time is required.
- (2) After this period Post Operations Support shall remain available as in all other operational cases, and the response time may be longer than during the initial period.

5.6.4 Reporting

- (1) Any special case shall be reported to NMOC and AOP-NOP, CDM or Advanced ATC TWR Airport specialist for further investigation.

5.6.5 Next steps

- (1) No more next steps.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

6 DPI OPS Evaluation Criteria

6.1 Introduction

- (1) The purpose of this section is to list criteria for validation and acceptance of the DPI messages.
- (2) This set of criteria needs to be fulfilled during the DPI Operational Evaluation in order to put the DPI messages into Operations.
- (3) The criteria have been split into 5 groups:
 1. Sanity Checks
 2. Quality of Data
 3. Predictability
 4. ATFCM Behaviour
 5. Operational Readiness
- (4) The “Sanity Checks” Indicators show the percentages of DPI messages that were considered to be erroneous, missing,...
- (5) The “Quality of Data” Indicators evaluate the number of updates received via DPI messages and evaluate the taxi-time.
- (6) The “Predictability” Indicators compare the DPI data with data of other sources such as flight plan data in terms of accuracy and the time when the updates have been received.
- (7) The “ATFCM Behaviour” Indicators compare the DPI data with expected ATFCM Operational behaviour such as Adherence to ATFM Slots, suspensions by Flight Activation Monitoring (FAM),...
- (8) The “Operational Readiness” Indicators show if the AOP-NOP Operations, CDM Operations or Advanced ATC TWR Operations and the corresponding DPI messages are sufficiently mature to be put into operations at NMOC.
- (9) The Indicators that are shown with a **yellow background** are also part of the CDM Completeness Criteria (see Doc Ref 1) that are applicable to CDM Airport implementation projects (only).

6.2 Sanity Checks

6.2.1 General

- (1) The below mentioned quality indicators are applicable to normal circumstances and shall be achieved for 95% of the flights or DPI messages.

6.2.2 DPI Syntax Error Indicator

- (1) The purpose of these statistics is to show the percentage of DPI messages that contain a syntax error.

Ref	Indicator Name	Target Value	Acceptable Range	Example
1.1	DPI_with_Syntax_Error	0 %	0%	0%

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

6.2.3 UnCorrelated DPI Messages Indicators

- (1) The purpose of these statistics is to show the percentage of DPI messages which could not be correlated to flight data by ETFMS.

Ref	Indicator Name	Target Value	Acceptable Range	Example
2.0	P-DPI_UnCorrelated	0%	<0.1%	0.0%
2.1	E-DPI_UnCorrelated	0%	<0.1%	0.0%
2.2	T-DPI-t_UnCorrelated	0%	<0.1%	0.1%
2.3	T-DPI-s_UnCorrelated	0%	<0.1%	0.0%
2.4	A-DPI_UnCorrelated	0%	<0.1%	0.1%
2.5	C-DPI_UnCorrelated	0%	<0.1%	0.0%

6.2.4 Rejected & Ignored DPI messages Indicators

- (1) The purpose of these statistics is to show the number of DPI messages which could not be processed by ETFMS.
- (2) ETFMS validates the DPI messages and if a message does not comply with the validation criteria, ETFMS will send a reply message to the originator.
- (3) This is the percentage of DPI messages that could not be processed by ETFMS. Examples are:
- DPI message received too early or too late
 - DPI message not in correct sequence
 - Provided take-off time out of bounds
- (4) The following table shows the total percentage of DPI message which could not be processed:

Ref	Indicator Name	Target Value	Acceptable Range	Example
3.1	DPI_RejectedIgnored	0%	<=1%	0.9%

6.2.5 DPI messages Not Fully Processed Indicators

- (1) The purpose of these statistics is to show the percentage of DPI messages that were not fully processed by ETFMS. Examples of such message are:
- Unknown SID
 - Unknown Aircraft Type
 - ...
- (2) The table below shows the percentage of not-fully processed DPI messages per DPI-type:

Ref	Indicator Name	Target Value	Acceptable Range	Example
4.0	P-DPI_Not_Fully_Processed	0 %	<= 1%	1%
4.1	E-DPI_Not_Fully_Processed	0 %	<= 1%	1%
4.2	T-DPI-t_Not_Fully_Processed	0 %	<= 1%	1%
4.3	T-DPI-s_Not_Fully_Processed	0 %	<= 1%	1%
4.4	A-DPI_Not_Fully_Processed	0 %	<= 1%	1%

NMOC	EUROCONTROL
Document Title: DPI & FUM Implementation Road Map	Document Reference: URB/USD/DPI_FUM_Impl_RM

6.2.6 DPI Completeness Indicators

- (1) The purpose of these statistics is to show the number of received DPI messages compared to the number of departures from the airport concerned.
- (2) The table shows the percentage of flights for which at least one P-DPI, E-DPI, T-DPI-t, T-DPI-s and A-DPI has been received. It also shows the percentage of flights for which a C-DPI has been received and the percentage of flights for which no DPI at all was received.

Ref	Indicator Name	Target Value	Acceptable Range	Example
5.0	P-DPI Completeness	100%	>=98.0%	100%
5.1	E-DPI Completeness	100%	>=99.5%	100%
5.2	T-DPI-t Completeness	100%	>=99.5%	99.5%
5.3	T-DPI-s Completeness	100%	>=99.5%	100%
5.4	A-DPI Completeness	100%	>=99.5%	99.5%
5.5	C-DPI Completeness	0%	<=2%	4%
5.6	Flights_without_DPIs	0%	<0.5%	0.2%

Notes:

- 1) The yellow colour shows that it is also part of the CDM Completeness Criteria (see Doc Ref 1).
- 2) The P-DPI completeness is expected to be lower because of CNL and Refile after EOBT – 3h should not contain P-DPI messages

6.3 Quality of Data

6.3.1 DPI Update Rate Indicators

- (1) The purpose of these statistics is to show flights for which many DPI message updates of the same type have been sent. Further investigations may be required to identify if this is normal behaviour (for the evaluated day) or if there is an area for improvement for the airport.

Ref	Indicator Name	Target Value	Acceptable Range	Example
6.21	P-DPI UpdateRate_1	100%	70% - 100%	99%
6.22	P-DPI UpdateRate_2	0%	<=30%	1%
6.23	P-DPI UpdateRate_3	0%	<=20%	0%
6.24	P-DPI UpdateRate_3+	0%	<=10%	0%
6.1	E-DPI UpdateRate_1	100%	89% - 100%	99%
6.2	E-DPI UpdateRate_2	0%	<=10%	1%
6.3	E-DPI UpdateRate_3	0%	<=1%	0%
6.4	E-DPI UpdateRate_3+	0%	<=1%	0%
6.5	T-DPI-t UpdateRate_1	100%	65% - 100%	89%
6.6	T-DPI-t UpdateRate_2	0%	<=35%	10%
6.7	T-DPI-t UpdateRate_3	0%	<=20%	1%
6.8	T-DPI-t UpdateRate_3+	0%	<=5%	1%
6.9	T-DPI-s UpdateRate_1	100%	40% - 100%	89%
6.10	T-DPI-s UpdateRate_2	0%	<=40%	10%

NMOC	EUROCONTROL
Document Title: DPI & FUM Implementation Road Map	Document Reference: URB/USD/DPI_FUM_Impl_RM

6.11	T-DPI-s_UpdateRate_3	0%	<=30%	1%
6.12	T-DPI-s_UpdateRate_3+	0%	<=10%	1%
6.13	A-DPI_UpdateRate_1	100%	89% - 100%	90%
6.14	A-DPI_UpdateRate_2	0%	<=15%	9%
6.15	A-DPI_UpdateRate_3	0%	<=1%	1%
6.16	A-DPI_UpdateRate_3+	0%	<=0.5%	1%
6.17	C-DPI_UpdateRate_1	0%	<=3%	2%
6.18	C-DPI_UpdateRate_2	0%	<=1%	2%
6.19	C-DPI_UpdateRate_3	0%	<=0.5%	0%
6.20	C-DPI_UpdateRate_3+	0%	<=0.5%	0%

6.3.2 IFPS Inconsistency Indicators

- (1) The purpose of these statistics is to show the number of Aircraft Type, Registration and EOBT inconsistencies that have been derived from DPI messages.
- (2) Assuming that the Airport has better information about ARCTYP and REG than can be derived from FPL data, any positive value can be considered as a benefit of DPI messages.

Ref	Indicator Name	Target Value	Acceptable Range	Example
7.1	DPI_ARCTYP_Inconsistency	No target	Any value is an improvement	0%
7.2	DPI_REG_Inconsistency	No target	Any value is an improvement	5%
7.3	DPI_EOBT_Inconsistency	No target	Any value is an improvement	2%

6.4 Predictability

6.4.1 Filing Time Behaviour Indicators

- (1) These indicators show the filing-time of the DPI messages compared to the:
 - TTOT in the message
The purpose of these statistics is to show average prediction time of the DPI messages. The prediction time is the time that the provided TTOT is in the future. For example: Is the TTOT from the DPIs 20 minutes in the future or 2 hours in the future?
 - Flight plan derived ETOT (EOBT+taxitime) or the CTOT
The purpose of these statistics is to show average prediction time of the provided TTOTs compared to the flight data in ETFMS. For example: do DPIs provide an estimate at 20 minutes before the ETOT/CTOT or at 2 hours before the ETOT/CTOT?
 - ATOT (from FSA messages)
The purpose of these statistics is to show the average prediction time of the provided TTOTs compared to the Actual Take-Off Time (ATOT) derived from the FSA message.

Ref	Indicator Name	Min [Min]	Max [min]	Average [min]		
				Target Value	Acceptable Range	Ex.
8.0	P-DPI_AvgFilTime_Before_turnaroundTTOT			None yet	180 – 1200+VTT	600
8.1	E-DPI_AvgFilTime_Before_TTOT			180+VTT	100 – 180+VTT	172
8.2	T-DPI-t_AvgFilTime_Before_TTOT			120+VTT	60 – 120+VTT	103
8.3	T-DPI-s_AvgFilTime_Before_TTOT			40+VTT	25 – 40+VTT	32
8.4	A-DPI_AvgFilTime_Before_TTOT			Avg VTT	5 – 30	13

NMOC	EUROCONTROL
Document Title: DPI & FUM Implementation Road Map	Document Reference: URB/USD/DPI_FUM_Impl_RM

Ref	Indicator Name	Min [Min]	Max [min]	Average [min]		
				Target Value	Acceptable Range	Ex.
9.0	P-DPI AvgFilTime Before ETOTCTOT			None yet	180 – 1200+VTT	600
9.1	E-DPI AvgFilTime Before ETOTCTOT			180+VTT	100 – 180+VTT	184
9.2	T-DPI-t AvgFilTime Before ETOTCTOT			120+VTT	60 – 120+VTT	95
9.3	T-DPI-s AvgFilTime Before ETOTCTOT			40+VTT	25 – 40+VTT	39
9.4	A-DPI AvgFilTime Before ETOTCTOT			Avg VTT	5 – 30	19

Ref	Indicator Name	Min [Min]	Max [min]	Average [min]		
				Target Value	Acceptable Range	Ex.
10.0	P-DPI AvgFilTime Before ATOT			None yet	180 – 1200+VTT	600
10.1	E-DPI AvgFilTime Before ATOT			180+VTT	100 – 180+VTT	189
10.2	T-DPI-t AvgFilTime Before ATOT			120+VTT	60 – 120+VTT	98
10.3	T-DPI-s AvgFilTime Before ATOT			40+VTT	25 – 40+VTT	32
10.4	A-DPI AvgFilTime Before ATOT			Avg VTT	5 – 30	15

- (2) Note that the Indicators 10.1 – 10.4 are based upon non-regulated flights only.

6.4.2 Take-Off-Time (TOT) Predictability Accuracy Indicators - 1

- (1) The Take-Off-Time (TOT) Predictability is determined by calculating the absolute average differences between the ATOT and the TOTs from different messages.
- (2) The comparison between the different message types shall be done by comparing the Performance Indicators of each message type.
- (3) The ATOT is derived from FSA messages.
- (4) Each indicator is calculated as follows:

FPL_Avg_Abs_ETOT_to_ATOT: $\text{avg}(\text{abs}(\text{ATOT} - (\text{EOBT} + \text{StandardTaxiTime})))$
 T-DPI-t_Avg_Abs_TTOT_to_ATOT: $\text{avg}(\text{abs}(\text{ATOT} - \text{TTOT}))$
 T-DPI-s_Avg_Abs_TTOT_to_ATOT: $\text{avg}(\text{abs}(\text{ATOT} - \text{TTOT}))$
 A-DPI_Avg_Abs_TTOT_to_ATOT: $\text{avg}(\text{abs}(\text{ATOT} - \text{TTOT}))$

Ref	Indicator Name 1)	Target Value [min]	Acceptable Range [min]	Example
11.1	FPL Avg Abs ETOT to ATOT 2)	0	<= 15	
11.2	T-DPI-t Avg Abs TTOT to ATOT	0	<= 12	
11.3	T-DPI-s Avg Abs TTOT to ATOT	0	<= 10	
11.4	A-DPI Avg Abs TTOT to ATOT	0	<= 5	

Notes:

- 1) These statistics are based upon the last received message of that type.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

- 2) "FPL" includes FPL+DLA+CHG messages
- 3) The yellow colour shows that it is also part of the CDM Completeness Criteria (see Doc Ref 1).

6.4.3 Take-Off-Time (TOT) Predictability Accuracy Indicators - 2

- (1) A second method of determining the Take-Off-Time (TOT) Predictability is by determining the percentage of messages that are within a pre-defined range.
- (2) It starts with calculating the absolute average differences between the ATOT and the TOTs from different messages. Then the percentage of messages that are within a certain accuracy, for example 10 min is calculated.
- (3) The Comparison between the different message types shall be done by comparing the Performance Indicator of each message type.
- (4) The ATOT is derived from FSA messages.

Ref	Indicator Name 1)	Target Value	Acceptable Range	Example
12.1	FPL_Predictability_10min_Acc 2)	100%	No range	69%
12.6	P-DPI_Predictability_10min_Acc (tTTOT)	100%	>= FPL percentage	73%
12.7	P-DPI_Predictability_10min_Acc (eTTOT)	100%	>= FPL percentage	73%
12.2	E-DPI_Predictability_10min_Acc (tTTOT)	100%	>= FPL percentage	73%
12.8	E-DPI_Predictability_10min_Acc (eTTOT)	100%	>= FPL percentage	73%
12.3	T-DPI-t_Predictability_10min_Acc (tTTOT)	100%	5% better than FPL	78%
12.9	T-DPI-t_Predictability_10min_Acc (eTTOT)	100%	5% better than FPL	78%
12.4	T-DPI-s_Predictability_10min_Acc	100%	10% better than FPL	83%
12.5	A-DPI_Predictability_10min_Acc	100%	>=95%	98%

Notes:

- 1) These statistics are based upon the last received message of that type. In order to be able to compare data, these indicators are produced on non-regulated flights only.
- 2) "FPL" includes FPL+DLA+CHG messages.

6.5 ATFCM Behaviour

6.5.1 Adherence to ATFM Slot Tolerance Window Indicators

- (1) The purpose of these statistics is to compare the DPI Target Take-Off Time (TTOT) with the CTOT in order to determine if the AOP-NOP, CDM or Advanced ATC TWR Airport is usually providing a TTOT before the STW, inside the STW or after the STW.
- (2) These indicators show the percentage of A-DPI messages for regulated flights that have a TTOT inside the Slot Tolerance Window (default value: -5 - +10).around the CTOT.

Ref	Indicator Name	Target Value	Acceptable Range	Example
13.1	A-DPI_Inside_STW	100 %	>= 90%	89%

- (3) Overall figures of the OPERATIONAL Adherence to ATFM Slots (based upon the ATOT from FSA messages) must be better than 80%.

NMOC	EUROCONTROL
Document Title: DPI & FUM Implementation Road Map	Document Reference: URB/USD/DPI_FUM_Impl_RM

Ref	Indicator Name	Target Value	Acceptable Range	Example
14.1	FSA_ATOT_Inside_STW	100 %	>= 80%	89%

6.5.2 Adherence to Departure Tolerance Window Indicators

- (1) The purpose of these statistics is to compare the DPI Target Take-Off Time (TTOT) of non-regulated flights with the last received OBTT+Taxi-Time in order to determine if the AOP-NOP, CDM or Advanced ATC TWR Airport is usually providing a TTOT in accordance with the Departure Tolerance Window (DTW).
- (2) These indicators show the percentage of A-DPI messages for non-regulated flights that have an TTOT inside the Departure Tolerance Window (default value: -15 - +15) around the last received OBTT+DPI_TaxiTime.

Ref	Indicator Name	Target Value	Acceptable Range	Example
15.1	A-DPI_Inside_DTW	100 %	>= 80%	72%

6.6 Operational Readiness

- (1) In order for an airport to be ready to be integrated operationally with the ATM network, it is required that local AOP-NOP, CDM or Advanced ATC TWR operations are sufficiently mature.
- (2) It is essential to have done sufficient testing with operational data with the NMOC in order to detect most special cases (e.g. night and weekend operations) and identify solutions.
- (3) It is essential that most operations staff, including handling staff, pilots, TWR,... have become used to the newly introduced AOP-NOP, CDM or Advanced ATC TWR working methods and tools. The impact on the network of staff learning new working practices and inevitable making mistakes should be reduced to the absolute minimum.
- (4) For these reasons, it is required that a AOP-NOP, CDM or Advanced ATC TWR airport provides DPI data for live traffic during an uninterrupted period of at least 7-14 days to the ETFMS test system before the DPIs are sent to the ETFMS Operational system.

Ref	Indicator Name	Target Value	Acceptable value	Example
16.1	Long duration test	1 month	7 days	21 days

6.7 TOBT and TSAT quality

- (1) The TOBT and TSAT values are disseminated via CHMI, the NOP Portal and B2B web services, in order to increase the situational awareness of stakeholders of the departures.
- (2) In addition, the EOBT update service for airlines is based on the TOBT value.
- (3) TOBT and TSAT values of a sufficient quality are therefore desirable.
- (4) The indicators used, measure the presence rate as well as the acceptance rate of the TOBT and TSAT values in the different DPI messages (in percentages):

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

DPI Type	TOBT Present (%)	TSAT Present (%)	TOBT Rejected (%)	TSAT Rejected (%)
E-DPI		0%		0%
T-DPI-t				
T-DPIs				

Ref	Indicator Name	Target Value	Acceptable Range	Measured Value
17.1	E-DPI TOBT Present (%)	No target	-	
17.2	T-DPI-t TOBT Present (%)	No target	-	
17.3	T-DPI-s TOBT Present (%)	100%	>95%	
17.4	T-DPI-t TSAT Present (%)	No target	-	
17.5	T-DPI-s TSAT Present (%)	100%	>=95%	
17.6	E-DPI TOBT Rejected	0.0%	<=3%	
17.7	T-DPI-t TOBT Rejected	0.0%	<=3%	
17.8	T-DPI-s TOBT Rejected	0.0%	<=3%	
17.9	T-DPI-t TSAT Rejected	0.0%	<=3%	
17.10	T-DPI-s TSAT Rejected	0.0%	<=3%	

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

7 FUM Evaluations

7.1 Communication and Message Syntax

7.1.1 Purpose

- (1) The purpose of the “Communication and Message Syntax” test is to verify if the messages are addressed to the correct AFTN address and if the connection is in place.
- (2) An initial and quick verification of message syntax will save time during testing with live data.
- (3) Note that this process mainly applies to FUM messages that are provided via the AFTN network. The ELDT values can also be provided via B2B web services and in such cases the B2B evaluation process is followed (refer to the NM B2B web service documentation for further details).

7.1.2 How

- (1) On request of an airport the NMOC can provide a sample of FUMs. Such FUMs are extracted from ETFMS log-files and are provided via e-mail. It is possible to provide FUMs for a whole day or a part of the day. The airport is expected to use the off-line FUMs for local system testing such as validation of the parsing of FUMs.
- (2) Note that ETFMS needs to be specially configured in order to produce FUMs (in log files).
- (3) Step 1: Transmission of off-line copies of messages using E-mail for initial validation of syntax.
- (4) Step 2: Provide on-line FUMs from an ETFMS system to the airport system.
- (5) These messages usually contain live data.

7.1.3 How long

- (1) One or several e-mails may be provided.
- (2) The initial trials may last from several minutes to 1 hour with the purpose of testing the connections.

7.1.4 Report

- (1) The NMOC may answer any questions and comments related to the provided off-line copies via e-mail.
- (2) The results of the connection test may be provided via phone or e-mail.

7.1.5 Follow-up

- (1) If the report identifies significant problems it will be necessary to find solutions and repeat the test. In all other cases the Evaluation of Live Data will be planned.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

7.2 Evaluation of Live Data

7.2.1 Purpose

- (1) The purpose of the Evaluation of Live Data is to offer the airport the opportunity to evaluate the use of FUMs for their operations and integration into their systems.

7.2.2 How

- (1) The test consists of the transmission of FUM messages for Live/Operational traffic to an address at the airport.
- (2) The FUM messages will be transmitted via AFTN to the address specified by the airport. This may be the AFTN address of a test system or of an operational system.
- (3) The NMOC will log the outgoing messages for off-line analysis.

7.2.3 How long

- (1) During the first hour of the trial, addressing, format and common understanding by applications will be verified.
- (2) This provision of data could last from several hours to approximately 1 week.
- (3) At a later stage of FUM trials it could also be envisaged to repeat the trials during special circumstances such as strike, runway closure, de-icing...

7.2.4 What

- (1) It will be up-to the airport to do the analysis using its own tools.
- (2) The NMOC is available for answering questions about special cases.

7.2.5 Follow-up

- (1) If the report identifies significant problems it will be necessary to find solutions and repeat the test.

7.3 Operational Trial

- (1) No specific operational trials are foreseen for FUM messages.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

8 Contacts

- (1) For details on Project management issues, DPI, FUM message specifications and Operational matters related to DPI Evaluations:

Mr. Hans Koolen
Senior Expert ATFCM and Airport CDM
EUROCONTROL
Network Operations – Airports Unit
Rue de la Fusée 96
B-1130 Bruxelles
Tel: +32 2 729 9876
Fax: +32 2 729 9189
E-mail: johannes.koolen@eurocontrol.int

- (2) For other questions on DPI & FUM:

Ms. Ioana Suciu
Expert Airport CDM
EUROCONTROL
Network Operations – Airports Unit
Rue de la Fusée 96
B-1130 Bruxelles
Tel: +32 2 729 3938
E-mail: ioana.suciu.ext@eurocontrol.int

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

Annex 1

- (3) The following table provides an overview of all the steps to be taken for a DPI Operational Evaluation, including an estimation of the duration.

Ref nr	Description	Est Dur [days]	Estd Dur [weeks]
T1	Communication and Message Syntax		0.4
T1.1	Actual tests	1	
T1.2	Report writing and Review	1	
T2	Evaluation of Live Data		
T2.1	Evaluation - I		4
T2.1.1	Execution, data analysis, report writing by NMOC	5	
T2.1.2	Analysis and Review of the report by Airport	5	
T2.1.3	Possible Adjustment of system and procedures	10	
T2.2	Evaluation - II		4
T2.2.1	Execution, data analysis, report writing by NMOC	5	
T2.2.2	Analysis and Review of the report by Airport	5	
T2.2.3	Possible Adjustment of system and procedures	10	
T2.3	Evaluation - III		4
T2.3.1	Execution, data analysis, report writing by NMOC	5	
T2.3.2	Analysis and Review of the report by Airport	5	
T2.3.3	Possible Adjustment of system and procedures	10	
T2.4	DPI Operational Evaluation Review meeting	1	0.2
T3	ATFCM Impact Assessment		0.6
T3.1	Execution of test by NMOC	1	
T3.2	Data analysis, Report writing and review by NMOC	1	
T3.3	Review by AOP-NOP, CDM or Advanced ATC TWR Airport	1	
T4	Operation Trial		1
T4.1	Operational Trial - I	1	
T4.2	Analysis, Report writing and review - I	1	
T4.3	Operational Trial - II	1	
T4.4	Report writing and review - II	1	
T4.5	Review and analysis of the report by the Airport	1	
T5	Operations (including preparation for Operations)		3
T5.1	Continuous provision of Operational DPIs 1)	10	
T5.2	GoNoGo Decision	1	
T5.3	Final preparations for Operations	4	
T6	Post Operations Support		4
T6.1	Post Operations support	20	
	TOTAL:		21.2

Notes:

- 1) if DPIs had been provided on a continuous basis during the previous tests, this step can be skipped.

NMOC		EUROCONTROL
Document Title: DPI & FUM Implementation Road Map		Document Reference: URB/USD/DPI_FUM_Impl_RM

DOCUMENT FINAL PAGE