



## DPI Implementation Guide

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Document Title: DPI Implementation Guide		Document Reference: URB/USD/DPI_Impl_Guide

## Document Control

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## **ANNEXES**

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APPENDIX E: Operational Procedures issues @CDM Airports – Summary

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# 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\_Impl\_Guide ".
- (3) This document has a Title of "DPI Implementation Guide".

## 1.2 Purpose

- (1) The purpose of this document is to provide an overview of the available DPI messages.
- (2) This document contains a description of the different types of DPI messages. It starts with a description of the general fields, i.e. fields that can be used in any DPI message. It is followed by a detailed description of each type of DPI message.
- (3) This document also contains a short description of other ETFMS messages and inputs that have a strong relationship with DPI messages such as use or REA and DLA/CHG messages.
- (4) This results in a Reference & Implementation guide for DPI messages.
- (5) The detailed DPI message syntax and semantic requirements from a "NMOC external" point of view, i.e. requirements for implementation of DPI messages by "external" (i.e. ATC and CDM Airport systems) are described in Doc Ref 1 (see below).
- (6) This document describes the DPI implementation as implemented in the current NMOC release. It also contains outstanding issues to be implemented in future NMOC software releases.

## 1.3 Scope

- (1) The intended audience of this document is anybody who would like to have an Overview of the DPI messages. This includes CDM Airports, AOs, NMOC OPSD staff, FMP managers, software developers.

## 1.4 Requirement Identification

### 1.4.1 Requirements Terminology

- (1) Although they look rather formal, the following notations are designed to provide a clear, concise and homogeneous way of expressing either mandatory requirements, preferred choices, or free choices. In particular, the notation of bold "**shall**" highlights mandatory requirements, thus allowing an easier application and better auditability of this document.
- (2) Throughout this document the following use of terminology **shall** apply:
- (3) The word "**shall**" as shown **shall** always be used in the text to indicate a statement of requirement which is mandatory.
- (4) The word "will" as shown in lower case **shall** only be used in the text to indicate the future tense.
- (5) The word "should" as shown in lower case **shall** only be used in the text to indicate a statement of preference.
- (6) The word "may" as shown in lower case **shall** only be used in the text to indicate a statement of choice.
- (7) Any text to be reproduced exactly **shall** be enclosed in quotes (ie "").

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### 1.4.2 Requirement Labels

- (1) Each requirement inside this document has been given a unique identification/label.

- (2) The syntax of the identification is:

[<type\_of\_requirement>.<Domain>.<sub-domain>.<sub-sub-domain>.<req\_nr>]

Examples:

[URE.ACDM.DPI.GEN.001]

[URE.ACDM.DPI.EDPI.022]

- (3) Note that the number of levels of sub-, sub-sub-, sub-sub-sub-,... domains is not a constraint and may vary according to the needs.
- (4) The <req\_nr> contains the number of the requirement within the last sub-domain and usually consists of 3 digits.
- (5) The requirement identification is written in the MS-word-style named: *"requirement"*
- (6) The text/description of each requirement is delimited by the Requirement Identification and a "#". This allows for automatic extraction of the requirements.
- (7) The "#" is written in the word-style *"hidden"*. Note that the "#" is only visible when the option "show hidden text" has been selected in MS-word.

### 1.4.3 Requirement Domains and Sub-domains

- (1) The following type\_of\_requirements are used in this document:

Type_of_requirement	Description
URE	User Requirement External

- (2) The following Domains are used in this document:

Domain	Description
ACDM	Airport CDM

Note: This allows for defining requirements for other users/systems than Airport CDM.

- (3) The following Sub-Domains are used in this document:

Sub-Domain	Description
DPI	Departure Planning Information

Note: This allows for defining requirements for other users/systems than DPI.

- (4) The following sub-sub-Domains are used in this document:

Sub-Sub-Domain	Description
GEN	General DPI requirements
EDPI	Early DPI message
TDPI	Target DPI message (T-DPI-t)
TDPIs	Target DPI-s message (T-DPI-s)
ADPI	ATC DPI
CDPI	Cancel DPI message

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SEQ	Sequence of DPI messages
DEICING	De-Icing

## 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 NMOC:
- (2) Doc Ref 4: Airport CDM manual – Edition 5.0, dated March 2017.

### 2.2 NMOC

- (1) NMOC referenced documents **shall** take precedence over any referenced external documents wherever conflict arises between them. The following documents are referenced within this document:
- (2) Doc Ref 1: Flight Progress Messages, ref URB/USD/MSG\_INTF, Edition 2.400, author Hans Koolen, dated 01/08/2017.
- (3) Doc Ref 2: DPI Implementation Road Map, ref URB/USD/DPI\_FUM\_Impl\_RM, Edition 1.900, author Hans Koolen, dated 01/08/2017.
- (4) Doc Ref 3: NM B2B web services reference manuals  
The NM B2B web services reference manuals are published in the Eurocontrol One-SKY teams B2B library. Access to the library can be requested to [NM.customersupport@eurocontrol.int](mailto:NM.customersupport@eurocontrol.int). More info can also be found on “[www.eurocontrol.int/services/nm-b2b-web-services](http://www.eurocontrol.int/services/nm-b2b-web-services)”
- (5) Doc Ref 4: NM B2B web services – Use cases, Business documentation – Flight Management, Edition 0.102, author Benjamin Queval, dated 08/05/2017
- (6) Doc Ref 5: ATFCM Operations Manual, Network Operations Handbook, Edition 21.0, author(s) S. Niarchakou, J. Simón Selva, dated 03/05/2017

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## 3 DPI Introduction

### 3.1 Airport CDM Implementation Manual

- (1) The overall Airport CDM process is described in the Airport CDM Implementation Manual (Doc Ref 4). This document also describes the link between the CDM implementation milestones and the transmission of DPI messages.
- (2) The DPI Implementation Guide describes the DPI messages with all the required and available details.
- (3) To be able to place the DPI messages in the appropriate CDM context, it is highly recommended to read the relevant parts in the Airport CDM Implementation Manual. This will also ease the reading and understanding of the DPI Implementation Guide.
- (4) The DPI messages shall be triggered based upon the milestone approach as described in the Airport CDM Implementation manual (see Doc Ref 4).

### 3.2 Objectives

- (1) The overall objective of the DPI messages is to better coordinate ATFCM with CDM Airport operations in order to ensure on time update of the flight data, more consistent slot calculation and improve slot adherence. Four phases have been identified which require coordination with ATFCM:
- (2) Planning phase: CDM Airport schedule and flight plan estimates must be re-conciliated and consistent information must be sent to NMOC. Ghost flights and duplicated flights shall be suppressed. A first evaluation of the realistic taxi-time and SID will be indicated to NMOC in order to make a more realistic calculation of the ATFM slot.
- (3) Turn-around phase: based on the flight connection, a more realistic estimate of the Off Block time will be available based on the arrival time of the inbound flight and turnaround time. It generally results in the creation and accurate maintenance of the Target Off-Block Time (TOBT) by AOs and handlers.
- (4) Pre-sequencing: 30-40min before the TOBT, the flight is included in the ATC pre-departure sequence which will result in a Target Start-up Approval Time (TSAT). For regulated flights, the TSAT takes the ATFM slot into account.
- (5) ATC phase: At engine start-up clearance delivery, the flight is handed over to the tower for push-back, taxiing and take-off. Local control units (ATC/Apron) will ensure that the flight goes off-blocks and takes-off as close as possible to the local target times (TSAT, TTOT).
- (6) At any time during these four phases a change in the CDM Airport operating conditions may alter the taxi-time and/or SID.
- (7) In order to be described as a CDM Airport an airport should have a proper CDM procedure at the airport level with the appropriate mandate and a clear defined role agreed by all involved partners (AOs, Airport Authority and ANSPs). The mandate of this CDM Airport must clearly describe the project management responsibilities as well as the operational responsibilities in particular as far as ATC & ATFCM procedures are concerned. For more details see Doc Ref 4.

### 3.3 Benefits of DPI/FUM messages

#### 3.3.1 Introduction

- (1) The purpose of FUM is to make NMOC partners aware of the situation of a given flight, in particular regarding the Estimated LanDing Time, through a message that can be automatically processed.

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- (2) The purpose of DPI is to make NMOC and its partners (i.e. ATC Units, AOs, airports of destination,...) aware of the situation of a given flight in respect of the pre-departure phase, in particular with regard to the Take-Off-Time (TOT), through a message that can automatically be processed.

### **3.3.2 Benefits**

- (1) The messages are a way for the CDM Airports and the ATFCM process to be integrated, supporting therefore the management of the network. They contribute to the common picture of the network situation, facilitating its understanding and further decision making.
- (2) They allow the NMOC to better know the CDM Airport constraints for a given flight and to take them into account in its own processes.
- (3) They allow the CDM Airport to have a better knowledge of the traffic to its destination and to take it into account in its own processes.
- (4) They allow a best adjustment between CDM Airport and ATC capacity.
- (5) Although intended for exchanging messages between systems, they are short messages that can be used directly by persons, and also rather easily integrated in systems.
- (6) They provide more accurate timing of the traffic enabling automatic processes such as slot allocation to be more effective.
- (7) They improve the short term forecast of the traffic situation.
- (8) They enable airlines to get a better view of their respective fleet situation before the departure of the flights.
- (9) They will support the management of critical situation at CDM Airports and the impact on other actors.

## **3.4 Pre-requisites**

### **3.4.1 General**

- (1) Before reading the following summary description of the DPI messages, the following pre-requisites must be known and well understood.
- (2) DPI messages can be sent by Airport CDM systems and ATC systems. Such systems will have to be adapted in order to be able to output DPI messages.
- (3) DPI messages are messages that will be automatically generated by such systems. In general, no human operator should be requested to type or input DPI messages.

### **3.4.2 Minimum Requirements / DPI Readiness Criteria**

- (1) Before starting the transmission of DPI messages to the NMOC, the CDM Airport must provide evidence that it has reached an advanced stage of CDM implementation.
- (2) It shall show that it has fulfilled the criteria as specified in Doc Ref 2.
- (3) At that stage, several issues will be verified, e.g. verify the Slot Adherence behaviour and Departure Tolerance. See Doc Ref 2 for more details.
- (4) Also the interface details need to be recorded in a DPI Interface Control Document (DPI-ICD) and will comprise e.g. the source of Taxi-Time (EXOT)s and SIDs, the operational trigger events of DPI messages,...

## **3.5 Implementation and Operational Evaluation**

- (1) The next step is the implementation of the DPI by the Airport CDM system at the CDM Airport.

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- (2) After the implementation has been completed the transmission to an ETFMS test system can be started. The NMOC will perform an operational validation of the newly implemented DPI messages during a period which is agreed between the CDM Airport and the NMOC.
- (3) Only if the acceptance rate by ETFMS of these messages is considered to be high enough, a GoNoGo meeting will be organised. The transfer of DPI messages into operations will only take place after the DPI quality criteria are above the agreed NMOC acceptable values. The quality criteria are defined in Doc Ref 2.

## 3.6 IFPS Discrepancies

### 3.6.1 Description

- (1) The DPI messages are intended to supply ETFMS with flight data updates that are not to be obtained from AO's via IFPS.
- (2) However, there are three important flight plan (i.e. Aircraft Operator owned) fields that can be received via DPI messages. These fields are TOBT, Aircraft Type and Aircraft Registration.
- (3) In case one of these fields is received via a DPI message and it appears to be (significantly) different from the data received via IFPS, then ETFMS will report an IFPS discrepancy.
- (4) The AO can view IFPS Discrepancies on the CHMI and NOP portal or they can be retrieved via B2B. Such a discrepancy shall be solved by the AO by filing a DLA or CHG message to IFPS.

### 3.6.2 Procedural issues

- (1) The processing of the DPI message is acceptable under the assumption that any IFPS discrepancies will be shown to the Airport-CDM platform users (e.g. Apron/TWR controller).
- (2) The NMOC recommends that the pushback/start-up clearance is refused if any IFPS discrepancy has not been resolved at the moment of requested departure clearance.

### 3.6.3 Quality Control

- (1) When receiving A-DPIs, ETFMS will be able to check for remaining IFPS discrepancies. Remaining discrepancies will be part of the QC made on DPI for the transfer in operation. Acceptance criteria will be defined and included in the DPI SA.
- (2) If, during operations, the quality control of DPI messages and of any other parameter (e.g. adherence to ATFM slots) descends below the agreed NMOC acceptable values, the NMOC may decide to ignore/reject any DPI messages from that concerned originator (the following day). Note that the Interruption of DPI messages procedure is set out in Doc Ref 5.

## 3.7 Networks for transmission of DPI data

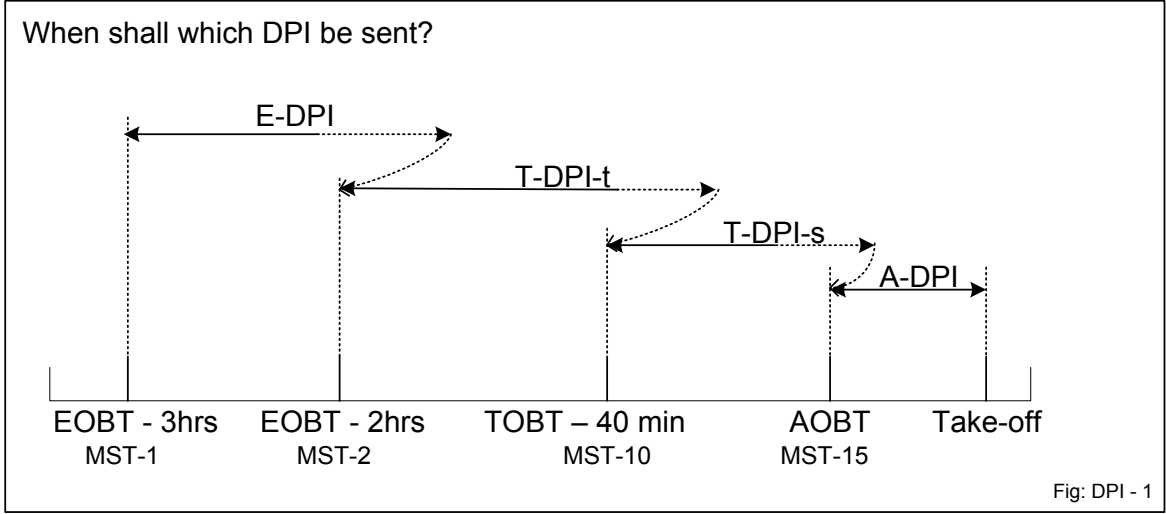
- (1) The DPI data can be transmitted either:
  - Via the AFTN network
  - Via NM B2B web services (Doc ref 3).

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## 4 Overview

- (1) The purpose of the Departure Planning Information (DPI) message is to supply the NMOC with flight data related updates that are only available from sequencing tools (e.g. DMAN), CDM Airport systems and TWR systems or data that is only available shortly before departure.
- (2) The DPI shall supply the NMOC with more recent and more accurate flight plan data than the data that is currently available from IFPS and that cannot be sent via IFPS.
- (3) The DPI message can be triggered by ATC (TWR) systems, by sequencing tools (e.g. DMAN) or by Collaborative Decision Making (CDM) systems at airports.
- (4) Airport CDM systems are systems where AOs, Ground handling Agencies, Airport authorities and ATC work in a collaborative way in order to handle the traffic in an optimised way.
- (5) The main data to be received via the DPI message are
  - an accurate estimation of the take-off time
  - the taxi-time (EXOT)
  - the SID
- (6) At CDM systems, at which the Aircraft Type and Registration are verified, the DPI message can also contain updates of:
  - the aircraft type
  - the aircraft registration
- (7) The DPI will be used by the NMOC to update the flight data for ATFCM purposes. An early accurate update of the flight data will improve the ATFM slot allocation process by reducing overloads, reducing bunching and additionally it may reduce the ATFM delay for other non-departed flights.
- (8) The data received via DPI messages will also be shared with ANSPs, AOs and Airports of Destination via the NMOC's Data Distribution Services.
- (9) There are six types of DPI messages, where each DPI message type gives a more accurate update of the flight. They are called:
  - E-DPI - Early DPI
  - T-DPI-t - Target DPI - Target
  - T-DPI-s - Target DPI - Sequenced
  - A-DPI - ATC DPI
  - C-DPI - Cancel DPI
 These DPI messages are described in more detail in the sections below.
- (10) The detailed operational procedures associated to DPIs for the co-ordination between ATFCM and CDM Airports are described in the ATFCM Operations Manual, Doc Ref 5.

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## 5 CDM Airport Information, Airline Information, DPISTATUS, DEPSTATUS

### 5.1 Description

[URE.ACDM.DPI.GEN.001]

- (1) The CDM Airport Information data fields, SID & Taxi-Time (EXOT) and the Airline Information data fields ARCTYP and REG **should** be included in DPI messages.

[URE.ACDM.DPI.GEN.002]

- (2) ETFMS will use the dpistatus-field to identify the type of DPI message. The contents of the dpistatus-field **shall** be as specified in Doc Ref 1. A summary is:

DPI-type	DPISTATUS
E-DPI	EARLY
T-DPI-t	TARGET
T-DPI-s	SEQ
A-DPI	ATC
C-DPI	CNL

- (3) ETFMS will use the depstatus-field to identify that the flight is subject to special circumstances at the airport.

### 5.2 Who (can send it)

- (1) For CDM Airport Information: An Advanced TWR system or CDM Airport system that can supply ETFMS with more accurate data than is currently available in ETFMS (which is a default value per runway).
- (2) For Airline Information: A CDM Airport or Advanced TWR system that can supply ETFMS with more accurate data than is currently available in ETFMS, which is data from IFPS.

### 5.3 When (can it be sent)

[URE.ACDM.DPI.GEN.003]

- (1) When these fields are included in DPI messages then corresponding DPI updates **shall** be sent when
  - The Taxi-Time (EXOT) changes by more than 3 Min
  - Any SID change
  - Any ARCTYP change
  - Any REG change
  - The TOBT field changes by 5 min or more
  - The TSAT field changes by 5 min or more

[URE.ACDM.DPI.GEN.004]

- (2) These fields **should** be included in any DPI message when these are sent for the reasons that are specified in the sections of the descriptions of the E-DPI, T-DPI-t, T-DPI-s, A-DPI and C-DPI messages.

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[URE.ACDM.DPI.GEN.005]

- (3) The depstatus-field **shall** be included in a DPI message as soon as it is known that the flight will be subject to special circumstances at the airport. For example, “-DEPSTATUS DEICING” can be included as soon as it is known that the flight has to be de-iced. This may only be known at shortly before off-block or sometimes several hours before off-block.

[URE.ACDM.DPI.GEN.006]

- (4) If a flight, that was previously subject to special circumstances, is no longer subject to these circumstances, an updated DPI message **shall** be sent. This DPI message shall no longer contain that depstatus-field.

[URE.ACDM.DPI.GEN.008]

- (5) If available, the TOBT-field **should** be provided. The purpose of this field is:
1. to inform ETFMS about the Target Off Block Time (TOBT)

[URE.ACDM.DPI.GEN.009]

- (6) If present, the tobt-field **shall** contain the Target Off Block Time, which is the time at which the aircraft is planned to be ready from an AO & Handling Agent perspective (doors closed and pushback truck available).
- (7) It shall only contain a very reliable and/or confirmed TOBT value. Such a reliable/confirmed value could be calculated when the aircraft is on final approach and/or it could be input by a Handling Agent,...
- (8) The TOBT could be considered as confirmed when for example it is:
- Input/provided by the AO or Handling Agent
  - automatically calculated and aircraft is on final, TMO
  - At ELDT -30min
  - At TSAT issue time

[URE.ACDM.DPI.GEN.010]

- (9) If available, the TSAT-field **should** be provided. The purpose of this field is:
1. to inform ETFMS about the Target Start-up Approval Time (TSAT)

[URE.ACDM.DPI.GEN.011]

- (10) If present, the tsat-field **shall** contain the Target Start-up Approval Time (TSAT), which is the time at which the aircraft can expect start-up clearance from TWR.
- (11) For all flights, but for ATFCM regulated flights in particular, it shall contain the TSAT that corresponds to the CTOT.
- (12) It must be noted that in cases of transmission of a “REA T-DPI-s” or a T-DPI-s with an “optimalTTOT”, this TSAT value is later then the TTOT value. This is considered as normal.

[URE.ACDM.DPI.GEN.014]

- (13) The TOBT and TSAT fields **shall** be provided by the TSAT issue time at the latest.

## 5.4 Acceptance rules

### 5.4.1 Technical

- (1) The CDM Airport Information and Airline Information fields are extracted from E-DPI, T-DPI-t, T-DPI-s and A-DPI messages.

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[URE.ACDM.DPI.GEN.007]

- (2) The sid-, taxitime-, arctyp-, reg-, dpistatus-, depstatus-, tobt- and tsat- fields **shall** be in accordance with the message-, field- syntax & semantic descriptions as specified in Doc Ref 1.

[URE.ACDM.DPI.GEN.012]

- (3) The TOBT field shall comply with the following acceptance rules:
- TOBT  $\geq$  EOBT - 45min
  - TOBT  $\leq$  EOBT + 240min
  - TOBT  $\leq$  TTOT (in the same E-DPI or T-DPI-t message only)
  - TOBT  $\leq$  clock + 240min
- (4) If not, the TOBT value will be ignored and also a previously received TOBT value will be erased. The rest of the DPI message will be processed.
- (5) When the TOBT value is ignored, the ETFMS oplog will contain a History message with the value "TOBT\_VALUE\_INVALID".
- (6) When an E-DPI, T-DPI-t or T-DPI-s message is received after EOBT (ETFMS OBT) - 40 minutes and it does not contain a TOBT field, an oplog History message "TOBT missing" will be created, even if a previous DPI contained a TOBT value.

[URE.ACDM.DPI.GEN.013]

- (7) The TSAT field for non-regulated flights shall comply with the following acceptance rules:
- A valid TOBT (as described above) shall be present in the same message
  - TSAT  $\geq$  TOBT - 15 min - DTW\_LowerBound\_Extension
  - TSAT  $\leq$  TTOT (in the same T-DPI-s message)
  - (There is no comparison between TSAT and TTOT in a T-DPI-t msg)
  - TSAT  $\geq$  clock - 10min
  - TSAT  $\leq$  clock + 240min
- (8) If not, the TSAT value will be ignored and also a previously received TSAT value will be erased. The rest of the DPI message will be processed.
- (9) When the TSAT value is ignored, the ETFMS oplog will contain a History message with the value "TSAT\_VALUE\_INVALID".
- (10) DTW\_LowerBound\_Extension is the value of the extension of the lower of the DTW (the value is zero if the regular window, i.e. [-15,+15], has not been extended).

[URE.ACDM.DPI.GEN.014]

- (11) The TSAT field for regulated flights shall comply with the following acceptance rules:
- A valid TOBT (as described above) shall be present in the same message
  - TSAT  $\geq$  TOBT - 15 min - STW\_LowerBound\_Extension
  - TSAT  $\leq$  CTOT + STW\_UpperBound\_Extension + 115min
  - TSAT  $\geq$  clock - 10min
  - TSAT  $\leq$  clock + 240min
- (12) If not, the TSAT value will be ignored and also a previously received TSAT value will be erased. The rest of the DPI message will be processed.
- (13) When the TSAT value is ignored, the ETFMS oplog will contain a History message with the value "TSAT\_VALUE\_INVALID".
- (14) STW\_Lower/UpperBound\_Extension are the values of the extension of the lower/upperbound of the STW (the values are zero if the regular window, i.e. [-5,+10], has not been extended).

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### 5.4.2 Quality

- (1) Not applicable.

## 5.5 How (does ETFMS use it)

### 5.5.1 Taxi-Time (EXOT)

- (1) The Taxi-Time (EXOT) is normally used to update the ETFMS filed demand (FTFM). These fields in T-DPI-s and A-DPI messages are normally only used to update the Actual Flight Model (CTFM).
- (2) The Taxi-Out-Time (EXOT) is considered to be the time between off-block and take-off, so including any waiting times such as e.g. runway delay and De-icing. It will be used to derive the OBT (internal to ETFMS) if the TTOT is specified.
- (3) The Taxi-Time will be used to derive a TOBT value after reception of a T-DPI-t message. This derived TOBT value is e.g. used in the acceptance criteria of the T-DPI-s and is required to compare it to the newEOBT from DLA messages.
- (4) The Taxi-Time (EXOT) will be used to derive the TTOT if no TTOT is specified in the E-DPI.
- (5) The Taxi-Time (EXOT) received via a DPI message can only be modified via another DPI message, not via an ENV runway update.
- (6) The Taxi-Time (EXOT) from a DPI message always prevails over other taxi-times.
- (7) The deterioration of a slot will be limited where the delay can be absorbed within the ATFM delay and slot tolerance window.

### 5.5.2 SID

- (1) The CDM Airport Data fields SID is normally used to update the ETFMS filed demand (FTFM). This field in T-DPI-s and A-DPI messages is normally only used to update the load (Actual Flight Model, CTFM).
- (2) The SID will not be used but stored for later use when none of its connecting points is on the route of the flight.
- (3) The value "DCT" in the sid-field is interpreted by ETFMS as direct TWR clearance to the first en-route point. Note that ETFMS only uses the DCT value if a relevant DCT-segment has been defined in the NMOC CACD system.
- (4) A waypoint name in the sid-field is interpreted by ETFMS as direct TWR clearance to the provided waypoint. Note that ETFMS only uses the waypoint if a DCT-segment has been defined in the NMOC CACD system between the Airport and the specified way-point.
- (5) Note that a DPI message is still accepted if SID field value cannot be used.
- (6) The SID received via a DPI message can only be modified via another DPI message, not via an ENV runway update and not via a CHG message. The SID from the DPI prevails.
- (7) The deterioration of a slot will be limited where the delay can be absorbed within the ATFM delay and slot tolerance window.

### 5.5.3 DPISTATUS & DEPSTATUS

- (1) The DPISTATUS-field is used to derive the type of DPI message.
- (2) If present in a DPI Message, ETFMS will use the depstatus-field for special processing of the flight (see section 10.4 Use of DPIs during Special Circumstances at the airport)

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#### **5.5.4 ARCTYP, REGistration**

- (1) The AO data fields ARCTYP and REG are stored and only used to show IFPS discrepancy reporting.
- (2) For the time being, the ARCTYP and REG-fields are not used to update the flight profiles in ETFMS. This may be a future extension.
- (3) The ARCTYP and REGistration fields shall only contain values that have been confirmed/verified by the AO and/or Ground handlers.
- (4) In the future, this will allow the NMOC to file CHG messages on behalf of the AO in case the ARCTYP or REGistration in the ICAO flight plan is incorrect or missing.

##### **5.5.4.2 TOBT**

- (1) ETFMS will use the TOBT value to display on CHMI and NOP portal flight displays. This is particularly useful for AOs when their flight is at a CDM Airport which is an outstation for them.
- (2) It is important to note that the AOs must update their flight plan EOBT via DLA or CHG messages in case there is a difference of more than 15min between the EOBT (from IFPS) and the TOBT value in the DPI message.
- (3) An AO may also request NM to automatically file a DLA message in case the TOBT in a DPI message is more than 15min after the EOBT of the flight plan 11.8 EOBT Update Service for A-CDM departures.
- (4) Note that the provision of a tobt-field in T-DPI-s messages is particularly useful for non-regulated flights. For such flights the network (including AOs) are currently not aware of the cause of the new TTOT (TSAT delay only or TOBT and TSAT delay).

##### **5.5.4.3 TSAT**

- (1) ETFMS will use the TSAT value to display on CHMI and NOP portal flight displays. This is particularly useful for AOs when their flight is at a CDM Airport which is an outstation for them.
- (2) Note that a tsat-field in all T-DPI-s messages is particularly useful for regulated flights departing from airports that provide a T-DPI-s message with an "optimal TTOT". The tsat-field will contain the real-TSAT (i.e. the TSAT that corresponds to the CTOT) while the TTOT will be the earliest possible take-off time and it may be before the TSAT value.

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## 6 E-DPI

### 6.1 Description

#### 6.1.1 Message

[URE.ACDM.DPI.EDPI.001]

- (1) The transmission of an E-DPI **shall** confirm to NMOC that an airport slot and flight plan for a particular flight have been correlated in accordance with local rules at the airport (A-CDM Mile stone 1).
- (2) The E-DPI will allow (in the future) eliminating ghost flights and duplicated flight plans.
- (3) When no airport slot can be found or when the flight plan EOBT is not consistent with the airport slot SOBT, the AO shall be informed (by the A-CDM platform) and the E-DPI shall not be sent until the problem has been solved.
- (4) Possible reasons for not sending the E-DPI are:
  - No airport slot exists for the flight plan
  - The airport slot has already been assigned to another flight plan (ghost or duplicate flight plan)
  - The flight plan EOBT is (long) before the SOBT of the airport slot which is an indication that EOBT is made earlier to anticipate e.g. an ATFM delay.
- (5) E-DPI is also used to supply ETFMS with a first update of the Taxi-Time (EXOT) and SID (CDM Airport Information), the Aircraft Type and Registration and TTOT.

[URE.ACDM.DPI.EDPI.002]

- (6) The E-DPI **shall** be in accordance with the message-, field- syntax & semantic descriptions as specified in Doc Ref 1.

#### 6.1.2 Link to the A-CDM milestone approach

- (1) The DPI messages shall be triggered based upon the milestone approach as described in the Airport CDM Implementation manual (see Doc Ref 4).
- (2) The transmission of the E-DPI shall be linked to Milestone – 1.
- (3) The E-DPI shall be transmitted in case there are outstanding IFPS discrepancies (EOBT-TOBT, Aircraft Type, REGistration).
- (4) This allows the NMOC to inform the AO community of the discrepancy via CHMI, NOP portal, Data Distribution Service,...
- (5) The AO at the OCC may decide to file a DLA or CHG or may even delegate the DLA filing to the NMOC.

#### 6.1.3 Fields

##### 6.1.3.1 TTOT

[URE.ACDM.DPI.EDPI.003]

- (1) This TTOT **shall** be part of the E-DPI to indicate the first estimate of the Take-Off Time of the Airport CDM system.
- (2) The purpose of the TTOT field is to:

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1. Inform ETFMS about the most accurate TOT available.
2. Give ETFMS advanced warning about an EOBT change (EOBT=TTOT-Taxi-Time (EXOT)).

[URE.ACDM.DPI.EDPI.004]

- (3) The TTOT **shall** be based upon the most accurate time available at that moment. Usually it is the flight plan EOBT+EXOT but it could also be a TOBT+EXOT or an EIBT+MTTT+EXOT if already available.

[URE.ACDM.DPI.EDPI.005]

- (4) The TTOT-field **shall** contain the best known take-off-time of the flight WITHOUT taking any ATFM delay (CTOT) into account.

### 6.1.3.2 SOBT & SOBD

[URE.ACDM.DPI.EDPI.006]

- (1) The E-DPI **should** also contain the SOBT-field and the SOBD-field. The purpose of these fields is:
  1. to inform ETFMS about the airport Scheduled Off Block Date & Time (SOBD & SOBT)

[URE.ACDM.DPI.EDPI.007]

- (2) If present, the SOBT and SOBD fields **shall** contain the airport Scheduled Off Block Date & Time, which is the time coordinated with the national airport slot coordinator. For example, for passenger flights, this is usually the time that the passenger has on his ticket.
- (3) For flights that are exempted from having an airport slot, the SOBT and SOBD fields shall be omitted. An example of such flights is Ambulance flights.
- (4) It is important to note that the AOs must update their flight plan EOBT via DLA or CHG messages in case there is a difference of more than 15min between the EOBT (from IFPS) and the TTOT - EXOT from the E-DPI.

## 6.2 Who (can send it)

[URE.ACDM.DPI.EDPI.008]

- (1) The E-DPI without a TTOT **should** be sent by Advanced ATC TWR systems that can provide ETFMS with more accurate data than the data that can currently be obtained from IFPS or NMOC ENV data.

[URE.ACDM.DPI.EDPI.009]

- (2) The E-DPI that contains a TTOT **shall** only be sent by Airport CDM systems.

## 6.3 When (can it be sent)

[URE.ACDM.DPI.EDPI.011]

- (1) The first E-DPI **shall** be sent after EOBT – 3 hours.

[URE.ACDM.DPI.EDPI.010]

- (2) For CDM Airports, the E-DPI **shall** be sent after verification of the airport slot with the flight plan EOBT.

[URE.ACDM.DPI.EDPI.012]

- (3) For Advanced ATC TWR airports, the E-DPI **should** be sent between EOBT – 3 hours and take-off or until the transmission of the A-DPI message (whichever comes first or is available).

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[URE.ACDM.DPI.EDPI.013]

*Requirement deleted because it was equal to URE.ACDM.DPI.EDPI.010*

[URE.ACDM.DPI.EDPI.014]

- (4) Updates of E-DPI **shall** be sent when the TTOT changes by 5 min or more compared to the previously provided TTOT via E-DPI.

[URE.ACDM.DPI.TDPIS.023]

- (5) Updates of E-DPI **should** be sent when the TOBT is available and changes by 5 min or more.

## 6.4 Acceptance rules

[URE.ACDM.DPI.EDPI.015]

*Requirement deleted because it was equal to URE.ACDM.DPI.EDPI.011*

[URE.ACDM.DPI.EDPI.016]

- (1) The E-DPI **should**<sup>1</sup> also be sent when the flight is suspended. This applies to ATFCM suspensions such as suspensions due to closed airspace, FAM,...
- (2) The E-DPI is rejected for IFPS suspensions with comment "FLIGHT IS SUSPENDED BY IFPS REVALIDATION". IFPS suspended the flight due to an invalid flight plan. Flights with invalid flight plans shall not take place.

[URE.ACDM.DPI.EDPI.017]

- (3) The TTOT **shall** be between (EOBT + Min\_TT – 45 min) and (ETFMS\_OBT/COBT + Max\_TT + 180min).
- (4) If it is not, the E-DPI is rejected with "PROVIDED TAKE OFF TIME OUT OF BOUNDS".
- (5) The ETFMS\_OBT is the last known OBT in ETFMS so it is IFPS\_OBT possibly updated, with E-DPI, T-DPI-t, REA,... The COBT = CTOT – taxi-time.
- (6) Min\_TT / Max\_TT are the minimum / maximum of the current taxi time of FTFM and the new taxi time from DPI message that is being validated.

[URE.ACDM.DPI.EDPI.018]

- (7) The TTOT **should** only be included in an E-DPI when the flight is a "CDM-flight" (address dependent)

[URE.ACDM.DPI.EDPI.019]

- (8) Requirement removed.

[URE.ACDM.DPI.EDPI.020]

- (9) The TTOT **shall** be inside the window around the clock; the TTOT shall be between:  
clock – 10 min and  
clock + 300min + Max\_TT + DTW/STW\_UpperBound
- (10) If it is not, the E-DPI is rejected with "PROVIDED TAKE OFF TIME OUT OF BOUNDS".

<sup>1</sup> This is a "should" requirement to allow the CDM-airport to request AOs to send an IFPS message to resolve the suspension.



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When is the TTOT of the E-DPI accepted or used?

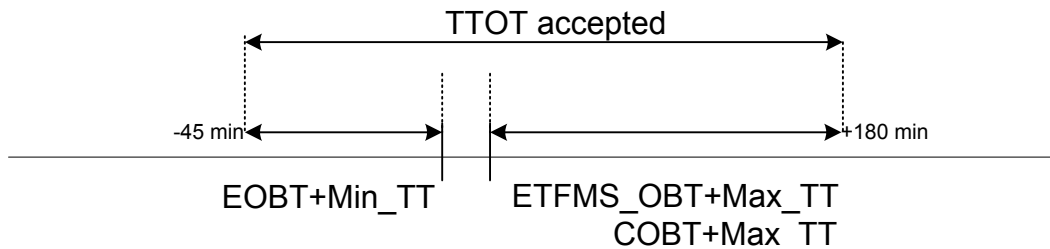


Fig: DPI - 2

## 6.5 How (does ETFMS use it)

- (1) ETFMS uses the TTOT to update the Filed Demand (FTFM).
- (2) ETFMS will re-assess the impact of the E-DPI on the ATM network.
- (3) Furthermore ETFMS shows an IFPS Discrepancy (see section 3.6 IFPS Discrepancies) if the provided TOBT is outside a window of +/- 15 min around the EOBT (IFPS OBT).
- (4) Any ATFCM suspension conditions will be re-assessed. If the flight remains or becomes suspended, the Estimated Flight Model (FTFM) becomes the reference and it is based upon the TTOT of the E-DPI. ETFMS will (re-)send an FLS after EOBT-2hrs (SIT1).
- (5) Flight Activation Monitoring (FAM) may start shifting at the TTOT and may suspend 30 min (default value) after the TTOT if no further information is received for the flight.
- (6) In case of a suspension due to IFPS revalidation the DPI is rejected and an FLS is NOT resent.
- (7) The CDMSTATUS is set to "e – estimated" if the E-DPI is accepted.
- (8) Initially, the SOBT and SOBD fields will be used for off-line evaluation purposes only. ETFMS will parse this field and will not base any logic upon the SOBT/SOBD.
- (9) After reception of the first E-DPI, ETFMS will apply the "first-planned first-served" principle on a time derived from this first E-DPI. This derived time (called ETFMS\_CASA\_ref\_time) is set to the latest of the IFPS\_OBT and the EOBT in this E-DPI message. This applies only to E-DPI from A-CDM Airports.
- (10) ETFMS will use the depstatus-field to verify if the provided TTOT may be inside an extended STW or extended DTW. See sections 11.2 The STW and the DTW and 10.4 Use of DPIs during Special Circumstances at the airport for more information.
- (11) In a first release, ETFMS will only use the TOBT for evaluation purposes. It will not be used for updating flight data.

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## 7 T-DPI-t

### 7.1 Description

#### 7.1.1 Message

[URE.ACDM.DPI.TDPI.001]

*Requirement deleted because it was equal to URE.ACDM.DPI.TDPI.007.*

- (1) The T-DPI-t message must contain the Target Take-Off Time (TTOT) that takes into account all constraints from an AO and Handling Agent perspective. This TTOT is the Target take-off time, which is known by the Airport CDM system.
- (2) The T-DPI-t is considered as a confirmation of the TTOT by the AO/CDM Airport and ETFMS will use it to re-assess the network impact.

[URE.ACDM.DPI.TDPI.002]

- (3) Requirement removed.

[URE.ACDM.DPI.TDPI.003]

- (4) A T-DPI-t **shall** be used to provide ETFMS with the latest confirmed TTOT (TOBT+EXOT).

[URE.ACDM.DPI.TDPI.004]

- (5) The T-DPI-t **shall** be in accordance with the message-, field- syntax & semantic descriptions as specified in Doc Ref 1.

#### 7.1.2 Link to the A-CDM milestone approach

- (1) The DPI messages shall be triggered based upon the milestone approach as described in the Airport CDM Implementation manual (see Doc Ref 4).
- (2) The transmission of the first T-DPI-t shall be at Milestone 2. Updates shall be sent when necessary, e.g. at the milestones 3 – 9. Dependent on the status of the flight updates could be sent up to 10min before milestone 14.

#### 7.1.3 Fields

##### 7.1.3.1 TTOT

[URE.ACDM.DPI.TDPI.005]

- (1) The TTOT-field **shall** contain the best known earliest take-off-time from an Aircraft Operator/Handling Agent point of view of the flight WITHOUT taking any ATFM delay (CTOT) into account.

[URE.ACDM.DPI.TDPI.006]

*Requirement deleted because it was equal to URE.ACDM.DPI.TDPI.007.*

[URE.ACDM.DPI.TDPI.007]

- (2) The TTOT is calculated by the CDM turn-around and **shall** take all known constraints such as; the ELDT from the previous leg, the flight connection, crew connection, passenger connections, the estimated turn-around process, etc...into account. It is usually based upon the Target Off-Block Time (TOBT) + EXOT.

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## 7.2 Who (can send it)

- (1) T-DPI-t messages will only be accepted from airport CDM systems.

## 7.3 When (can it be sent)

[URE.ACDM.DPI.TDPI.008]

- (1) Requirement removed.

[URE.ACDM.DPI.TDPI.009]

- (2) The T-DPI-t message **shall** be sent when the sending Airport CDM system has established the TTOT as specified in section 7.1.2 Link to the A-CDM milestone approach above and when it can be published to NMOC.

[URE.ACDM.DPI.TDPI.010]

*Requirement deleted because it was equal to URE.ACDM.DPI.TDPI.007.*

[URE.ACDM.DPI.TDPI.011]

- (3) The first T-DPI-t message **shall** not be sent earlier than 2 hours before EOBT and not later than 2 hours after EOBT.

[URE.ACDM.DPI.TDPI.012]

- (4) Updates of T-DPI-t **shall** be sent when the TTOT changes by 5 min or more compared to the TTOT in the previous T-DPI-t.

[URE.ACDM.DPI.TDPI.021]

- (5) Updates T-DPI-t **should** be sent when the TOBT or TSAT are available and change by 5 min or more compared to a previously provided TOBT or TSAT.

## 7.4 Acceptance rules

### 7.4.1 Pre-requisites

- (1) The T-DPI-t will only be accepted on the ETFMS operational system if the Quality control parameters are above a pre-defined level. An example of such a QC parameter could be Slot-Adherence shall be above an agreed value (e.g. 80%). See Doc Ref 2 for more details.

### 7.4.2 Technical

- (1) The purpose of these validation rules is to identify TWR or Airport CDM system bugs and wrong ATC/Airport controller system inputs (activation of wrong flight plan).

[URE.ACDM.DPI.TDPI.013]

- (2) Requirement combined with requirement URE.ACDM.DPI.TDPI.011.

[URE.ACDM.DPI.TDPI.014]

- (3) The TTOT **shall** be between EOBT + Min\_TT – 45 min and ETFMS\_OBT/COBT + Max\_TT + 120 min.
- (4) If it is not, the T-DPI-t is rejected with “PROVIDED TAKE OFF TIME OUT OF BOUNDS”.
- (5) The EOBT is the latest EOBT provided by IFPS, taking into account the FPL message and any DLA or CHG messages. The COBT = CTOT – taxi-time.
- (6) Min\_TT / Max\_TT are the minimum / maximum of the current taxi time of FTFM and the new taxi time from DPI message that is being validated.

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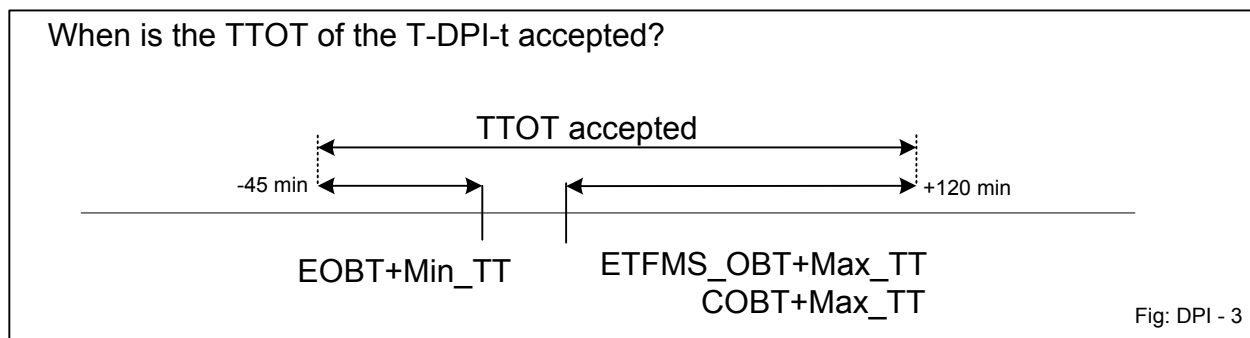
- (7) ETFMS\_OBT is the last received EOBT from IFPS, possibly updated by the flow controller and possibly updated by E-DPI messages, T-DPI-t messages, REA, ....

[URE.ACDM.DPI.TDPI.015]

- (8) The T-DPI-t **shall** be sent when the flight is suspended. This applies to ATFCM suspensions such as suspensions due to closed airspace, FAM,...
- (9) The T-DPI-t message is rejected for IFPS suspended flights. IFPS suspended the flight due to an invalid flight plan. Flights with invalid flight plans shall not take place.

[URE.ACDM.DPI.TDPI.016]

- (10) The TTOT **shall** be inside the window around the clock; the TTOT shall be between:  
clock – 10 min and  
clock + 240 min + Max\_TT + DTW/STW\_UpperBound
- (11) If it is not, the T-DPI-t is rejected with “PROVIDED TAKE OFF TIME OUT OF BOUNDS”.



## 7.5 How (does ETFMS use it)

- (1) ETFMS will use the TTOT to update the Filed Demand (FTFM).
- (2) ETFMS will re-assess the impact of the T-DPI-t on the ATM network.
- (3) Furthermore ETFMS will show an IFPS Discrepancy (see section 3.6 IFPS Discrepancies ) if the provided TOBT is outside a window of +/- 15 min around the EOBT (IFPS OBT).
- (4) Any ATFCM suspension conditions will be re-assessed. If the flight remains or becomes suspended, the Estimated Flight Model (FTFM) becomes the reference and it is based upon the TTOT of the T-DPI-t and ETFMS will (re-)send an FLS.
- (5) In case of a suspension due to IFPS revalidation the DPI is rejected and an FLS is NOT resent.
- (6) Flight Activation Monitoring (FAM) may start shifting at the TTOT and may suspend 30 min (default value) after the TTOT if no further information is received for the flight.
- (7) The CDMSTATUS is set to “t – targeted” if the T-DPI-t is accepted.
- (8) The Flight will get the status RFI automatically regardless what the ENV settings for the AO concerned are and regardless of any previously received ATFCM message.
- (9) A SWM message is rejected from that moment onwards because it does not seem to be very logical for departures from a CDM Airport. The update of the TOBT is the best solution to inform all concerned.
- (10) ETFMS will use the depstatus-field to verify if the provided TTOT may be inside an extended STW or extended DTW. See sections 11.2 The STW and the DTW and 10.4 Use of DPIs during Special Circumstances at the airport for more information.

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- (11) The TOBT and TSAT value are used for display on CHMI and NOP portal and are output via B2B web-services and EFD messages. The tobt-field and tsat-field are not used for updating the flight profiles.

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## 8 T-DPI-s

### 8.1 Description

#### 8.1.1 Message

[URE.ACDM.DPI.TDPIS.001]

- (1) A T-DPI-s **shall** contain the Take-Off-Time as calculated by the Pre-Departure Sequence. This Take-Off-Time (target take-off-time) is included in the TTOT-field.
- (2) The input for the Pre-departure Sequence are the TOBT+Taxi-Time (EXOT) (for non regulated flights), the CTOT (for regulated flights) and any CDM Airport constraints. The output of the Pre-Departure Sequence is the Target Start-up Approval Time (TSAT).
- (3) The provision of the TSAT + Taxi-Time (EXOT) will be most beneficial in circumstances where there are big differences between the TOBT and the TSAT, which will often be the case during special circumstances at the CDM Airport such as reduction in runway capacity, de-icing, use of MDI's,...
- (4) It may be possible that a CDM Airport also creates an Optimal-Pre-Departure Sequence. This Optimal Pre-Departure Sequence is based upon the TOBT+Taxi-Time (EXOT) for all flights, including regulated flights. The purpose of the Optimal Pre-Departure Sequence is to determine the earliest possible TOT for regulated flights, solely based upon CDM Airport/ATC constraints.
- (5) This Optimal Pre-Departure Sequence is used to provide ETFMS with an Optimal\_TTOT for regulated flights. This is the earliest possible TOT, taking all CDM Airport/ATC constraints into account. The Optimal\_TTOT is very useful for ETFMS and Airport CDM, especially if it is after TOBT + Taxi-Time (EXOT) and before CTOT, because it will prevent that ETFMS provides a CTOT that cannot be met due to (significant) CDM Airport constraints. ETFMS will make the flight REAdy for improvement automatically and will try to advance the CTOT up to the provided TTOT.

[URE.ACDM.DPI.TDPIS.002]

- (6) The T-DPI-s **shall** be in accordance with the message-, field- syntax & semantic descriptions as specified in Doc Ref 1.

#### 8.1.2 Link to the A-CDM milestone approach

- (1) The DPI messages shall be triggered based upon the milestone approach as described in the Airport CDM Implementation manual (see Doc Ref 4).
- (2) The transmission of the first T-DPI-s could be at milestone 10 and updates should then be sent up-to milestone 11-14. Please note further details in the sections below.
- (3) A dedicated T-DPI-s could be sent at milestone 12 to inform NMOC that the flight reported to be ready.

#### 8.1.3 Fields

##### 8.1.3.1 TTOT for non-regulated flights

[URE.ACDM.DPI.TDPIS.003]

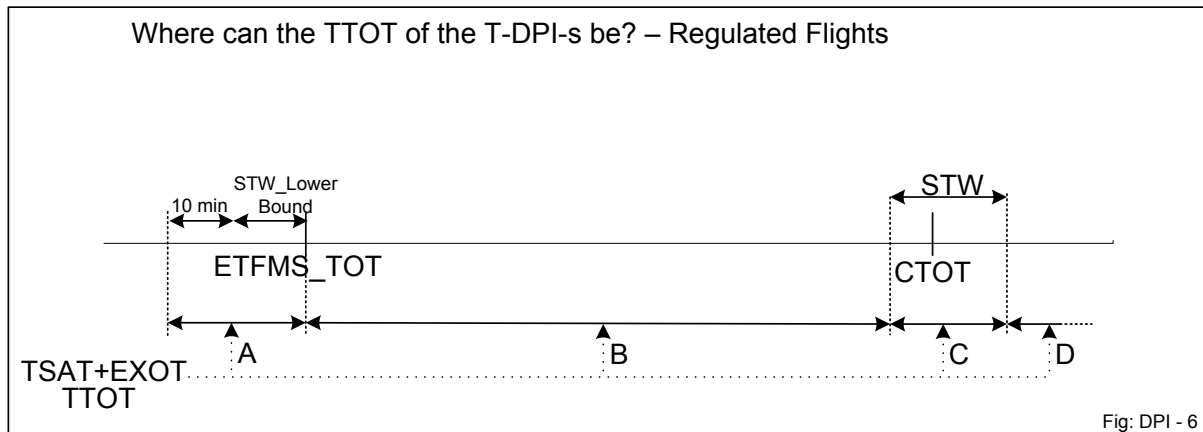
- (1) For non-regulated flights, the TTOT-field **shall** contain the take-off-time as calculated by the Pre-Departure Sequencer, it is the Target Start-up Time (TSAT) + Taxi-Time (EXOT).

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### 8.1.3.2 TTOT for regulated flights

[URE.ACDM.DPI.TDPIS.004]

- (1) For regulated flights, the TTOT-field **shall** contain the best known take-off-time of the flight WITH or WITHOUT taking any ATFM delay (CTOT) into account.
- (2) The graph below shows four different cases, illustrated by the letters A, B, C or D.



[URE.ACDM.DPI.TDPIS.005]

- (3) When the Airport CDM no longer wants to obtain any improvements to the ATFM slot (CTOT) then a T-DPI-s with a TTOT which is inside the Slot Tolerance Window (STW) **shall** be sent. In this case, the TTOT-field contains the TSAT + Taxi-Time (EXOT). This is illustrated as “case C” in graph “Fig DPI -6” above.
- (4) For more information on STW and DTW, see section 11.2 The STW and the DTW .

[URE.ACDM.DPI.TDPIS.006]

- (5) In case the flight cannot make its ATFM slot, i.e. the TTOT is after the STW, then the CDM Airport **shall** inform the NMOC via an updated TTOT. This is illustrated as “case D” in graph “Fig DPI -6” above.

[URE.ACDM.DPI.TDPIS.007]

- (6) In case the CDM Airport wants to prevent that ETfms advances the CTOT up-to a time that is before the STW, then the CDM Airport **shall** send an updated T-DPI-s. This is shown in “case B” in graph “Fig DPI -6” above in which the TTOT does not take the CTOT into account. The TTOT is from the optimal pre-departure sequence and it provides the earliest possible TOT, taking all CDM Airport/ATC constraints into account. This earliest possible TOT is also referred to as the no-slot-before time or as the Optimal\_TTOT.
- (7) This may also be used to inform NMOC that the flight has reported REAdy.

[URE.ACDM.DPI.TDPIS.021]

- (8) In case the flight is ready to off block shortly before its TOBT, then a T-DPI-s with a TTOT before the TTOT of the last T-DPI-t should be sent. This is illustrated as “case A” in graph “Fig DPI -6” above.
- (9) For further details see also section 8.5 How (does ETfms use it).

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## 8.2 Who (can send it)

- (1) T-DPI-s messages will solely be accepted from Airport CDM systems.

## 8.3 When (can it be sent)

### 8.3.1.1 All flights

[URE.ACDM.DPI.TDPIS.008]

- (1) Updates of T-DPI-s **shall** normally be sent when the TTOT changes by 5 min or more compared to the TTOT in the last provided T-DPI-s.
- (2) However during e.g. adverse conditions the TSAT-TOBT differences may increase, taxi-time values may also be longer and the pre-departure sequence may become less accurate and possibly instable. For this reason, it is proposed to decrease the accuracy of the update window if TTOT is “far” in the future in accordance with the following proposal:

Note that by TTOTs is meant, the “TTOT of the T-DPI-s”.

- (3) In case the start-up delay is more than 90min then the update accuracy of the TTOTs should be +/-15min. If however, the TSAT is less then 90min in the future, then the TTOTs accuracy is back to normal, i.e +/-5min.
- (4) In such cases, also an increased taxi-time accuracy window of +/- 8min can be applied.
- (5) More formal this means:  
If TSAT-TOBT > 90min and TSAT-current\_time>90min  
Then  
    TTOTs\_accuracy\_window is +/- 15min  
    Taxi-time accuracy window is +/- 8min.  
Else  
    TTOTs\_accuracy\_window is +/- 5min  
    Taxi-time accuracy window is +/- 3min.  
Endif

[URE.ACDM.DPI.TDPIS.026]

- (6) Updates of T-DPI-s **should** be sent when the TOBT or TSAT are available and change by 5 min or more compared to the TOBT or TSAT respectively in the last provided T-DPI-s.
- (7) The TSAT accuracy\_update window shall be increased in accordance with what is specified in [URE.ACDM.DPI.TDPIS.008] above.

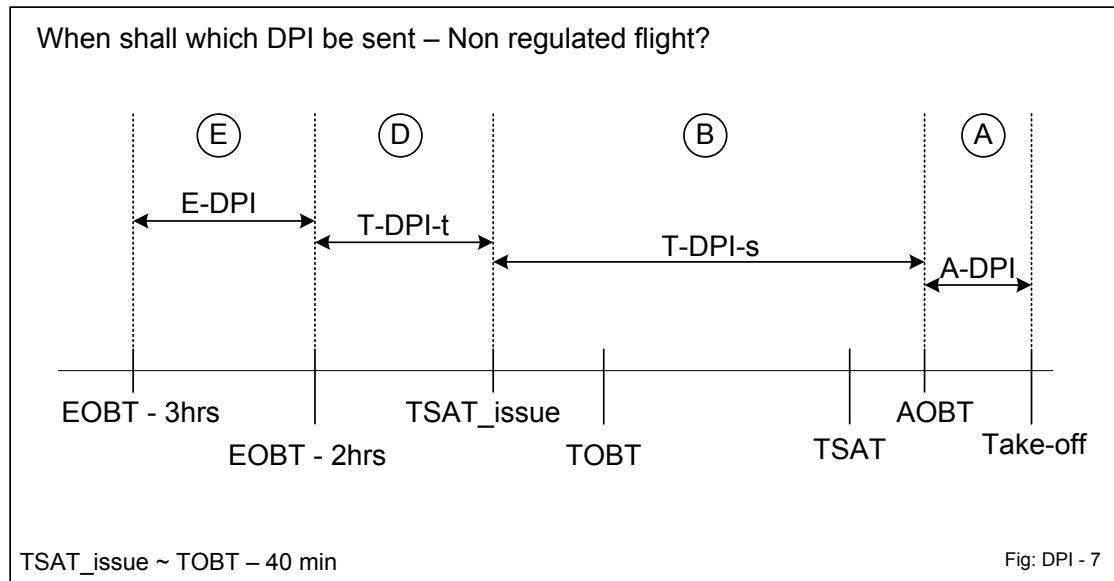
### 8.3.1.2 Non-regulated flights

[URE.ACDM.DPI.TDPIS.009]

- (1) The T-DPI-s message **shall** be sent when the Airport CDM system has included the flight in the pre-departure sequence, i.e. when the TSAT is issued to the NMOC. The flight is normally included in the pre-departure sequence approximately 30-40 min before the TOBT.
- (2) This shown by period “B” in the diagram “Fig: DPI – 7” below.



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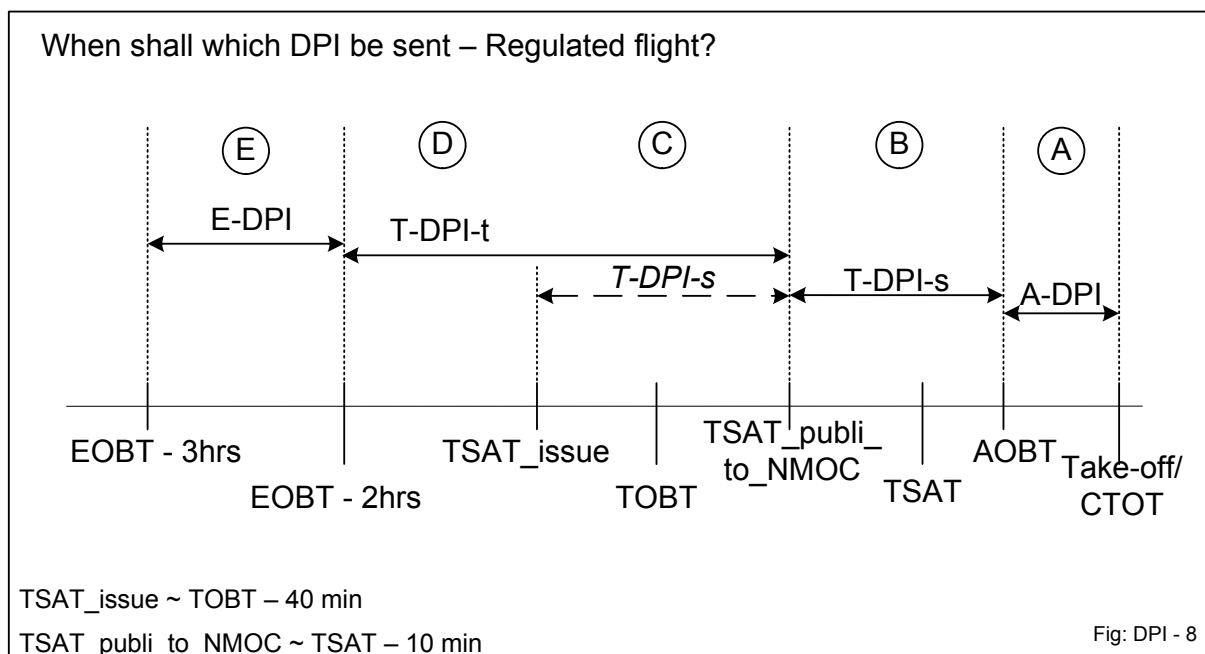


### 8.3.1.3 Regulated flights

- (1) The T-DPI-s message could be sent when the Airport CDM system has included the flight in the pre-departure sequence, i.e. when the TSAT is issued to the NMOC.
- (2) However, the Airport CDM must take the processing of this TTOT in ETFMS into account for determination of the most appropriate time/event.

[URE.ACDM.DPI.TDPIS.010]

- (3) An overview is shown by periods “C” and “B” in the diagram “Fig: DPI – 8” below.



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- (4) The above graph makes a distinction between TSAT\_issue\_time and TSAT\_publi\_to\_NMOC\_time:  
The TSAT\_issue\_time is the time when the TSAT is published to all partners at the airport such as pilots, handlers,...  
The TSAT\_publi to NMOC time is the time when the TTOT, which is based upon the TSAT, is published/provided to the NMOC.  
For regulated flights, the TSAT\_issue\_time is usually different from the TSAT\_publi\_to\_NMOC\_time.
- (5) The CDM Airport **shall** send the T-DPI-s to the NMOC at TSAT\_publication\_to\_NMOC\_time. This is shown by period “B” in the diagram “Fig: DPI – 8” above. The TSAT\_publication\_to\_NMOC\_time could e.g. be TSAT-10min or the start-up-given event.

[URE.ACDM.DPI.TDPIS.011]

- (6) During period “C” in the diagram “Fig: DPI – 8” above, the T-DPI-s:
- shall** be sent as soon as it is known that TSAT+EXOT will be after the STW. The earlier ETFMS is provided with this information the bigger the chances are that ETFMS can adjust the CTOT to the provided TTOT. This is illustrated as “case D” in graph “Fig: DPI – 6” in section 8.1.3.2.
  - shall** be sent when Airport CDM no longer wants ETFMS to improve/advance the CTOT. This is usually 5-10 min before the TSAT or at start-up clearance issue but in special circumstances, this may be earlier. This is illustrated as “case C” in graph “Fig: DPI – 6” in section 8.1.3.2.

[URE.ACDM.DPI.TDPIS.012]

- (7) If the Airport CDM calculates an Optimal Pre-Departure Sequence, the T-DPI-s for regulated flights **shall also** be sent (see “case B” in graph “Fig: DPI – 6” in section 8.1.3.2) when both below conditions have been met:
- If the difference between TOBT+EXOT and the Optimal\_TTOT is bigger than SYSPAR (5 min)
  - When the Airport CDM wants to inform ETFMS about the earliest possible TOT, taking into account any Airport CDM constraints, excluding the CTOT. In this case the Optimal\_TTOT may be well before the STW but not earlier than the TOBT+EXOT.
- (8) In case the flight requires De-icing, a T-DPI-s with a TTOT=TOBT+taxitime+deicing\_time may be sent to provide ETFMS with a no-slot-before to prevent a CTOT advancement at a time when De-icing is not yet finished. This can also be considered as an optimal TTOT (see section “10.4 Use of DPIs during Special Circumstances at the airport” for more details).

## 8.4 Acceptance rules

### 8.4.1 pre-requisites

- (1) The T-DPI-s will only be accepted on the ETFMS operational system if the Quality control parameters are above a pre-defined level. An example of such a QC parameter could be Slot-Adherence shall be above an agreed value (e.g. 75%). The quality criteria are defined in Doc Ref 2.

### 8.4.2 Technical

- (1) The purpose of these validation rules is to identify TWR or CDM system bugs and wrong ATC/Airport controller system inputs (activation of wrong flight plan).

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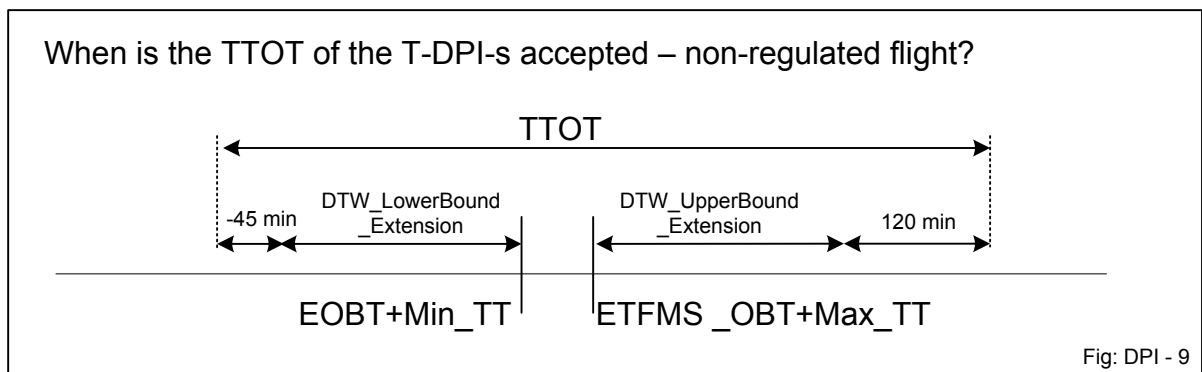
- (2) The “correctness” of an operational decision of Airport CDM staff shall be questioned by quality control actions, if necessary online.

[URE.ACDM.DPI.TDPIS.013]

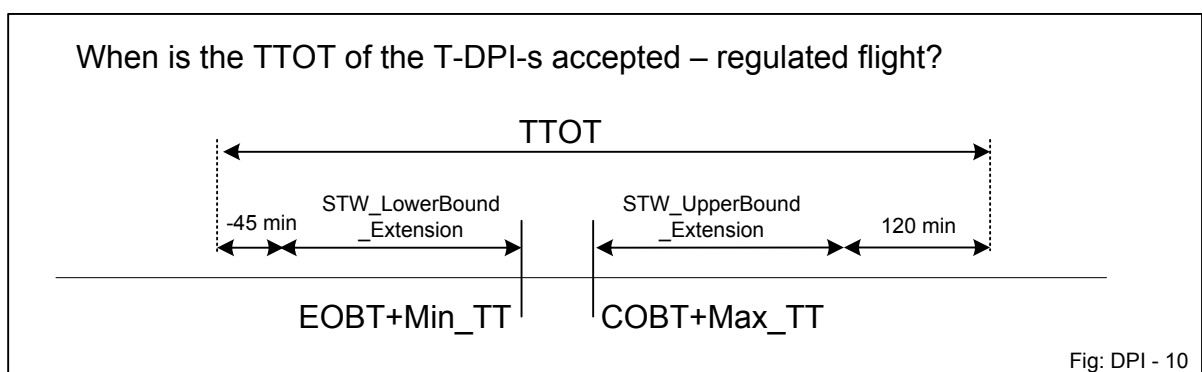
- (3) The T-DPI-s **shall** never be sent earlier than last received (TOBT or EOBT\_from IFPS) – 40min.
- (4) An earlier received T-DPI-s message is rejected with “MESSAGE RECEIVED TOO EARLY OR TOO LATE”.

[URE.ACDM.DPI.TDPIS.014]

- (5) The TTOT of the T-DPI-s for non-regulated flights **shall** be between:  
 $EOBT + Min\_TT - DTW\_LowerBound\_Extension - 45 \text{ min}$  and  
 $ETFMS\_OBT + Max\_TT + DTW\_UpperBound\_Extension + 120 \text{ min}$



- (6) The TTOT of the T-DPI-s for regulated flights **shall** be between:  
 $EOBT + Min\_TT - STW\_LowerBound\_Extension - 45 \text{ min}$  and  
 $COBT + Max\_TT + STW\_UpperBound\_Extension + 120 \text{ min}$



- (7) If it is not, the T-DPI-s is rejected with “PROVIDED TAKE OFF TIME OUT OF BOUNDS”.
- (8) The ETFMS\_OBT is the Off-Block-Time in the ETFMS “filed” flight model, i.e. the last received OBT, derived from the last received DLA, CHG, E-DPI, T-DPI-t, REA,... (derived OBT in DPI msg is TOT – last-received-taxi-time).
- (9) Min\_TT / Max\_TT are the minimum / maximum of the current taxi time of FTFM and the new taxi time from DPI message that is being validated.

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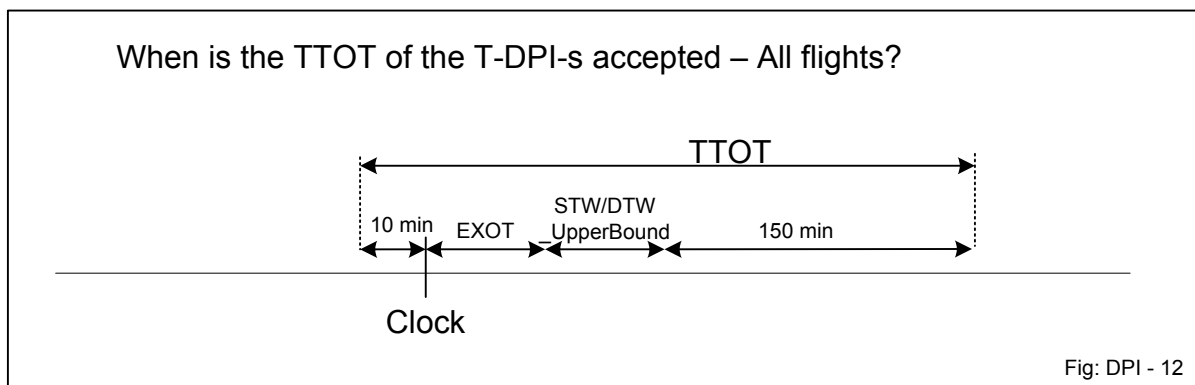
- (10) DTW/STW\_Lower/UpperBound\_Extension are the values of the extension of the lower/upperbound of the DTW/STW (the value is zero if the regular window, i.e. [-5,+10], has not been extended).

[URE.ACDM.DPI.TDPIS.015]

- (11) The T-DPI-s **shall** be sent when the flight is suspended by ATFM.

[URE.ACDM.DPI.TDPIS.020]

- (12) The TTOT of non-regulated flights **shall** be inside the window around the clock; the TTOT shall be between:  
clock – 10min and  
clock + EXOT + DTW\_UpperBound + 150 min
- (13) The TTOT for regulated flights **shall** be inside the window around the clock; the TTOT shall be between:  
clock – 10min and  
clock + EXOT + STW\_UpperBound + 150 min
- (14) If it is not, the T-DPI-s is rejected with “PROVIDED TAKE OFF TIME OUT OF BOUNDS”.



## 8.5 How (does ETFMS use it)

### 8.5.1 General

- (1) ETFMS will store the provided TTOT (TSAT+ Taxi-Time (EXOT)) as a no-slot-before time.
- (2) Note that this no-slot-before time will be kept by ETFMS. It will only be removed at the reception of a C-DPI message.
- (3) ETFMS will not use the TTOT of a T-DPI-s to check an IFPS EOBT Discrepancy (see section 3.6 IFPS Discrepancies), but it will use the TOBT field value.
- (4) ETFMS will use the Slot Tolerance Window (STW) and Departure Tolerance Window (DTW) for the processing of T-DPI-s messages. See section 11.2 The STW and the DTW for further details.
- (5) ETFMS will use the depstatus-field to verify if the provided TTOT may be inside an extended STW or extended DTW. See sections 11.2 The STW and the DTW and 10.4 Use of DPIs during Special Circumstances at the airport for more information.

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- (6) The TOBT and TSAT value are used for display on CHMI and NOP portal and are output via B2B web services and EFD messages. The tobt-field and tsat-field are not used for updating flight profiles.

### 8.5.2 Non-regulated flights

- (1) The Take-Off-Time of the Estimated Flight Model (FTFM) is based upon the flight plan (FPL, DLA, CHG) and updates of E-DPI, T-DPI-t,...
- (2) If the TTOT (TSAT+Taxi-Time (EXOT)) is inside the Departure Tolerance Window (DTW) around the take-off-time of the Estimated Flight Model (FTFM) then
  - Regulations Crossed and Suspension Conditions are not assessed
  - Traffic Load is updated through the creation of the Actual Flight Model (CTFM) based upon the TTOT
  - The CDMSTATUS is set to "s – (pre-)sequenced".
- (3) If the TTOT (TSAT+ Taxi-Time (EXOT)) is after the Departure Tolerance Window (DTW) around the take-off-time of the Estimated Flight Model (FTFM) then
  - Regulations Crossed and Suspension Conditions are assessed
  - For further details see 8.5.5 General Processing.
- (4) If the TTOT (TSAT+ Taxi-Time (EXOT)) is before the Departure Tolerance Window (DTW) around the take-off-time of the Estimated Flight Model (FTFM) then the TTOT is ignored. It is however stored for possible future use.

### 8.5.3 Suspended flights

#### Suspension by ATFM:

- (1) Suspension conditions and regulations crossed are (re)-assessed.
- (2) If the flight remains suspended, the FLS message is re-sent.
- (3) If the flight becomes de-suspended, then a DES or SAM message is sent.

#### Suspension due to IFPS re-validation:

- (4) If the flight is suspended due to IFPS re-validation then the T-DPI-s is rejected with ERR "FLIGHT SUSPENDED DUE TO IFPS REVALIDATION".

### 8.5.4 Regulated flights

- (1) When the TTOT (TSAT+EXOT) is before the TTOT of the last T-DPI-t then (see "case A" in graph "Fig: DPI – 6" in section 8.1.3.2): TTOT is used to update the Estimated Flight Model (FTFM) and it will overwrite the TTOT of the last received T-DPI-t.
- (2) When the TTOT (TSAT+EXOT) is equal or between the TTOT of the last T-DPI-t and the LowerBound of the STW then (see "case B" in graph "Fig: DPI – 6" in section 8.1.3.2): TTOT is only stored for possible future use as a no-slot-before time and the Actual Flight Model (CTFM) is removed if it existed.
- (3) In this case, the flight will receive the REA status and ETFMS will try to improve the CTOT up-to the provided no-slot-before time at regular intervals. ETFMS will also use the no-slot-before time when the regulation-schema is modified.
- (4) When the TTOT (TSAT+EXOT) is inside STW then (see "case C" in graph "Fig: DPI – 6" in section 8.1.3.2): the Traffic Load is updated through the creation or update of the Actual Flight Model (CTFM). The REA status will be removed and ETFMS will no longer provide any CTOT improvements and the flight may be impacted by modifications of the regulation schema.

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- (5) When the TTOT (TSAT+EXOT) is after the STW then (see “case D” in graph “Fig:DPI – 6” in section 8.1.3.2): regulations crossed and suspension conditions are (re-) assessed.
- (6) In this case, the flight may get the status REA if the newCTOT-STW\_LowerBound is after provided TTOT (TSAT+EXOT).
- (7) For further details see 8.5.5 General Processing.
- (8) Currently the TTOT of the T-DPI-s is ignored if:
  - The TTOT > STW
  - The T-DPI-s is received after ETFMS\_OBT/AOBT – TRS value AND
  - The flight is no longer entering the regulated sector at the provided TTOT (OUT\_REG)
 This is to prevent the regulated – non-regulated ping pong effect. (it is expected that this rule will change in a next ETFMS SW release).

### 8.5.5 General Processing

- (1) The TTOT (TSAT+ EXOT) is always stored for (possible future) use as a no-slot-before time.
- (2) If the flight remains/becomes non-regulated/no-longer-suspended then: Traffic Load is updated through the creation or update of the Actual Flight Model (CTFM). An SLC or DES is sent if necessary. The CDMSTATUS is set to: “s-sequenced”.
- (3) If the flight remains/becomes ATFM suspended then: The Estimated Flight Model (FTFM) is the reference and an FLS is sent or re-sent.
- (4) If the flight becomes regulated or the CTOT changes then:
  - a) if TTOT (TSAT+EXOT) < newSTW then: SAM/SRM is sent and NMOC expects a new T-DPI-s at the appropriate moment which contains a TTOT that is based upon the newCTOT. The CDMSTATUS is set to “e-estimated” or “t-targeted” dependent if the last received DPI message was an E-DPI or a T-DPI-t. The flight will get the status REA.
  - b) if TTOT (TSAT+EXOT) inside newSTW then: Traffic Load is updated through the creation or update of the Actual Flight Model (CTFM) and SAM/SRM is sent. The CDMSTATUS is set to: “s-sequenced”. The flight will not get the status REA because it does not require improvements anymore.

Note that in this case it will not be possible that the TTOT is after the newSTW because ETFMS uses the TTOT as the earliest possible TOT for searching a new CTOT.

- (5) Flight Activation Monitoring (FAM) may start shifting at the TTOT and may suspend 30 min (default value) after the TTOT if no further information is received for the flight.
- (6) Any Taxi-Time (EXOT) in the T-DPI-s is used to create the Actual Flight Model (CTFM). It will also be stored with the Estimated Flight Model (FTFM) for use in case a re-calculation is required for the FTFM.
- (7) Any SID in the T-DPI-s is used to create the Actual Flight Model (CTFM). It will also be stored with the Estimated Flight Model (FTFM) for use in case a re-calculation is required for the FTFM.
- (8) When the CTOT was already manually forced and a new T-DPI-s message is received with the TTOT after STW of the forced CTOT, this T-DPI-s is rejected and an ERR message is sent: "REJECTED DUE TO FORCED CTOT AND TTOT AFTER STW". This means that a forced CTOT will not be overruled by a T-DPI-s subsequently received.
- (9) Note that CTOTs can be forced upon:
  - decision of the Flow Controller
  - an ATFM Slot swap on request of the AO
  - application of a Mandatory Cherry Pick (MCP) regulation
  - ...

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## 8.6 Additional requirements for Airport CDM

[URE.ACDM.DPI.TDPIS.016]

- (1) Airport CDM **shall** be aware that the TTOT (TSAT+Taxi-Time (EXOT)) is always kept by ETFMS and used as a no-slot-before time. It can be changed by a new T-DPI-s. It is only removed by a C-DPI. The CDM Airport **shall** take this into account for sending DPI message updates.

[URE.ACDM.DPI.TDPIS.017]

- (2) A newCTOT that is received after a T-DPI-s **shall** be confirmed by a new T-DPI-s which is in accordance with the newCTOT. This is not required when the previously provided TTOT is still inside the newSTW. A new T-DPI-s shall of course be provided at a time that is in accordance with the newly provided CTOT (e.g. at newTSAT-10min).
- (3) Note: Taxi-Time (EXOT) and SID from the T-DPI-s are initially only used to update the Actual Flight Model (CTFM). Only in case that the Estimated Flight Model (FTFM) has to be updated (for other reasons, the SID and Taxi-Time (EXOT) are reflected in the Estimated Flight Model (FTFM).

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## 9 A-DPI

### 9.1 Description

#### 9.1.1 Message

[URE.ACDM.DPI.ADPI.001]

*Requirement removed.*

- (1) The purpose of the A-DPI is to inform ETFMS that the flight has off-blocked, i.e. the flight is “under ATC (or Apron) control” and taxiing to take-off.

[URE.ACDM.DPI.ADPI.002]

- (2) The A-DPI message **shall** supply a reliable estimate of the Take-Off Time, in the TTOT-field from AOBT till 10-30 min before take-off.

[URE.ACDM.DPI.ADPI.003]

- (3) The A-DPI **shall** be in accordance with the message-, field- syntax & semantic descriptions as specified in Doc Ref 1.

#### 9.1.2 Link to the A-CDM milestone approach

- (1) The DPI messages shall be triggered based upon the milestone approach as described in the Airport CDM Implementation manual (see Doc Ref 4).
- (2) The transmission of the first A-DPI shall be at milestone 15 and updates should then be sent up-to milestone 16.

#### 9.1.3 Fields

##### 9.1.3.1 TTOT

[URE.ACDM.DPI.ADPI.004]

- (1) The A-DPI **shall** supply ETFMS with an estimate of the actual take-off-time in the Target Take-Off-Time (TTOT)-field.

[URE.ACDM.DPI.ADPI.005]

- (2) In case of a regulated flight the TTOT **shall** take into account the CTOT and **shall** be inside the Slot Tolerance Window (-5 to +10 min) see section 11.2 The STW and the DTW for more details.

### 9.2 Who (can send it)

- (1) The A-DPI can be sent by Airport CDM systems and advanced airport TWR systems.

### 9.3 When (can it be sent)

[URE.ACDM.DPI.ADPI.006]

- (1) The first A-DPI **shall** be sent at the off-block event/push-back clearance delivery. This is considered the moment when the TTOT is reliable & stable enough to inform ETFMS.



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[URE.ACDM.DPI.ADPI.007]

- (2) If the TTOT changes by 5 min or more compared to the previously provided A-DPI a new A-DPI **shall** be sent.

[URE.ACDM.DPI.ADPI.008]

- (3) In case the flight is using a remote-hold procedure and has to off-block in order to free a stand and to wait elsewhere on the airport for CTOT improvements, the transmission of the A-DPI **shall** be postponed until Airport CDM no longer wish to receive any CTOT improvements for the flight (see also “10.3 Remote Holding (Push & Hold procedure)” section for more details).

## 9.4 Acceptance rules

### 9.4.1 pre-requisites

- (1) The A-DPI will only be accepted on the ETFMS operational system if the Quality control parameters are above a pre-defined level. An example of such a QC parameter could be Slot-Adherence shall be above an agreed value (e.g. 80% in normal circumstances).
- (2) It must be well understood that the A-DPI is the end of a process which is the management of EOBT/TOBT by the AOs. All measures should be taken before to comply with the CTOT. This should be done using the T-DPI-t and T-DPI-s if available or the DLA.

### 9.4.2 Technical

- (1) The purpose of these validation rules is to identify TWR or CDM system bugs and wrong ATC/Airport controller system inputs (activation of wrong flight plan).
- (2) The “correctness” of an operational decision of TWR controller shall be questioned by quality control actions. If necessary on-line.

[URE.ACDM.DPI.ADPI.009]

- (3) The A-DPI **shall** not be sent when the flight is suspended (both ATFM and IFPS suspensions). The A-DPI is rejected with “FLIGHT IS SUSPENDED” because a flight is not supposed to off-block when it is suspended.
- (4) An A-DPI is accepted when the flight was suspended by a C-DPI, i.e. “SUSPENDED BY DEPARTURE AIRPORT”.

[URE.ACDM.DPI.ADPI.010]

- (5) The A-DPI for non regulated flights **shall** be sent between:  
 (ETFMS\_TOT – EXOT - DTW\_LowerBound – 25 min)  
 And  
 ETFMS\_TOT – EXOT + DTW\_UpperBound + 140 min.
- (6) If it is not, the A-DPI is rejected with “MESSAGE RECEIVED TOO EARLY OR TOO LATE”.

[URE.ACDM.DPI.ADPI.011]

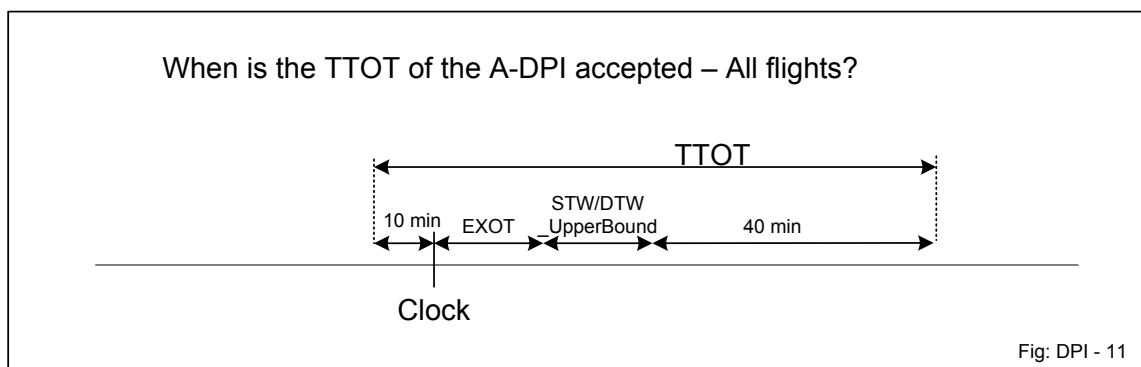
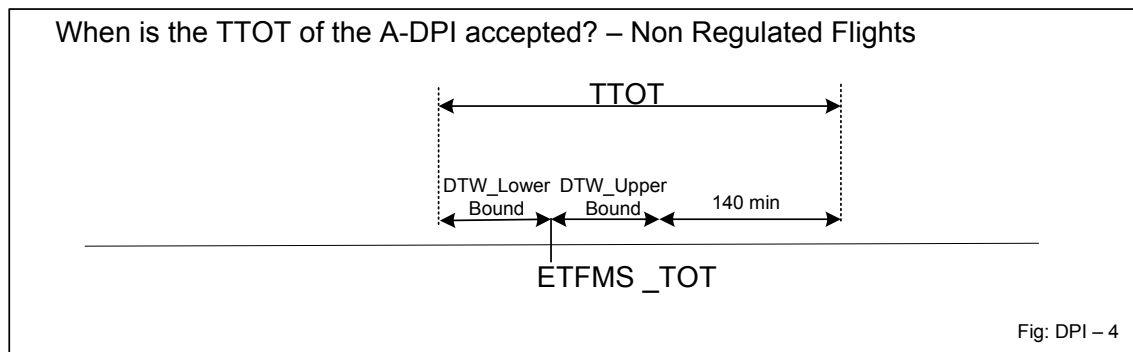
- (7) The TTOT of the A-DPI for non-regulated flights **shall** be between:  
 ETFMS\_TOT – DTW\_LowerBound and  
 ETFMS\_TOT + DTW\_UpperBound + 140 min  
 And  
 clock – 10 min and  
 clock + EXOT + DTW\_UpperBound + 40 min

ETFMS\_TOT = ETFMS\_OBT+EXOT

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The ETFMS\_OBT is the Off-Block-Time in the ETFMS “filed” flight model, i.e. the last received OBT, derived from the last received DLA, CHG, E-DPI, T-DPI-t, REA,....  
(derived OBT in DPI msg is TOT – last-received-taxi-time).

- (8) If it is not, the A-DPI is rejected with “PROVIDED TAKE OFF TIME OUT OF BOUNDS”.



[URE.ACDM.DPI.ADPI.012]

- (9) The A-DPI for regulated flights **shall** be sent between:  
(CTOT – EXOT - STW\_LowerBound – 25 min)  
And  
(CTOT - EXOT + STW\_UpperBound + 140 min).

- (10) If it is not, the A-DPI is rejected with “MESSAGE RECEIVED TOO EARLY OR TOO LATE”.

[URE.ACDM.DPI.ADPI.013]

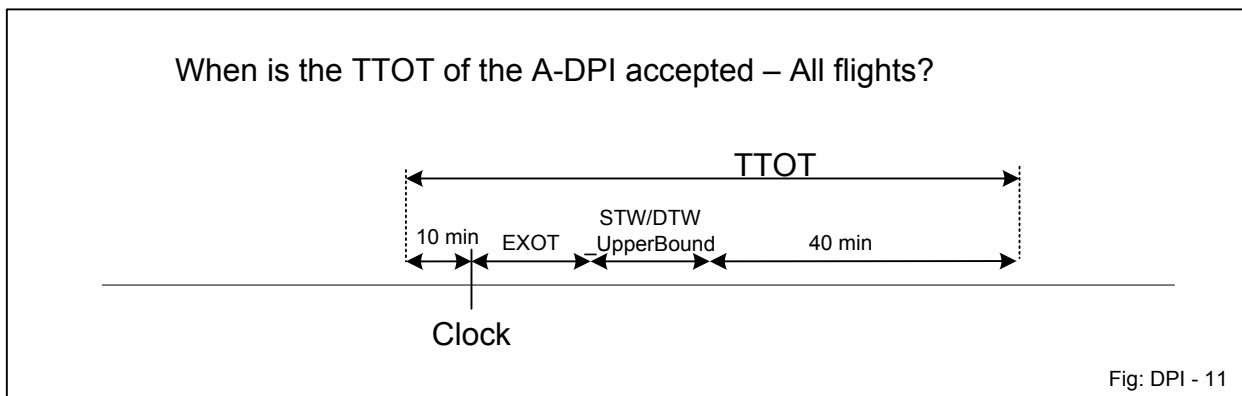
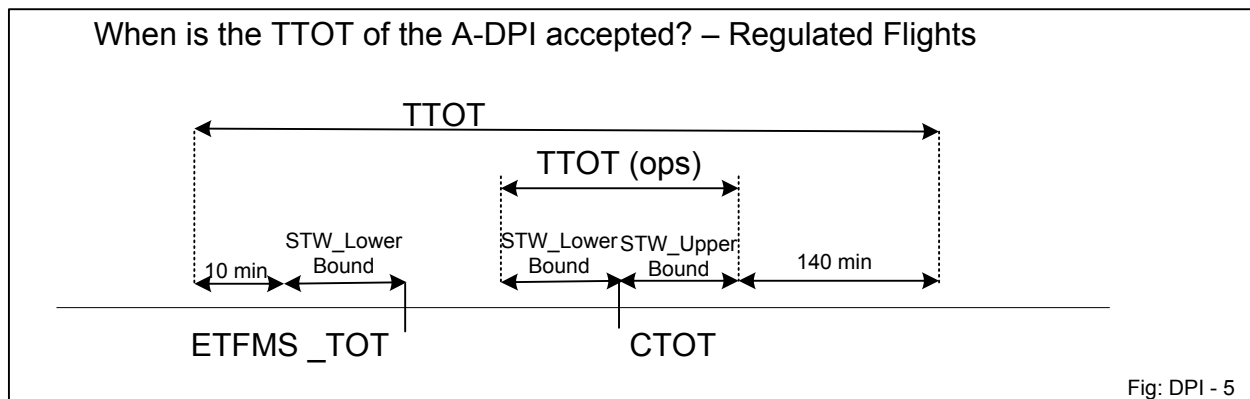
- (11) The TTOT of A-DPIs for regulated flights **shall** first of all be between:  
ETFMS\_TOT – STW\_LowerBound - 10 min and  
CTOT + STW\_UpperBound + 140 min  
AND  
clock -10 min and  
clock + EXOT + STW\_UpperBound + 40 min

- (12) If it is not, the A-DPI is rejected with “PROVIDED TAKE OFF TIME OUT OF BOUNDS”.

- (13) As a second check, the TTOT of A-DPIs for regulated flights **shall** be between:  
CTOT – STW\_LowerBound and  
CTOT + STW\_UpperBound  
(see section 11.2 The STW and the DTW for more details)

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- (14) If it is not, the A-DPI is rejected with “TTOT OUTSIDE SLOT TOLERANCE WINDOW”.
- (15) In the event that an error message "A-DPI rejected due to Slot Tolerance Window violation" is received by TWR ATCO, they should make every effort to let flight depart within its Slot Tolerance Window (-5, +10). If that is not possible for operational reasons, TWR ATCO shall contact NMOC ops and request CTOT extension.



## 9.5 How (does ETFMS use it)

- (1) ETFMS will use the TTOT to update/create the Actual Flight Model (CTFM) and place the flight at its ATO (ETO derived from the TTOT) in the slot list. As such, flights that have been updated with an A-DPI are reflected in the “load” graphs of ETFMS.
- (2) The ATFM slot will be frozen at the reception of an A-DPI and consequently any REA status will be removed.
- (3) IFPS will be informed about the “Actual Off-block state” of the flight and the IFPS Operator may decide to reject any DLA or CHG message.
- (4) Flight Activation Monitoring (FAM) may start shifting at the TTOT and may suspend 30 min (default value) after the TTOT if no further information is received for the flight.
- (5) ETFMS will use the depstatus-field to verify if the provided TTOT may be inside an extended STW. See sections 11.2 The STW and the DTW and 10.4 Use of DPIs during Special Circumstances at the airport for more information.
- (6) Any Taxi-Time (EXOT) in the A-DPI is used to create the Actual Flight Model (CTFM). It will also be stored with the Estimated Flight Model (FTFM) for use in case a re-calculation is required for the FTFM.

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- (7) Any SID in the A-DPI is used to create the Actual Flight Model (CTFM). It will also be stored with the Estimated Flight Model (FTFM) for use in case a re-calculation is required for the FTFM.

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## C-DPI

### 9.6 Description

#### 9.6.1 Message

- (1) The purpose of the C-DPI is to inform ETFMS that previously sent DPI information is no longer valid.
- (2) The C-DPI is a solution to manage unknown TTOTs for a single flight but not for an airport sequence issue.

[URE.ACDM.DPI.CDPI.001]

- (3) The C-DPI **shall** be in accordance with the message-, field- syntax & semantic descriptions as specified in Doc Ref 1.

#### 9.6.2 Fields

- (1) It is not logical for a C-DPI message to contain any update data such as SID or taxi time. However, if present, ETFMS will use these data fields to update its flight data.

[URE.ACDM.DPI.CDPI.003]

- (2) The reason-field of the C-DPI should contain one of the following values in order to specify why the C-DPI was sent and to clarify which action should be taken.

Reason value ADEXP / Reason value B2B	Possible transmission reasons	Possible Actions
NOAIRPORTSLOT / NO_AIRPORT_SLOT	The airport did not have an airport slot for the departure	AO to request an airport slot or to CNL the flight plan
TOBTUNKNOWNOREXPIRED / TOBT_UNKNOWN_OR_EXPIRED	The TOBT was deleted, the pilot did not request start-up or report ready in accordance with the procedures at the Airport, ...	AO/Handling Agent to update the TOBT, to file a DLA message, AO to CNL the flight plan,...
TSATEXPIRED / TSAT_EXPIRED	The pilot did not request start-up in accordance with the CDM procedures at the airport	AO/Handling Agent to update the TOBT, to file a DLA message, AO to CNL the flight plan,...
RETURNSTAND / RETURN_TO_STAND	After having started taxi, the flight returned back to stand/ramp	AO/Handling Agent to update the TOBT, to file a DLA message, to CNL the flight plan,...
FLIGHTPLANINVALID / FLIGHT_PLAN_INVALID	The discrepancy between TOBT and EOBT is larger than 15min (and needs to be resolved before start-up will be issued)	AO/Handling Agent to update the TOBT or send a DLA message
FLIGHTCANCELINAODB / FLIGHT_CANCEL_IN_AODB	Cancellation of the airport slot or Schedule before the ICAO FPL has been	Cancel ICAO flight plan

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	cancelled (CNL).	
OTHER / OTHER	Special value to be used when other C-DPI reason applies than the ones listed above. To be used until this other C-DPI reason is made official in NM systems	None

## 9.7 Who (can send it)

- (1) The C-DPI can be sent by Airport CDM systems and advanced airport TWR systems.

## 9.8 When (can it be sent)

[URE.ACDM.DPI.CDPI.002]

- (1) The C-DPI **shall** be sent at moments when a previously sent TTOT is no longer valid AND a new TTOT is not yet known. A typical example is a technical problem during taxiing when the Departure Clearance is revoked.
- (2) The C-DPI should typically be sent at:
  - TOBT deletion (e.g. after 3 modifications)
  - Flight did not call for start-up x min after TSAT
  - Flight has a technical problem after Actual Off Block and returns to stand

[URE.ACDM.DPI.CDPI.04]

- (3) The C-DPI **may** be sent when there is no airport slot for the flight. In this case the reason-field shall contain the value "NOAIRPORTSLOT".

[URE.ACDM.DPI.CDPI.05]

- (4) The C-DPI **may** be sent when the flight plan is considered as invalid by the airport. This could be the case when e.g. the TOBT > EOBT+15min. In this case the reason-field shall contain the value "FLIGHTPLANINVALID".

## 9.9 Acceptance rules

### 9.9.1 Technical

- (1) The C-DPI is only rejected if it is received more than 3hrs before EOBT.

### 9.9.2 Quality

- (1) None.

## 9.10 How (does ETFMS use it)

- (1) ETFMS will use the C-DPI to re-create the Filed Demand based upon the latest received IFPS information (EOBT likely already in the past !).
- (2) The Taxi-Time (EXOT), SID, ARCTYP and REG are not reset after a Cancel DPI.
- (3) The TOBT and TSAT fields are reset.
- (4) ETFMS will suspend the flight and an FLS message with comment "SUSPENDED BY DEPARTURE AIRPORT" will be sent.

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- (5) The CDMSTATUS is set to “c – departure from CDM airport” which is the initial value.

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## 10 Additional Info & Special Circumstances

### 10.1 Sequence of DPI messages

#### 10.1.1 Description

[URE.ACDM.DPI.SEQ.001]

- (1) For CDM Airports, the normal sequence of DPI messages **shall** be, first is an E-DPI, followed by a T-DPI-t, followed by a T-DPI-s and followed by an A-DPI.

[URE.ACDM.DPI.SEQ.002]

- (2) For non-CDM airports, the E-DPI message (without TTOT) **should** be sent until the A-DPI message is sent.

[URE.ACDM.DPI.SEQ.003]

- (3) The type of DPI message to be sent **shall** correspond to the progress status of the flight at the CDM Airport.

[URE.ACDM.DPI.SEQ.004]

- (4) For CDM Airports, a T-DPI-t or a T-DPI-s message **shall** be preceded by an E-DPI.

[URE.ACDM.DPI.SEQ.005]

- (5) The C-DPI **shall** not be sent if previously no other DPI message has been sent (for the flight concerned). The C-DPI is only rejected when no other DPI message has been received before.

[URE.ACDM.DPI.SEQ.006]

- (6) If the flight is becoming "valid" again (after e.g. transmission of a C-DPI) and a TTOT is known a new T-DPI-t or T-DPI-s **shall** be sent regardless which status had been reached before sending the C-DPI.
- (7) After the transmission of a C-DPI (flight is suspended), the AO/Ground Handler are expected to enter a new TOBT and a new E-DPI, T-DPI-t or T-DPI-s is expected. However in exceptional cases the A-DPI could also be sent for flights that are suspended by a C-DPI.

[URE.ACDM.DPI.SEQ.007]

- (8) Any update of the airport and airline information **shall** be sent in the last sent DPI message type (E-DPI, T-DPI-t, T-DPI-s or A-DPI), keeping the same (previously sent) TTOT if necessary.
- (9) In special cases (e.g. the flight has an unexpected delay after a T-DPI-t, T-DPI-s or an A-DPI has been sent), ETFMS expects the DPI message type that belongs to the new status of the flight (e.g. E-DPI or T-DPI-t). So a C-DPI is not mandatory before sending a DPI of an "earlier" type.
- (10) After the Airport CDM has issued the T-DPI-s to ETFMS, it is normally no longer required to provide TOBT+Taxi-Time (EXOT) updates in the form of a T-DPI-t. This will prevent the need to send 2 messages. It will only be useful to send a T-DPI-t again when the new TOBT is after the TSAT or when flight is taken out-of the pre-departure sequence.

### 10.2 Additional guidelines for Airport CDM

[URE.ACDM.DPI.SEQ.008]

- (1) If a non-regulated flight becomes regulated, the Airport CDM system **shall** not automatically send a T-DPI-s update other than a TTOT which is inside the STW. This is to avoid a



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regulated $\leftrightarrow$  non-regulated ping-pong effect. Manually triggered T-DPI-s messages (i.e. via user inputs) may always be sent.

[URE.ACDM.DPI.SEQ.009]

- (2) If a regulated flight becomes non-regulated, the Airport CDM system **shall** not automatically send a T-DPI-s update. This is to avoid a regulated $\leftrightarrow$  non-regulated ping-pong effect. Manually triggered T-DPI-s messages (i.e. via user inputs) may always be sent.

### 10.3 Remote Holding (Push & Hold procedure)

- (1) Some airports have a shortage of gates and they use procedures to free the gate as soon as the aircraft is ready to move.
- (2) In such cases, the aircraft is cleared to off-blocks and to move to a remote holding position, waiting for the next clearance to taxi to the runway.
- (3) It is assumed that this procedure is mainly applied for flights which have a “longer” ATFM delay (> 30-45min) compared to the TOBT.
- (4) In cases of Remote Holding, the normal transmission of DPI messages and the A-DPI at AOBT in particular, cannot be used because this would prevent the flight from receiving any possible CTOT improvements.
- (5) The following DPI transmission sequence is recommended:
  1. Send T-DPI-s  
This T-DPI-s shall be sent when the start-up clearance is given (ASAT) or at the AOBT event. The TTOT should be set to the earliest possible TTOT. For Airports providing an optimal\_TTOT/TSAT this time is provided by the pre-departure sequencer for other airports this is usually ASAT/AOBT+EXOT.  
This will provide ETFMS with the earliest possible TTOT, it will make the flight REAdy for improvement automatically and ETFMS will try to advance the CTOT up-to the provided TTOT.  
The taxi-time field shall contain the time from the gate/parking position to the runway, excluding the waiting time at the remote-hold.
  2. Send T-DPI-s update  
As soon as the flight has arrived at the remote hold, a new T-DPI-s shall be sent with an updated TTOT and an updated taxi-time. The taxi-time should be the time that is required to re-start the engines (if necessary) and to taxi from the remote hold to the runway. The TTOT should be set to clock + taxi-time or to optimal\_TTOT in order to provide ETFMS with the no-slot-before time.  
ETFMS will also use this updated/short taxi-time to calculate a minimum CTOT based upon the clock (minCTOT=clock+taxi-time) as soon as the provided TTOT is in the past.  
An updated T-DPI-s shall be sent if taxi-time changes or if TTOT changes for any other reason than changes of the clock.
  3. Send A-DPI  
When the flight is cleared to taxi from the remote hold to the runway, the A-DPI shall be sent. The trigger of this A-DPI could possibly be linked to the (new or 2<sup>nd</sup>) re-clearance to taxi.  
The taxi-time field shall contain the time from the remote hold position to the runway.
- (6) This sequence of DPI messages will ensure that ETFMS is informed about the earliest possible TTOT for the flight. It will make the flight REAdy for improvement and request ETFMS to provide CTOT improvements.

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## 10.4 Use of DPIs during Special Circumstances at the airport

### 10.4.1 Introduction

#### 10.4.1.1 General

- (1) The DPI messages will improve the cooperation between the CDM Airport and the NMOC/ETFMS during Special Circumstances at the airport.
- (2) It is the intention to improve the traffic predictability for ATFCM and to improve the stability of the departure sequence also during these difficult circumstances at the airport.
- (3) A compromise is needed between protecting the ATM network from over-deliveries and the prevention that the departure sequence of the flight is disturbed by ATFCM actions on the flight.
- (4) The DPI messages will indicate that the flight's departure is suffering from Special Circumstances by the inclusion of the depstatus-field.
- (5) For the time being, De-icing is the only Special Circumstance at the airport for which special procedures for DPI message transmission have been defined. This may evolve depending on experience and the requirements from CDM Airports.
- (6) A pre-requisite for using DPI messages in De-icing situations is that the Airport CDM **shall** be able to estimate the time it takes to de-ice (including the time it may take to line up for De-icing, to vacate the de-icing bay,...). This estimation **shall** be used to update the TTOT of DPI messages.

#### 10.4.1.2 Remote De-icing

- (1) In case of remote De-icing the aircraft will be ready to off-block at the TOBT, i.e. the TOBT is not influenced by De-icing.
- (2) The De-icing will be seen as part of the time between off-block and take-off, i.e. the time it takes to taxi.

#### 10.4.1.3 On-stand De-icing

- (1) For on-stand de-icing, the de-icing is planned to take place before off-block and is normally not considered as part of the taxiing time.
- (2) For on-stand de-icing, it is recommended to identify two TOBT values: TOBT and TOBT\_deice.
- (3) The TOBT is the time at which "normal" ground handling is finished, the doors are closed and de-icing could be started.
- (4) TOBT\_deice is the time at which de-icing is planned to be finished. It is also sometimes called EEZT (Estimated End of Deicing Time).
- (5) It is also a requirement and common practice that an aircraft that has been de-iced has to take-off as soon as possible and that the flight is included in the pre-departure sequence very close to the time that the De-icing is finished.
- (6) In order to prevent that NMOC/ETFMS impacts the pre-departure sequence for a flight under De-icing, a "late" update for de-icing should be prevented by updating the taxi times for flights as soon as possible and it may possibly be provided in a T-DPI-s message. For more information see section 10.4.4 Overview. Note that De-icing is the only exception to this rule.

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#### **10.4.1.1 General De-icing versus De-icing-on-request**

- (1) It is recommended to identify and process “General De-icing” and “De-icing on request” differently.

##### **General De-icing**

- (2) Based upon the weather forecast, it may be known well in advance that the majority of the flights are expected to require de-icing during a period of time.
- (3) In order to improve TTOT predictability and to increase the probability to have “on-time CTOT” it is recommended to extend the taxi-times with an average value for all departures within the specified period as soon as the weather forecast is available, preferably several hours before departure.

##### **De-icing upon request only**

- (4) When it is expected that only a minority of the departures requires de-icing, then the taxi-time should not be extended globally and should only be done after the de-icing has been requested.

#### **10.4.2 Significant reduction of Runway availability**

- (1) The Active Departure Runway may be changed regularly. This is normal operations and is normally taken into account by the pre-departure sequencer, i.e. in case of runway change, the pre-departure sequencer will sequence the flight(s) for the new active runway(s) and send T-DPI-s updates if necessary.
- (2) However, some special cases may happen and this may require special handling of the pre-departure sequencer and updating of DPI messages, mainly the T-DPI-s message.
- (3) The special cases that have been identified are:

##### **A) Temporary runway closure - short duration**

- (4) This may happen in e.g. snow removal cases. The RWY is closed for e.g. 10-20min. In such cases, the flights will probably not be re-sequenced to another RWY but they are sequenced after the re-opening time of the RWY.
- (5) If the aircraft is still at the gate, an updated T-DPI-s may have to be sent in accordance with the standard transmission rules as specified in section “8 T-DPI-s”.
- (6) If the aircraft is already taxiing, an A-DPI with an updated taxi-time and TTOT shall be sent.

##### **B) Temporary runway closure - longer duration**

- (7) This may happen due to e.g. an accident. The RWY is closed for e.g. 20-120min. In this case the flights will normally be re-sequenced to another RWY (if available).
- (8) If the aircraft is parked at the gate, an updated T-DPI-s may have to be sent in accordance with the standard transmission rules as specified in section “8 T-DPI-s” and also taking into account the special rules when TTOT is far in the future as described in section “8.3 When (can it be sent)”.
- (9) If the aircraft is already taxiing, an A-DPI with an updated taxi-time and TTOT may have to be sent.

##### **C) Complete closure (until further notice)**

- (10) In case there is no departure RWY available anymore, then a TSAT cannot be issued. Previously issued TSATs may be erased.

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- (11) In such cases, the FMP shall request activation of a zero-rate regulation to NMOC for all flights (arrivals and departures) and/or the activation of an EU restriction.
- (12) This will result in a suspension (FLS message) for all flights.
- (13) In case the aircraft was already taxiing, return to stand procedure should be applied.
- (14) It is recommended to stop the transmission of the DPI messages until the flights are able to depart again and the zero-rate regulation is lifted.
- (15) Refer to Doc Ref 5 Section 7.2 Management and recovery of a disruption for a detailed description of the procedure.
- (16) See also section “12 Operational Procedures” for more details on the Operational Procedures required during such special operating conditions.

### 10.4.3 Contents of DPI messages

#### 10.4.3.1 TTOT

[URE.ACDM.DPI.DEICING.001]

- (1) The TTOT-field in these DPI messages **shall** be updated with the time it takes to de-ice the aircraft. For more details refer to section 10.4.4 Overview.

#### 10.4.3.2 TAXITIME

- (1) It is recommended to identify the following two situations:

##### **General De-icing**

- (2) When the majority of flights are expected to require de-icing, a general taxi-time extension should be set by TWR by inputting a time duration (in minutes) or by the selection of an Operational Scenario. An operational scenario will have pre-defined taxi-time extension values included.
- (3) This taxi-time extension for de-icing can be cancelled manually or automatically at a certain time before departure if the pilot has not requested/confirmed the need for de-icing.
- (4) A general taxi-time extension should also be removed after the flight has been sequenced for de-icing by a de-icing sequencing tool or procedure.
- (5) Note that the global extension of taxi-times in ETFMS is a well-known common practice since many years for non-CDM Airports during e.g. winter operations. It is usually provided by FMPs via the CHMI.
- (6) For CDM Airports, global taxi-time extensions shall be provided in DPI messages because a taxi-time in a DPI always has a higher priority than the taxi-times updates provided via CHMI.

##### **De-icing upon request only**

- (7) When it is expected that only a minority of the departures requires de-icing, then the taxi-time should not be extended globally and should only be done after the de-icing has been requested by the pilot.

[URE.ACDM.DPI.DEICING.002]

- (8) Dependent on the De-icing method, the taxitime-field **should** also include the time it takes to de-ice.

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[URE.ACDM.DPI.DEICING.003]

*Requirement replaced by the tables of requirement URU.ACDM.DPI.DEICING.007 and URU.ACDM.DPI.DEICING.008.*

[URE.ACDM.DPI.DEICING.004]

*Requirement replaced by the tables of requirement URU.ACDM.DPI.DEICING.007 and URU.ACDM.DPI.DEICING.008.*

*Note that this requirement is for the taxitime-field in the DPI messages. Local procedures may result in different habits and requirements.*

### 10.4.3.3 DEPSTATUS

- (1) The DEPSTATUS is used to mark that the flight will be de-iced. In that case it will contain the value "DEICING" (In the future the depstatus-field may be used for other special circumstances).

[URE.ACDM.DPI.DEICING.005]

- (2) If the flight requires De-icing, the depstatus-field with contents "DEICING" **shall** be included in any DPI that is sent after the De-icing has been decided.

[URE.ACDM.DPI.DEICING.006]

- (3) However, the "-DEPSTATUS DEICING" **shall** no longer be included in the DPI messages after the pilot has cancelled his request for De-icing.
- (4) ETFMS will use the DEICING flag to allow a departure in the extended DTW or STW. See section 11.2 The STW and the DTW for more details.

### 10.4.4 Overview

#### 10.4.4.1 All flights

- (1) The DPI messages must be sent in accordance with the trigger events as described in the sections of E-DPI, T-DPI-t, T-DPI-s, A-DPI and C-DPI.
- (2) They also have to be sent for example when the TTOT changes by 5 min or more. This could for example be the case at exit of the De-icing queue, at entry of the De-icing stand or at exit of the De-icing stand.
- (3) In the tables below the following abbreviations are used:

bestOBT: best known OBT for the flight  
The bestOBT is the most accurate value of the Off-Block-Time from AO/HA perspective that is available at that moment. It could e.g. be EOBT, TOBT input by Handling Agent, EIBT+MTTT if already available.

optimalTSAT: earliest possible TSAT  
The optimalTSAT could be received from an optimal pre-departure sequence tool or based upon the "REA function". It contains the earliest possible off-block time from ATC perspective.

EXOT\_standard: Normal Variable Taxi-Out-Time (VTT/EXOT)  
The EXOT\_standard is the time between off-block and take-off, excluding any time required for de-icing the aircraft.

EXOT\_gen\_ext: General Extended Taxi-Out-Time

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The EXOT\_gen\_ext is the time between off-block and take-off, including the global estimated increase of the delay of the flight due to de-icing. This is the equivalent of the taxi-time extension that is/was done by FMP in ETFMS via CHMI.

**EXOT\_DI\_rem:** Increased Taxi-Out-Time for De-Icing Remote  
The EXOT\_DI\_rem is taxiing time from stand to de-icing platform + waitingtime in de-icing queue + EDIT + taxiing time from de-icing platform to runway.

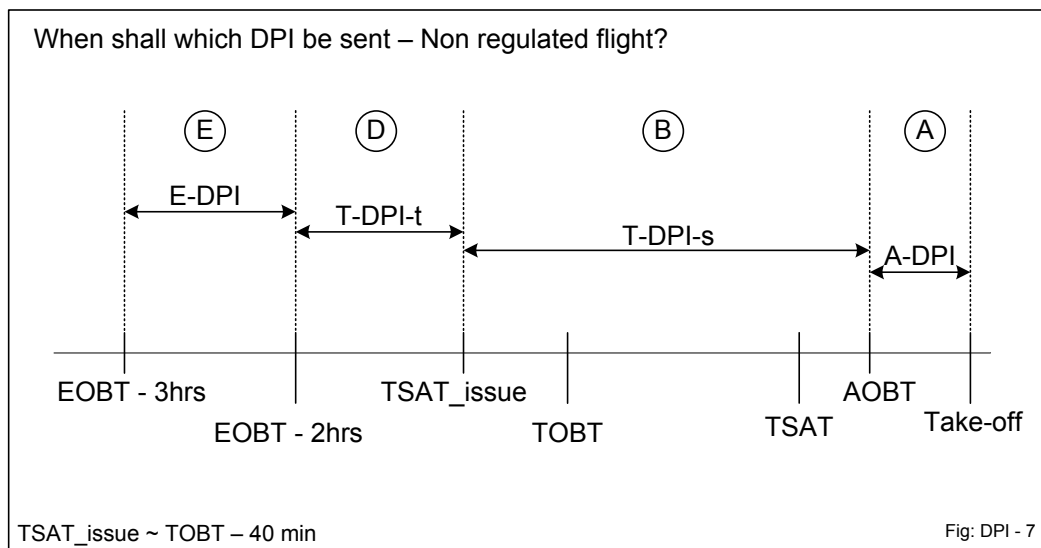
**EDIT\_DI\_os:** De-Icing estimation, for De-Icing On-Stand  
The EDIT\_DI\_os is an estimation of the time that is required for de-icing. It is: waitingtime in de-icing queue + EDIT.

**EDIT :** Estimated De-Icing Time (duration)  
EDIT is the most accurate estimate of the De-Icing time that is available. It range from an accurately estimated and update value to a rough estimation. If not yet available it is expected to be 0.

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#### 10.4.4.2 Non regulated flights

- (1) The following is an overview of triggering of DPI messages for non-regulated flights during De-icing circumstances.



[URE.ACDM.DPI.DEICING.007]

- (2) The ttot- and the taxitime- fields in DPI messages for non-regulated flights for De-icing **shall** be calculated as specified in the tables below.

#### Remote de-icing

When flight is not yet sequenced for de-icing or de-icing sequencing is not (yet) available:

Period	DPI-type	taxitime-field	TOBT-field	ttot-field
E	E-DPI	EXOT_gen_ext	TOBT (if available)	bestOBT+EXOT_gen_ext
D	T-DPI-t	EXOT_gen_ext	TOBT (if available)	bestOBT+EXOT_gen_ext
B	T-DPI-s	EXOT_gen_ext	TOBT	TSAT+EXOT_gen_ext
A	A-DPI	EXOT_gen_ext	--	AOBT+EXOT_gen_ext

#### Remote de-icing

After the flight has been sequenced for de-icing:

Period	DPI-type	taxitime-field	TOBT-field	ttot-field
E	E-DPI	EXOT_DI_rem	TOBT	TOBT+EXOT_DI_rem
D	T-DPI_t	EXOT_DI_rem	TOBT	TOBT+EXOT_DI_rem
B	T-DPI-s	EXOT_DI_rem	TOBT	TSAT+EXOT_DI_rem
A	A-DPI	EXOT_DI_rem	--	AOBT+EXOT_DI_rem

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#### On stand de-icing:

When flight is not yet sequenced for de-icing or de-icing sequencing is not (yet) available:

Period	DPI-type	taxitime-field	tobt-field	ttot-field
E	E-DPI	EXOT_gen_ext	TOBT (if available)	bestOBT+EXOT_gen_ext
D	T-DPI-t	EXOT_gen_ext	TOBT (if available)	bestOBT+EXOT_gen_ext
B	T-DPI-s	EXOT_gen_ext	TOBT	TSAT+EXOT_gen_ext
A	A-DPI	EXOT	--	AOBT+EXOT

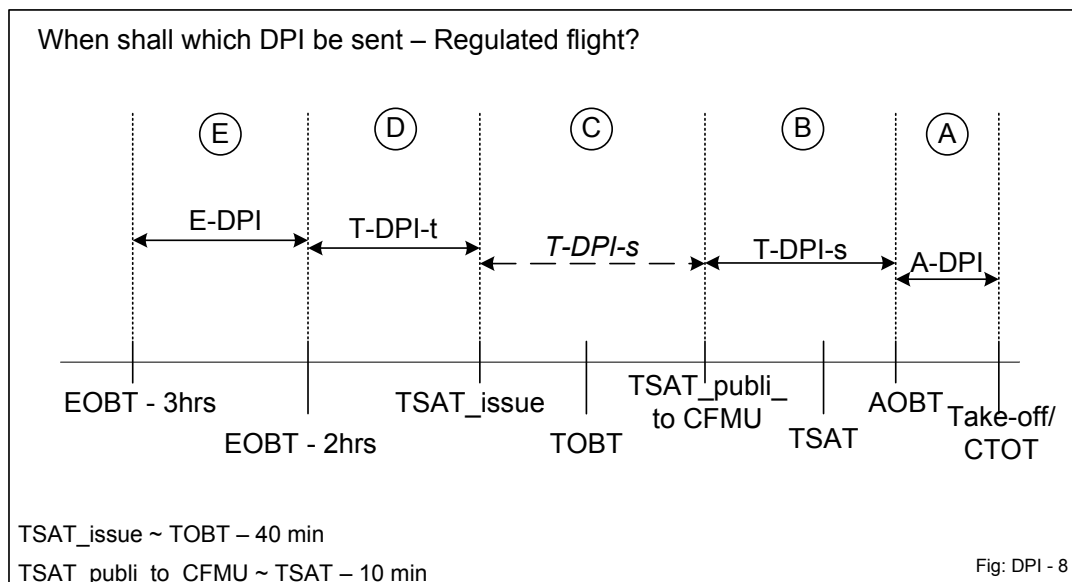
#### On stand de-icing:

After the flight has been sequenced for de-icing:

Period	DPI-type	taxitime-field	tobt-field	ttot-field
E	E-DPI	EXOT_standard	TOBT	TOBT_deice+EXOT_standard
D	T-DPI-t	EXOT_standard	TOBT	TOBT_deice+EXOT_standard
B	T-DPI-s	EXOT_standard	TOBT	TSAT+EXOT_standard
A	A-DPI	EXOT_standard	--	AOBT+EXOT_standard

### 10.4.4.3 Regulated flights

- (1) The following is an overview of triggering of DPI messages for regulated flights during De-icing circumstances.



[URE.ACDM.DPI.DEICING.008]

- (2) The ttot- and taxitime-fields in DPI messages for regulated flights for De-icing **shall** be calculated as specified in the table below.

#### Remote de-icing



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When flight is not yet sequenced for de-icing or de-icing sequencing is not (yet) available:

Period	DPI-type	taxitime-field	TOBT-field	ttot-field
E	E-DPI	EXOT_gen_ext	TOBT (if available)	bestOBT+EXOT_gen_ext
D	T-DPI-t	EXOT_gen_ext	TOBT (if available)	bestOBT+EXOT_gen_ext
C	T-DPI-s	EXOT_gen_ext	TOBT	optimalTSAT+ EXOT_gen_ext
B	T-DPI-s	EXOT_gen_ext	TOBT	TSAT+EXOT_gen_ext
A	A-DPI	EXOT_gen_ext	--	AOBT+EXOT_gen_ext

#### Remote de-icing

After the flight has been sequenced for de-icing:

Period	DPI-type	taxitime-field	TOBT-field	ttot-field
E	E-DPI	EXOT_DI_rem	TOBT	TOBT+EXOT_DI_rem
D	T-DPI-t	EXOT_DI_rem	TOBT	TOBT+EXOT_DI_rem
C	T-DPI-s	EXOT_DI_rem	TOBT	optimalTSAT+ EXOT_DI_rem
B	T-DPI-s	EXOT_DI_rem	TOBT	TSAT+EXOT_DI_rem
A	A-DPI	EXOT_DI_rem	--	AOBT+EXOT_DI_rem

#### On stand de-icing:

When flight is not yet sequenced for de-icing or de-icing sequencing is not (yet) available:

Period	DPI-type	taxitime-field	tobt-field	ttot-field
E	E-DPI	EXOT_gen_ext	TOBT (if available)	bestOBT+EXOT_gen_ext
D	T-DPI-t	EXOT_gen_ext	TOBT (if available)	bestOBT+EXOT_gen_ext
C	T-DPI-s	EXOT_gen_ext	TOBT	optimalTSAT+EXOT_gen_ext
B	T-DPI-s	EXOT_standard	TOBT	TSAT+EXOT_standard <sup>1</sup>
A	A-DPI	EXOT_standard	--	AOBT+EXOT_standard

(3) Notes:

1) This TSAT is expected to be after De-icing has been finished.

#### On stand de-icing:

After the flight has been sequenced for de-icing:

Period	DPI-type	taxitime-field	tobt-field	ttot-field
E	E-DPI	EDIT_DI_os	TOBT	TOBT+EDIT_DI_os
D	T-DPI-t	EDIT_DI_os	TOBT	TOBT+EDIT_DI_os
C	T-DPI-s	EDIT_DI_os	TOBT	optimalTSAT+ EDIT_DI_os
B	T-DPI-s	EXOT_standard	TOBT	TSAT+EXOT_standard
A	A-DPI	EXOT_standard	--	AOBT+EXOT_standard

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## 11 Relationship between DPI and other NMOC inputs & messages

### 11.1 CDM Status

#### 11.1.1 Description

- (1) This section describes the relationship between the DPI message type, the DPISTATUS and the CDMSTATUS.
- (2) The DPISTATUS is the field inside the DPI message that indicates the DPI message type.
- (3) The CDMSTATUS is the column that is shown in ETFMS HMI and CHMI and NOP portal flight lists. It provides the latest information about the DPI messages to the operational users.
- (4) The CDMSTATUS may for example change at the reception of a DPI message, at reception of a DLA or CHG messages and at modifications of the regulation-scheme.
- (5) The purpose of the CDMSTATUS-field is not only to show the last received DPI message but also the usage of the DPI message in the ETFMS flight profiles.
- (6) The following table lists the different values of DPISTATUS and CDMSTATUS and it shows their basic relationship:

Message-type	DPISTATUS	CDMStatus		
		HMI value	Value in EFD or FUM	Meaning
--	--	N	Not included	Departure from a standard airport. Note that this value is normally not shown in CHMI.
--	--	c	DPIEXPECTED	Departure from CDM Airport or advanced TWR (initial value)
E-DPI	EARLY	e	ESTIMATED	<u>e</u> stimated
T-DPI-t	TARGET	t	TARGETED	<u>t</u> argeted
T-DPI-s	SEQ	s	PRESEQUENCED	(pre-) <u>s</u> equenced
A-DPI	ATC	a	ACTUALOFFBLOCK	<u>a</u> ctual off-block
C-DPI	CNL	c	DPIEXPECTED	Departure from CDM Airport (initial value)

- (7) The CDMSTATUS may change due to the reception of messages (e.g. DLA) or due to the modification of the regulation-scheme. The following general rules apply:
  - The CDMSTATUS “s – sequenced” is set when the TTOT of the T-DPI-s is used by ETFMS, i.e. the Actual Flight Model (CTFM) is created by ETFMS. For example, if ETFMS receives a DLA message of which the EOBT is after TTOT – Taxi-Time (EXOT) (of the T-DPI-s) then the CDMSTATUS is re-set to “e - estimated”.
  - After modification of the regulation-scheme the CDMSTATUS may be set to “t - targeted” or “e - estimated” dependent on the last received DPI message.
  - After reception of a REA, FCM, the CDMSTATUS will be reset to “e - estimated”.
- (8) ATFCM suspension of a flight does not change the CDMSTATUS.

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## 11.2 The STW and the DTW

### 11.2.1 Introduction

- (1) ETFMS uses a Slot Tolerance Window (STW) for regulated flights and a Departure Tolerance Window (DTW) for non regulated flights. These windows are used for the production of statistics and for the processing of DPI messages.
- (2) During adverse conditions at a CDM Airport, it happens that Flow Management Positions (FMPs) and NMOC/OPSD flow controllers agree upon a general extension of the Slot Tolerance Window (STW) and Departure Tolerance Window (DTW) if required. This is usually an extension of 5-10 min during a period of approximately 1 hour.
- (3) Extensions of STW and DTW need to be input into ETFMS so that they can be used for the processing of the DPI messages. For example ETFMS must accept an A-DPI if its TTOT is outside the standard STW but still inside the agreed extended STW.

### 11.2.2 Extensions of the STW and DTW

#### 11.2.2.1 General

- (1) The NMOC flow controller may decide to extend the upper and lower limits of the STW and the DTW during a limited period of time (e.g. 1 hour).
- (2) The extension is input into the ETFMS HMI per CDM Airport by specifying the upper and lower limits and the validity period.
- (3) When defining the DTW and STW extensions and validity periods, the NMOC Flow Controller will have the possibility to specify if the extensions will be applicable for:
  - a) all flights
  - b) only for flights for which ETFMS has received the information that these are being de-iced via the inclusion of “-DEPSTATUS DEICING” (see section 10.4 Use of DPIs during Special Circumstances at the airport)
- (4) Note that ETFMS will use the DTW and STW when it is updating the data of a flight, e.g. at reception of messages such as DPI, DLA,... The modification of the DTW or STW parameters themselves via the HMI will not lead to a search for flights that may be affected by the new parameters.
- (5) Note that it will only be possible to modify parameter that are in the future.
- (6) The extended STW and DTW limits are shown on ETFMS HMI and CHMI for FMPs in the flight data displays and on the flight lists.

#### 11.2.2.2 The STW

- (1) The standard Slot Tolerance Window (STW) is a window of -5 min to +10 min around the last published CTOT. It applies to regulated flights only.
- (2) The STW is used for the processing of the T-DPI-s and the A-DPI messages. For the purpose of this document the STW\_LowerBound (-5) and STW\_UpperBound (+10) are used. See corresponding sections about T-DPI-s 8.5 How (does ETFMS use it) and A-DPI 9.5 How (does ETFMS use it) for the details.
- (3) If the CTOT is inside the validity period, ETFMS will use the extended limits instead of the standard limits.

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- (4) The STW is also used to delay the moment that Flight Activation Monitoring (FAM) suspends a regulated flight. A flight is suspended by FAM if at CTOT + STWUpperLimit + 20 min, the flight is not reported as airborne.

### 11.2.2.3 The DTW

- (1) The standard Departure Tolerance Window (DTW) is a -15 min to +15 min window around the take-off-time of the Estimated Flight Model (FTFM). It applies to non-regulated flights only.
- (2) The take-off-time of the Estimated Flight Model (FTFM). consists of the EOBT+Taxi-Time (EXOT) from the FPL message, possibly updated with the last of:
- the EOBT + Taxi-Time (EXOT) from a DLA or from a CHG message
  - the TTOT from the E-DPI message
  - the TTOT from the T-DPI-t message
  - the timestamp + minlineup from a REA message (only in the exceptional case when a regulated flight becomes non regulated)
  - the FCM done by the NMOC Flow Controller
  - ...
- (3) The DTW is used for the processing of the T-DPI-s messages. For the purpose of this document the DTW\_LowerBound (-15) and DTW\_UpperBound (+15) are used. See corresponding section about T-DPI-s 8.5 How (does ETFMS use it) for the details.
- (4) If the take-off-time of the Estimated Flight Model (FTFM) is inside the validity period, ETFMS will use the extended limits instead of the standard limits.
- (5) The DTW is also used to delay the moment that Flight Activation Monitoring (FAM) suspends a non-regulated flight. A flight is suspended by FAM if, at ETOT/TTOT + DTWUpperLimit + 15 min, the flight is not reported as airborne.

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### 11.3 Use of TIS/TRS for CDM Airports

- (1) The parameter "Time to Remove from the Sequence" (TRS) will prevent a change to the Take-Off time once the clock reaches TRS minutes before the current Off-Block time of the flight (CTOT – Taxi-Time (EXOT) (COBT) if any, or EOBT). It is only applicable when the scheme of regulations is modified by NMOC. It is not considered in reaction to an input message. A flight becoming regulated will receive a SAM with zero delay. It represents the local latest time to modify an already organised departure sequence. A too big value will prevent the CTOT to be still improved.
- (2) The parameter "Time to Insert into the Sequence" (TIS) will insure the provision of a new CTOT so that an already organised departure sequence may still be adapted. It is the necessary number of minutes needed to adapt the departure sequence before the Off-block time. It is used every time a CTOT is computed.
- (3) Note that the TIS parameter is not applicable for flights that have the status REAdy for improvement.
- (4) These parameters may be adjusted at any time depending on the departure aerodrome traffic situation and may vary during the day and the runway in use.
- (5) It is recommended to reduce the TIS value once CDM has been put into operations because a longer TIS value may not be required when a pre-departure sequence is being used.

### 11.4 DLA/CHG

#### 11.4.1 Introduction

- (1) ETFMS will normally process each DLA or CHG message that it receives from IFPS.
- (2) The DLA and CHG messages update the Estimated Flight Model (FTFM).
- (3) If the CHG message contains a SID, then it is ignored. A SID from a DPI message prevails.

#### 11.4.2 E-DPI

- (1) Sequence of events, example I:
  1. Last received DPI message is an E-DPI
  2. ETFMS receives a DLA message or a CHG message that significantly changes the OBT\_of\_FTFM. The EOBT from the DLA or CHG message is called the IFPS\_OBT  
A significant change of EOBT is defined as:  
$$\text{IFPS\_OBT} > \text{TTOT\_of\_last\_E-DPI} - \text{Taxi-Time (EXOT)}$$
- (2) In this case, ETFMS\_TOT of the Estimated Flight Model (FTFM) will be set to this IFPS\_OBT + Taxi-Time (EXOT). This Taxi-Time (EXOT) is the last received value in a DPI. The CDMSTATUS will be (re-)set to "e – estimated".

#### 11.4.3 T-DPI-t

- (1) Sequence of events, example II:
  1. Last received DPI message is a T-DPI-t
  2. ETFMS receives a DLA or a CHG message that significantly changes the OBT that ETFMS derived from the T-DPI-t (TTOT-Taxitime). The EOBT from the DLA or CHG message is called the IFPS\_OBT.  
A significant change of EOBT is defined as:  
$$\text{IFPS\_OBT} > \text{TTOT\_of\_last\_T-DPI-t} - \text{Taxi-Time (EXOT)}$$

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- (2) The ETFMS\_TOT of the Estimated Flight Model (FTFM) will be set to this IFPS\_OBT + Taxi-Time (EXOT). The Taxi-Time (EXOT) is the last received value in a DPI.
- (3) The CDM status will be changed from “t-targeted” to “e - estimated” because the TTOT (TOBT+EXOT) of the T-DPI-t is no longer used.
- (4) Sequence of events, example III:
  1. Last received DPI message is a T-DPI-t
  2. ETFMS receives a DLA or CHG message with an EOBT that is “before” a previously received (TTOT\_of\_T-DPI-t – Taxi-Time (EXOT)).  
 “Before” is defined as:  

$$\text{IFPS\_OBT} \leq \text{TTOT\_of\_last\_T-DPI-t} - \text{Taxi-Time (EXOT)}.$$
- (5) The Estimated Flight Model (FTFM) is updated with the data from the DLA or CHG message (route, ARCTYP, ...), except for the newEOBT. The ETFMS\_TOT of the Estimated Flight Model (FTFM) will be therefore kept at the TTOT of the T-DPI-t (TOBT + EXOT). The CDM status will be kept at “t - targeted”.
- (6) In this case the newEOBT of the DLA message has no impact on a possible CTOT, as the newEOBT is not used to update the FTFM.

#### 11.4.4 T-DPI-s

- (1) Sequence of events, example IV:
  1. Last received DPI message is a T-DPI-s
  2. ETFMS receives a DLA message or a CHG message. The EOBT from the DLA or CHG message is called the IFPS\_OBT.
- (2) A possible previously received TTOT from a T-DPI-t will be re-processed as described in section of the T-DPI-t see 11.4.3 T-DPI-t.
- (3) The TTOT from the T-DPI-s will be kept as a no-slot-before. If possible the Actual Flight Model (CTFM) will be re-created and in that case the CDM status will be kept at “s - (pre-)sequenced”. If the Actual Flight Model (CTFM) is not re-created, the CDMSTATUS is set as described in 11.4.3 T-DPI-t.
- (4) The effect of a DLA/CHG message on a previously received TTOT of a T-DPI-s message depends on the value of the new IFPS\_OBT. For example:
  - If the new IFPS\_OBT of a DLA/CHG message is after the TTOT-Taxi-Time (EXOT) then a previously created Actual Flight Model (CTFM) is removed.
  - If the new IFPS\_OBT of a DLA/CHG message is before the TTOT-Taxi-Time (EXOT) then ETFMS will try to keep Actual Flight Model (CTFM) based upon this TTOT. This could for example be feasible if this TTOT is inside the STW of a possible newCTOT.

#### 11.4.5 A-DPI message

- (1) Sequence of events, example V:
  1. Last received DPI message is an A-DPI.
  2. ETFMS receives a DLA message or a CHG message. The EOBT from the DLA or CHG message is called the IFPS\_OBT.
- (2) The CTFM based upon the TTOT will be deleted.
- (3) ETFMS will try to re-apply a TTOT from a previously received T-DPI-t and T-DPI-s as described in section 11.4.4 T-DPI-s.
- (4) ETFMS will try to re-apply the TTOT of the last ATC-DPI.
- (5) The CDMSTATUS will be set to in accordance with the new state of the flight.

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## 11.5 REA message

- (1) The REA message can still be used but it is recommended to use the T-DPI-t or the T-DPI-s messages. The use of the REA should be reserved for special occasions such as during an interruption of CDM procedures at the Airport CDM or during interruption of the DPI connection (AFTN or B2B web services) with NMOC.
- (2) The main differences between the T-DPI-t, T-DPI-s and REA messages are:
  1. The REA:
    - is only accepted for regulated flights
    - provides ETFMS with a new earliest TOT the TWR controller can afford. This TOT is set to REA\_receptiontime+MINLINEUP
    - the flight receives the status REA
  2. The T-DPI-t
    - is accepted for all flights
    - provides ETFMS with a new earliest TOT the AO/handlers can afford, which is the TTOT (TOBT+EXOT)
    - the flight receives the status RFI
  3. The T-DPI-s
    - is accepted for all flights
    - provides ETFMS with a new earliest TOT from the ATC pre-departure sequence, which is the TTOT (TSAT+EXOT)
    - the flight may receive the status REA (see section on T-DPI-s for details).
- (3) In case the reception\_time + MINLINEUP of the REA message is before the ETOT of the FTFM, the REA results in an update of the Estimated Flight Model (FTFM) and overwrites the TTOT of a previously received T-DPI-t. If this occurs, the CDMSTATUS is (re-)set to "e-estimated".
- (4) A previously received TSAT+EXOT (from a T-DPI-s or an A-DPI) will be overruled by the minCTOT (clock+MINLINEUP) from the REA.
- (5) If the clock+MINLINEUP is before the last received TTOT of a T-DPI-s, it will also overrule this TTOT.

## 11.6 SWM message

- (1) A flight for which a T-DPI-t message is received, automatically obtains the RFI status.
- (2) In the CDM process, AO/handlers are expected to provide accurate EOBT/TOBT updates to all partners and these times are used as the earliest possible off-block time from an AO/handler perspective.
- (3) Providing a SWM message to NMOC only, does not make sense in a CDM environment.
- (4) For this reason, the SWM message is rejected for flights for which a T-DPI-t, T-DPI-s or an A-DPI message has been received.
- (5) The rejection message is: "FLIGHT MANAGED BY CDM PROCESS AT DEPARTURE AIRPORT."
- (6) After reception of a C-DPI, a SWM is accepted again.
- (7) At reception of a C-DPI message, the RFI/SWM status is set back to the value that is specified for the AO concerned in the NMOC ENVIRONMENT database.

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## 11.7 Suspensions

### 11.7.1 Introduction

- (1) This section describes what will happen to data that has been received via DPI messages when the flight becomes suspended due to other (non-DPI) events.
- (2) This section also describes what will happen to previously received DPI data when the suspension status is removed due to other (non-DPI) events.
- (3) How ETFMS processes a just received DPI for a suspended flight is described with each type of DPI message.

### 11.7.2 Flight becomes suspended by ATFM

- (1) A flight may become ATFM suspended after it has received one or more DPI messages. This section describes what happens to the data that has been received via the DPI messages.
- (2) Such a suspension may for example occur due to a modification of the regulation-scheme, due to the reception of an SMM or due to the reception of a C-DPI.
- (3) ETFMS keeps the Estimated Flight Model (FTFM) if a flight is suspended. This means that the last received TOT from an E-DPI or a T-DPI-t is kept.
- (4) ETFMS keeps the possible receive TTOT from the T-DPI-s as a no-slot-before for possible later use.
- (5) Note that the above does not apply due to a suspension by a C-DPI because at the reception of a C-DPI all TTOTs of DPI messages have been erased.
- (6) The TTOT from an A-DPI is removed.
- (7) The Taxi-Time (EXOT) and SID are stored in the Filed Flight Model (FTFM).

### 11.7.3 ATFM Suspension status is removed

- (1) A suspended flight may become de-suspended or regulated. This section describes what happens to a flight if it had previously received DPI data.
- (2) Such a de-suspension may for example occur due to the modification of the regulation-scheme or reception of a message such as FCM.
- (3) It may also occur due to the reception of an E-DPI, T-DPI-t or T-DPI-s. An A-DPI could also de-suspend the flight, but only when the suspension was due to a C-DPI.
- (4) The network impact is assessed based upon the Filed Flight Model (FTFM), so possibly including the TOT from the last received DPI.
- (5) The possibly stored TTOT from a T-DPI-s (no-slot-before) may be used in a similar way as if the T-DPI-s was received after the removal of the suspension status. So for example, the Actual Flight Model (CTFM) may be re-created.

### 11.7.4 Suspension due to FPL re-validation is removed

- (1) This suspension status can only be removed through the reception of a DLA or a CHG message. See section 11.4 DLA/CHG for details.

### 11.7.5 Flight becomes suspended due to (manual) FPL re-validation

- (1) This is currently not possible.



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### 11.7.6 Recommendation related to suspensions

- (1) A flight that was regulated and becomes suspended shall be considered as “no longer regulated” and consequently the CTOT shall be erased (for a suspended flight).
- (2) After the flight is de-suspended, ETFMS will send a new SAM message if the flight is still regulated and it will send a DES if the flight is no longer regulated. Note that in this sequence of inputs and outputs no SLC message is sent.

## 11.8 EOBT Update Service for A-CDM departures

### 11.8.1 Introduction

- (1) The airlines have to update their flight plan if it is delayed by more than 15 min and this delay is due to the airline’s own operations.
- (2) Airlines can delegate to NM the filing of the DLA message for departures from designated A-CDM airports.
- (3) For flights operated by an airline which has delegated to NM the filing of the DLA, NMOC will automatically file a DLA message using the TOBT values in the DPI messages received.

### 11.8.2 Legal requirements

- (1) This service assists the airlines in complying with the following legal requirements:
- (2) The ICAO prescription, as set out in doc 7030:  
*“Any changes to the EOBT of more than 15 minutes for any IFR flight within the IFPS shall be communicated to the IFPS”.*
- (3) The EU IR 255/2010, article 6/6 (c), which stipulates that, by failing to comply with this ICAO prescription, flights risk not being granted take-off clearance:  
*“The ATS Unit at the departure airport shall ensure that:  
(c) flights not adhering to their estimated off-blocks time, taking into account the established tolerance, are not given take-off clearance”.*

### 11.8.3 Benefits

- (1) Solving the EOBT/TOBT discrepancies is significantly expedited via this service.
- (2) Reduced risk for the pilot of being refused a start-up request when TOBT and EOBT are not aligned due to the airline’s late response to resolve an EOBT/TOBT discrepancy. In addition, efficiency gains can be achieved throughout the turnaround process due to:
  - Reduction of radio communications between the ATC / TWR and the flight crew;
  - Optimised need for coordination between the ground handler and the AO or between the Airport Management Unit and the ground handler/AO.
- (3) The number of MVT messages sent by the ground handler could be reduced.
- (4) Possible reduction of workload for the partners involved.

### 11.8.4 How does it work

- (1) The airline has to request to NM the activation of the service.
- (2) Any TOBT value which exceeds the EOBT by more than a set parameter threshold (e.g. 15 min) will be transmitted to IFPS in an internal DLA message with an EOBT = TOBT.
- (3) IFPS will process and distribute this DLA message in the same manner as if the request was received from the airline directly via e.g. AFTN or SITA networks.

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- (4) The aircraft operator is derived from the Field 18 (OPR) of the FPL if it is filled in; otherwise it is derived from the ARCID.
- (5) When an ORM (Operational Reply Message – sent by IFPS) is generated for a DLA message received from ETFMS, the ORM message will include a comment field stating "THIS DLA MESSAGE HAS BEEN TRIGGERED FROM A DPI MESSAGE".
- (6) These ORM messages are addressed to the AOCC and/or to the FPL originator, following the same configuration as specified in the NM ENV system for regular FPL messages.
- (7) The visibility over any REJ message is particularly important as these inform the AOCC that the DLA triggered by the TOBT has not been successfully done.
- (8) IFPS will automatically reject the DLA messages received from ETFMS that fail IFPS validation. A REJ ORM would be sent. In this case, the AO has to correct the problem by e.g. filing a CHG message, similarly to the current procedure.
- (9) A TOBT which is earlier than the EOBT will not trigger an update of the EOBT. A TOBT which is more than 15 min earlier than the EOBT raises a discrepancy, displayed on CHMI/NOP Portal/B2B.
- (10) This discrepancy could also be caused by the reception of a DLA/CHG with an EOBT which is after TOBT+15min. In this case, the ground handler or in general, the “person responsible to update the TOBT” has to update the TOBT to the value of the EOBT.
- (11) If the airline needs to advance the EOBT by more than 15 min, the action it should take is CNL and re-file, similarly to the current procedure.
- (12) A possible use case which would justify the need for the AO having to CNL and re-file is presented below:
  - The CDM airport provides TOBT values to NMOC as soon as they are available (ground handler input error);
  - EOBT=1000; TOBT=1030 is NOT accurate; it updates the EOBT anyway; EOBT=1030;
  - Next received TOBT=1010 is a more accurate one; as it is more than 15 min earlier compared to EOBT it is ignored by NMOC; only a discrepancy would be shown;
  - In order to reflect the correct OBT in the FPL, the AO needs to CNL and re-file.
- (13) TOBT values are normally made available to NMOC at TSAT issue time, which is 30-40min before TOBT. In this timeframe the TOBT is considered to be confirmed and reliable. Therefore, the earliest automatic update of the EOBT can be expected in this period.
- (14) A TOBT value may be available locally before TSAT issue time, but NM has so far chosen not to use it for the EOBT update service as it might not be sufficiently stable.
- (15) The update of the EOBT with a TOBT from a DPI message does normally not result in a network impact (re)assessment because the EOBT is simply being aligned to a previously received TOBT.

#### 11.8.5 Recommendations for the AO and Ground Handler

- (1) In order for this service to be effective, the quality of the TOBT values received from a CDM airport should be of a sufficient level at all times. Prior to making the service available for a specific airport, NM assesses the quality of the TOBT.
- (2) The aircraft operator that has activated this service for a particular CDM airport will still be able to file DLA/CHG messages on its own, if necessary.
- (3) Before the first DPI message is received (normally EOBT-3hrs), it is recommended that the OCC monitors and informs NM of any expected delay. Any DLA/CHG message is used to update the flight profile. At this point, this is the only information that can provide a more accurate demand picture.

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- (4) As soon as the first DPI message is received, NM has a correct demand picture based on the TTOT and Taxi Time values received. In this timeframe, it is recommended that the OCC lets the automatic function update the EOBT, unless a DLA message is required before the first TOBT is made available to NM (30-40min before TOBT). Note that the TOBT value itself is NOT used for updating the flight profiles.

#### **11.8.6 Service request and (de)activation**

- (1) The service can be requested by any airline for departures from CDM airports.
- (2) It is based upon the three letter ICAO code of an airline.
- (3) The requests for activation or deactivation of the service should be addressed to:  
[airport-cdm@eurocontrol.int](mailto:airport-cdm@eurocontrol.int)
- (4) Follow the below link for a complete list of A-CDM airports at which this service can be activated on request:  
<http://www.eurocontrol.int/articles/airport-collaborative-decision-making-cdm>  
<http://www.eurocontrol.int/publications/estimated-block-time-eobt-update-service-cdm-departures>
- (5) Upon request from the airline, NM will activate the service on a trial basis. During the trial period, the NM/APT Unit will ensure support and guidance to the AOCC, the ground handler and to the concerned CDM airport(s).

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## 12 Operational Procedures

### 12.1 Introduction & Background

#### Introduction

- (1) This section summarizes the operational procedures that need to be taken into account when A-CDM is put into operations at an airport and the DPI messages are provided to the NMOC Operational system. It consolidates the procedures laid out in the ATFCM Operations Manual (Doc Ref 5) which are relevant for CDM Airports.

#### Contingency Operations

- (2) This section also summarizes the required contingency procedures that need to be followed when CDM is put into operations at an airport and the DPI messages are provided to the NMOC Operational system.

#### Working relationship TWR – FMP - NMOC

- (3) For most airports (that are not CDM), the communication concerning ATFCM matters is done between the FMP and NMOC. The TWR usually does not communicate directly with the NMOC. For example, the TWR provides runway-in-use changes to the FMP who then provides these to the NMOC .
- (4) For CDM Airports it is normally agreed that the TWR and the NMOC communicate directly when it concerns individual flights, for example a flight for which a DPI has been received with late TTOT. The communication concerning global airport related issues should still go via the FMP, for example Airport Default Capacity changes.
- (5) For a detailed list of responsibilities of TWR and FMP at CDM Airports, please refer to Appendix D.
- (6) In order to cover these specific working arrangements used at individual airports the general convention “FMP/TWR” is used in the procedures to refer to the entity responsible for the action.
- (7) The communication and cooperation between a CDM Airport and NMOC may depend on the level of impact on Network Operations and different procedures may apply accordingly. For a full description of these Network Impact Levels please refer to Doc Ref 5, ANNEX B AIRPORT CDM → LEVELS OF IMPACT ON NETWORK OPERATIONS OF CDM AIRPORTS.
- (8) A summary can be found in Appendix E.

### 12.2 Procedures for FMP/TWR and NMOC

#### **12.2.1 Level 0 - Normal Operations**

- (1) The NMOC may support the CDM Airport during normal operations with the following actions if requested by FMP/TWR.
  - a) CTOT Improvements
  - b) CTOT Extensions
  - c) Slot swapping
- (2) The FMP/TWR at the CDM Airport will coordinate individual flights as required with the NM Tactical Team.

##### **12.2.1.1.2 CTOT improvements for individual flights**

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- (1) Note that the use of this condition is by exception for when a flight appears to have been excessively penalised for reasons that are not evident.
- (2) After coordination between NMOC Flow Controller and TWR (A-CDM) an improved CTOT can be agreed upon. Following the agreement, the flight should be forced in the regulation by the Flow Controller at the agreed CTOT, which will be distributed in an SRM to the ATM community. The TWR pre-departure sequencer will sequence the flight according to the newly received CTOT in the SRM.
- (3) Refer to Doc Ref 5 Section 6.7.2.4 Forcing a flight to an improved CTOT for a detailed description of the procedure.

#### **12.2.1.1.3 CTOT extensions for individual flights.**

- (1) Refer to Doc Ref 5 Section 6.7.2.5 CTOT Extension Management for a detailed description of the procedure.

#### **12.2.1.1.4 Slot Swapping**

- (1) Swaps of ATFM slots could take place, also for departures from CDM Airports, either on request of an AO or on initiative of a Flow Controller. The CTOT shall not be before the TTOT from last received DPI message.
- (2) Refer to Doc Ref 5 Section 6.7.2.6 Slot Swapping for a detailed description of the procedure.

#### **12.2.2 Level 1 - Adverse Conditions or Hindered Operations**

- (1) The NMOC may support the CDM Airport during Adverse Conditions by extending the slot or departure tolerance windows for de-icing flights or for all flights during a limited period of time if requested by FMP/TWR.
- (2) The FMP/TWR at the CDM Airport will coordinate with the NM DOM as soon as possible when local constraints severely affect the flow of traffic.

#### **12.2.2.2 STW & DTW Extension**

- (1) In case of Adverse Conditions and De-icing the first action that can be taken is that, where possible, the A-CDM TWR supervisor requests a slot/departure (STW/DTW) extension.
- (2) Such a general extension can, for example, be requested during other adverse conditions such as runway closure, fog, thunderstorms etc...
- (3) The slot extension can be applied for de-icing flights only or for all flights. The selection of de-icing flights is only possible if the de-icing status is present in the DPI message. If not present, the default 'All Flights' should be left (see para below).

Example of ETFMS HMI (for de-icing only):

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Start Time	End Time	Non Regulated DTW Before After	Regulated STW Before After	Concerned Flights
01-12:24	01-13:24	15 15	05 10	De Icing <input type="checkbox"/>

- (4) In case the Adverse Condition continues, TWR may request further extensions of the DTW and STW. The maximum duration is always 1hr and consequently the request has to be repeated every hour to confirm that the adverse condition continues and to verify if the current network situation allows for further extensions.
- (5) By extending the STW & DTW the period before FAM suspensions are applied is extended too.
- (6) Refer to Doc Ref 5 Section 7.1.1 Short-term ATFCM solutions for a detailed description of the procedure.

### 12.2.3 Level 2 - Disrupted Operations

- (1) The NMOC may support the CDM Airport during Disrupted Operations by:
  - a) Further extension of STW & DTW
  - b) Interruption of DPI messages.
- (2) The A-CDM TWR supervisor (or representative) will inform NM DOM and FMP as soon as possible when local constraints have fully disrupted the current operations.

#### 12.2.3.2 Further extension of STW & DTW

- (1) In case of severely Disrupted Operations at an Airport, the NMOC, after Network Impact assessment, will assist the CDM TWR with manual CTOT management. A small number of flights could be forced to depart after STW but with updated CTOT equal to TTOT. Specific flights going into problem (high delay and adverse conditions) areas may not be granted a STW/DTW extension.
- (2) By extending the STW & DTW the period before FAM suspensions are applied is extended too.
- (3) Refer to Doc Ref 5 Section 7.1.1 Short-term ATFCM solutions for a detailed description of the procedure.

### 12.3 Interruption of DPI messages Procedure

- (1) In case the quality of the DPI messages deteriorates, either due to severely disrupted operations that affect the airport or to a technical system failure, a temporary interruption of the DPI messages may be required.

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- (2) Refer to Doc Ref 5 Section 7.1.4 Interruption of DPI messages for a detailed description of the procedure.
- (3) This procedure also stipulates the required coordination between FMP/TWR and NMOC in case of a planned technical maintenance/outage
- (4) As soon as the DPI messages are interrupted contingency operations should be activated.

## 12.4 Contingency Scenarios

- (1) A CDM airport is normally operating using its CDM Operational Procedures and systems locally and the DPI messages are provided to the NMOC/ETFMS Operational system.
- (2) Ideally a CDM Airport should be able to operate, using CDM Operations locally, while the DPI messages are not provided to the NMOC/ETFMS Operational system.
- (3) This is already required during the DPI Operational Evaluations and during the transition period just before putting the DPIs into operations. It is also required during temporary interruptions of the DPI messages after CDM has become fully operational.
- (4) However, if an airport is not able to operate its local CDM procedures without operational DPI connections to NMOC/ETFMS, then the airport shall foresee a contingency for the case DPI messages are interrupted and ETFMS is stopped for maintenance purposes.
- (5) Such a contingency shall consist of appropriate operational procedures and if necessary supported by adequate system functionalities.
- (6) A stepped approach to start contingency operations is described in Annex F, "Procedure for Contingency Operations with CDM Aerodromes".
- (7) Note that ETFMS is interrupted during approximately 1 hour every 4 weeks for scheduled maintenance and for about 3 hours and during the installation of new software releases 2-3 times per year as well as, rarely, during ad-hoc exceptional maintenance windows. The regular and increment ETFMS maintenance windows are published on the NMOC website and the exceptional ones also via AIM.

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## 13 NM Software releases

### 13.1 Introduction

- (1) This document describes the DPI implementation of a next release.
- (2) The following section provides a short overview of the changes compared to the previous software releases.
- (3) It summarizes the outstanding issues for future releases and provides details, where available.

### 13.2 NM Release overview

#### 13.2.1 Overview of changes in NM Release 21.0 to NMOC 20.5

- (1) The following CRs were implemented in the NM release 21.0 :

CR number	Title
CR_040776	Display TOBT / TSAT / TT to ops users (CHMI)
CR_039938	Accept waypoint in SID field
CR_039931	Improve processing of EOBT from DLA/CHG
CR_040026	Display C-DPI Reason-field in the Flight Data Display (CHMI & NOP Portal)
CR_040223	Output C-DPI Reason-field via B2B CDMInfo

- (2) This DPI Implementation Guide has been updated in accordance with the above listed CRs.

#### 13.2.1 Overview of outstanding changes currently planned for NM Release 22.0

- (1) The following CRs are currently planned for implementation in NM Release 22.0:

CR number	Title
CR_040822	Real time monitoring of DPI quality

#### 13.2.2 Overview of outstanding changes after NMOC 22.0

- (1) The following CRs are listed for implementation after NMOC 22.0:

CR number	Title
CR_040223	Use STW values dependent on consumed slot zone
CR_042119	IFPS (re)validation for DPI updates
CR_039216	Acceptance of TTOT of ATC-DPI slightly outside STW
CR_039924	Manual TWR Update of ATC-DPI

- (2) These CRs can hopefully be planned for inclusion in a future NM release. The NMOC 22.5 in autumn 2018 will be the first opportunity for inclusion.



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## APPENDIX A: Acronyms and Abbreviations

The following are the definitions of the Acronyms and Abbreviations that are particular to this document and not of a more general nature:

### A

Airport CDM	Airport CDM (CDM airport)
ADEP	Aerodrome of Departure
ADES	Aerodrome of Destination
AIP	Aeronautical Information Publication
AOBT	Actual Off-Block Time
ARCID	Aircraft Identification
ARCTYP	Aircraft Type (ADEXP)
ATC	Air Traffic Control
ATFCM	Air Traffic Flow and Capacity Management
ATO	Actual Time Over
ATS	Air Traffic Services

### B, C

CDM	Collaborative Decision Making
CFMU	Central Flow Management Unit (now called NMOC)
CHMI	Collaborative Human Machine Interface
COBT	Computed Off-Block Time (CTOT – TaxiTime)
CTFM	Current Traffic Flight Model (also called Actual Flight Model on CHMI)
CTOT	Calculated Take-Off Time

### D

DEP	Departure Message
DES	De-suspension (message)
DPI	Departure Planning Information
DTW	Departure Tolerance Window

### E

EDIT	Estimated De-Icing Time
EOBD	Estimated Off-Block Date (off block date provided by IFPS)
EOBT	Estimated Off-Block Time (off block time provided by IFPS)
ENV	ENVironment
ETFMS	Enhanced Tactical Flow Management System
ETO	Estimated Time Overhead
ETOT	Estimated Take-Off Time
EXIT	Estimated taXi-In Time
EXOT	Estimated taXi-Out Time

### F

FAM	Flight Activation Monitoring
FCM	Flight Confirmation Message
FDPS	Flight Data Processing System

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FMP Flow Management Position  
FPL Flight Plan Message (ICAO format)  
FTFM Filed Traffic Flight Model (also called Estimated Flight Model on CHMI)  
FUM Flight Update Message

## **G, H, I**

IFPLID Initial Flight Plan Identification

## **K, L, M**

MDI Minimum Departure Interval  
MFD Mini Flightplan Data (created by CCAMS when COR received and no flight plan available)

## **N**

NA Not applicable  
NM Network Manager  
NMOC Network Manager Operations Centre

## **O**

OAT Operational Air Traffic

## **P, Q**

## **R**

REA REAdy (message)  
RFI Ready For Improvement  
REG aircraft REGistration  
RTFM Regulated Traffic Flight Model

## **S**

SAM Slot Allocation Message  
SID Standard Instrument Departure  
SMM Slot Missed Message  
SOBT Scheduled Off Block Time  
SRM Slot Revision Message  
STW Slot Tolerance Window  
SWM Sip Wanted Message

## **T**

TBC To Be Completed  
TBD To Be Defined  
TIS Time to Insert into the Sequence  
TOBT Target Off-Block Time (from AO/Handler)  
TRS Time to Remove from the Sequence  
TSAT Target Start-up Approval Time  
TWR Tower

## **U, V, W, X, Y, Z**

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## **APPENDIX B**

### **DPI ERRor Reply messages**

Comment-field text	Description	Notes
TAXI TIME OUT OF RANGE	The taxi-time is not between 1 and 90 min.	
MESSAGE RECEIVED TOO EARLY OR TOO LATE	<p>An E-DPI that is received earlier than EOBT - 3hrs  An C-DPI that is received earlier than EOBT - 3hrs  A T-DPI-t that is received earlier than EOBT - 2 hrs  A T-DPI-s that is received earlier than TOBT - 40min  An A-DPI for non-regulated flights that is received:  earlier than ETOT - DTW_LowerBound - EXOT - 25 min or  later than ETOT + DTW_UpperBound - EXOT + 140min</p> <p>An A-DPI for regulated flights that is received:  earlier than CTOT - STW_LowerBound - EXOT - 25 min or  later than CTOT + STW_UpperBound - EXOT + 140min</p>	
DPI MESSAGES NOT IN CORRECT SEQUENCE	- a C-DPI is received after another C-DPI	
PROVIDED TAKE OFF TIME OUT OF BOUNDS	<p>For E-DPI:  TTOT &gt; EOBT + Min_TT – 45 min or  TTOT &lt; ETFMS_OBT/COBT + Max_TT + 180 min or  TTOT &gt; clock -10min or  TTOT &lt; clock + 300min + Max_TT + DTW/STW_UpperBound</p> <p>For T-DPI-t:  TTOT &gt; EOBT + Min_TT – 45 min or  TTOT &lt; ETFMS_OBT/COBT + Max_TT + 120min or  TTOT &gt; clock -10min or  TTOT &lt; clock + 240min + Max_TT + DTW/STW_UpperBound</p> <p>For T-DPI-s (non regulated):  TTOT &gt; EOBT + Min_TT – DTW_LowerBound_Extension – 45 min or  TTOT &lt; ETFMS_OBT + Max_TT + DTW_UpperBound_Extension + 120min  or  TTOT &gt; clock -10min or  TTOT &lt; clock + EXOT + DTW_Upperbound + 150min</p>	(1)

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	For T-DPI-s (regulated): TTOT > EOBT + Min_TT – STW_LowerBound_Extension – 45 min or TTOT < COBT + Max_TT + STW_UpperBound_Extension + 120 min or TTOT > clock -10min or TTOT < clock + EXOT + STW_UpperBound + 150min	(1)
	For A-DPI (Non_regulated): TTOT > ETOT – DTW_LowerBound or TTOT < ETOT + DTW_UpperBound + 140min or TTOT > clock -10min or TTOT < clock + EXOT + DTW_UpperBound + 40min	
	For A-DPI (regulated): TTOT > ETOT – STW_LowerBound - 15min or TTOT < CTOT + STW_UpperBound + 140min or TTOT > clock -10min or TTOT < clock + EXOT + STW_UpperBound + 40min	(1)
TTOT OUTSIDE SLOT TOLERANCE WINDOW	For A-DPI: TTOT > CTOT – STW_LowerBound min or TTOT < CTOT + STW_UpperBound min	(1)
NOT EXISTING FLIGHT	The message could not be matched to flight data in ETFMS because ETFMS had not (yet) received the flight plan or because the AO had cancelled the flight plan.	
NOT AUTHORIZED TO SEND THIS MESSAGE	When DPI received from an address which is not allowed to send DPI	
PLEASE PROVIDE A VALID DPISTATUS	The DPISTATUS-field is missing or incorrect in a T-DPI message	
FLIGHT ALREADY ACTIVATED	The flight has already been reported as airborne to ETFMS so DPI messages are no longer accepted.	
FLIGHT ALREADY TERMINATED	ETFMS has already terminated the flight. DPI messages not accepted	
FLIGHT IS SUSPENDED	The flight is suspended. This DPI messages is not accepted.	
FLIGHT NOT YET CONFIRMED BY FLIGHT PLAN	The DPI has been associated to an RPL/MFD for which no FPL message has been received from the AO yet	
FLIGHT IS SUSPENDED BY IFPS REVALIDATION	The flight is suspended by IFPS re-validation. The AO must send a DLA of CHG message before DPI messages are accepted.	

**Notes:**

(1) - Please note that these ERROR messages should be interpreted with care when testing the A-CDM system on the B2B\_OPEVAL, B2B\_PREOPS or on the ETFMS OPS evaluation system via AFTN to the test address EUCHZMTT. These ERROR messages returned by the OPS evaluation system might not be sufficiently reliable. For an explanation of the general ERROR "Syntax Error", please refer to Doc Ref 1.

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## APPENDIX C

DPI Summary Table

Message	E-DPI	T-DPI-t	T-DPI-s	A-DPI	C-DPI
<b>Timing from OBT</b>	From EOBT - 3 hrs	From EOBT-2 hrs	From TOBT - 40 mins (non reg), From TSAT - 10 mins (reg)	At Actual OBT	From EOBT-3hrs
<b>Received From</b>	CDM-A or TWR	CDM-A (AO)	CDM-A (TWR)	CDM-A or TWR	CDM-A or TWR
<b>Received Data</b>	TT, SID, TTOT {Optional} DPI-Status = EARLY	TT, SID TTOT DPI-Status = TARGET	TT, SID TTOT DPI-Status = SEQ	TT, SID TTOT DPI-Status = ATC	TT, SID  DPI-Status = CNL
<b>Derived Data</b>	ETOT {Optional}  CDM status = e	TOBT = TTOT – TT Target TOT CDM status = t	TSAT = TTOT – TT Sequence TOT = No slot before CDM status (when tac activated) = s, (else)= t	ATC's Anticipated TOT CDM status = a	CDM status = c
<b>Effect on ETFMS</b>	FTFM recomputed with ETOT or EOBT + TT	FTFM recomputed with SID, TT, TTOT	<b>For Non Regulated Flight</b> When TTOT after DTW ⇒ Perform Network assessment for suspension/regulation. When TTOT inside DTW ⇒ CTFM created based on TTOT ⇒ Tac activated  <b>For Regulated Flight</b> When TTOT before ETOT ⇒ Same processing as REA message When TTOT before STW ⇒ CTFM deleted ⇒ CTOT improvement possible When TTOT inside STW ⇒ CTFM based upon TTOT ⇒ Tac activated (No CTOT improvement) When TTOT after STW ⇒ Perform Network assessment for suspension/regulation	<b>For Non Regulated Flight</b> When TTOT inside -30 to +155 of ETOT ⇒ CTFM created/updated with: TT, SID and TTOT ⇒ Tac activated When TTOT outside -30 to +155 of ETOT ⇒ TTOT rejected  <b>For Regulated Flight</b> When TTOT inside STW ⇒ CTFM created/updated with: TT, SID and TTOT ⇒ Tac activated When TTOT outside STW ⇒ TTOT rejected	Flight is suspended..

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<b>Notes</b>	<b>T-DPI-s (continued)</b>		
TTOT      Target Take Off Time TOBT      AO's Target OBT TSAT      ATC's Target Start-up Approval Time No slot before      Sequenced TOT STW      Slot Tolerance Window (Default -5 to +10 of CTOT) DTW      Dep Tolerance Window (Default -15 to +15 of ETOT)  N.B.      Prior to new TTOT from A-CDM airports the CFMU12.2 message fields will continue to be received from A-CDM i.e., T-DPI_c/s (ATTOT) and A-DPI (AATOT)	<b>Following Network assessment:</b> When Flight non regulated/desuspended: ⇨ CTFM re/computed ⇨ SLC/ DES sent appropriately When Flight assessed regulated: ⇨ SAM/SRM sent ⇨ CTOT improvement possible If TTOT inside STW ⇨ CTFM created based on TTOT ⇨ Tac activated (No CTOT improvement) When Flight assessed ATFCM suspended: ⇨ FLS sent		

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## **APPENDIX D**

### Working relationship TWR – FMP - NMOC Operation @ CDM Airports

#### **FMP@CDM Airport**

The FMP at a CDM Airport needs to keep a close link between CDM TWR and NMOC Operations

In general, the FMP for a CDM Airport will be the main contact for:

- Implementation decision for ATFCM inbound regulations
- Coordination with NMOC with regards to general information (e.g. WX, technical issues,...)
- Defining the TIS value

When CDM and DPI messages are fully operational, the FMP for a CDM Airport provides:

- runway configuration updates for arriving flights
- taxi-time extensions in ENV data for departures of which EOBT is more than 3hr in the future

#### **TWR@CDM Airport**

The TWR at a CDM Airport needs to keep a close link between FMP and NMOC Operations

The TWR at a CDM Airport needs to communicate with NMOC Operations for:

- Actions on individual flights (e.g. adjust CTOT)
- Situation at the airport to improve situational awareness for NMOC for e.g. display in NOP Portal.

The TWR at a CDM Airport will be the main contact for:

- informing of unexpected runway (un)availability
- Ensure that updates to taxi-times (via DPI messages) are adjusted to the operational circumstances (e.g. general de-icing)
- STW & DTW extensions
- CTOT extensions for individual flights

#### **FMP or TWR @CDM Airport**

During Contingency Operations, when CDM and DPI messages are no longer operational, the FMP or TWR, dependent on local arrangements for a CDM Airport provides:

- all changes to runway configurations
- send REA messages
- send DLA messages (if required in the past)



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## **APPENDIX E**

### **Operational Procedures issues @CDM Airports - Summary**

#### **1. Level 0 - Normal Operations**

##### Situations that Qualify

- situations during which Demand & Capacity are in Balance.

##### Actions required by TWR (if necessary):

- Coordinate on individual flights
- Inform NMOC about any changes in the situation
- Inform FMP about any changes in the situation
- Identify & help flights with disproportional ATFM delay

##### Actions required by NMOC (if necessary):

- ATFM Slot Improvements for individual flights
- ATFM Slot extensions for individual flights
- ATFM Slot swaps
- Identify & help flights with disproportional ATFM delay

#### **2. Level 1 – Adverse Conditions**

##### Situations that Qualify

##### The following situations may qualify:

- emergencies such as security alerts, fire, closure of runway/apron,...
- ATC, airport system failures
- Extreme adverse weather such as freezing rain, thunderstorm,,,

##### Actions required by TWR (if necessary):

- Inform NMOC about any changes in the situation
- Inform FMP about any changes in the situation

##### Actions required by NMOC (if necessary):

- Extend STW and DTW
- Inform ATFM Community

#### **3. Level 2 – Disturbed Operations**

##### Situations that Qualify

##### The following situations may qualify:

- Significant number (e.g. 40%) of the regulated flights are not able to take off within the extended STW
- if TOBT and TSAT of the majority of the flights are differing by 90min or more
- During e.g. the last 2hrs there have been 2-4 runway closures of which the estimated begin and end times have been exceed by more than e.g. 10min.
- Suspension of departures (e.g. freezing rain) and no estimation for reopening plannable
- Unexpected Runway closure and no estimate can be made for reopening

##### Actions required by TWR (if necessary):

- Inform NMOC about any changes in the situation
- Inform FMP about any changes in the situation

##### Actions required by NMOC (if necessary):

- Further extend STW and DTW
- Extend FAM suspension period
- Inform ATFM Community

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## **APPENDIX F**

### **Procedure for Contingency Operations with CDM Aerodromes**

#### **1. Procedure**

##### **1.1 Step 1 – Information Exchange**

Refer to Doc Ref 5 Section 7.1.4 Interruption of DPI messages for a detailed description of the procedure.

A-CDM TWR supervisor (or representative) will inform NMOC supervisor as soon as possible of any interruption or change of local CDM procedures that have an impact on the quality and availability of the DPI messages.

If the problem is detected by NMOC, the A-CDM TWR supervisor and Technical help desk will be informed by NMOC.

Note that the NMOC is not monitoring the quality and completeness of the reception of DPI messages continuously.

Following the coordination between the FMP/TWR and NMOC, disabling the acceptance of DPI messages may be decided. This could be required if all DPI messages are erroneous and are consequently rejected by ETFMS.

NMOC will send AIM messages to inform the ATFM community of any relevant changes to the interface (both operational and technical) with the CDM Airport.

Example:

CDM DATA EXCHANGE (DPI) FROM .... TO NMOC INTERRUPTED

-----

. VALID: WEF DD.MM.YYYY HH:MM UTC UNTIL UFN.

. REASON .....

. THE DPI TRANSMISSION TO NMOC IS INTERRUPTED FOR TECHNICAL . REASONS

. IMPACT ON OPERATIONS:

. IT IS REQUIRED TO REVERT TO:

. UPDATE OF EOBT IN CASE OF ATC GROUND DELAY VIA DLA MESSAGES

. UPDATE OF STANDARD TAXITIME IN NMOC IF APPLICABLE

. TRANSMISSION OF REA MESSAGE IF APPLICABLE

. NOTE THAT CDM OPERATIONS LOCALLY AT THE AIRPORT MAY CONTINUE

. WE WILL KEEP THE COMMUNITY INFORMED WHEN NEW INFORMATION IS AVAILABLE

. NETWORK MANAGER OPERATIONS CENTER - BRUSSELS

##### **1.2 Step 2 – Activate Contingency procedures**

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Examples of actions may be required by the CDM Airport during the interruptions of DPI messages to the ETFMS Operational system:

a) REA messages

If the CDM Airports is using the DPI messages to provide the REAdy for improvement status of flights the NMOC/ETFMS, a contingency must be foreseen.

The contingency could consist of a different operational procedure to send REA messages via the NMOC CHMI or to provide REA message from the local TWR software application.

b) DLA messages

TWR ATC controllers at some airports, which are not yet CDM, send DLA messages. Sometimes on behalf of the pilot, sometimes because the flight is delayed by ATC, sometimes to prevent suspension by Flight Activation Monitoring (FAM), and other times because the flight cannot adhere to its CTOT,...

When the CDM airport provides DPI messages to the NMOC/ETFMS operational systems such DLA messages are no longer required.

However, when the DPI messages are interrupted, a contingency procedure shall ensure that the DLA messages can be sent again, as was done before CDM operations.

c) Global taxi-time increase

DPI messages provide a variable taxi-time (VTT/EXOT) for each individual flight. The DPI messages contain longer taxi-times in case this is required during for example adverse conditions.

When the DPI messages are interrupted, the TWR controller in close cooperation with the FMP, shall request to extend the global taxi-time in NMOC. This is the same procedure that was used before CDM was put into operations.

d) Modifying TIS back to standard value (for large airports usually 20 min)

During the period the DPI messages are interrupted the NMOC may provide additional support to the Airport, similar to the support provided during adverse conditions as specified in section 12.2 Procedures for FMP/TWR and NMOC.

### 1.3 Step 3 – Analyse and solve problem

Analyse and solve the problem. Agree date and time with Current OPS Manager (NM OM) when DPI message transmission can be re-started.

### 1.4 Step 4 – Normal Operations

Revert back to normal CDM operations on the agreed date and time.

Refer to Step 2 of the list of actions that may have to be taken.

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## **APPENDIX G**

### **Conversion table of DPI data fields B2B ↔ AFTN**

DPI messages can be provided to NMOC either via AFTN or via B2B Web Services.

In support of those airports wishing to implement DPI transmission via B2B, the table below shows the equivalent ADEXP field name for each B2B attribute.

<b>B2B attribute</b>	<b>ADEXP</b>
aircraftId: AircraftCAOld	ARCID
aerodromeOfDeparture: AerodromeCAOld	ADEP
aerodromeOfDestination: AerodromeCAOld	ADES
estimatedOffBlockTime: DateTimeMinute	EOBT + EOBD
ifplId: IFPLid	IFPLID
targetOffBlockTime: DateTimeMinute	TOBT (+date)
targetStartupApprovalTime: DateTimeMinute	TSAT (+date)
taxiTime: DurationHourMinute	TAXITIME
targetTakeOffTime: DateTimeMinute	TTOT (+date)
scheduleOffBlocktime: DateTimeMinute	SOBT + SOBD
departureProcedure: TerminalProcedure	SID
aircraftType: AircraftTypeCAOld	ARCTYP
registrationMark: AircraftRegistrationMark	REG
deicing: DeicingStatus	DEPSTATUS
reason: ReasonForDPICancellation	REASON

Note: The syntax of the B2B attributes may vary slightly compared with the syntax of the ADEXP fields.

For more detailed technical specifications on using NM B2B web services please refer to Doc Ref 4.

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