



# DPI Implementation Guide

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**ANNEXES**

APPENDIX A: Acronyms and Abbreviations

APPENDIX B: DPI ERRor reply messages comment-field

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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 GuideDPI 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 "CFMU 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 CFMU 13.0 release. It also contains outstanding issues to be implemented in future CFMU 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, CFMU 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.

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- (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 "").

### 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 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 DPI requirements for others users/systems then Airport CDM.

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

Sub-Domain	Description
DPI	Departure Information Planning

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

- (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-p & T-DPI-c)
TDPI-S	Target DPI-s message (T-DPI-s)
ADPI	Target DPI message (T-DPI-p & T-DPI-c)
CDPI	Cancel DPI message
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 CFMU:
- (2) Doc Ref 4: Airport CDM manual – Edition 2, dated October 2006.
- (3) None

### 2.2 CFMU

- (1) CFMU 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: CFMU Flight Progress Messages, ref URB/USD/MSG\_INTF, Edition 1.600, author KOO, dated 28/02/2009
- (3) Doc Ref 2: DPI Implementation Road Map, ref URB/USD/DPI\_FUM\_Impl\_RM, Edition 1.100, author KOO/GOZ, dated 28/02/2009.
- (4) Doc Ref 3: not used

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## 3 DPI Introduction

### 3.1 Objectives

- (1) The overall objective of the DPI messages is to better coordinate ATFM 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 ATFM:
- (2) Planning phase: CDM Airport schedule and flight plan estimates must be re-conciliated and consistent information must be sent to CFMU. Ghost flights and duplicated flights should be suppressed. A first evaluation of the realistic taxi-time and SID will be indicated to CFMU 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 turn around 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.

### 3.2 Benefits of DPI/FUM messages

#### 3.2.1 Introduction

- (1) The purpose of FUM is to make CFMU partners aware of the situation of a given flight, in particular regarding the Estimated LanDing Time, through a message that can be automatically processed.
- (2) The purpose of DPI is to make CFMU and its partners (i.e. ATC Units, AOs, airports of destination,...) aware of the situation of given flight situation 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

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### 3.2.2 Benefits

- (1) The messages provide a way for the CDM Airports to be integrated into the ATFCM process, 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 CFMU 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) They are short messages that can be used directly by persons, but 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.

## 3.3 Pre-requisites

### 3.3.1 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.

### 3.3.2 Minimum Requirements / DPI Readiness Criteria

- (1) Before starting the transmission of DPI messages to the CFMU, the CDM Airport must provide evidence that it is has reached an advanced stage of CDM implementation.
- (2) It shall show that is 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,...

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### 3.4 Implementation and Operational Evaluation

- (1) The next step is the implementation of the DPI by the Airport CDM system at the CDM Airport.
- (2) After the implementation has been completed the transmission to an ETFMS test system can be started. The CFMU will perform an operational validation of the newly implemented DPI messages during a period which is agreed between the CDM Airport and the CFMU.
- (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 CFMU acceptable values. The quality criteria are defined in Doc Ref 2.

### 3.5 IFPS Discrepancies

#### 3.5.1 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 EOBT, 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 CFMU terminals. It will also be available on the Tool for Tower. Such a discrepancy shall be solved by the AO by filing a DLA or CHG message to IFPS.

#### 3.5.2 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 CFMU recommends that the pushback/start-up clearance is refused if any IFPS discrepancy has not been resolved at the moment of requested departure clearance.

#### 3.5.3 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 CFMU acceptable values, the CFMU may decide to ignore/reject any DPI messages from that concerned originator (the following day). Note that interrupting the DPI message will be agreed by CFMU and A-CDM and will be specified in operational procedures between these 2 units.

#### 3.5.4 Outstanding Issues

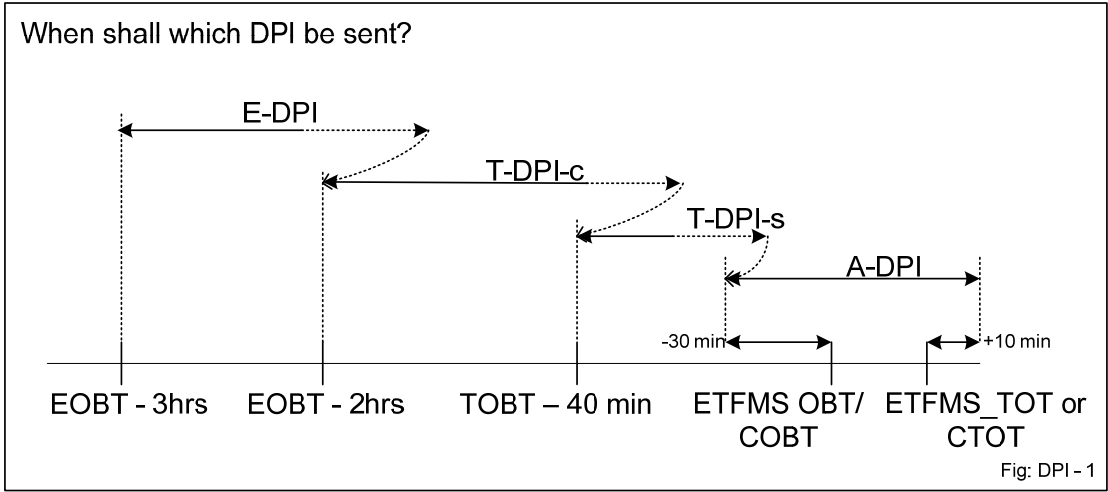
- (1) None.

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## 4 Overview

- (1) The purpose of the Departure Planning Information (DPI) message is to supply the CFMU 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 CFMU 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) For CDM systems, systems where Aircraft Operators play an important role, the DPI message can also contain updates of:
  - the aircraft type
  - the aircraft registration
  - 24 bit ICAO aircraft address
- (7) The DPI will be used by the CFMU to update the flight data for ATFM 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) 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-p - Target DPI - Provisional
  - T-DPI-c - Target DPI - Confirmed
  - 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.
- (9) The detailed operational procedures associated to DPIS for the co-ordination between ATFM and CDM Airports will be described in the ATFM Handbook.

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## 5 CDM Airport Information, Airline Information, DPSTATUS, 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 & 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	DPSTATUS
E-DPI	EARLY
T-DPI-p	PROV
T-DPI-c	TARGET
T-DPI-s	SEQ
A-DPI	ATC
C-DPI	CNL

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

### 5.2 Who (can send it)

- (1) For CDM Airport Information: An ATC 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 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 **shall** be sent when
- The Taxi-Time (EXOT) changes by more than 3 Min
  - Any SID change
  - Any ARCTYPE change
  - Any REG change

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[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-p, T-DPI-c, T-DPI-s, A-DPI and C-DPI messages.

[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.

## 5.4 Acceptance rules

### 5.4.1 Technical

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

[URE.ACDM.DPI.GEN.007]

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

### 5.4.2 Quality

- (1) Not applicable.

## 5.5 How (does ETFMS use it)

- (1) The CDM Airport Data fields SID and Taxi-Time (EXOT) are 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 load (Actual Flight Model, CTFM).
- (2) The SID will not be used but stored for later use when one of its connecting points is not on the route of the flight.
- (3) 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.
- (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) and SID received via a DPI message can only be modified via another DPI message, not via an FMD/ENV runway update and not via a CHG message. The SID from the DPI prevails.
- (6) The deterioration of a slot will be limited where the delay can be absorbed within the ATFM delay and slot tolerance window.

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- (7) The AO data fields ARCTYP and REG are stored and only used to show IFPS discrepancy reporting,.
- (8) If present in a DPI Message, ETFMS will use the depstatus-field for special processing of the flight (see section 11.3 Use of DPIs during Special Circumstances at the airport)

## 5.6 Outstanding issues

### 5.6.1 SID at ATC Discretion

- (1) ATC units at some CDM Airports have defined SIDs that can only be used at the discretion of the TWR controller. These may not be used in flight plans. If this is the case, it is indicated in the national AIP.
- (2) Normally, “SIDs at ATC discretion” are not input into the CFMU ENVironment database. However, if such SIDs are included in DPI messages, the CFMU ENVironment database must be updated to include them.
- (3) However, in the current and future CFMU software releases 12.2 and 13.0 it is not yet possible to make a distinction between “flight plannable SIDs” and “SIDs at ATC discretion” so there is a (small) risk that “SIDs at ATC discretion” is included in a flight plan.
- (4) It is planned to improve this situation in a future software release (probably CFMU 14.0). It is recorded under CR\_023769.

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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 CFMU 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) to eliminate ghost flights and duplicate flight plans.
- (3) E-DPI is also used to supply ETFMS with a first update of the Taxi-Time (EXOT) and SID (CDM Airport Information) and TTOT.

[URE.ACDM.DPI.EDPI.002]

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

#### 6.1.2 Fields

##### 6.1.2.1 TTOT

[URE.ACDM.DPI.EDPI.003]

- (1) This TTOT **shall** be part of the E-DPI to indicate is the first estimate of the Take-Off Time of the Airport CDM system.
- (2) The purpose of the TTOT field is to:
  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 a consistency check between the flight plan EOBT and the CDM Airport schedule. Via this comparison, the Airport CDM system is helping in suppressing duplicate and ghost flight plans.

[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.

##### 6.1.2.2 SOBT

[URE.ACDM.DPI.EDPI.006]

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

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[URE.ACDM.DPI.EDPI.007]

- (2) If present, the SOBT field **shall** contain the airport Scheduled Off Block Time, which is the time coordinated with the national airport slot coordinator. For example, for passenger flights, this is the time that the passenger has on his ticket.
- (3) 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 an TTOT **should** be sent by ATC and CDM Airport systems that can provide ETFMS with more accurate data that can currently be obtained from IFPS or CFMU 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 Non-CDM airports, the E-DPI **should** be sent between EOBT – 3 hours and take-off or until the transmission of the A-DPI message (which ever comes first or is available).

[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 more than 5 min compared to the previously provided TTOT.

## 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 ATFM suspensions such as suspensions due to closed airspace, FAM,...

---

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

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- (2) The E-DPI is accepted for IFPS suspensions. Note that this may change in a future software release.

[URE.ACDM.DPI.EDPI.017]

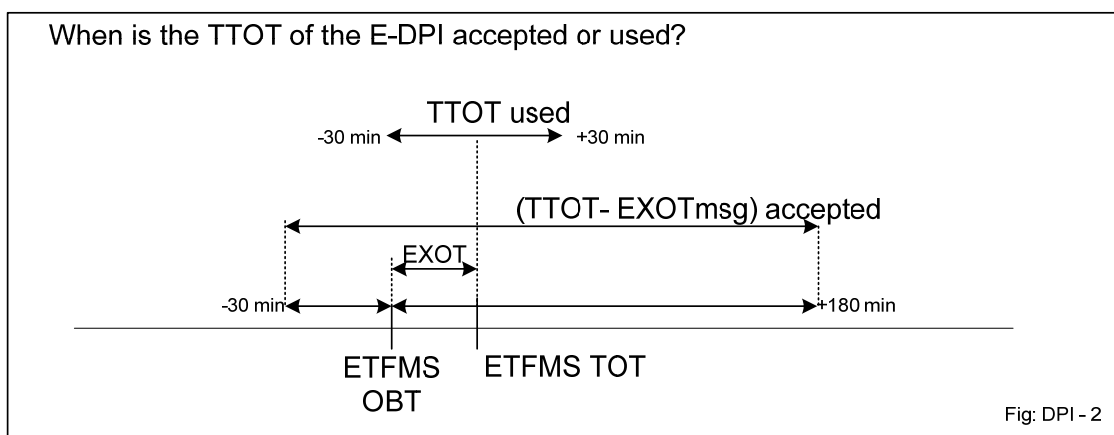
- (3) The TTOT **shall** be between (ETFMS\_OBT – 30 min) and (ETFMS\_OBT + 3 hours). The ETFMS\_OBT is the last known OBT in ETFMS so is IFPS OBT updated, with DPI, REA,.....

[URE.ACDM.DPI.EDPI.018]

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

[URE.ACDM.DPI.EDPI.019]

- (5) The TTOT **should** be inside the window ETFMS\_ETOT +/- DPI\_TTOT\_USAGE\_WINDOW (30 min). During the E-DPI reception time-frame CHG and DLA messages should be used to inform ATC/ATM about big EOBT/ETOT changes.



## 6.5 How (does ETFMS use it)

- (1) ETFMS uses the TTOT to update the Filed Demand (FTFM). The CDM\_ETOT is the TTOT. The CDM\_OBT is set to CDM\_ETOT – Taxi-Time (EXOT).
- (2) ETFMS will re-assess the impact of the E-DPI on the ATM network.
- (3) Furthermore ETFMS shows an IFPS Discrepancy (see section 3.5 IFPS Discrepancies) if the OBT derived from the TTOT and Taxi-Time (EXOT) is outside a window of +/- 15 min around the EOBT (IFPS OBT).
- (4) Any ATFM suspension conditions will be re-assessed. If the flight remains or becomes suspended, the Estimated Flight Model (FTFM) becomes the reference and is based upon the TTOT of the E-DPI. ETFMS will (re-)send an FLS after EOBT-2hrs (SIT1).
- (5) In case of a suspension due to IFPS revalidation then the Estimated Flight Model (FTFM) will also be updated but the flight remains suspended in any case. An FLS is NOT resent.
- (6) The CDMSTATUS is set to “e – estimated” if the E-DPI is accepted.

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- (7) Initially, the SOBT field will be used for off-line evaluation purposes only. ETFMS will parse this field and will not base any logic upon the SOBT.

## 6.6 Outstanding issues

- (1) .None

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## 7 T-DPI (T-DPI-p & T-DPI-c)

### 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-p and the T-DPI-c messages must contain the Target Take-Off Time (TTOT) that takes into account all constraints from an AO and Handler perspective. This TTOT is the Target take-off time, which is known by the Airport CDM system.
- (2) The T-DPI-p is a “what-if TTOT”. ETFMS will calculate a provisional slot (if any) which will be displayed on the CFMU terminal.
- (3) The T-DPI-c 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]

- (4) A T-DPI-p **should** be used to “ask” ETFMS what would be the CTOT for a provided TTOT. The “would-be-CTOT” is displayed on the CFMU terminal. If this CTOT is acceptable this can be confirmed via the CFMU terminal or a T-DPI-c can be sent.

[URE.ACDM.DPI.TDPI.003]

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

[URE.ACDM.DPI.TDPI.004]

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

#### 7.1.2 Fields

[URE.ACDM.DPI.TDPI.005]

- (1) The TTOT-field **shall** contain the best known earliest take-off-time from an Aircraft Operator/Handler 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 messages will only be accepted from airport CDM systems.

## 7.3 When (can it be sent)

[URE.ACDM.DPI.TDPI.008]

- (1) The T-DPI-p message **should** be sent when the sending Airport CDM system has established the TOBT.

[URE.ACDM.DPI.TDPI.009]

- (2) The T-DPI-c message **shall** be sent when the sending Airport CDM system has established the TTOT as specified in section 7.1.2 Fields above and when it can be published to CFMU.

[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-p or T-DPI-c message **shall** not be sent earlier than 2 hours before EOBT.

[URE.ACDM.DPI.TDPI.012]

- (4) Updates of T-DPI-p or T-DPI-c **shall** be sent when the TTOT changes by more than 5 min.

## 7.4 Acceptance rules

### 7.4.1 pre-requisites

- (1) The T-DPI-p and T-DPI-c 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) The T-DPI-p or T-DPI-c **shall** be sent between EOBT and EOBT + 120min.

[URE.ACDM.DPI.TDPI.014]

- (3) The TTOT **shall** be between EOBT+EXOT – 30 min and ETFMS\_TOT/CTOT + 120 min.
- (4) In fact, the TTOT **should** be between LOBT+EXOT – 30 min and ETFMS\_TOT/CTOT + 120 min.

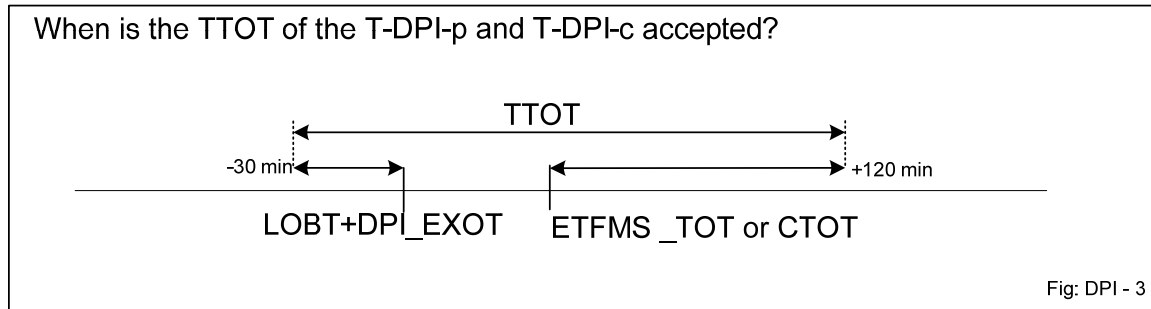
LOBT is the last received EOBT from IFPS possibly updated by the flow controller (so excluding updates from DPI messages).

[URE.ACDM.DPI.TDPI.015]

- (5) The T-DPI-p and the T-DPI-c **shall** be sent when the flight is suspended. This applies to ATFM suspensions such as suspensions due to closed airspace, FAM,...

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- (6) The T-DPI-p and the T-DPI-c are accepted for IFPS suspended flights. Note that this may change in a future software release.



## 7.5 How (does ETFMS use it)

### Provisional T-DPI-p:

- (1) ETFMS will use the TTOT to assess the impact on the ATM network. It will not be used to update any flight profile. The Taxi-Time (EXOT) and SID will NOT be used to update the Filed Demand (FTFM). The Provisional T-DPI is a true “what-if”.
- (2) The provisional TTOT will be kept and displayed on the CFMU terminal for confirmation by the AO.
- (3) The CDMSTATUS will not be changed.

### Confirmed T-DPI-c:

- (4) ETFMS will use the TTOT to update the Filed Demand (FTFM).
- (5) ETFMS will re-assess the impact of the T-DPI-c on the ATM network.
- (6) Furthermore ETFMS will show an IFPS Discrepancy (see section 3.5 IFPS Discrepancies ) if the OBT derived from the TTOT and Taxi-Time (EXOT) is outside a window of +/- 15 min around the EOBT (IFPS OBT).
- (7) Any ATFM 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-c and ETFMS will (re-)send an FLS.
- (8) In case of a suspension due to IFPS revalidation then the Estimated Flight Model (FTFM) will also be updated and the flight remains suspended in any case. An FLS is NOT resent.
- (9) The CDMSTATUS is set to “t – targeted” if the T-DPI-c is accepted.
- (10) The Flight will get the status RFI automatically regardless what the ENV settings for the AO concerned are and regardless of any previously received ATFM message.
- (11) The AO may wish to send a SWM message as well but this does not seem to be very logical for departures from a CDM Airport.

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- (12) Note that the confirmation via CFMU terminal of a previously sent T-DPI-p will be processed in the same way as a new T-DPI-c.

## 7.6 Outstanding issues

- (1) None

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## 8 T-DPI (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 usually 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 a Shadow-Pre-Departure Sequence. This Shadow Pre-Departure Sequence is based upon the TOBT+Taxi-Time (EXOT) for all flights, including regulated flights. The purpose of the Shadow Pre-Departure Sequence is to determine the earliest possible TOT for regulated flights, solely based upon CDM Airport/ATC constraints.
- (5) This Shadow Pre-Departure Sequence is used to provide ETFMS with a TSAT\_shadow+Taxi-Time (EXOT) for regulated flights. The TSAT\_shadow is very useful for ETFMS and Airport CDM, especially if it is after TOBT and before CTOT-Taxi-Time (EXOT), because it will prevent that ETFMS provides a CTOT that cannot be met due to (significant) CDM Airport constraints.

[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 Fields

##### 8.1.2.1 TTOT for non-regulated flights

[URE.ACDM.DPI.TDPIS.003]

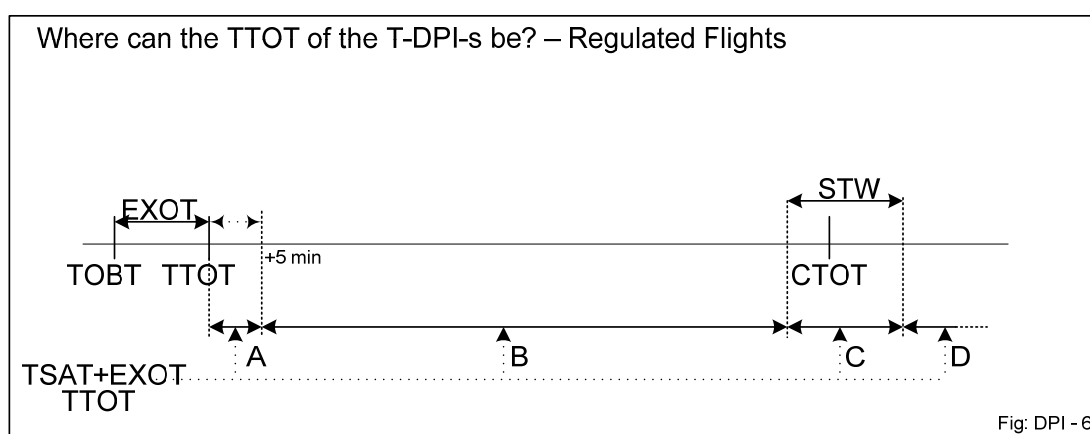
- (1) For non-regulated flights, the TTOT-field **shall** contain the take-off-time as calculated by the Pre-Departure Sequence, it is the Target Start-up Time (TSAT) + Taxi-Time (EXOT).

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### 8.1.2.2 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 an 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 12.2 The STW and the DTW for more details.

[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 CFMU 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 TSAT+EXOT, 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 shadow 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 TSAT\_shadow+Taxi-Time (EXOT).
- (7) For further details see also section 8.5 How (does ETFMS use it).

## 8.2 Who (can send it)

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

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## 8.3 When (can it be sent)

### 8.3.1.1 All flights

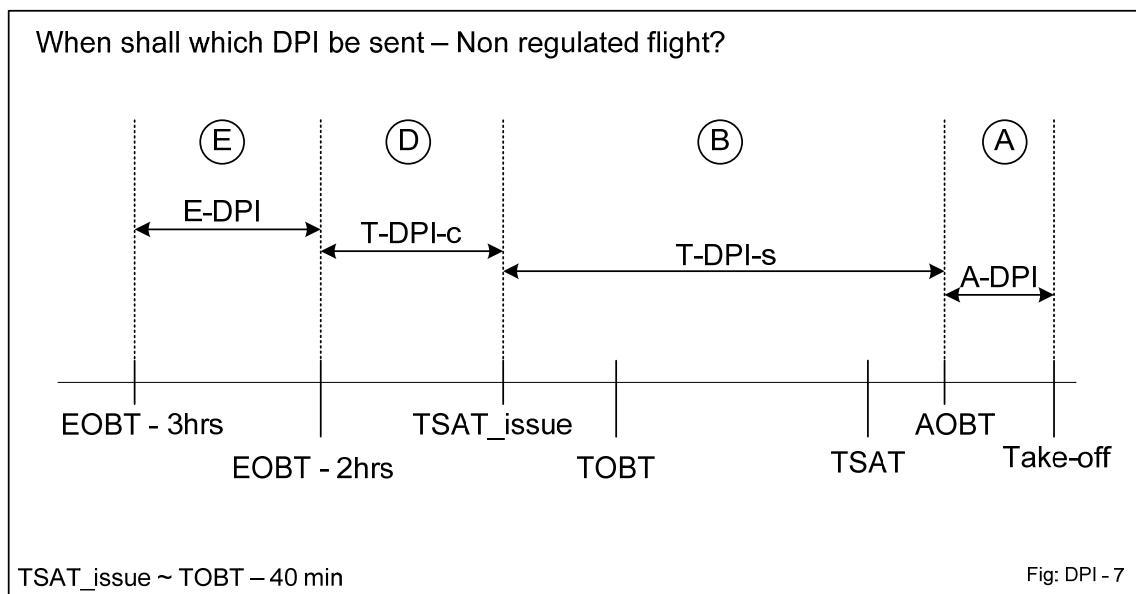
[URE.ACDM.DPI.TDPIS.008]

- (1) Updates of T-DPI-s **shall** be sent when the TTOT changes by more than 5 min.

### 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 CFMU. 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.



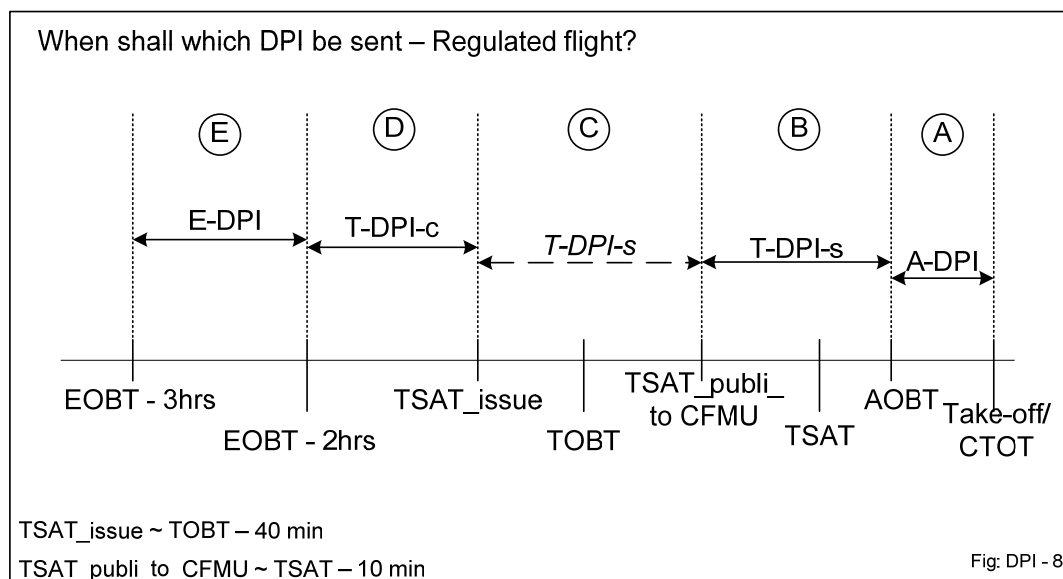
### 8.3.1.3 Regulated flights

- (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 CFMU.
- (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\_CFMU\_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\_CFMU\_time is the time when the TTOT, which is based upon the TSAT, is published/provided to the CFMU.

For regulated flights, the TSAT\_issue\_time is usually different from the TSAT\_pUBLI\_to\_CFMU\_time.

- (5) The CDM Airport **shall** send the T-DPI-s to the CFMU at TSAT\_publication\_to\_CFMU\_time. This is shown by period “B” in the diagram “Fig: DPI – 8” above.

[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”.
  - shall** be sent when Airport CDM no longer wants ETFMS to improve/advance the CTOT. This is usually 5-10 min before the TSAT but in special circumstances, this may be earlier. This is illustrated as “case C” in graph “Fig: DPI – 6”.

[URE.ACDM.DPI.TDPIS.012]

- (7) If the Airport CDM calculates a Shadow Pre-Departure Sequence, the T-DPI-s for regulated flights **shall also** be sent (see “case B” in graph “Fig: DPI – 6”):
- If the difference between TOBT+EXOT and TSAT\_shadow+EXOT is bigger than SYSPAR (5 min) and...
  - 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 TTOT (TSAT\_shadow+EXOT) may be well before the STW but not earlier than the TOBT+EXOT.

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- (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 a shadow TTOT (see section “11.3 Use of DPIs during Special Circumstances at the airport” for more details).
- (9) If the Airport CDM calculates a Shadow Pre-Departure Sequence and in case the difference between the  $TOBT+Taxi-Time$  (EXOT) from the T-DPI-c and the  $TSAT+Taxi-Time$  (EXOT) is smaller than 5 min, it is not required to send a T-DPI-s. This is illustrated as “case A” in graph “Fig: DPI -6”. In fact, the T-DPI-s from a shadow pre-departure sequence is only required when there is a “big” difference between TSAT and TOBT.

## 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).
- (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  $TOBT - 40min$ .

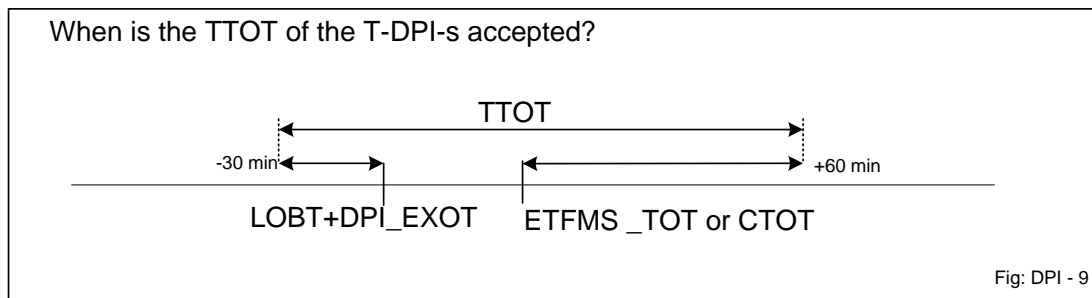
*[URE.ACDM.DPI.TDPIS.014]*

- (4) The TTOT of the T-DPI-s **shall** be between  $EOBT+EXOT - 30 min$  and  $ETOT/CTOT + 60 min$   
EOBT is the last received OBT from IFPS (so excluding updates from DPI messages)
- (5) The TTOT of the T-DPI-s **should** be between  $LOBT+EXOT - 30 min$  and  $ETOT/CTOT + 60 min$   
LOBT is the last received EOBT from IFPS possibly updated by the flow controller (so excluding updates from DPI messages)

*[URE.ACDM.DPI.TDPIS.015]*

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

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## 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 a T-DPI-s to check an IFPS EOBT Discrepancy (see section 3.5 IFPS Discrepancies).
- (4) ETFMS will use the Slot Tolerance Window (STW) and Departure Tolerance Window (DTW) for the processing of T-DPI-s messages. See section 12.2 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 12.2 The STW and the DTW and 11.3 Use of DPIs during Special Circumstances at the airport for more information.

### 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-c,...
- (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 outside 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.

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### 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 processed. Note that in a future software release, it may be rejected with ERR "FLIGHT SUSPENDED DUE TO IFPS REVALIDATION".

### 8.5.4 Regulated flights

- (1) When the TTOT (TSAT+EXOT) is before the STW then (see "case B" in graph "Fig: DPI – 6"): TTOT is stored for possible future use as a no-slot-before time and the Actual Flight Model (CTFM) is removed if it existed. See "case B" in graph "Fig: DPI – 6".
- (2) ETFMS will try to improve the CTOT up-to the provided no-slot-before time at regular intervals and ETFMS will use the no-slot-before time when the regulation-schema is modified.
- (3) When the TTOT (TSAT+EXOT) is inside STW then (see "case C" in graph "Fig: DPI – 6"): the Traffic Load is updated through the creation or update of the Actual Flight Model (CTFM). ETFMS will no longer provide any CTOT improvements and the flight may be impacted by modifications of the regulation schema.
- (4) When the TTOT (TSAT+EXOT) is after the STW then (see "case D" in graph "Fig:DPI-6"): regulations crossed and suspension conditions are (re-) assessed.
- (5) For further details see 8.5.5 General Processing.

### 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.
- (3) If the flight remains/becomes 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 CFMU expects a new T-DPI-s at the appropriate moment which contains a TTOT that is based upon the newCTOT.
  - 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.

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.

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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 new CTOT that is received after Airport CDM has sent a T-DPI-s **shall** be confirmed by a new T-DPI-s except when the previously provided TTOT is still inside the new STW. 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 new TSAT-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).

## 8.7 Outstanding issues

- (1) In a future software release (probably CFMU 14) additional validation rules will be implemented for the T-DPI-s. In fact some of the validation criteria as specified in previous sections will be enforced. This change is covered by CR\_026998.
- (2) In a future CFMU release it is planned that the status of the flight will be changed from RFI to REA and the flight will be processed in a very similar way as if ETFMS had received a REA for this flight (e.g. TIS is not used/set to 0). This change is covered by CR\_027390.

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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 Fields

##### 9.1.2.1 TTOT

[URE.ACDM.DPI.ADPI.004]

- (1) The A-DPI **shall** supply ETFMS with an estimate 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 12.2 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 reliably & stable enough to inform ETFMS.

[URE.ACDM.DPI.ADPI.007]

- (2) If the TTOT changes by more than 5 min a new A-DPI **shall** be sent.

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[URE.ACDM.DPI.ADPI.008]

- (3) In case the flight 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.

## 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-c 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 online.

[URE.ACDM.DPI.ADPI.009]

- (3) The A-DPI **shall** not be sent when the flight is suspended. The A-DPI is rejected for a suspended flight because a flight is not supposed to off-block when it is suspended.

[URE.ACDM.DPI.ADPI.010]

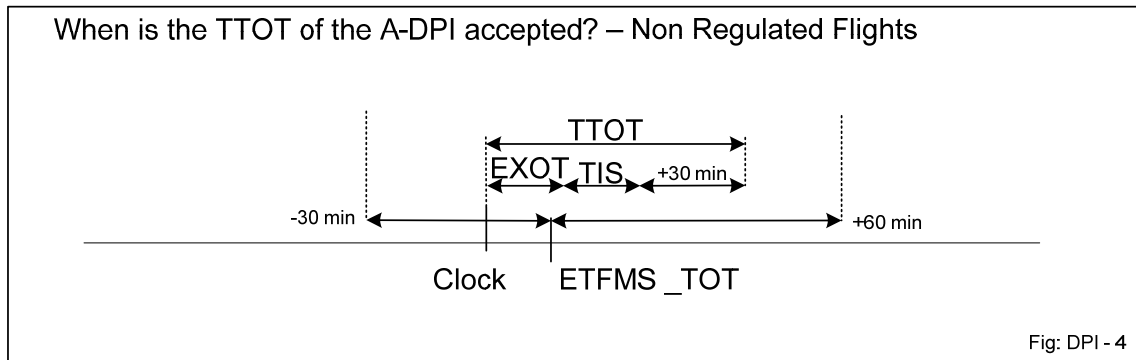
- (4) The A-DPI for non regulated flights **shall** be sent between (ETFMS\_OBT – 30 min) and ETFMS\_OBT + EXOT + 20 min.

[URE.ACDM.DPI.ADPI.011]

- (5) The TTOT of the A-DPI for non-regulated flights **shall** be between:
- ETFMS\_TOT – 30 min and ETFMS\_TOT + 60 min
- And
- clock and (clock + EXOT + TIS + 30 min)

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

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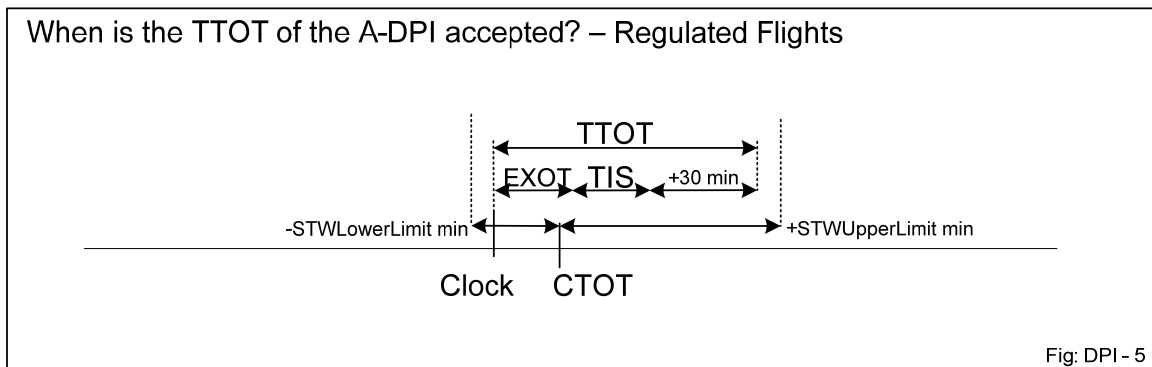


[URE.ACDM.DPI.ADPI.012]

- (6) The A-DPI for regulated flights **shall** be sent between (CTOT - EXOT - 30 min) and (CTOT + 20 min).

[URE.ACDM.DPI.ADPI.013]

- (7) The TTOT of A-DPIs for regulated flights **shall** be between:
- CTOT - STWLowerLimit min and CTOT + STWUpperLimit min (default 5 and 10 mins respectively) (see section 12.2 The STW and the DTW for more details)
- And
- clock and (clock + EXOT + TIS + 30 min)



## 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.
- (3) Flight Activation Monitoring (FAM) may start shifting at the TTOT and may suspend 30 min after the TTOT.

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- (4) ETFMS will use the depstatus-field to verify if the provided TTOT may be inside an extended STW. See sections 12.2 The STW and the DTW and 11.3 Use of DPIs during Special Circumstances at the airport for more information.
- (5) Any Taxi-Time (EXOT) in the A-DPI will be stored with the Estimated Flight Model (FTFM) for use in case a re-calculation is required for the FTFM.
- (6) Any SID in the A-DPI will be stored with the Estimated Flight Model (FTFM) for use in case a re-calculation is required for the FTFM but it is also used to update the Actual Flight Model (CTFM).

## 9.6 Outstanding issues

- (1) None

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## 10 C-DPI

### 10.1 Description

#### 10.1.1 Message

- (1) The purpose of the C-DPI is to inform ETFMS that previously sent DPI information is no longer valid.

*[URE.ACDM.DPI.CDPI.001]*

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

#### 10.1.2 Fields

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

### 10.2 Who (can send it)

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

### 10.3 When (can it be sent)

*[URE.ACDM.DPI.CDPI.002]*

- (1) The C-DPI **shall** be sent at moments when 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.

### 10.4 Acceptance rules

#### 10.4.1 Technical

- (1) The C-DPI must 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.

#### 10.4.2 Quality

- (1) None.

### 10.5 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.

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- (3) The impact on the network is re-assessed (i.e. a slot may be re-calculated (Always in the future!)).
- (4) FAM will be based upon the ETOT/CTOT (but may still take 30 min to suspend).
- (5) The CDMSTATUS is set to “c – departure from CDM airport” which is the initial value.

## 10.6 Outstanding issues

- (1) None.

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## 11 Additional Info & Special Circumstances

### 11.1 Sequence of DPI messages

#### 11.1.1 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-c, followed by a T-DPI-s, 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-p, T-DPI-c 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-c, T-DPI-s or an A-DPI **shall** be sent regardless which status had been reached before sending the C-DPI.

[URE.ACDM.DPI.SEQ.007]

- (7) Any update of the airport and airline information **shall** be sent in the last sent DPI message type (E-DPI, T-DPI-c, T-DPI-s or A-DPI), keeping the same (previously sent) TTOT if necessary.
- (8) In special cases (e.g. the flight has an unexpected delay after a T-DPI-c, 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-c). So a C-DPI is not mandatory before sending a DPI of an "earlier" type.
- (9) 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-c. This will prevent the need to send 2 messages. It will only be useful to send a T-DPI-c again when the new TOBT is after the TSAT or when flight is taken out-of the pre-departure sequence.

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## 11.2 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 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.

## 11.3 Use of DPIS during Special Circumstances at the airport

### 11.3.1 Introduction

#### 11.3.1.1 General

- (1) The DPI messages will improve the cooperation between the CDM Airport and the CFMU/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.

#### 11.3.1.2 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.

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### 11.3.1.3 On-stand De-icing

- (1) In case of on-stand De-icing, it may be common practice at a CDM Airport to update the TOBT with the time it takes to de-ice.
- (2) But 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.
- (3) In order to prevent that CFMU/ETFMS impacts the pre-departure sequence for a flight under De-icing, a “late” TOBT update for de-icing should possibly be provided in a T-DPI-s message. For more information see section 11.3.3 Overview. Note that De-icing is the only exception to this rule.

## 11.3.2 Contents of DPI messages

### 11.3.2.1 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 11.3.3 Overview.

### 11.3.2.2 TAXITIME

[URE.ACDM.DPI.DEICING.002]

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

[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.*

### 11.3.2.3 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.

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[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 12.2 The STW and the DTW for more details.

### 11.3.3 Overview

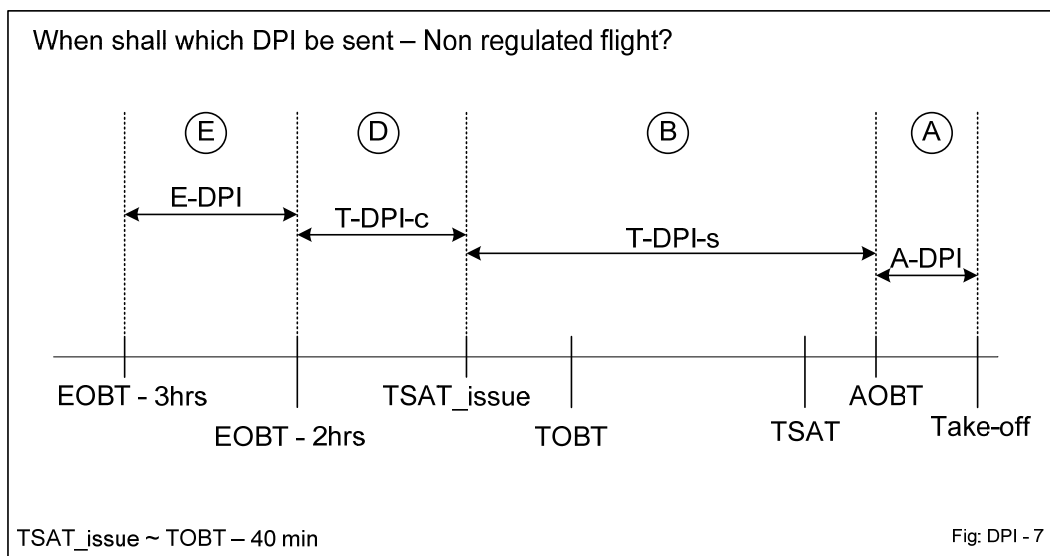
#### 11.3.3.1 All flights

- (1) The DPI messages must be sent in accordance with the trigger events as described in the sections of E-DPI, T-DPI-c, T-DPI-s, A-DPI and C-DPI.
- (2) They have for example also to be sent when the TTOT changes by more than 5 min. 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:
  - EXOT : Normal Variable Taxi-Out-Time (VTT)  
The EXOT is the time between off-block and take-off, excluding the time it takes to de-ice the aircraft.
  - EDIT : Estimated De-Icing Time  
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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### 11.3.3.2 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 table below.

Pe-riod	DPI-type	Remote De-icing		On-stand De-icing		Not es
		taxitime-field	ttot-field	taxitime-field	ttot-field	
E	E-DPI	EXOT+EDIT	OBT+EXOT+EDIT	EXOT+EDIT	OBT+EXOT	1,2,3
D	T-DPI-c	EXOT+EDIT	TOBT+EXOT+EDIT	EXOT+EDIT	TOBT+EXOT	2,3
B	T-DPI-s	EXOT+EDIT	TSAT+EXOT+EDIT	EXOT	TSAT+EXOT	4
A	A-DPI	EXOT+EDIT	AOBT+EXOT+EDIT	EXOT	AOBT+EXOT	-

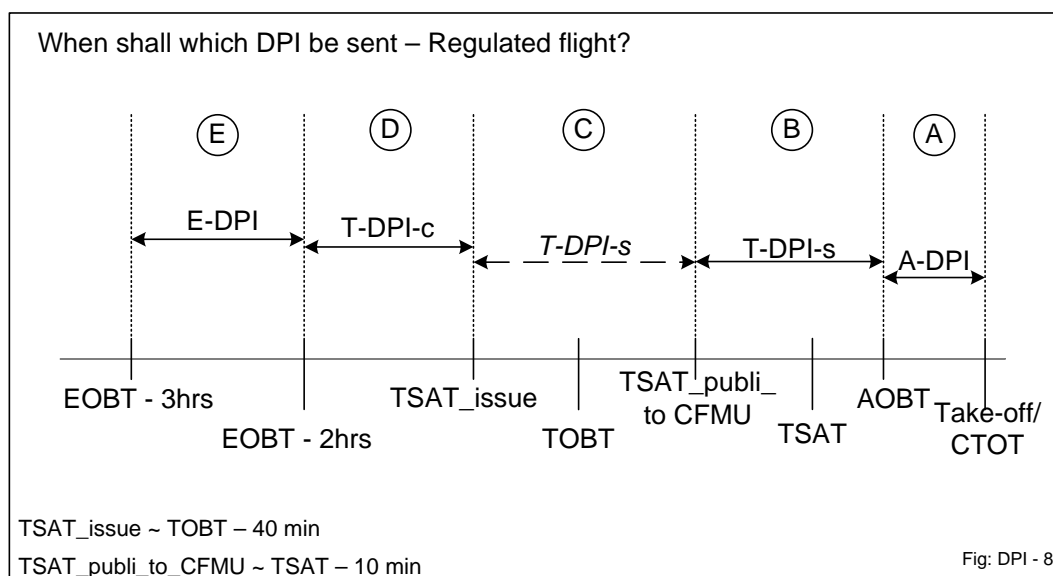
- (3) Notes:

- 1) The OBT is the most accurate value of the Off-Block-Time that is available.
- 2) In case of on-stand De-icing, this OBT/TOBT is expected to include the De-icing time.
- 3) The taxitime-field should contain the OBT delay due to de-icing to prevent that ETFMS raises an EOBT-inconsistency warning.
- 4) In case of on-stand De-icing, this TSAT is expected to be after De-icing has been finished.

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### 11.3.3.3 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.

Pe-riod	DPI-type	Remote De-icing		On-stand De-icing		Notes
		taxitime-field	ttot-field	taxitime-field	ttot-field	
E	E-DPI	EXOT+EDIT	OBT+EXOT+EDIT	EXOT+EDIT	OBT+EXOT	1,2,3
D	T-DPI-c	EXOT+EDIT	TOBT+EXOT+EDIT	EXOT+EDIT	TOBT+EXOT	2,3
C	T-DPI-s	EXOT+EDIT	TOBT+EXOT+EDIT	EXOT	TOBT+EXOT	2,5
B	T-DPI-s	EXOT+EDIT	TSAT+EXOT+EDIT	EXOT	TSAT+EXOT	4
A	A-DPI	EXOT+EDIT	AOBT+EXOT+EDIT	EXOT	AOBT+EXOT	-

- (3) Notes:

- 1) The OBT is the most accurate value of the Off-Block-Time that is available.
- 2) In case of on-stand De-icing, this OBT/TOBT is expected to include the De-icing time.
- 3) The taxitime-field should contain the OBT delay due to de-icing to prevent that ETFMS raises an EOBT-inconsistency warning.
- 4) In case of on-stand De-icing, this TSAT is expected to be after De-icing has been finished.
- 5) This T-DPI-s is exceptionally based upon the TOBT in order to provide a no-slot-before. For more details of the trigger events of T-DPI-s refer to section 8.3 When (can it be sent).

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## 12 Relationship between DPI and other CFMU inputs & messages

### 12.1 CDM Status

#### 12.1.1 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 flight lists. It provides the latest information about the DPI messages to the operational users.
- (4) The CDMSTATUS may 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.

The following is implemented in CFMU 12.2:

DPI-type	DPISTATUS	CDMSTATUS	
		Letter	Meaning
--	--	" "	Departure from non-CDM airport
--	--	c	Departure from CDM Airport (initial value)
E-DPI	--	e	<u>e</u> stimated
T-DPI-p	P	--	Does not change the CDMStatus
T-DPI-c	C or T or TARGET	t	<u>t</u> argeted
T-DPI-s	S	s	(pre-) <u>s</u> equenced
A-DPI	--	a	<u>a</u> ctual off-block
C-DPI	--	c	Departure from CDM Airport (initial value)

- (6) 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".
- (7) ATFCM suspension of a flight does not change the CDMSTATUS.

The following will be implemented in CFMU 13.0:

- (8) In CFMU 13.0 it is planned to include a DPISTATUS-field in all DPI messages. This will result in a clear relationship between the CDMSTATUS and the DPISTATUS. The main difference is

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that the CDMSTATUS may be affected by other events and messages such as a modification of the regulation-scheme and reception of an other message such as DLA, CHG,.... This is covered by CR\_026771.

Message-type	DPISTATUS	CDMStatus	
		Letter	Meaning
--	--	" "	Departure from non-CDM airport
--	--	c	Departure from CDM Airport (initial value)
E-DPI	EARLY	e	<u>e</u> stimated
T-DPI-p	PROV	--	Does not change the CDMStatus
T-DPI-c	TARGET	t	<u>t</u> argeted
T-DPI-s	SEQ	s	(pre-) <u>s</u> equenced
A-DPI	ATC	a	<u>a</u> ctual off-block
C-DPI	CNL	c	Departure from CDM Airport (initial value)

### 12.1.2 Outstanding issues

- (1) None

## 12.2 The STW and the DTW

### 12.2.1 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 CFMU/OPSD flow controllers agree upon a general extension of the Slot Tolerance Window (STW). 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.

### 12.2.2 Extensions of the STW and DTW

#### 12.2.2.1 General

- (1) The CFMU/OPSD 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 CFMU Flow Controller will have the possibility to specify if the extensions will be applicable for:
  - a) all flights

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- 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 11.3 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 a 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.

### 12.2.2.2 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 STWLowerLimit (-5) and STWUpperLimit (+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.

### 12.2.2.3 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-c message
  - the OBT + minlineup from a REA message
  - the FCM done by the CFMU Flow Controller
  - ...
- (3) The DTW is used for the processing of the T-DPI-s messages. For the purpose of this document the DTWLowerLimit (-15) and DTWUpperLimit (+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.

### 12.2.3 Outstanding issues

- (1) None

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## 12.3 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 CFMU. 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) 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.

## 12.4 DLA/CHG

### 12.4.1 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.

### 12.4.2 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 changes the EOBT. The EOBT from the DLA or CHG message is called the IFPS\_OBT
- (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".

### 12.4.3 T-DPI-c

- (1) Sequence of events, example II:
  1. Last received DPI message is a T-DPI-c
  2. ETFMS receives a DLA message or a CHG message that changes the EOBT. The EOBT from the DLA or CHG message is called the IFPS\_OBT.
- (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-c is no longer used.

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- (4) Sequence of events, example III:
1. Last received DPI message is a T-DPI-c
  2. ETFMS receives a CHG message with an EOBT that is equal to a previously received IFPS\_OBT. For example a CHG that changes only the ARCTYP.
- (5) The Estimated Flight Model (FTFM) is updated with the data from the CHG message (route, ARCTYP, ...). However, the ETFMS\_TOT of the Estimated Flight Model (FTFM) will be kept at the TTOT of the T-DPI-c (TOBT + EXOT). The CDM status will be kept at "t - targeted".

#### 12.4.4 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 that changes the EOBT. The EOBT from the DLA or CHG message is called the IFPS\_OBT.
- (2) The ETFMS\_TOT of the Estimated Flight Model (FTFM) will be set to this IFPS\_OBT + Taxi-Time (EXOT). In this case the Taxi-Time (EXOT) is the last received value in a DPI.
- (3) A possible previously received TTOT from a T-DPI-c will be re-processed as described in section of the T-DPI-c see 12.4.3 T-DPI-c.
- (4) 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 to "t - targeted".
- (5) 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.

#### 12.4.5 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 that changes the EOBT. The EOBT from the DLA or CHG message is called the IFPS\_OBT.
- (2) The ETFMS\_TOT will initially be set to this IFPS\_OBT + Taxi-Time (EXOT). In this case the Taxi-Time (EXOT) is the last received value in a DPI.
- (3) The CTFM based upon the TTOT will be deleted.
- (4) ETFMS will try to re-apply a TTOT from a previously received T-DPI-c and T-DPI-s as described in section 12.4.4 T-DPI-s.
- (5) The CDMSTATUS will be set to in accordance with the new state of the flight.
- (6) Note that the CTFM based upon the TTOT will not be recreated. Also note that in the future it is the intention that IFPS rejects DLA and CHG messages after the flight has off-blocked, i.e. after the CFMU/ETFMS has received an A-DPI message.

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## 12.5 REA message

- (1) The REA message is not accepted after an A-DPI has been received. The REA will also be rejected after a T-DPI-s message that has tact-activated the flight (CTFM created). In those cases, the REA will be rejected with an ERR message with comment "REA IN CONFLICT WITH LAST KNOWN TAKE OFF TIME".
- (2) The REA message can still be used but it is recommended to use the T-DPI-c 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 AFTN connection with CFMU.
- (3) The main differences between the T-DPI-c, 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-c
    - 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 receives the status REA (not yet implemented, planned for a future ETFMS release)
- (4) In case the TimeStamp of the REA message is before the EOBT/TOBT of the FTFM, the REA results in an update of the Estimated Flight Model (FTFM) and overwrites a previously received T-DPI-c.
- (5) A previously received TSAT+EXOT(from a T-DPI-s) will always be kept. This means that the no-slot-before from the T-DPI-s always has precedence over the minCTOT that is derived from a REA (minCTOT=clock+minlineup). If the REA is accepted (see above), the flight will get the "REA/Ready-to-depart" status.

## 12.6 Suspensions

### 12.6.1 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.

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### **12.6.2 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 or due to the reception of an SMM.
- (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-c is kept.
- (4) ETFMS keeps the possible receive TTOT from the T-DPI-s as a no-slot-before for possible later use.
- (5) The TTOT from an A-DPI is removed.
- (6) The Taxi-Time (EXOT) and SID are stored in the Filed Flight Model (FTFM).

### **12.6.3 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) The network impact is assessed based upon the existing Filed Flight Model (FTFM), so possibly including the TOT from the last received E-DPI or T-DPI-c.
- (4) The possibly stored TTOT from a T-DPI-s (no-slot-before) will 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.

### **12.6.4 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 12.4 DLA/CHG for details.

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

- (1) This is currently not possible but may be implemented in a future CFMU software release (> CFMU 14).
- (2) To be specified.

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## 13 CFMU Software releases

### 13.1 Introduction

- (1) This document describes the DPI implementation of the CFMU release 13.0
- (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 Overview of changes in 12.2 compared to 12.1

- (1) Syntax of the ERR message. See Doc Ref 1, CFMU Flight Progress Messages for details.
- (2) Changes of CDMSTATUS. See section 12.1 CDM Status.
- (3) Improved processing of T-DPI-s. See section 8 T-DPI (T-DPI-s)
- (4) Improved processing of DLA/CHG messages after reception of T-DPI-s. See section 12.4 DLA/CHG
- (5) Use of General Extension of STW and DTW input into ETFMS. See section 12.2 The STW and the DTW.
- (6) Add ERR reply message for rejection of REA. The text will be "REA IN CONFLICT WITH LAST KNOWN TAKE OFF TIME".
- (7) Add change of ERR message "flight already Actual off block" instead of "flight already pre-sequenced".

### 13.3 CFMU 13.0

#### 13.3.1 Overview of changes in 13.0 compared to 12.2

- (1) Use of input of special Circumstances at the CDM Airport, including the inclusion of a De-icing flag in the DPI message. See section 11.3 Use of DPIs during Special Circumstances at the airport.
- (2) Simplification of DPI message syntax, including the inclusion of DPISTATUS in all DPI messages. See all sections in this version of this document and for an overview see section: 13.3.2 Simplification of DPI message syntax.
- (3) Improve text of COMMENT-field in DPI ERR reply messages. See section 13.3.3 Improve text of DPI ERR reply messages.
- (4) Do not raise an IFPS discrepancy - EOBT inconsistency at reception of an A-DPI.

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### 13.3.2 Simplification of DPI message syntax

- (1) Currently there are several types of DPI messages. Each type is recognized by the presence of a special TOT-field (ETOT, ATTOT, AATOT) or by the presence of a dpistatus-field (T-DPI-p, T-DPI-c, T-DPI-s) or by the presence of a reason-field (C-DPI).
- (2) This is complicated to understand and it takes some training to be able to recognize the various DPI-types.
- (3) It has been decided to simplify the DPI identification mechanism by including a dpistatus-field in all the DPI messages. This will also allow the three different TOT-fields (ETOT, ATTOT, AATOT) to be replaced by one TTOT-field.
- (4) The following dpistatus-fields and TOT-fields will be applicable:

DPI-type	CFMU 12.2 implementation		Final solution (CFMU 13)		CDMSTATUS
	TOT-field	DPISTATUS	TOT-field	DPISTATUS	
Initial value for non-CDM airport	--	--	--	--	“ “
Initial value for CDM airport	--	--	--	--	c
E-DPI	ETOT	--	TTOT	EARLY	e
T-DPI-p	ATTOT	P	TTOT	PROV	--
T-DPI-c	ATTOT	C	TTOT	TARGET	t
T-DPI-s	ATTOT	S	TTOT	SEQ	s
A-DPI	AATOT	--	TTOT	ATC	a
C-DPI	--	--	--	CNL	c

- (5) In order to provide some time to Airport CDM that have already implemented DPI messages to adapt their systems to the new syntax, a transition period will be taken during which old and new syntax will be acceptable. So during the CFMU 13 release, both old and new syntaxes will be accepted.
- (6) In order to increase the readability of the DPI messages, the Airport CDM are strongly recommended to include the dpistatus-field as the second field in the DPI message, i.e. immediately after the “-TITLE DPI” on the second line in the message.
- (7) This change is covered by CR\_026771.
- (8) These modifications are also be described in the CFMU Flight Progress Messages document, see Doc Ref 1.

### 13.3.3 Improve text of DPI ERR reply messages

- (1) Due to the introduction of the severity-field (WARNING or ERROR) in ERR reply messages, the text in the comment fields can be simplified. This change is covered by CR\_026996.
- (2) The current ERR reply about the REG-field in the DPI, reporting an IFPS inconsistency needs to be improved. This change is covered by CR\_024993.
- (3) This results in the table that is described in Appendix B.
- (4) These modifications are also be described in the CFMU Flight Progress Messages document, see Doc Ref 1.

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### 13.4 Overview of outstanding changes after CFMU 13.0

- (1) Identify SIDs and STARs at ATC discretion in CFMU ENV and use it in IFPS and ETFMS processing (CR\_023769).
- (2) Improve validation of T-DPI-s messages (CR\_026998).
- (3) Take variable/extended STW into account in the CFMU/DWH and Adherence to ATFM Slot statistics (CR\_026997).
- (4) A T-DPI-s shall give the flight the status SEQ which means that the flight shall be processed equal to a REA (CR\_27390).
- (5) Reject any DPI message for an IFPS\_Suspended flight (CR\_027391). A flight plan that has been suspended by IFPS is a non-valid flight plan and consequently updates cannot be processed.

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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

AATOT	Anticipated Actual Take-Off Time
Airport CDM	Airport CDM (CDM airport)
ADEP	Aerodrome of Departure
ADES	Aerodrome of Destination
AIP	Aeronautical Information Publication
AOBT	Actual Off-Block Time
ARCADDR	24 bit ICAO Aircraft Address
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
ATTOT	Aircraft operator Target Take-Off Time

### B, C

CDM	Collaborative Decision Making
CFMU	Central Flow Management Unit
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

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## F

FAM	Flight Activation Monitoring
FCM	Flight Confirmation Message
FDPS	Flight Data Processing System
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
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## K, L, M

MDI	Minimum Departure Interval
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## N

NA	Not applicable
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## O

OAT	Operational Air Traffic
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## 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

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

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APPENDIX B

DPI ERRor Reply messages

<b><u>Old</u></b> Comment-field text	<b><u>New</u></b> Comment-field text	Description	Severity	Result of ETFMS processing
Taxi time out of range	<i>Not changed</i>	The taxi-time is not between 1 and 90 min.	ERROR	DPI rejected
Message received too early or too late	<i>Not changed</i>	An E-DPI that is received earlier than EOBT - 3hrs An T-DPI-c or a T-DPI-s that is received earlier than EOBT – 2 hrs An T-DPI-s that is received earlier than TOBT – 40min An A-DPI that is received earlier than EOBT/COBT – 30 min or later than EOBT/COBT + EXOT + 20min	ERROR	DPI rejected
DPI messages not in correct sequence	<i>Not changed</i>	- DPI message received after flight has been reported as almost airborne by ATC. - C-DPI received as the first DPI for a flight	ERROR	DPI rejected
Target DPI rejected Early DPI required first	<i>Not changed</i>	Self explanatory	ERROR	DPI rejected
Provided Take Off time out of bounds	<i>Not changed</i>	For E-DPI: TTOT-taxi-time < EOBT - 30min or TTOT-taxi-time > EOBT+180min For T-DPI-c: TTOT < ETOT – 30min or TTOT >E/CTOT + 120min For T-DPI-s: TTOT < ETOT – 30min or TTOT >E/CTOT + 60min For A-DPI: TTOT < ETOT – 30min or TTOT >ETOT + 60min (for non-regulated flights only) TTOT < system clock or TTOT > system clock + taxi-time + TIS+ 30min	ERROR	DPI rejected
AATOT OUTSIDE SLOT TOLERANCE WINDOW	TTOT OUTSIDE SLOT TOLERANCE WINDOW	For A-DPI: TTOT < CTOT – STWLowerLimit (5) min or TTOT >CTOT + STWUpperLimit (10) min	ERROR	DPI rejected

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Not existing flight	<i>Not changed</i>	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.	ERROR	DPI rejected
Not Authorised to send this message	<i>Not changed</i>	When DPI received from an address which is not allowed to send DPI	ERROR	DPI rejected
Please add a valid (P/C) confirmation status	PLEASE PROVIDE A VALID DPISTATUS	The DPISTATUS-field is missing or incorrect in a T-DPI message	ERROR	DPI rejected
Message received but flight has already been activated	FLIGHT ALREADY ACTIVATED	The flight has already been reported as airborne to ETFMS so DPI messages are no longer accepted.	ERROR	DPI rejected
Message received but flight is terminated	FLIGHT ALREADY TERMINATED	ETFMS has already terminated the flight, so DPI messages are no longer accepted	ERROR	DPI rejected
Message ignored for suspended flight	FLIGHT IS SUSPENDED	The flight is suspended. DPI messages are not accepted. IFPS message required.	ERROR	DPI rejected
Message processed but AO aircraft type inconsistent with IFPL	DPI ARCTYP INCONSISTENT WITH ARCTYP FROM FLIGHT PLAN	IFPS discrepancy report	WARNING	--
Message processed but AO registration mark type inconsistent with IFPL	DPI REGISTRATION MARK INCONSISTENT WITH REGISTRATION MARK FROM FLIGHT PLAN	IFPS discrepancy report	WARNING	--
--	NO REGISTRATION MARK AVAILABLE IN FLIGHT PLAN	IFPS discrepancy report	WARNING	--
Message processed but EOBT inconsistent with IFPL	DPI OBT INCONSISTENT WITH EOBT FROM IFPS	IFPS discrepancy report	WARNING	--
MESSAGE RECEIVED BUT NO SLOT HAS BEEN ISSUED	FLIGHT NOT YET CONFIRMED BY FLIGHT PLAN	The DPI has been associated to an RPL for which no FPL message has been received from the AO yet	ERROR	DPI rejected

Notes:  
None

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