TITAN
Turnaround Integration in Trajectory And Network
Project Number: 233690

Report on Validation Scenarios Workshop

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EXECUTIVE SUMMARY

This deliverable presents the report on Validation Scenarios workshop, based on the results of the second workshop that was held in the scope of TITAN (Turnaround Integration in Trajectory And Network) in Madrid on the 22nd February 2011.

This workshop was aimed to define the warnings and information flows during the turnaround process. All the actors who would be affected by the implementation of the new TITAN concept were invited in order to capture their remarks.

Results of the workshop showed that most of information needed during the planning phase is currently available and already provided. However, during the execution phase, it is expected that the TIS (TITAN Information Sharing) provides information related to the short-term changes and warnings raised during the sub-processes. These warnings are mainly focused in some specific processes, such as refuelling. At least two levels of warnings should be defined: information warnings and unexpected short-term changes.

External attendees were asked during the workshop to fill out a short questionnaire related to their interest in the future steps of the project. Results showed that most of the demands have been previously considered within the project, however this information provides a guide to progress in TITAN.
1. INTRODUCTION

1.1 Purpose
TITAN will aim at raising common awareness during the turnaround process of the impact of each stakeholder’s performance in the global process performance and stressing the importance of making the conditions of transfer of responsibility among actors much more detailed and explicit.

In order to ensure the widest possible scope of feedback from the different stakeholders involved in the turnaround process, TITAN will organise a number of workshops during the project to present and obtain feedback from them.

This workshop was aimed to collect stakeholders’ expertise to ensure that the validation results were significant enough through the revision or definition, if needed, of the assumptions and inputs to the validation scenarios. One of the main needs identified in the project regarding the validation scenarios was the definition of warnings and information flows. Therefore this 2nd workshop was focused on those two issues.

The present deliverable, D7.8, presents the report on Validation Scenarios workshop, based on the results of the second workshop that was held in the scope of TITAN. This deliverable provides input to the task 3.2, dealing with validation scenarios and exercises definition.

1.2 Intended Audience
This document is public and may be distributed freely, both within and outside the TITAN consortium.

1.3 Associated Documentation
[1] TITAN_WPT_INE_PPT_01_v1.0_2nd workshop presentation.pdf
[2] TITAN_WPT1_INE_DEL_04_v1.0_Operational Concept (Issue 1)

1.4 Abbreviations and Acronyms
A-CDM Advanced CDM
ANSP Air Navigation Service Provider
AOC Airlines Operations Centre
AOP Airport Operations Plan
ATC Air Traffic Control
CBA Cost Benefit Analysis
CDM Collaborative Decision Making
ETA Estimated Time of Arrival
ETD Estimated Time of Departure
GH Ground Handling
GPU Ground Power Unit
NM Nautical Miles
<table>
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<tr>
<th>Acronym</th>
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<tr>
<td>PSS</td>
<td>Passenger Services Supervisor</td>
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<tr>
<td>RMP</td>
<td>Reduced Mobility Passenger</td>
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<tr>
<td>SWIM</td>
<td>System Wide Information Management</td>
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<tr>
<td>TBO</td>
<td>Trajectory Based Operations</td>
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<td>TITAN Information Sharing</td>
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2. WORKSHOP

2.1 Objectives
The objective of the 2nd workshop was to keep in contact with the turnaround community, to show the progress made so far in the project and to identify relevant warnings and information flows in the turnaround process, according to stakeholders’ needs and requirements. Stakeholders’ expertise was expected to ensure that results are adjusted to the real needs in the current turnaround process. For that reason, the attendance of the main affected actors in the turnaround process: airlines, airports, ground handlings and ANSPs is of special value.

The workshop contained presentations and brainstorming sessions, from which TITAN consortium obtained feedback. Therefore, the brainstorming sessions were led by facilitators in order to get the appropriate information from stakeholders, but always favouring a free and enriching dialogue.

One of the objectives of this working meeting was to define warnings and information flows in the turnaround process. After being filtered and worked out, this information will be validated within the project, and will provide inputs to the 2nd issue of the TITAN concept.

During the turnaround process the individual performance of involved stakeholders is important, but coordination of the actions among them has a fundamental influence on the final result. This workshop will provide attendees with a better understanding of the point of view of other stakeholders, an improvement of information sharing level between them, an identification of current inefficiencies regarding information flows and a definition of potential solutions to the current problems.

2.2 Planning
The 2nd TITAN Workshop was held in the Novotel Madrid Campo de las Naciones hotel, in Madrid, the 22nd February 2011.

Madrid was chosen as the best location to hold the workshop with the aim of facilitating the assistance of the main stakeholders and at the meantime reducing travel costs, since many of them are based there. Furthermore, the location of the Novotel Campo de las Naciones Hotel facilitates the access for the attendees, avoiding city traffic jam and decreasing the travel time to/from the airport.

The planned agenda was:

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<td>10:15 – 10:30</td>
<td>Presentation of the Project and 1st Workshop</td>
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<td>10:30 – 11:00</td>
<td>Need for a new turnaround concept: inefficiencies and bottlenecks</td>
<td>SLO</td>
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<td>11:00 – 11:30</td>
<td>TITAN Operational Concept</td>
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Coffee Break
### 2.3 Workshop Conduct

#### 2.3.1 Project Overview – Part I

After welcoming the participants for their attendance, TITAN project was presented to the audience together with the goals of the present workshop. The aim was to introduce or recall the project to the attendees.

External attendees were asked during the workshop to fill out a short questionnaire of four questions related to their interest in the future steps of the project and if they were interested in being consulted during the development of the TITAN tool and the CBA. The fulfilled questionnaires were handed over to the project members so that they can take stakeholders’ advice into account in the future.

Afterwards the need for a new turnaround concept based on current inefficiencies and bottlenecks was presented in order to introduce the TITAN Operational Concept.

#### 2.3.2 Brainstorming - Part I: Definition of Warnings

The first brainstorming session was focused on the definition of warnings in the turnaround process by the stakeholders involved in the process. It started with a short presentation on the methodology to be followed during the session (see ref [1]) and also on the posters on the wall (see [2]).

**2.3.2.1 Methodology**

The attendees were introduced to the TITAN project and the ongoing work; afterwards they took part in the workshop in an active way. They were distributed in four working groups defined according to the four main organisations involved in the turnaround: airline, airport, ANSP and ground handlers, so that there were representatives of all of the stakeholders in each group. In the case of the TITAN partners, they were distributed according to their expertise and preference.

The teamwork discussions were based on the Turnaround Service Sequence Diagrams (see ref [2]) already presented to the audience in which the project milestones defined in the TITAN Concept (see ref [2]) had been previously added.
To lead the discussion, a definition of what TITAN understands as warning and four criteria for their definition were presented (see ref [1]). The four groups discussed during one hour about the warnings they would be interested in receiving during the turnaround process. They were focused by a facilitator during fifteen minutes in a specific part of the TSSD, they defined the warnings in these diagrams and stuck on the posters the warnings they considered important for their operation. Each fifteen minutes approximately they were focused in a different part of the TSSD until they assessed all the turnaround sub-processes.

Afterwards, facilitators presented a brief summary on the main conclusions in a plenary session for further comments and discussions.

2.3.2.2 Identification of warnings

In the following sub-sections the warnings identified during the brainstorming session are listed together with the TSSD process they are associated to. Any milestone, either A-CDM or TITAN, associated to any of the processes, is included in the corresponding section.

A. Overview

- Aircraft Touch Down (or 10NM out)
- Change in stand allocated (not later than touch down)
- Gate/Stand change (last change depends on the airport - Taxiing time)
- Stand/Gate change (depends on the airport taxiing time)
- Lack of resources to de-ice (glycol)
- De-icing concluded 15 minutes before departure (max.)
- Sequence of de-icing ≠ ATC departure sequence
- Accessibility to the airport
- Number of aircraft in sequence for de-icing (CDM)
- Diverted aircraft coming in de-icing purpose
- Airport/ATC: problem with de-icing (equipment, resources, time)
- De-icing: Max 45 min before departure. Report on difference
- Real sequence of aircraft to be de-iced (CDM)
- Meteorological conditions for De-icing triggered by airports
- Airline reporting "not ready" if anything goes wrong
- APU not working
- Disruption of equipment (GPU not working)
- GPU not available. Not correctly located.
- For De-icing: If capacity exceeds the demand, a warning should be raised. (Airport or GH will rise it)

1 It should be understood as limited accessibility to airport
2 Diverted aircrafts requiring de-icing
• Type of aircraft changed (De-ice purposes)
• Pre-flight checking: something wrong that prevents aircraft to depart
• Push back can not be met within the expected time

Milestones:
• Landing (A-CDM milestone)
• In-block (A-CDM milestone)
• Ground handling starts (A-CDM milestone)
• Final update of TOBT (A-CDM milestone)
• Aircraft ready (A-CDM milestone)
• Off-block (A-CDM milestone)
• Take-off (A-CDM milestone)

B. Check-in and security
• Inbound aircraft late (transfer passenger late)
• RMP type
• Passenger processing error: Check in / Security / Passport
• Check-in closing late
• IT problems. Changes in processes
• Accessibility inside airport. Equipment out of work, slower passenger flow expected.
- Demand Capacity Balance (for instance to open fast-track) trend
- Passenger rejected at security / passport control
- Passenger jam in the security control. Staff is short.
- Check in web error

Milestones:

- Close check-in (TITAN milestone)
- Last passenger crossing security control (TITAN milestone)
- Last passenger crossing passport control (TITAN milestone)
- Last baggage delivery to hold baggage bay (TITAN milestone)

Figure 2: Identified warnings in the Check in and Security sub-processes

C. Disembark

- Aircraft at schengen position with passenger non-schengen
- Ground handling detect people to be deported
- Problem resource (RM equipment, UM)
- Operator (bridge or stairs) not there
- Disembark via bridge:
  - Deboarding blocked because problems with door, etc.
  - Problematic passengers, delay in deboarding
- Disembark via stairs:
  - All bus / gates occupied
Milestones:

- End of deboarding (TITAN milestone)

Figure 3: Identified warnings in the Disembark sub-process

D. Unload baggage/cargo/mail

- Cargo door is not opening
- Malfunction unloading equipment
- Equipment staff is not available before dispatch
- Equipment/staff has not arrived at aircraft
- Turn off beacon light
- Equipment/staff not present at aircraft
- Failure in opening cargo door
- Unload baggage (containers and/or pallets):
  - Availability of equipment staff before dispatch
  - Baggage cannot be unloaded (contaminated wild animals)
  - Aircraft deloading system malfunctioning
  - Baggage not properly loaded/sorted (connections flights)
  - Delay in sorting baggage to connecting flights
  - Missed baggage

Milestone:

- End of baggage unloading (TITAN milestone)
Due to the similarity of the sub-processes, no specific milestones and warnings were defined for the unload cargo/mail (containers and/or pallets) and unload baggage/cargo/mail (neither containers nor pallets) sub-processes.

Figure 4: Identified warnings in the Unload baggage/cargo/mail sub-processes

E. Refuelling

- Timely delivery of information
- Safety Process (Observed, breach)
- Weather conditions (safety)
- Non standard fuel equipment required
- De-fuel (rare)
- Late truck
- Need for extra fuel
- Aircraft technical issue
- Get refuel before flight arrival (timely)\(^3\)
- Pump of fuelling truck malfunction
- Polluted stand
- Fuel spill
- Too many warnings

\(^3\) It should be understood as get refuel information (i.e. quantity, type, etc) in advance
Milestones:
- Start of fuelling (TITAN milestone)

Figure 5: Identified warnings in the Re-fuelling sub-process

F. Aircraft cleaning
- Late arrival (planning issue)
- Aircraft configuration (planning and operations issues)
- Security check
- Routine spot checks
- Cleaning delayed
- Availability of resources on time & quantity
- Cleaning type
G. Catering replenishment

- Late arrival (planning issue)
- Aircraft configuration (planning and operations issues)
- Need for additional food (replenishment)
- Catering equipment failure on board (i.e. coffee)
H. Boarding

- Aircraft late for many reasons
- Transfer passenger not boarding at first airport flight
- Resources, staff, IT problems
- Board via bridge or stairs:
  - Late passenger at gate
  - Boarding end time deviation
  - All 3 OK must be synchronous: passenger agent, cabin crew and flight dispatcher on checked-in passengers and bags, RMPs, UMs and other specials

Milestones:

- Boarding starts (A-CDM milestone)

---

4 Passengers’ information coming from the three sources has to be the same. If not, a warning should be raised.
I. Load baggage/cargo/mail
   - Loading into aircraft delayed
   - Breakdown of baggage distribution system
   - Loading: security breech
   - Equipment/staff not arrived at aircraft
   - Cargo door does not close
   - Load baggage (containers and/or pallets)
     - Lack of containers / pallets
     - Transport equipment breakdown
     - Containers don't turn up in right sequence or one is delayed
     - First/Last cargo late
     - First/Last baggage late
     - Aircraft damage during loading
     - Unload baggage of missing passenger not within agreed time limit

Due to the similarity of the sub-processes, no specific milestones and warnings were defined for the load cargo/mail (containers and/or pallets) and load baggage/cargo/mail (neither containers nor pallets) sub-processes.

Milestone:
   - Close cargo doors (TITAN milestone)
Figure 9: Identified warnings in the Load baggage/cargo/mail sub-process

J. Maintenance
Neither milestones nor warnings were defined for this sub-process

K. Start up and push back
- Truck not available / Tow bar due to change of aircraft type
- Foreign objects debris
- Departure sequence change
- Need to de-ice
- Blocked apron
- Aircraft technical damage
- Passenger deplane
- Snow removal from aircraft surface
- Lack of ground movement safety personnel

Milestones:
- Remove push back (TITAN milestone)
- End of de-icing (TITAN milestone)
- ATC Issues TSAT (A-CDM milestone)
- Start up request (A-CDM milestone)
- Start up approved (A-CDM milestone)
2.3.3 Brainstorming – Part II: Definition of Information Flows

The second brainstorming session was intended to define the desired information flows associated to all sub processes of the turnaround as captured in the TSSD. As the previous brainstorming, it started with a short presentation of the methodology and continued with expert groups focused on the subject itself.

2.3.3.1 Methodology

During this brainstorming session, the attendees were split into three groups, in order to discuss the information flows of the following three subjects, see also Figure 11:

- Passengers check in and security
- Baggage / Cargo / Mail
- Ground handling
For each of these subjects, the corresponding TSSD as defined in the concept description (see ref. [2]) were redrawn, omitting the currently available information about the actors and already identified information flow but maintaining the approximate timeline. This was done in order to stimulate the participants to think freely and not being guided (or mislead) by the current situation. The only extra information contained in the diagrams was arrows indicating end-start dependencies between different activities (e.g. boarding does not start before cleaning of the aircraft has ended).

The new diagrams are given in Annex B, and Table 2 shows the link to the original TSSDs.

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<tr>
<th>Process</th>
<th>Workshop sub-process TSSDs</th>
<th>Corresponding TSSDs in Operational Concept Document (see [2])</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check in and Security</td>
<td>Check-in &amp; Security</td>
<td>Fig. 7: TSSD Check-in and Security</td>
</tr>
<tr>
<td></td>
<td>Boarding</td>
<td>Fig. 12: TSSD Boarding</td>
</tr>
<tr>
<td>Baggage/Cargo/mail</td>
<td>Unload Baggage</td>
<td>Fig. 13: TSSD Load Baggage and Cargo/Mail</td>
</tr>
<tr>
<td></td>
<td>Load Baggage</td>
<td>Fig. 9: TSSD Unload Baggage and Cargo/Mail</td>
</tr>
<tr>
<td>Ground Handling</td>
<td>De-boarding</td>
<td>Fig. 8: TSSD Disembark</td>
</tr>
</tbody>
</table>
The participants of each group could use pictures representing all actors of the turnaround process (not only actors for the process under consideration) and orange and yellow post-its. The idea was to go collectively through the diagrams and identify for each activity the actors involved, the information that he/she requires to carry out that activity (to be written down on the orange post-its), and the information that he/she provides during or after carrying out that activity (to be written down on the yellow post-its), see Figure 12. The TIS (TITAN Information Sharing), containing turnaround related information, was used as starting point for the brainstorming sessions.

### Table 2: Traceability of brainstorming session TSSDs

<table>
<thead>
<tr>
<th>Process</th>
<th>Workshop sub-process TSSDs</th>
<th>Corresponding TSSDs in Operational Concept Document (see [2])</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refuelling</td>
<td>Fig. 11, sub-process 5: TSSD Refuelling, Aircraft Cleaning and Catering Replenishment</td>
<td></td>
</tr>
<tr>
<td>Aircraft Cleaning and Catering Replenishment</td>
<td>Fig. 11, sub-process 6 and 7: TSSD Refuelling, Aircraft Cleaning and Catering Replenishment</td>
<td></td>
</tr>
<tr>
<td>Aircraft handling (outside A/C)</td>
<td>Fig. 6 TSSD Overview: Part of the diagram in light orange within Main Turnaround Process.</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 12 Example result of the brainstorming session II**

#### 2.3.3.2 Identification of Information Flows

**A. Check in and Security**

The first remark made was that the scope of the information subscriptions was the check-in process for a particular/ specific flight. The combined check-in process for more than one flight was not analysed. It is in any case expected that the information subscriptions needed when more than one flight is involved are not varying in nature. It should be clarified that, in the TITAN context, the information needs of each actor identified through the brainstorming will be satisfied by means of information service subscriptions. The focus here is on specifying which specific information within the service is needed by whom and when.

The information subscriptions gathered for the three main processes are shown in Table 3 (Check-in Process), Table 4 (Security Process) and Table 5 (Boarding Process) per sub-process, actor and time-line. Due to time restrictions the diagrams were not completed by the attendees during the workshop.
## Sub-Process

### Open Check-in
- **Airport Operator**
  - Trains running late; Road congestion; Maintenance planned on desks/counters.
  - Needed RMP/UM assistants.

- **AOC**
  - Maintenance planned on desks/counters; Passengers non-show in advance; Check-in counters assigned to flights; Options for desks.
  - Desk Number; Needs for RMP/UM assistants.

- **Passenger Services Supervisor (PSS)**
  - All information related to Check-in process.

### Check-in process
- **Passenger Agent**
  - Data in flight details; Desk number; Passenger list.
  - Information about RMP/UM needs; Checked-in baggage.

- **PSS**
  - All information related to Check-in process.

- **Operation Controller**
  - Information about RMP/UM needs.

- **Cockpit Crew**
  - Information about RMP/UM needs.

### Close Check-in
- **Passenger Agent**
  - Complete passenger list; Last checked baggage and passenger.
  - Possible late passenger at gate; Check-in completed.

- **Baggage Agent**
  - Checked-in baggage.

### Update Pass Number & Configuration
- **Passenger Agent**
  - Time for passengers to get to gate; Passenger list; Passenger arriving late (passenger on bar)

- **Baggage Agent**
  - Time for passengers to get to gate; Passenger list; Passenger arriving late

---

5 The roles performed by the Passenger Services Supervisor are included in TITAN D1.4 (see [2] under the Operation Controller actor. In this brainstorming, the group considered that it was important to highlight that the information subscriptions during the check-in sub-process was relevant for this particular role of the Operation Controller as Passenger Services Supervisor. The role is slightly described in section 3.2.1.
Table 3: Information Delivery and Subscriptions during Check-in Process

<table>
<thead>
<tr>
<th>Sub-Process</th>
<th>Information Delivery (►)</th>
<th>Subscription (◄)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer Passengers with Reduced Mobility and Unaccompanied Minors</td>
<td>Reduced Mobility Assistant</td>
<td>Needs related to RMP.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of resources.</td>
</tr>
<tr>
<td></td>
<td>Unaccompanied Minors</td>
<td>Needs related to UM.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of resources.</td>
</tr>
<tr>
<td>Operation Controller</td>
<td></td>
<td>Lack of resources for RMP/ UM.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Resources/ lack of resources for RMP/ UM.</td>
</tr>
<tr>
<td>Equipment Operator</td>
<td></td>
<td>Resources/ lack of resources for RMP/ UM.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub-Process</th>
<th>Information Delivery (►)</th>
<th>Subscription (◄)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger Security/ Passport Control</td>
<td>Airport Operator</td>
<td>Check-in data on passenger number.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Open more passport desks.</td>
</tr>
<tr>
<td></td>
<td>Passport Control</td>
<td>Open more passport desks.</td>
</tr>
<tr>
<td>Security Personnel</td>
<td></td>
<td>Number of expected passengers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of control security points.</td>
</tr>
<tr>
<td></td>
<td>AOC</td>
<td>Number of control security points; Live data on security delays.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of expected passengers.</td>
</tr>
</tbody>
</table>

Table 4: Information Delivery and Subscriptions during Security Process

<table>
<thead>
<tr>
<th>Sub-Process</th>
<th>Information Delivery (►)</th>
<th>Subscription (◄)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport of Passengers</td>
<td>Passenger Agent</td>
<td>All information related to Transport of Passengers.</td>
</tr>
<tr>
<td></td>
<td>AOC</td>
<td>All information related to Transport</td>
</tr>
<tr>
<td></td>
<td>Flight Dispatcher (GH)</td>
<td>Stairs location.</td>
</tr>
<tr>
<td></td>
<td>Unaccompanied Minors</td>
<td>Start transport.</td>
</tr>
<tr>
<td></td>
<td>Reduced Mobility Assistant</td>
<td>Start transport.</td>
</tr>
</tbody>
</table>

6 Similarly to the case for the actor PSS, here the brainstorming group considered important that Passport Control supervisor/ operators are informed about the passenger flows expected, in order to better plan the resource allocation.

7 A remark was made about the Flight Dispatcher actor: the brainstorming group considered that, even though in TITAN D1.4 (see [2] the Flight Dispatcher is clearly associated to Ground Handling (GH), it is important to always specify this when referring to this actor, to avoid confusion with the common airport role of Airline Flight Dispatcher (assumed in TITAN under AOC role).
<table>
<thead>
<tr>
<th>Sub-Process</th>
<th>Information Delivery (►)/ Subscription (◄)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge/ Stairs Location</td>
<td>AOC  ► All information related to Bridge/Stairs Location.</td>
</tr>
<tr>
<td></td>
<td>Equipment Operator  ► Stairs/ buses.</td>
</tr>
<tr>
<td></td>
<td>Unaccompanied Minors  ► OK to pre-board.</td>
</tr>
<tr>
<td></td>
<td>Reduced Mobility Assistant  ► OK to pre-board.</td>
</tr>
<tr>
<td>Assistance to passenger boarding/ UM/ RM</td>
<td>Passenger Agent  ► Technical incidents at the boarding gate.</td>
</tr>
<tr>
<td></td>
<td>AOC  ► All information related to Assistance to passenger boarding/ UM/ RMP.</td>
</tr>
<tr>
<td></td>
<td>Airport Operator  ► Technical incidents at the boarding gate.</td>
</tr>
<tr>
<td>Headcount</td>
<td>Flight Crew  ► Total passengers on-board; Special requirements from check-in (UM, wheelchairs, etc.).</td>
</tr>
<tr>
<td></td>
<td>AOC  ► All information related to Headcount.</td>
</tr>
<tr>
<td></td>
<td>Cabin Crew  ► Special requirements from check-in (UM, wheelchairs, etc); Special meals.</td>
</tr>
<tr>
<td></td>
<td>Flight Dispatcher (GH)  ► OK to all passengers on-board.</td>
</tr>
<tr>
<td>Close Aircraft Door</td>
<td>Flight Crew  ► Briefings (weather, NOTAM, etc.)</td>
</tr>
<tr>
<td></td>
<td>AOC  ► All information related to Close Aircraft Door.</td>
</tr>
<tr>
<td></td>
<td>Equipment Operator  ► Remove steps elevator, etc.</td>
</tr>
</tbody>
</table>

Table 5: Information delivery and Subscriptions during Boarding Process

---

8 See footnote 7.
B. Baggage / Cargo / Mail

Figure 13 shows the results after the brainstorming session about the actors and information flow of the baggage / cargo / mail Loading Processes.

![Figure 13: Results of the brainstorming session for the Loading Process](image)

By going through this diagram with the participants it was concluded that the results so far were more an inventory of the current situation rather than the identification of new, desired information flow. After a more open discussion with sound unanimously agreed conclusions the “unloading” diagram was not completed anymore and the brainstorming session was terminated. The conclusions of that discussion are given in section 3.2.2.

C. Ground handling

After having explained globally the ground handling process, and although the methodology was designed to not provide the actors, in this case with many sub-processes and actors involved, a preliminary actor assignment - according to the corresponding TSSDs - was done in order to speed-up the process and focussing on information flow. However, experts could add or remove actors from this list if needed.

One of those actor changes was the replacement of the role of Flight Dispatcher by the role of Ramp Agent.

**De-boarding**

The information that GH actors have previously to the arrival of the flight is:

- Parking stand
- Passenger Load
- ETA
- Origination Station (from previous Ground Handling)
Regarding the location of stairs/ambulift:
- Airline (AOC) provides procedure to Equipment Operator
- To locate ambulift, Ramp Agent/Aircraft Operator and Reduced Mobility Assistance should have the following information: number of passengers, specific needs of the passengers with reduced mobility and the standards to be applied in the assistance

Regarding the open of the aircraft door:
- “Ready to open” and “slides disarmed” confirmation that Cabin Crew gives to the Ramp Agent and then to the Equipment Operator.

Regarding the transport passengers to terminal by bus, the following information was found as needed for the equipment operator:
- Information about if any Custom process is going to be performed for the flight
- The direct connection to perform in case of the flight has a connection and there is no time enough to perform this connection via terminal access.
- Security processes required for the flight (issues which requires any specific security revision to the passengers, for example, suspect or signs about some passenger affected with swine influenza)

The most important information missed for the Equipment operator and Ramp agent during the current de-boarding performance is the Airport Custom information, the belt information and any late change in the initial information or unexpected event during the operation.

**Fuelling**

The main actors during the fuelling process are the Fuel Provider and the Ramp Agent.

The Fuel Provider needs the following information:
- Stand location and how to drive there (from AOP)
- Aircraft type (from AOC)
- Quantity of fuel (from tank driver)
- National Law on fuelling and Status on the availability to start of fuelling from AOP

The Fuel Provider sends information about the start of fuelling to the Ramp agent and also to Maintenance, but not to the fire fighters.

The Ramp Agent should be informed about the unexpected/late changes and also about the end of the refuelling.

**Cleaning and Catering**

The information required by the Equipment Operator before the start of the Cleaning and Catering operations is:
- The airline Procedure
- Destination
- Aircraft Stand
- ETA
• ETD

The main outputs of Cleaning and Catering are:

• The alteration of the seat configuration is in charge of the Maintenance.

• The end of the catering and cleaning sub-processes were identified as milestones because the Security checks can be initiated subsequently.

• In the same way as in the other sub-processes, actors should be informed if any late change or unexpected event happens (actually this does not happen).

Aircraft Handling (out of cabin passenger)

• No new information flow or specific information needs were identified for this process.

• Deflation of waste water and air-conditioning provision are not usual sub-processes within the turnaround and are only provided under request. In any case, the water replenishment is done taking into account the airline policy and the air-conditioning provision will need the range of temperatures which are stated within AOC Procedure.

• The roles involved for the de-icing process are: de-icing staff, Airport Operator, Cockpit Crew and Ground Controller. The most important information needed by De-icing staff and currently not available is the ATC sequence, the slots allocation and also the Airlines Priority. It is the airport operator which controls the quantity of liquid at the store.

2.3.4 Project overview – Part II

To finish the meeting and the overview of the progress made so far, the initial version of the TITAN model and the methodology of the CBA in the TITAN tool were presented. The aim was to show the participants not only the ongoing work in the project but also its future steps.

Finally, the stakeholders were invited to visit the TITAN website which is updated frequently with information regarding the progress of the project. The report of this workshop will be uploaded there and also sent out to all the attendees for their consideration.
3. ANALYSIS OF RESULTS

The collected material during the workshop is analysed and consolidated in this section. The purpose of the consolidation is to analyse all the individual comments so that some conclusions could be derived regarding common interests and main discrepancies between the different stakeholders.

3.1 Brainstorming Part I

3.1.1 Definition of warnings in the turnaround

Warnings can be grouped in two types: information messages (warnings related to information itself, e.g. Aircraft Touch Down) and unexpected events messages (warnings related to non expected events or breakdowns).

Information messages are shared among all stakeholders and used as a means to monitor that the turnaround process flows according to the planning. No action is expected when information warnings are raised. On the other hand, unexpected events are related to decision making since they are raised in case the turnaround differs from original planning. These warnings are defined in order to alert involved stakeholders so they can take a decision to solve or mitigate the problem and not involved stakeholders for situational awareness reasons so they are warned that some sub-process may be delayed or changed.

Below there is an initial classification of the warnings defined during the workshop in information and non expected events/breakdowns warnings. However, in some cases these warnings could be considered in both types depending on each specific turnaround process and the actor that receives the information.

3.1.1.1 Overview

- Information messages:
  - Aircraft touchdown (or 10NM out)
  - Number of aircraft in sequence for de-icing (CDM)
  - Real sequence of aircraft to be de-iced (CDM)
  - Meteorological conditions for De-icing triggered by airports

- Unexpected events warnings
  - Gate/Stand change (last change depends on the airport)
  - Lack of resources to de-ice
  - De-icing concluded more than 15 minutes before departure (max.). Report on difference.
  - For De-icing: If capacity exceeds the demand, a warning should be raised. (Airport of GH will rise it)
  - Type of aircraft changed (De-ice purposes)
  - Diverted aircraft coming in de-icing purpose
  - Airport/ATC: problem with de-icing (equipment, resources, time)
3.1.1.2 Check-in and security

- Information messages:
  - RMP type
  - Demand Capacity Balance (for instance to open fast-track) trend

- Unexpected events warnings
  - Inbound aircraft late (transfer passenger late)
  - Passenger rejected at security / passport control
  - Passenger processing error: Check in / Security / Passport
  - Check-in closing late
  - IT problems. Changes in processes
  - Accessibility inside airport. Equipment out of work, slower passenger flow expected.
  - Passenger jam in the security control. Staff is short.
  - Check in web error

3.1.1.3 Disembark

- No Information message has been identified

- Unexpected events warnings
  - Aircraft at schengen position with passenger non-schengen
  - Ground handling detect people to be deported
  - Problem resource (RMP equipment, UM)
  - Operator (bridge or stairs) not there
  - Disembark via bridge:
    - Deboarding blocked because problems with door, etc.
    - Problematic passengers, delay in deboarding
  - Disembark via stairs:
    - All bus / gates occupied
3.1.1.4 **Unload baggage/cargo/mail**

- **Information messages**
  - Turn off beacon light

- **Unexpected events warnings**
  - Malfunction unloading equipment
  - Equipment / staff is not available before dispatch
  - Equipment /staff has not arrived/is not present at aircraft
  - Failure in opening cargo door
  - Unload baggage (containers and/or pallets):
    - Availability of equipment staff before dispatch
    - Baggage cannot be unloaded (contaminated wild animals)
    - Aircraft deloading system malfunctioning
    - Baggage not properly loaded / sorted (connections flights)
    - Delay in sorting baggage to connecting flights
    - Missed baggage

3.1.1.5 **Refuelling**

- **Information messages**
  - Timely delivery of information
  - Weather conditions (safety)
  - Get refuel before flight arrival (timely)

- **Unexpected events warnings**
  - Safety Process (Observed, breach)
  - Non standard fuel equipment required
  - De-fuel
  - Need for extra fuel
  - Late truck
  - Aircraft technical issue
  - Pump of fuelling truck malfunction
  - Polluted stand
  - Fuel spill
  - Too many warnings

3.1.1.6 **Aircraft cleaning**

- **Information messages**
- Aircraft configuration (planning and operations issues)
- Security check
- Routine spot checks
- Cleaning type

- Unexpected events warnings
  - Late arrival (planning issue)
  - Cleaning delayed
  - Availability of resources on time & quantity

### 3.1.1.7 Catering replenishment

- Information messages
  - Aircraft configuration (planning and operations issues)

- Unexpected events warnings
  - Late arrival (planning issue)
  - Need for additional food (replenishment)
  - Catering equipment failure on board (i.e. coffee)

### 3.1.1.8 Boarding

- Information messages
  - Transfer passenger not boarding at first airport flight

- Unexpected events warnings
  - Aircraft late for many reasons
  - Resources, staff, IT problems
  - Board via bridge or stairs:
    - Late passenger at gate
    - Boarding end time deviation
    - All 3 OK must be synchronous: passenger agent, cabin crew and flight dispatcher on checked-in passengers and bags, RMPs, UMs and other specials

### 3.1.1.9 Load baggage/cargo/mail

- No Information message has been identified

- Unexpected events warnings
  - Loading into aircraft delayed
  - Breakdown of baggage distribution system
  - Loading: security breech
- Equipment/staff not arrived at aircraft
- Cargo door doesn't close
- Load baggage (containers and/or pallets)
  - Lack of containers / pallets
  - Transport equipment breakdown
  - Containers don't turn up in right sequence or one is delayed
  - First/Last cargo late
  - First/Last baggage late
  - Aircraft damage during loading
  - Unload baggage of missing passenger not within agreed time limit

3.1.1.10 Start up and push back

- No Information message has been identified
- Unexpected events warnings
  - Truck non available / Tow bar due to change of aircraft type
  - Foreign objects debris
  - Departure sequence change
  - Blocked apron
  - Aircraft technical damage
  - Snow removal from aircraft surface
  - Lack of ground movement safety personnel
  - Need to de-ice
  - Passenger deplane

Most of the defined warnings have been considered as unexpected events warnings as some action should be taken and usually they may imply a decision is made. Furthermore some of these warnings, once solved, could be used as information for following processes since something has been changed from the original planning.

The milestones defined in the TITAN concept (see ref. [2]) can all be considered as information warnings, provided that all of them are carried out on time.

3.1.2 Non-verbal issues

Non-verbal issues should be understood as those messages that were sent and received wordless during the meeting. In this case, only the communication through an object such as the TSSD diagrams will be analyzed. Likewise, post-its have non-verbal elements such as where they were placed or which sub-processes were the most addressed.

Most of the warnings were stuck on the start and the end of the turnaround sub-processes. As it can be seen in the figure below (Figure 14), stakeholders mainly addressed to the overview, refuelling and unload baggage/cargo/mail diagrams. They were also interested in the check in and
start up and push back sub-processes. On the other hand, there were processes in which no warning was defined or in which they were not quite interested, such as cleaning, catering replenishment or maintenance. This figures are in accordance with the milestones definition in the TITAN concept, sub-processes which have received more warnings are also the ones with more number of milestones. It can also be highlighted that most of the warnings raised are related to unexpected events, not many information messages have been defined.

![Figure 14: Number of warnings by sub-process](image)

The topics addressed more times were de-icing, lack or breakdown of resources, passengers tracking and refuelling. De-icing was a sensitive topic during the meeting. It was always considered as an unexpected event out of the planning and stakeholders couldn't agree on time to finish the process before departure; however they all agree that this process causes a huge disruption in the turnaround process. Regarding refuelling sub-process, warnings were raised for almost all possible non planned events and also for the time of information delivery. Another warning was defined as “too many warnings” in case too many events do not run properly.

### 3.2 Brainstorming Part II

#### 3.2.1 Check in and Security

From the information gathered the following conclusions were drawn:

- The information needed or (ideally) wanted by the different actors during the analysed processes is currently available at airports but not shared. This fact highlights the issue that the lack of information encountered by some actors during turnaround is not due to a lack of information produced, but to a lack of sharing existing information. This conclusion is drawn up anytime that stakeholders are invited to share their needs and problems and reinforces the results of the 1st workshop and the problem that the TITAN concept is addressing;

- As a side result of the brainstorming, the participants highlighted that, given that naming and even role of actors change at different airports, some remarks were necessary when designing the information flows about specific roles of the actors in place being the target of the information subscriptions. Although this issue was already discussed and agreed within
the project (see [2]), the attendees suggested some changes. As an example, the Passenger Services Supervisor (PSS) was highlighted as being responsible for the smooth running of passenger services at airports. This role would correspond to the Operation Controller actor as per TITAN D1.4 list of actors.

The result of the brainstorming shows an agreed-by-the-group flow of information, though it must be noted that this might vary depending on the specific airport and/or country.

- Additionally, some new information (not currently being delivered or shared and not yet included in TITAN Information Sharing – TIS) was signalled as being useful for some actors:
  - Delays on transportation systems connecting the passengers with the airport (trains running late, road congestion, etc.) This information will be useful for the Airport Operator and for the AOC during the “Open Check-in” sub-process, serving to better plan the resources utilisation (counters, RMP/UM, etc.)
  - The maintenance planned on desk/counters would be needed by both Airport Operator and AOC to assign the desk number in the most efficient way. Here, maintenance on desks was used by the group as activities implying the unavailability of the resource, such as fixing mechanical or electrical problems (in case of resource out of order and needing a repair) or performing routine actions which keep the resource in working order;
  - Baggage policies are issued by the role of PSS for each flight and are impacting the work of the Passenger Agent during the check-in process. This impact is related, for instance, to check-in baggage restrictions, baggage allowances and charges;

A general remark was made about the relevance of having live data on security process overload and delays at the Security Control. This information, available in the TIS as, for instance, “queue waiting times”, will be very useful for the Airport Operator in order to adjust the number of passport desks as well as for the AOC to consequently delay resource mobilisation for boarding.

### 3.2.2 Baggage / Cargo / Mail

The following conclusions were drawn for the loading / unloading processes:

- More information than that mentioned in the TIS is not required for the (un)loading processes;
- The actors involved do not want to know all the information at any time. The current information is adequate for performing their tasks;
- The actors involved want to know when another activity has a deviation, the extent of the deviation and how this deviation may affect the activity of the actor. In other words, the actors should obtain from the TIS “what the problem is and how much time is needed to solve it”. So, the information flow needed is directly related to the warnings, which were discussed during the morning session of the workshop.

### 3.2.3 Ground handling

The following conclusions were drawn for the ground handling processes:

- Most information needed for the operation is already provided during the planning phase and is available at the start of the sub-processes. Not much information in case of normal
operation of turnaround is currently missed and the identified additional information needs are given below;

- Most information needed during the execution phase of the sub-processes is related to short-term changes and warnings. This information flow is linked to the warnings which were identified during the morning session and they were out of the scope of this session (session was focused on the turnaround sub-processes when normal operations);

- The role of Flight Dispatcher as identified in the TITAN Operational Concept Document was suggested to be replaced by the role of Ramp Agent. However the role of Ramp Agent and its responsibilities are included in the Flight Dispatcher role defined in TITAN D1.4 (see [2]). Attendees said that this role has nowadays different responsibilities depending on the countries (experts differentiated between Ramp Agent and Flight Dispatcher responsibilities for ground handling activities). Although this issue was already discussed when developing the TITAN D1.4, the attendees proposed other solutions to avoid any misunderstanding:
  - Change the role’s name of Flight Dispatcher by other which is currently not in use;
  - Add further clarifications to the TITAN roles definition in a future version of the TITAN D1.4 (e.g. Ramp Agent responsibilities are included in the TITAN Flight Dispatcher Role);
  - Differentiate between both roles adding the Ramp Agent role in a new version of TITAN D1.4.

3.2.4 Feedback and Conclusions on Applied Methodology

During the design of the methodology it was deliberately decided to not put the current situation (in terms of actors and existing information flows) in the diagrams in order to stimulate the participants to think freely, not being guided (or mislead) by the current situation. However, this methodology resulted in a time consuming identification of the current situation, despite repeatedly being stimulated to think “in the future” by the discussion leaders.

Another constraint was that only some of the group members participated actively thanks to their thorough knowledge of the processes. The material used was also considered slightly complex for a one-and-a-half-hour brainstorming. Too many actors (and corresponding avatars), complex diagrams, and the TIS were provided at once, with no time for familiarisation before starting to fill in the flip charts.

Finally, it was observed that the production of innovative ideas was somehow constrained by the normal operations approach that was given in the diagrams with the turn-around sub-processes since the diagrams displayed a nominal succession of processes.

It is therefore concluded that the ideal exercise would be a more directed role-play setting, starting from the current situation (information flow and actors) focusing at the occurrence of unexpected events of interest for the project and the group and aiming at identifying the “what” and “when” concerning the information subscriptions.

3.3 Project questionnaires

The answers to the questionnaire presented during the workshop were also addressing responsibilities of CDM and decision management in unusual situations, mainly if stakeholders’ policies differ: “who is going to do what in line with raised warnings?” Truthfulness, accurate and timely information were requested, also last minute changes, to avoid inconsistencies in the
information received. It was stressed that most of the information currently exists but it is not always shared.
4. SUMMARY OF FINDINGS

The main findings during the 2nd TITAN workshop were:

Regarding the questionnaire proposed to the stakeholders during the workshop, most of the demands have been previously considered within the project, however this information provides a guide to progress in TITAN.

The main conclusions from the brainstorming session on the warnings were:

- There are some processes which are considered more important to be monitored and that need many warnings: overview, refuelling and unload baggage/cargo/mail. On the other hand, there are processes in which stakeholders are not quite interested in receiving warnings although an unexpected event happens, such as maintenance, cleaning or catering replenishment;

- Overview was the sub-process with more warnings raised, however they were related to different activities. The refuelling was the one with more warnings focused on a single activity, warnings were raised for almost each step in the sub-process and could therefore considered one of the most critical activities in the turnaround;

- There are some sub-processes that should be further studied, since stakeholders involved in the turnaround are not able to reach an agreement, such as the de-icing sub-process;

- Levels of warnings should be defined: information messages and warnings related to non-planned events should at least be distinct. Besides, stakeholders were more interested in unexpected events warnings than in information messages.

The main conclusions from the brainstorming session on the Information Flows were:

- In case of normal operation of turnaround, although most of information needed is currently existing and available during the planning phase and previous to the start of the sub-processes, improvement is needed specially for non-nominal situations, and in sharing information in a more targeted and efficient way;

- TIS should provide information related to the short-term changes and warnings arisen during the sub-processes: “what is the problem and how much time is needed to solve it”;

- Further description or clarification is needed in the current list of turnaround actors and their associated role within the TITAN D1.4 (see [2] due to the identification of certain roles which are requested to be separated into a new actor. Although the responsibilities of these new actors are included in the roles’ list of TITAN operational concept, the use of the current nomenclature for the TITAN roles’ naming could lead to misunderstanding.
ANNEX A List of Attendees

Consortium attendees:
Laura Serrano (Ineco)  
Sara Luis (Ineco)  
Ana C. Sáez (Ineco)  
Rosa Ana Casar (Isdefe)  
Marta Sánchez Cidoncha (Isdefe)  
Martijn Koolloos (Isdefe)  
Valeria Salaris (Isdefe)  
Nicolás Suárez (Crida)  
Eva Puntero (Crida)

Maria Ruiz (Crida)  
Amalia García (Aena)  
David Esteban (BRTE)  
Jolanta Rekiel (ECORYS)  
Sebastian Kellner (RWTH Aachen University)  
Noémi Kral (Slot Consulting)  
Steve Zerkowitz (Blusky Services)  
Marco Gaertner (Jeppesen)

External Attendees:
Thorsten Astheimer (Fraport AG)  
Víctor Carballo (Acciona)  
Stuart Bensted (Flightcare Ground Services)  
Henrik Bagewitz (LFV)  
Cristina Carretero (Iberia)  
Aleria Lizariturry (Iberia)  
Mónica Núñez Aranda (Globalia)  
Ricardo Perea (Globalia)

Sebastián Vadell (Globalia)  
Alan Thorne (University of Cambridge)  
Olivier Mengenje (Eurocontrol)  
Axel Classen (DLR)  
Alejandro Egido (Aena – SJU)  
Francisco Fernández de Líger (Aena – SJU)  
Marcos Moura (Aviation Consulting)  
Alan Marsden (EUROCONTROL)
ANNEX B Modified TSSDs for the 2nd Brainstorming Session

B1 Check-in and security

Check in

Start checkin

OPEN CHECKIN

CHECKIN PROCESS

CLOSE CHECKIN

PREPARATION PASSENGER LIST

UPDATE PASS NUMBER AND CONFIGURATION

TRANSFER PASSENGER WITH REDUCED MOBILITY AND UNACCOMPANIED MINORS

PASSENGER SECURITY/PASSPORT CONTROL

Boarding

Close checkin

Boarding Starts
Figure 15: Check in
B2 Baggage / Cargo / Mail

Unloading

Figure 16: Unload baggage / Cargo / Mail
Load

TIME LINE

Start of Loading

If not previously unloaded

DISPATCH EQUIPMENT TO A/C

SECURIT CHECK BAGGAGE

SORT BAGGAGE

LOAD CONTAINERS/PALLETS

TRANSPORT TO A/C

LOAD INTO A/C

REMOVE EQUIPMENT FROM A/C

CLOSE SIDE CARGO DOOR

End of Loading

Figure 17: Load baggage / Cargo / Mail
B3 Ground handling

Deboarding

**Figure 18: Ground handling – deboarding**
Fuelling

Figure 19: Fuelling
Aircraft Handling (out of cabin passenger)

Figure 20: Aircraft handling (out of passengers cabin)
Cleaning & Catering

**Figure 21: Cleaning and catering**