Airline Turnaround Management

Lufthansa Systems White Paper
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Punctual turnarounds have become a critical factor for success for airline operations, though actively controlling ground processes is still a relatively uncharted territory for many airlines. The period of time between on-blocks and off-blocks therefore very often remains a “black box” for carrier of any business model - network carriers, low cost, charter airlines, cargo airlines or any hybrid model – even though there's a great potential to save delay costs, improve on-time performance and increase customer satisfaction.

This White Paper describes the purpose of Turnaround Management and gives an initial approach for the implementation of this important airline business process into an airline’s environment.

1. The benefit of Turnaround Management

What is a Turnaround Management?

Turnaround Management involves controlling the aircraft’s turnaround processes on the ground. A turnaround is like a pit stop which demands seamless coordination between the airline (boarding, etc.), the airport (jetway drivers, buses, etc.) and service providers (catering, cleaning, etc.). For this to run smoothly, everyone involved has to know what they need to do at which time.

Chart 1: Differentiation between actions fields of Operations Control and Hub Management
Where to find Turnaround Management within an airline?

Turnaround Management is usually an essential part of Ground Operations (Hub Management / Station Management) today, which becomes more and more important for airlines. Within some airlines the turnarounds are managed by the Operations Control department as well.

This remote handling of aircraft turnarounds by a Hub Manager / Station Manager or Operations Controller usually has an on-site counterpart on the apron: The Ramp Agent or Load Supervisor. He / she is also responsible for one or more dedicated turnaround processes and the information flow about process times to the Hub / Station Manager or Ops Controller.

How do airlines benefit from professional Turnaround Management?

Turnaround Management supports these coordinated activities described above right from the start. The benefits can be summarized as follows:

- Full transparency about the turnaround process;
- Higher turnaround process stability by process definition;
- Quick identification of delayed ground handling processes, and
- Minimization of operational disruptions by taking actions.

All this adds up to increased punctuality by making up for rotational delays and minimizing handling delays. This saves in consequence essential delay costs. Optimizing turnarounds is not only a topic for network-oriented airlines. Low-cost carriers as well benefit from optimized turnarounds – as very quick turnarounds are part of their business model.

Why shall professional Turnaround Management be supported by IT?

Turnaround Management is a highly complex process. For many airlines Turnaround Management means to work with independent service providers or with airport services. That’s why in consequence every turnaround represents a Supply Chain Management (SCM) process that needs proactive management and monitoring of the co-operation with external service providers and / or own involved departments.
To therefore successfully implement Turnaround Management, an airline has to consider the following action fields:

- Definition and set up of a Reference Model, that is agreed with the respective suppliers
- Monitoring of current Ground Handling by defining Target Time and Actual Times
- Setup of corresponding Service Level Agreements (SLAs) for real-time steering and post-flight monitoring of Service Providers
- Performance Monitoring and Analysis by Quality- and SLA Management.

These high-level requirements need an integrated IT support designed to plan the seamless interplay between airline, own departments and ground service providers, to enable short (= at the day of ops) and long-term monitoring, and to optimize exactly where it is needed.

This White Paper will now continue to focus on the operational part of Turnaround Management - the planning and real-time monitoring.

What are the central processes of a turnaround?

Some of the central processes of an aircraft turnaround are:

- De-boarding
- De-loading
- Cleaning
- Catering
- Fueling
- Loading
- (...)

Some of these basic turnaround processes might consist of sub processes, which have to be monitored. One example might be, if the (de-boarding) process happens on an apron position and more than one bus are needed to transport the passengers to or from the airport terminal. Here a set-up of sub-processes is necessary.
2. Setting up Turnaround Management within an airline

2.1 Set up of a Turnaround

Monitoring and steering of the actual operations is based on planned processes. The first action therefore is to setup a Turnaround which can be done in three steps:

- Step 1: Setup of a Reference Model
- Step 2: Configuration of Standard Rules
- Step 3: Definition of Process Reference Points

Step 1: Setup of a Reference Model

Essential for professional Turnaround Management is the set-up of the “Reference Model”, which exactly defines:

- Processes (Boarding, Cleaning, Catering, etc.);
- Process points (e.g. for de-boarding: aircraft door open, first passenger leaves aircraft, last passenger left aircraft)
- Target times (When shall process start?);
- Dependencies (is the start / execution dependent from another process?), and
- Responsibilities (which Service Provider / in-house department has to execute the process?)

within in the context of airports, sub-fleets, etc.
The visualization of an aircraft turnaround with all the ground processes involved and interdependencies is usually done by a Gantt Chart:

From this information the “critical path” can be defined. It is the longest sequence of activities in a Turnaround which must be completed on time for the turnaround to complete on due time; if it is delayed for a certain time, the entire turnaround will be delayed for exact this time period.

Ideally in real-time operations the Reference Model therefore shall adjust dynamically immediately with every delay of an aircraft arrival or of process handling on the critical path as well as due to short-term changes like aircraft or position changes.
Step 2: Configuration of Standard Rules

As a next step for a proper setup a turnaround system also should allow the configuration of standard rules for the reference model. It is necessary to differentiate between several situations of the airlines’ round handling. These might be for instance:

- Airport (FRA, HKG, JFK, etc.)
- Sub fleet (B737, B777, etc.)
- Ground Event Type (Catering, Cleaning, etc.)
- (…)

Via this differentiation respective rules can be defined for a single process point within the turnaround process. Example: For the Boarding process the following ground handling target times can be defined:

- Process point 1: Check in Staff at Position
- Process point 2 (optional): Flight Deck / Cabin gives “OK” for boarding process
- Process point 3: Boarding Gate is opened (for boarding process)
- Process point 4 (optional): First passenger passes boarding gate
- Process point 5 (optional): Last passenger passes boarding gate
- Process point 6: Boarding gate is closed
- Process point 7: Aircraft door is closed (boarding completed)
Step 3: Definition of Setting of Process Reference Points

To complete the setup another step is necessary: The definition of Process Reference Points. The process points are always referring to a certain reference time or a process reference point on which the rules are based on. There are two categories with different process points – absolute and relative process reference point.

The absolute process reference points are not depended in time from any sub-process, within the ground rotation. Example: De-boarding has the (calculated) arrival time as absolute reference point. It will always start within the pre-defined time range within the turnaround process.

Whereas the relative process reference points relate to another process within the Ground Handling. Example: Cleaning can only start, if all passengers have de-boarded, no matter, if there has been a change in the arrival time (= delay or early arrival) or not. Therefore is has the “last passenger left the aircraft” as relative process reference point.

Besides these standard rules, also be special rules should be implemented in order to calculate target times for extraordinary situations, like for instance ordering an additional passenger bus.
2.2 Real-time monitoring of turnaround operations

A successful real-time monitoring and pro-active managing of aircraft turnarounds by the Hub Manager or Ops Controller is based on three basics:

- Calculation of Target against Actual Times
- Visualization of the operational situation on different detail levels
- “Management by Exception”-philosophy

Calculation of Target against Actual Times

In order to monitor the performance of a turnaround in real-time, an airline needs – apart from the target times defined within the reference model - the actual times for each involved ground process.

A Turnaround Management system therefore shall be able to calculate the Target and Actual Times for any Ground Handling (sub-) processes. The required data collection about the different actions taking place by the service providers (or own airline departments) during ground handling is therefore the crucial and most difficult part for the setup of a professional Turnaround Management. But it is the prerequisite for a clear view of the current process execution.

Visualization on different detail levels

The remote Hub Manager or Ops Controller should ideally have three views:

- Gantt Chart view of all Turnaround processes happening on the hub / station;
- Gantt Chart view for one single Turnaround, and
- Table / journal view for one single Turnaround
These different detail levels allow the Hub Manager or Turnaround Manager to always have an overview about the overall situation of all turnarounds on his station / hub. But if required he can always immediately drill down to any single processes of this turnaround (Cleaning, Catering, etc.), indicating which of these processes is actually responsible for the delay.

For the on-site Ramp Agent or Load Supervisor on the apron an integrated mobile solution on a smartphone or tablet ideally shall be available for the coordination of the on-site activities. He / she can retrieve all the relevant data for a single turnaround.
“Management by Exception”-philosophy

As steering activity aims to reduce ground time within an ongoing operational process to make up for a rotational delay, a mechanism of raising the situational awareness for turnaround delays shall ideally be implemented within a Turnaround Management solution: The so-called “Management by Exception”-philosophy. Here, deviations are highlighted by traffic light colors (green: fine, no action needed / yellow: endangered, but within an “OK” limit, and therefore should be watched; red: turnaround or ground process is delayed, action shall /must be taken).

These basics will allow the Hub Manager or Ops Controller to take pro-active actions for delayed ground processes for keeping punctuality - for instance by ordering a “Quick Cleaning” to reduce the officially targeted ground time for this turnaround.

3. Mid- and long-term Turnaround Management

The solely monitoring aircraft turnarounds on the day of ops in real-time is not sufficient for efficient Turnaround Management. Each day you can spend a lot of time to optimize the same bunch of flights. But maybe it is worth to find out the potential root cause for these specific delays: Is it Cleaning, Catering or Fueling that always makes you trouble? Does the delay affect all fleets? Does the delay happen at a gate or rather at an apron position?

Professional Turnaround Management therefore goes far beyond operational monitoring. That’s why the following interacting business processes should ideally also be considered when optimizing turnarounds on mid- and long-term:

- **Quality and Performance Management**
  Quality and Performance Management identify problems and trends by comparing planning with the actual operations. You might for instance find out that your cleaning has severe time problems with the cleaning of the B777, because the targeted cleaning time was every time exceed, whereas all other sub-fleets were cleaned “as planned”. So it is time to adjust the reference model for this fleet only. This overall improvement would not be possible without a post-flight Quality and Performance Monitoring.

- **Managing the Service Level Agreements (SLAs) of the providers**
  An SLA Model allows the definition of SLA Agreements to implement the cost model, the process of evaluation and clearing the ground handling performance. For example, within the SLA management the contracts are defined that provide the guidelines for planning a turnaround.
About the author
Michael Muzik has worked since 2008 as a Product Consultant and Senior Product Manager at Lufthansa Systems for different operational solutions covering Operations Control, Crew Management, Re-accommodation Management, Turnaround Management, Hub Management and Load Control. Before Lufthansa Systems he was working since 1996 for Lufthansa German Airlines in the Revenue Accounting and Crew Management department.

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