Implementation Strategies & Methodologies for Airport Openings

The opening of new airports is a demanding and intriguing logistical project which requires three fundamental elements:

- Ability to capture and analyse all critical details, based on a broad and solid operational know-how, as well as the capacity to zoom-out and assess subjects globally
- Thorough planning, organisation and methodical implementation, as the large number of entities and stakeholders engaged adds to the challenge and complexity of the project
- Bonding of the entire airport community and the commitment at the highest level of the airport operator and each company, organisation or state authority involved.

Structure of the ORAT programme

The founding element of the Operational Readiness and Airport Transfer (ORAT) programme was the Integrated ORAT Group, which consisted of the Core Team and the Internal Stakeholders and was complemented by the External Representatives of the airport community.

The Core Team undertook the leadership in setting up and driving the implementation of the ORAT programme and opening strategy, attaining full visibility in all aspects of airport development and operational planning. It was composed of seven field experts in airport operations, training, information technology and telecommunications, special airport systems and technical maintenance.

The Internal Stakeholders group was comprised of nine key managers and formed an integral and indispensable part of the programme, as they were assigned the ‘ownership’ of certain domains (e.g. operations, ground handling, commercial, handover etc.) and were responsible for the implementation of the corresponding Stakeholder Action List (SAL) for each domain. This was one of the fundamental elements of the process, as it defined the three W’s (what, who, when) i.e. required actions, the pertinent leader for each action and the target date for completion until airport opening. More than 200 fundamental actions had been listed for the duration of the programme, with many of them broken down further, which the Core Team had to follow up in a systematic way.

On the side of the airport community, there were a total of 40 designated ORAT External Representatives from end-users and tenants serving as liaisons in the programme. These persons were responsible for leading and coordinating their organisation...
on issues such as familiarisation, system training, relocation planning and participation in trial operations.

In the course of an ORAT programme it is imperative that all parties involved have the same level of information, as well as a clear and common understanding on all matters, so that the likelihood of missing, overlooking or underestimating an issue are minimised. Effective coordination was based on the methodical and consistent documentation of issues and systematic follow up through a series of fixed meetings involving the Internal Stakeholders, the External Reps, and the Contractor in individual or general steering assemblies. The frequency of these meetings was increased after the handover of the facilities to the airport operator and intensified during the period of operational trials. A formal resolution process was employed in order to record, categorise, investigate where necessary and follow up on all issues until they were resolved.

Implementation pillars
The implementation of the ORAT programme was based on four main pillars: (i) the airport opening and transfer strategy, (ii) the training / familiarisation planning and monitoring, (iii) the operational readiness review and evaluation and (iv) the technical readiness assessment.

(i) Airport opening and transfer strategy
The opening strategy of both airports followed a two-phase progressive activation approach (‘soft opening’). This strategy achieves the smooth transition of the whole airport community to the new environment with the following established benefits:
- Gradual adaptation of all staff under real operating conditions
- Mitigation of possible start-up risks due to reduced traffic volumes
- Smaller operational impact from potential technical matters
- More time and flexibility in dealing with technical or operational issues
- Smoother and logistically less challenging physical transfer between the old and new facilities
- The intermediate period between the two opening phases serves as a potential ‘open house’ for non-travellers who choose to visit the new airport triggered by interest, thus reducing the ‘congestion factor’ induced by the non-passengers usually anticipated in full operating mode.

The ‘soft opening’ strategy of the two new airport facilities was implemented through different methodologies exploiting the individual physical characteristics and nature of traffic of each airport.

Segregated arrivals and departures
For PFO the two-phase opening was based on the sequential commencement of arrivals in the first phase and departures in the second phase four days later. The old facilities were comprised of two physically separate buildings for arrivals and departures respectively, thus airport end-users were accustomed to ‘split operations’ from two different locations. The opening of the arrivals section first allowed all resources to initially focus on one elementary area of airport operations, and the associated procedures, and provided a ‘risk-free’ start-up as the arrival processes are less demanding and complicated compared to departures.

Fractional Opening
For LCA, the corresponding progressive opening was achieved by the start-up of both arrivals and departures of the home carrier operating alone from the new airport terminal in the first phase. The resulting traffic volume through the new facilities was 34% of the total for the season, leaving the remaining 66% operating from the old airport until the full opening in the second phase seven days later. As both the old and new terminal facilities were simultaneously in operation for a week, key elements in the success of this method were the careful planning of resource allocation, mainly from ground handlers and
state authorities, and the clarity in the communication and guidance of the travelling public as to which terminal to use.

In both airports, the opening was achieved ahead of the defined contractual date and for selecting the ideal period a set of criteria was considered including: (a) the flight schedule volume and density, (b) the proximity to peak traffic days and (c) the Effective Buffer Time (EBT) for the final transfer of critical equipment and repositioning of aircraft.

The physical relocation of the airport operator to the new facilities was the first to be implemented. For the transfer of all tenants to their new premises, a detailed Transfer Plan was produced. It defined (a) the relocation schedule, (b) the external airside and landside transfer routes between the new and old terminal buildings and (c) the detailed moving paths within the old and new terminal facilities, so that each tenant knew exactly which collection or drop-off points, entrances, elevators and internal paths to use.

The Transfer Plan differentiated between Stage A (volume of non-critical items which can be moved in advance) and Stage B moves (volume of critical equipment which would have to be transferred during the Effective Buffer Time).

Another significant tool in the opening of the two new airports was the Transition and Opening Sequence (TOS) Plan. It was in essence a 45-day countdown of actions leading up to the airport opening date. The scope was to:

- Capture key actions by date and all the pre-requisites/conditions for these activities
- Identify additional staff requirements for the first two weeks of operation and define specific roles and positions
- Identify supplementary measures for the opening period to ensure the efficiency of key operational processes
- Consider the ‘quality perception’ of the opening for the public.

(II) Training / familiarisation planning and monitoring

The familiarisation and training of the entire airport community is of the utmost importance for the successful opening of a subsequently becoming trainers. It was initiated about four months before the official handover of the facilities to the airport operator and involved about 80 courses on 20 systems of electromechanical and plumbing (MEP) infrastructure, IT backbone and IT-based applications, as well as special airport systems such as Passenger and Hold Baggage Screening (PHBS), Baggage Handling System (BHS), Passenger Boarding Bridges (PBB), Aircraft Visual Docking Guidance System, etc. Staff from the airport operator, ground handlers and state authorities were the main participants with more than 400 attendees.

The second stage, dubbed ‘Initial Training’, was conducted by the qualified trainers to their own staff. This stage had to be completed before the operational readiness trials in order for all participating staff to be ready to operate in the new facilities.

The third stage covers ‘Recurrent Training’, which is one of the fundamental factors contributing to the successful airport opening as it refers to the continuous practice of staff. This helps to boost the learning curve of the user and build confidence in the operation of the new systems, while it also provides a natural testing period as systems will be in frequent use, rather than remaining inactive until opening, and therefore any technical issues can be identified well in advance.

The familiarisation programme for the whole airport community was initiated after the handover of the new facilities to the operator and was also distinguished in two phases: ‘Basic Familiarisation’, which was based on the train-the-trainer concept, and ‘Continuing Familiarisation’. More than 20 basic familiarisation sessions were delivered by the airport operator’s staff to designated people from all airport users. These sessions consisted of a general presentation and a walkthrough in the new terminal building. Special arrangements were made in the context of continuing familiarisation, to encourage the airport community to visit the new facilities as much as possible to feel comfortable in their new working environment.

To enhance the familiarisation process a concise Airport Familiarisation Handbook (AFH) was produced and distributed in advance. This 40-page guide covered all areas of the new terminal building, by floor, in a colour coded manner and introduced the key
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functionalities of the new facilities, the operability of some new systems broadly used by all (such as the biometrics-based Access Control System), the main staff routes and staff park and other key information relevant to the majority of all employees.

In order to have visibility and effectively monitor all planned system training and familiarisation activities, a schedule had to be submitted by all end-users defining the dates, attendees and trainers from their side. Evaluation forms helped to assess the quality of the training delivered and identify any needs for repetition of the initial or the original ‘train-the-trainer’ course. Moreover, standardised training records had to be maintained and submitted by all entities, which is an indispensable element of any safety management system.

Soon after the handover of the new airport from the contractor, a small number of staff from the airport operator were dedicated to work out of the new facilities and Operations Centre on a daily basis, ‘shadowing’ the work and activities of the old airport and forming a nucleus of trainers. The remainder of the operations staff were rotated through the new facilities for training and familiarisation. Entering ‘real-time’ information into the Airport Information Management System (AIMS) database and allocating aircraft stands, gates and check-in counters as per the traffic going through the old facilities, they had a four month period to assimilate with the systems and environment. In parallel, a training schedule on new standards, emergency and contingency procedures was instigated.

(III) Operational readiness review and evaluation

The analysis and evaluation of the operational readiness was realised through five different tiers:

Standard operating and contingency procedures

This refers to the hands-on involvement of the Core Team in the review, development or update of procedures, including the airport certification documentation, such as the Aerodrome Operations Manual and the Emergency Preparedness and Response Plan. More than 80 newly developed or updated Standard Operating Procedures (SOP) and 19 Contingency Procedures (CP) were brought to a first draft stage before the commencement of trials, having addressed interfaces with primary end-users. During the operational trials we had the opportunity to test, fine tune, validate and finalise all the SOP and CP.

Operational Integrated Validation Tests (IVT)

These focused on the airdside and included a series of 14 tests, which were performed prior to the execution of trials in order to validate a number of operational parameters and interfaces and identify possible issues early in the process. These tests included the manoeuvring requirements and compatibility of Ground Support Equipment (GSE) and servicing vehicles with the new airdside service roads, traffic flows, the BHS make-up areas, etc. Some results validated the design parameters and others revealed the need for remedial actions or procedural changes.

Operational trials

Critical to the readiness assessment are the trials, with the participation of the whole airport community and ‘mock’ passengers in large numbers, to challenge the airport systems and processes under simulated airport runs. The targeted number of passengers for PFO was 1000 people for the five trials planned and 3500 participants for the seven trials scheduled in LCA. The use of web-based tools such as Facebook and registration through the internet, along with e-tickets and an effective incentives package, made the recruitment of the large number of ‘mock’ passengers possible. All trials were designed to have a total duration of about two hours, starting with 100 ‘mock’ passengers for PFO and 200 for LCA and climaxing at 1000 and 1500 respectively in the last trials.

It was established that the progressive escalation of the number of participants in each trial, up to the ‘hourly design capacity’ of the terminal, was advantageous. It helped to generate the necessary complexity, challenge the staff adequately and provide hands-on practice under near-real conditions, while it also offered valuable insight into systems robustness and sustained performance.

The trials were designed to be executed within one month for PFO and a 45-day period for LCA, corresponding to the challengingly short period available between the handover of the new facilities and the actual airport opening.

A number of ‘artificials’ in various areas were introduced to approach the real operating environment to the extent possible, and a total of 54 special cases and contingencies were examined. Another 36 standard functions were observed and findings recorded.

Well ahead of each trial day a preparatory coordination meeting took place with all key participants, to enable the discussion and alignment of interfaces on the procedures and cases to be tested and the confirmation of the logistics and resources required.

Designated ‘observers’ from each participating
entity had an important contribution in reporting findings during the de-briefings, which were incorporated into the formal resolution process.

**Airside/Push-back Trials**

As contact stands and extensive push-back operations had not been previously used in Cyprus, this was seen to be one of the critical flight safety related areas. The primary objective was to familiarise the air traffic controllers and ground handling staff on the newly developed push-back procedures, communication and coordination. The first stage of these trials called for basic push-backs involving only the Air Traffic Control (ATC) and ‘mock’ aircraft, simulated by vehicles on mixed arrival and departure scenarios. In the second stage, push-back tractors were integrated for the familiarisation of the ramp handlers. The third stage called for the addition of other ground handling activities in order to rehearse the full ramp environment, while the full length of active taxiways were used by ‘mock’ aircraft to identify potential conflicts in ground control.

**Table-top Exercises**

These focused on elements of emergency planning, which were tested on a reduced scale in order to familiarise both the airport community and external responding agencies with the new areas defined in the emergency preparedness plan, such as new rendezvous points, assembly points for mass evacuation, reception areas for passengers, friends and relatives, etc.

**(IV) Technical Readiness Assessment**

The scope of the technical readiness assessment was to develop and perform a series of system Integrated Validation Tests (IVT) as well as to support, with know-how, the maintenance contract tendering and evaluation processes.

It is common, during the testing and commissioning period of a new airport, that the focus is on individual system testing, while a number of interfaces remain unexplored due to either system or external ‘component’ unavailability and possible technical hitches at the time. In the ORAT programmes employed for both PFO and LCA, a series of technical IVTs were implemented in order to:

- Test the interfaces between systems
- Validate system redundancy and interactions
- Explore parameters not considered or adequately examined in the commissioning period
- Build confidence on system performance and enhance the learning curve of maintenance staff, by promoting utilisation of systems within their specification envelopes in a systematic way.

There were a total of 16 technical (MEP) and 79 IT&T tests planned for LCA, which were recorded on special forms defining the test objectives, the methods and conditions used and the corresponding test results and recommendations. The basic IT&T tests referred mainly to the integration of airlines’ DCS with the automated BHS and Baggage Reconciliation System (BRS), the Airport Information Management System integration, the Access Control (ACS) and Fire Alarm (FAS) system functionality and interfaces, ground-to-ground communications effectiveness, etc. Key technical tests involved the Building Management System (BMS) integration, the functionality of Passenger Boarding Bridges (PBB) and the associated automation interfaces, coupled with the Ground Power Units (GPU), the laser-based Visual Docking Guidance System (VDGS) and the Aeronautical Information System of the airport, complete power down and system redundancy tests etc. All of the tests were planned to be completed by the commencement of trials, so that new systems were ready to cope with the simulated airport operation.

The planning and implementation of the tendering process for the maintenance contracts and the timely selection of all relevant contractors were of primary importance, so that all relevant technical crews were on board early enough to receive adequate training on the new systems and participate, to the extent required, in the trials.

A safety/risks assessment was also conducted prior to airport opening, to identify possible areas where additional safety measures may have been required and ensure that the new environment was safe for passengers and staff.

**Conclusion**

The complexity of an airport operational readiness programme depends predominately on the sophistication of the systems employed and the time available for preparation, rather than the physical dimensions of the airport per se. Although there is a set of basic principles for all ORAT programmes, the implementation strategies and methodologies have to be adapted to the specifics of each airport, cultural trends, local mentality and contractual obligations, in order to yield the desired results. Moreover, the intricate combination of thorough planning, methodical implementation and in depth knowledge of airport operations and design, coupled with the necessary visibility in all key aspects, are crucial to the effective steering of the airport community towards a successful airport opening.

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George Saounatos, is an Air Transport Consultant specialising in the field of airport operations and planning. He is currently assigned by Vancouver Airport Services (YVRAS), in the capacity of Manager for Operational Readiness and Airport Transfer (ORAT), to lead the opening of two new airport terminal facilities in Cyprus operated by HERMES Airports Ltd, the new Paphos International Airport, which opened successfully in November 2008, followed by the larger scale Larnaca International Airport opening in November 2009.

In his career he has held a number of senior operational, engineering and managerial positions. This encompasses his involvement in the development, opening and operation of the new Athens International Airport, initially involved in airport certification and safety in 1999 and later on as an airport operations centre Senior Supervisor. In 2003 he joined AIRBUS on the A380 Programme in Toulouse as a Senior Engineer in ground operations, where he managed international technical working groups and the functional integration requirements of the new aircraft in regards to services, ground operations, airport compatibility and equivalent testing.

In 2005 he was contracted by Aéroports De Paris Ingénier (ADP) in Dubai as an associate Project Director for Phase-1 design development of the first Terminal facilities of the new Dubai World Central International Airport in Jebel Ali. He is the holder of a Bachelors Degree (BSc) in Aerospace Engineering and a Masters Degree (MSc) in Air Transport Management from Cranfield University, an International MBA specialising in Transport and Logistics from Athens University of Economics and Business and also a FAA Commercial Pilot and Flight Instructor license.