13 October 2020

Cargo Operations

Today’s session will begin shortly
13 October 2020

Cargo Operations

Welcome
Microphones have been muted

Please submit your questions through the Question box and send to Everyone

The webinar is being recorded and will be made available afterwards, including the PPT slides.
Participants are cautioned that any discussion regarding matters such as fares, charges, division or sharing of traffic or revenues, or concerning any other competitively sensitive topics outside the scope of the agenda is strictly prohibited.

As a result, questions pertaining to individual policies or commercial decisions and/or being subject to bilateral commercial discussions between airlines and their suppliers or customers will not be answered.
Agenda

- Welcome Address
- Capitalizing on air cargo & managing through crisis
- Opportunities as we emerge from the crisis
- Sustainable air cargo operations
- Panel and Q&A with our experts
- Wrap up

Biographies are available on the IATA Website
Welcome Address

Brendan Sullivan
Head, Cargo Operations & E-Commerce
IATA
Capitalizing on air cargo & managing through crisis

Robert Fordree
Executive Vice President – Cargo
Menzies Aviation
Covid-19 and Cargo: An insight into how the pandemic is re-shaping our business

Robert Fordree, EVP, Cargo
October 2020
Industry leading services across the world

Cargo tonnes: 1.5M
Flights handled: 1.2m
Passengers served: 200m+
Litres fuelled: 34bn
Lounge guests: 1.5m
Global locations: 202

Revenue by region:
- AMERICAS: 39%
- SOUTHERN EUROPE & AFRICA: 47%
- UNITED KINGDOM & IRELAND: 47%
- NORTH & EAST & WEST EUROPE: 14%
- MIDDLE EAST, CENTRAL & SOUTHERN ASIA: 14%
- OCEANIA & SOUTH EAST ASIA: 14%
Building strong customer relationships

Our business is founded upon the strong relationships we have with our customers. We work with major global and regional airlines and service providers, including but not limited to those listed below:
Returning to the new normal

It is widely acknowledged that there will be no return to the 2019 business model based flight schedules and cargo volumes. Differing global markets have differing expectations and forecasts for this year and into the next.

Menzies Aviation 5 point plan for a safe return to work

1. Communication
2. Operational Processes: A New Normal
3. Social Distancing
4. PPE Supply
5. Disinfected working environments

All providers had to immediately react to the dramatic downturn in business with global lockdowns, this included a reduction in employees (in many cases through government support schemes) and the consolidation of work into smaller facilities, in order to get back to work we have adopted the above 5 point plan to do so safely.
Cargo Handling Facilities

Cargo Handlers are successful when they have a facility that is using its full capacity either with one key customer or a combination of customers with complementing schedules to avoid peaks of operation and bottlenecks for collections and/or deliveries at the same time.

CARGO

If we compare our operations to jigsaw puzzles the graphic shows a perfect puzzle. This would be:

- 4 Customers
- Schedules for arriving departing aircraft and/or trucks at different times throughout the day.
- Cargo volumes that maximise the use of the warehouse floor space but do not give large peaks of activity or significant downtime.
- Teams will be engaged throughout the day with a steady workload making them more productive.

This would be a carefully constructed, designed and planned out optimum Cargo Handling business. This takes a long time to ensure the right business is secured during often very competitive commercial discussions.
Cargo Handling Facilities – *Post COVID19*

**CARGO with COVID19 impact**

In this example the carefully constructed business model of capacity utilisation has been severely impacted by a number of factors from COVID19:

- Increase in piece counts largely due to PPE
- Change in Carrier schedules, Some have increased cargo with pax/freighters. Some are not operating at all
- This leads to large peaks in activity and extended periods of unproductive work
- Short, medium and long term forecasting to return to ‘optimum’ capacity utilisation remains very challenging due to the uncertainty of carrier schedules.

This means the previously perfect jigsaw puzzle now has pieces that are different sizes and shapes than before and the puzzle no longer fits together so well.
LHR Puzzle – A case study

On 1st September 2020 Menzies Aviation secured a new large scale airline contract at LHR. We experienced some well documented operational congestion issues. This is what happened ….

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Planning completed.</td>
<td>Existing customers dramatic volume reduction. New customer increased volume. Adequate capacity</td>
<td>Existing customers volumes start to return. New customer volumes still increasing</td>
</tr>
<tr>
<td>Existing customers volumes and new customer volumes Adequate capacity</td>
<td>Adequate capacity</td>
<td>Capacity issue</td>
</tr>
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</table>

- Existing customers who were not operating announced a return to scheduled operations.
- These schedule operations in some cases were using bigger aircraft.
- In addition without passengers the cargo payload was significantly greater.
- The result was capacity utilisation 30-40% above terminal capacity and significant peaks of operation particularly over the weekends.
The unprecedented volumes from all customers resulted in delays to import breakdown and excessive door queues for deliveries and collections.

Actions taken to address:

- **Customer relocations to alternative handling facilities**: Over 50% of existing customer volumes were relocated to alternative handling locations. This to protect their business from the terminal congestion and to also help to alleviate some of the peaks experienced.

- **Increase in labour**: All employees previously on furlough returned to work and additional labour to support import breakdown.

- **Management oversight**: A Senior Management support team overseeing all operational activity and customer engagement
Putting into place the perfect handling jigsaw puzzle

The global cargo business has a continued challenge to wrestle with, what will cargo volumes look like in 1, 3, 6 and 12 months time. How do you plan?

Will cargo volumes currently handled on larger aircraft without passengers continue long term?

If cargo volumes are greater from multiple customers how do you manage warehouse capacity requirements on a temporary basis when you don’t know how temporary it will be?

How do you manage your labour requirements when volumes can change exponentially from day to day and week to week?
Opportunities as we emerge from the crisis

Dr. Suraj Nair
Founder & CTO
SPEEDCARGO
SPEEDCARGO Technologies
Dr. Suraj Nair
Founder and CTO
13 October 2020
The Air Cargo Industry

US $6 TRILLION in value of goods

GLOBAL TRADE
1% by volume
35% by value

68 MILLION jobs

Revenue
US $102 Billion in 2019
US $138 Billion ~ 2021
Air-freight Industry Trends

Cargo revenue and volume on upward trajectory in the past 5 years, expected to return to growth by 2021

Demand for air cargo and travel will rise sharply in 2021
Stronger volumes next year but demand remains well below 2019 levels

**Historical trend: 2015-2019**

<table>
<thead>
<tr>
<th>Cargo industry revenue CAGR</th>
<th>5.79%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight tonnes CAGR</td>
<td>2.92%</td>
</tr>
</tbody>
</table>

**IATA Forecast: 2020F-2021F**

<table>
<thead>
<tr>
<th>Cargo industry revenue CAGR</th>
<th>7.76%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freight tonnes CAGR</td>
<td>0.89%</td>
</tr>
</tbody>
</table>

Source: IATA Economics using data from IATA Statistics

IATA: Stronger demand for air cargo is still below 2019 levels. IATA
Air Cargo Struggle—30 years Innovation Gap

Load Factor

**DIGITISATION**

**OPTIMISATION**

**AUTOMATION**

**AIR CARGO**

- Inaccurate/incomplete data
- Underutilized capacity
- Slow and inefficient handling

**CAPACITY UTILIZATION**

50% by weight

While pricing is volumetric, accurate and complete data is usually available only for weight. This current capacity optimisation process operates in a single dimension using Cubic Meter Volume (CBM) instead of 3D optimisation.
COVID-19 Impact

How can Airlines optimise existing Capacity?

Can Airlines and Terminal Operators continue to operate status-quo when Capacity returns?

Digitisation, Capacity Optimisation and Automation key in reviving Air Cargo Economics!
SPEEDCARGO Solutions

DIGITIZE

cargo eye

Cargo digitisation system

OPITIZE

cargo mind

Real time capacity optimisation engine

AUTOMATE

cargo arm

Automated cargo handling system
CARGO EYE

Instant, accurate dimensioning

**Instant dimensioning**
~2sec/scan, uninterrupted workflow

**Digital cargo records**
verification of claims and traceability

**Seamless data integration**
API based data integration with existing cargo management systems
Verified by Industry Leaders

Installations in Singapore

Cargo Terminal Operations

Large Freight Forwarder

Airline/Ground Handler
Video

https://youtu.be/ftRQAaG5EhU
CARGO MIND
A real-time capacity optimization engine

**Capacity optimization**

**Revenue optimization**

Deep-tech algorithms maximize the utilization of cargo capacity

Multiple ULDs planned simultaneously

Adhering to the regulations and standards for safe ULD build-up

Free up to 30% capacity for additional business*

*verified by large air cargo carrier after trials with CARGO MIND
Video

https://youtu.be/qjpy7_X-DiM

cargo mind
Assemble

Plug-in enabling manual build-up of ULDs planned using CARGO MIND
Video

**CARGO ARM**

End-to-end automation for air freight handling

**Swiss-made industrial robot**
Gudel

**24x7 operations**
Low maintenance, MTBF 8-10 years

**High payload**
Current payload 500kg
Can be configured up to 3.6 tons

**Grippers suite**
vacuum and fork grippers to handle cargo of various materials and dimensions
Video

https://youtu.be/rxa5MoeRCwA
SPEEDCARGO Solutions

INCREASE CAPACITY & THROUGHPUT
of cargo terminals within existing footprint

INCREASE RELIABILITY OF DELIVERY
improved quality of cargo handling

INCREASE WORK HEALTH SAFETY
accident free workplaces, upskilled jobs

SECURITY / RISK MANAGEMENT
operations secured from threats such as pandemics
Thank You

suraj@speedcargo.sg
Sustainable air cargo operations

Nadine Mücklich
Project Manager & Researcher
Fraunhofer IML
Sustainability in Air Cargo Operations

Why it is critical to keep investing in innovation

Nadine Muecklich, Fraunhofer IML – Aviation Logistics

IATA Cargo Virtual Events 2020
Innovation: from concept to finished product

Concepts, studies and roadmaps

Demonstrators, proof of concept

Support through to market maturity
Fraunhofer IML - Aviation Logistics
Frankfurt, Germany

- Aircraft
  - (Dis-) Embarkation
- Apron
  - Passenger-transport
- Terminal
  - Passenger-handling
  - Baggage-handling
- Pre-/ on carriage
  - Passenger-transport
  - Baggage-transport

- PAX
- Luggage
  - (un-)loading & servicing
- Cargo
  - Cargo- / Airmail-handling
- Others
  - Ground-handling
  - Security, infrastructure, customs, IT, VAS ...
Sustainability – a holistic approach
More than 'just' going green

Definition of Sustainable Development

… development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Limitation

… limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities. But technology and social organization can be both managed and improved to make way for a new era of economic growth.

Source: University of Alberta / UN Report on ‘Our Common Future: report of the World Commission on Environment and Development’
Sustainability in the Context of a Pandemic
Resilience of an organisation & the industry

- Resilience definition: „The intrinsic ability of a system to adjust its functioning prior to, during, or following changes and disturbances, so that it can sustain required operations under both expected and unexpected conditions”.

- In busy (good) times: Money, but limited capacity to assign resources to innovation creation

- During corona: No money, but more (additional) capacity to develop and push innovative ideas
  - It is about building strategy and investing in the right things at the right time
  - Anticipate post-COVID19 challenges and future demand

- Sustainable action does not only aim to aid the environment, but also the economic development

- Use the resources that are available (esp. use the unused)

- Benefit from own R&D and from funding opportunities

https://erikhollnagel.com/ideas/resilience-engineering.html
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COVID-19 and AirCargo

An Extract

- Individual impact dependent on the business model, location, and interdependencies
- Fast adaption to new circumstances during the crisis
  - Low belly capacity available
  - Limited capacity for full-freighter A/Cs & RFS
  - Cargo in pax cabins
- Lots of insecurities for all stakeholders
- In general, low willingness to invest in innovations – everything 'on hold'
- But investments in innovations help to recover and even benefit from the crisis
COVID-19 and AirCargo
Innovation during and after the pandemic

- Digitalisation and automation of air cargo processes
  - E.g. OneRecord and eAWB
- New technology to support or substitute manual processes
  - One step to address the problem of finding personnel
- Contactless processes
  - Less to no live human-human interaction needed
    - At the same time: enhanced efficiency
  - More resilient when facing crisis
- Interconnecting stakeholders in the air cargo processes
  - Enhanced communication of systems
INNOVATION AT/AROUND THE AIRPORT

- Automated Baggage Loading (Bulk)
- Smart Baggage (NB-IoT for Tracking / Tracing / Monitoring)
- Automated Build-up of AirCargo
- RoF “Green Ramp”
- CargoBoxx
- Smart Air Cargo Trailer
- Mobility / Last Mile
- Automated/autonomous driving - eETS
- KI & Predictive Capacity Planning
- eFreight OneRecord
- Smart ULD’S
- Connecting Communities
- Security (Drone / Cyber / Resilience)
- RadAR++
Artificial Intelligence and related Emerging Technologies
Green Airport Infrastructure & Processes

1. Landsite connection / Mobility / Transport
2. Terminal PAX & Cargo
3. Ground Operations / Airport
4. Utilities / PowerSupply

A/C Design (e.g. CleanSky)

ATC (e.g. SESAR)
Development on the Apron

Current research along the process chain

- Automation of processes & equipment
- Aircraft Handling – Resource Management
- Irregularity Management
- Renew, improve, avoid
  - Renewal of equipment & information systems
  - Improve operational processes (efficiency & effectiveness)
  - Avoid unnecessary pollution by optimized processes & corporate culture
Motivation
- Determine the potential of electronic transport AGVs on the apron

Key Findings
- Airport infrastructure highly suitable for the use of autonomous vehicles
- The electrical apron equipment already in use shows that the type of drive does not play a role in automation/autonomization. Therefore, from the emission point of view the electric drive should be given preference at the airport.
- Saving of various costs

Challenges
- Legal & regulatory framework
- High investment
- IT Infrastructure
Augmented Reality in Air Cargo Handling

Implementation Strategy

1. Training
   - Contour
   - Pile factor
   - Mixed-load prohibition
   - Pallet weight and balance

2. Contour check
   - Database for contours

3. Build-Up
   - 3D scan of pieces
   - Software
Increased Efficiency
Smart ULD and Equipment Tracking

Intelligent air cargo container:
- monitors environmental influences
- locates itself independently (tracking)
- communicates with surrounding objects and control center
- regularly reports status, location and alarm data

NB-IoT Equipment Tracking:
- Low bandwidth and low throughput data transmission
  → Low energy consumption = long battery life
- Equipment Tracking via GSM Network
  → No extra infrastructure
Way to the Future
Industrial Apps to improve Handling
Going Green in AirCargo Operations

- Using 'newer' equipment with less consumption during the product life cycle
- Increase efficiency of processes
  - Resource Management
  - People, Equipment, Information Management
- Balance reasonably between production & protection
  - Development of a sustainability strategy
  - Don’t procrastinate, but also don’t get ahead of yourself

Source: Modified Model from James Reason
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Panel Discussion
Q&A with our experts

Moderator:
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Robert Fordree
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Please submit your questions through the Questions box and send to Everyone
Wrap Up

Brendan Sullivan
Head, Cargo Operations & E-Commerce
IATA
Thank you

▪ Please visit iata.org/events for the upcoming webinars

▪ Please visit iata.org/cargo for all COVID-19 resources

▪ Contact us at cargo@iata.org