Augur - RosAeroSystems (RAS)
Russian leading LTA manufacturer since 1991

ATLANT: The Future Technology for Remote Territories Development
Among Worldwide LTA Leaders

- One of the very few companies in the World that produce both manned airships and tethered aerostats.
- One of three companies worldwide with proven capabilities for medium, large and extra-large aerostats
- One of the few companies in the World with completed envelope production based on computerized cutting and welding HF technology
- The Company combines professionals from Russian aerospace and defense industries.
Recent Achievements

2012

- Resident of the Skolkovo Innovation Centre. The project of Hybrid Airship “ATLANT” got a high experts total grade.

2013

- Manufacturing and Test Facility designated to manufacture envelopes for advanced LTA vehicles has been created.
Recent Achievements

2013

- The first Russian airship base equipped all necessary infrastructure has been revived.

2014

- Skolkovo Grant Committee has finally approved the funding of the “ATLANT” project
ATLANT – Glance to the Future

- Non-ballast loading and discharge
  - Hangarless long time operation
    - Buoyancy control
      - Large - dimensioned freight capabilities
        - VTOL
          - Low dimensions
            - No feathering at mooring
              - Door-to-door cargo delivery
                - Up to 160 km/h speed
### ATLANT vs. Other Aircrafts

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Helicopter</th>
<th>Airplane</th>
<th>ATLANT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mi-8T</td>
<td>Mi-26</td>
<td>IL-76TD</td>
</tr>
<tr>
<td>Maximum flight range, km</td>
<td>500</td>
<td>4,900</td>
<td>7,500</td>
</tr>
<tr>
<td>Maximum carrying capacity, kg</td>
<td>4</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>Maximum flight speed, km/h</td>
<td>250</td>
<td>295</td>
<td>800</td>
</tr>
<tr>
<td>Runway need</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Water landing</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Door-to-door delivery</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Comparative fuel consumption</td>
<td>5 – 15</td>
<td>2 – 3</td>
<td>1</td>
</tr>
<tr>
<td>Flight hour cost, €</td>
<td>2,935</td>
<td>18,065</td>
<td>4,539</td>
</tr>
</tbody>
</table>

### Cargo bay dimensions (meters)

<table>
<thead>
<tr>
<th>IL-76TD</th>
<th>ATLANT-30</th>
<th>An-124-100</th>
<th>ATLANT-100</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Cargo bay dimensions" /></td>
<td><img src="image2.png" alt="Cargo bay dimensions" /></td>
<td><img src="image3.png" alt="Cargo bay dimensions" /></td>
<td><img src="image4.png" alt="Cargo bay dimensions" /></td>
</tr>
</tbody>
</table>
Krasnoyarsk

R = 4 000 km
long-haul transportation
ATLANT-30 – 12 t
ATLANT-100 – 48 t

R = 1 000 km
short-haul transportation
ATLANT-30 – 16 t
ATLANT-100 – 60 t

Moscow

R = 2 000 km
medium-haul transportation
ATLANT-30 – 14 t
ATLANT-100 – 52 t

Coverage Area

R = 200 km

“Augur “Aeronautical Centre”
Technology Design Concept

In Flight

- Constant weight 55%
- Payload 45%
  - Commercial payload 40% 5%
- Aerostatic force 70%
- Aerodynamic force 30%
- Cruise thrust 20%
- Lift thrust 20%

Maximum take-off weight

- Forward flight
- Vertical takeoff +10%
- Short takeoff +5%

On Ground

- Constant weight 55%
- ABS 20%
- Mooring 20%

- Autonomous mooring -25%
Technology Design Concept

- Overview structure and mathematic model of the rigid hull’s surface are designed.

- Wind-tunnel tests of small-scale model are performed at Moscow Aviation Institute.

- Aircraft configuration and power plant composition are designed.

- Innovative design concepts and manufacturing from composite materials technique are practiced.

Any surface landing, no need for feathering are enabled by the structure of ATLANT.
Year-round operation with no hangars is enabled by rigid hull.
VTOL-ensured *ejector-lift and vectored-thrust* configuration is designed.

### ATLANT-30’s lift propulsion system

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total takeoff power</td>
<td>6,000 kgf</td>
</tr>
<tr>
<td>Number of engines</td>
<td>4</td>
</tr>
<tr>
<td>Fuel type</td>
<td>jet fuel, diesel oil</td>
</tr>
<tr>
<td>Fuel load</td>
<td>3,800 kg</td>
</tr>
<tr>
<td>Specific fuel consumption</td>
<td>0.158 kg/(hp·h)</td>
</tr>
<tr>
<td>Engine</td>
<td>RED-A03</td>
</tr>
</tbody>
</table>

### ATLANT-30’s ejector lift system

<table>
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<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total takeoff power</td>
<td>18,000 kgf</td>
</tr>
<tr>
<td>Number of core engines</td>
<td>4</td>
</tr>
<tr>
<td>Fuel type</td>
<td>jet fuel</td>
</tr>
<tr>
<td>Fuel load</td>
<td>1,650 kg</td>
</tr>
<tr>
<td>Specific fuel consumption</td>
<td>1.1 kg/(kgf·h)</td>
</tr>
<tr>
<td>Endurance per flight</td>
<td>6 minutes</td>
</tr>
<tr>
<td>Engine</td>
<td>RD-38</td>
</tr>
</tbody>
</table>
Technology Design Concept

In-house developed **Active Ballasting System (ABS)** is the core ingredient of ATLANT design to control buoyancy at flight and aircraft ballasting on the ground. ABS allows to unload immediately upon landing.

1. **Unloaded ABS** $\Delta G = 0$ tonnes

Air ballasting $\Delta G = 10$ tonnes
Ballasting time $T = 30$ minutes
Fuel consumption $G_T = 50$ liters
Technology Design Concept

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1. Utility model patent № 129080 «Rigid airship».

2. Invention patent № 2518381 «Rigid airship».

3. Utility model patent № 132051 «Vectored-thrust power plant».

4. Claim for an invention № 2013116717 «Vectored-thrust power plant».

5. Invention patent № 2434927 «The prevention method of hydrogen-air mixtures inflammation and detonation».

6. Invention patent № 2441685 «The gas composition for the prevention of hydrogen-air mixtures inflammation and detonation».
THANK YOU FOR THE ATTENTION!

ATLANT: The Future Technology for Remote Territories Development

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