



# **ATLANT: The future technology for Northern Territories**

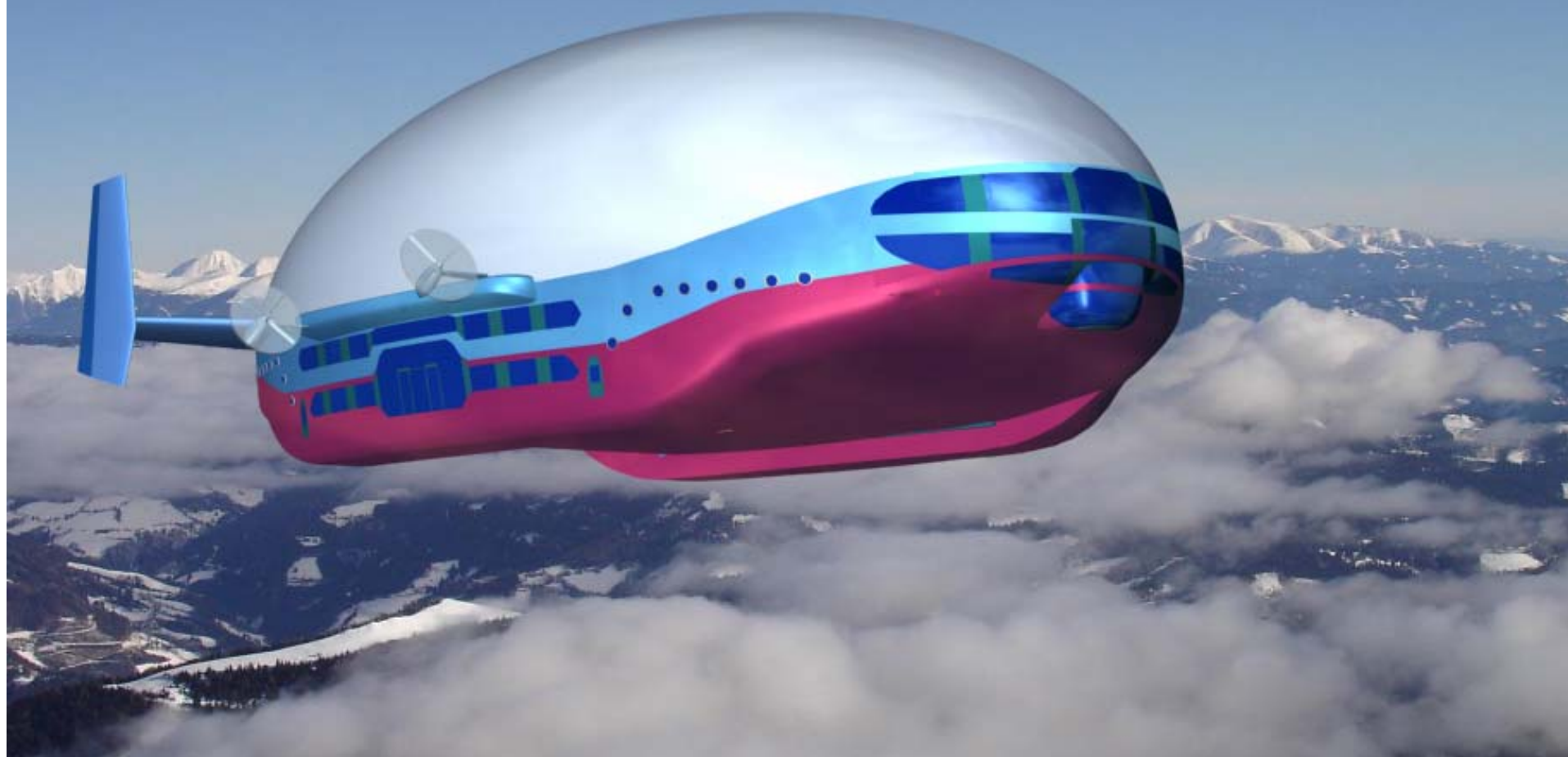
**Augur - RosAeroSystems**

**2009**



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## ATLANT – GLANCE TO THE FUTURE





## **LTA TRANSPORTATION TASKS:**

**Task 1. Long range, cost effective transportation missions between established logistic centers with specialized airship infrastructure.**

**Range – up to 15 000 km, Cost – below 0.5\$ per tone/km.**

**Hangars, masts/mooring devices, ballast/return cargo at both connected points.**



## **LTA TRANSPORTATION TASKS:**

**Task 2. Medium range transportation missions connecting established logistic centers with temporary logistic centers or destinations without any specialized airship infrastructure.**

**Range – up to 3 000 km, Cost – below 0.75\$ per tone/km.**

**Hangars, masts/mooring devices, ballast/return cargo are NOT required.**





## **LTA TRANSPORTATION TASKS:**

**Task 3. Short range cost effective unique transportation missions of moving, mounting/dismounting of large oversized cargo.**

**Range – up to 500 km, Cost – below 1.5\$ per tone/km.**

**Hangars, masts/mooring devices, ballast/return cargo at both connected points are NOT required.**



Авгурь - РосАэроСистемы

World LTA tendency: Type 1



Cargolifter CL-160



Aerostatica A-06



Ohio Airships



World LTA tendency : Type 2



**Lockheed-Martin**



**Millennium Airship Inc**

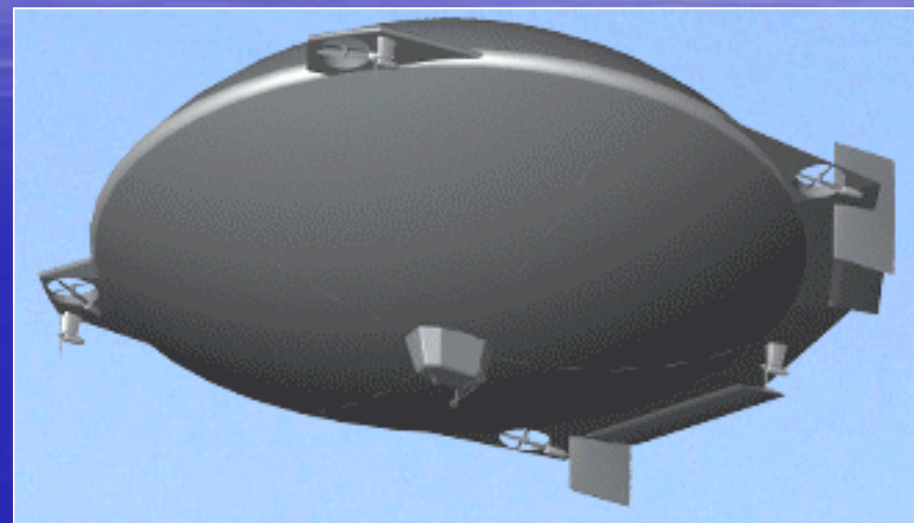


**Worldwide Aeros Corporation**





World LTA tendency: Type 3



Lokomosky





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ATLANT can be used for both: Type 2 and Type 3 transportation tasks



Oversized cargo

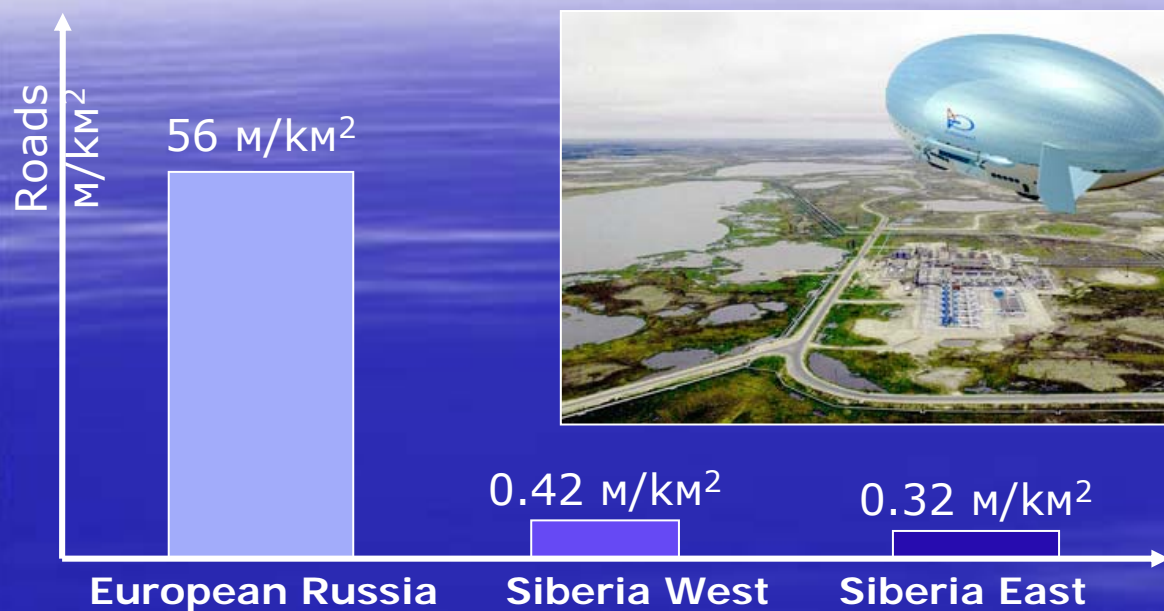


Large 28x10x6 cargo bay



# Авгурь - РосАэроСистемы

## Type 2 LTA transportation system







Авгурь - РосАэроСистемы

## ATLANT transportation coverage





Авгурь - РосАэроСистемы

## CHALLENGES OF NORTHERN TERRAINS FOR AIRSHIPS

High gusty winds

up to 60 knots

Heavy snow

up to 40 inches a day

Low temperatures

up to - 55 deg.C

No infrastructure

Big distances

1500 km +







## ATLANT vs. classic airship



- NO feathering
- smaller size
- higher speed
- NO mooring mast

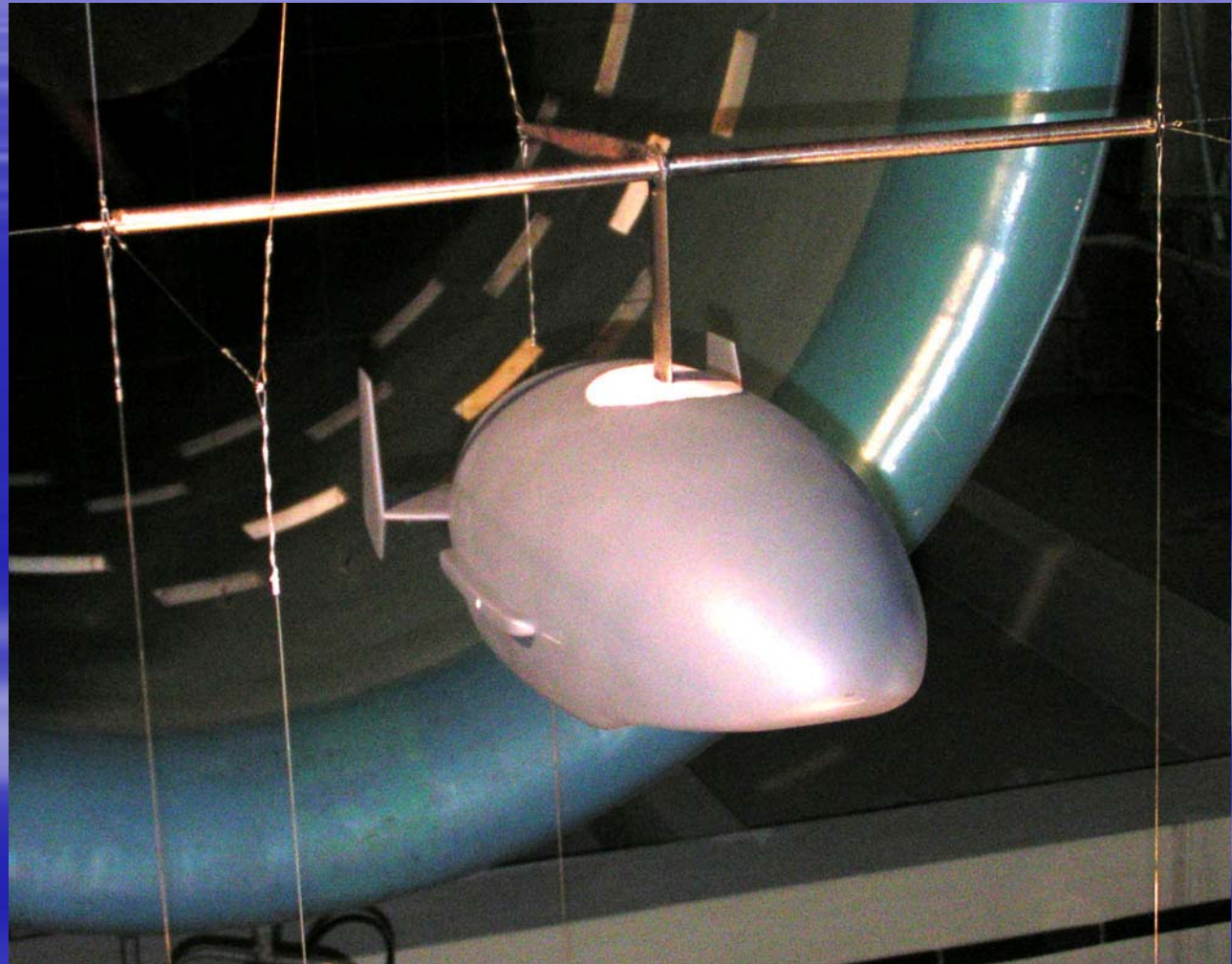
- NO hangar
- NO ground team
- NO ballast
- wider weather limits on ground and in flight



## ATLANT R&D

Special shape provide  
ATLANT additional lift,  
Stability and low loads  
both: in flight and on  
ground.

Rigid shell allow  
hangarless operation  
At strong side winds

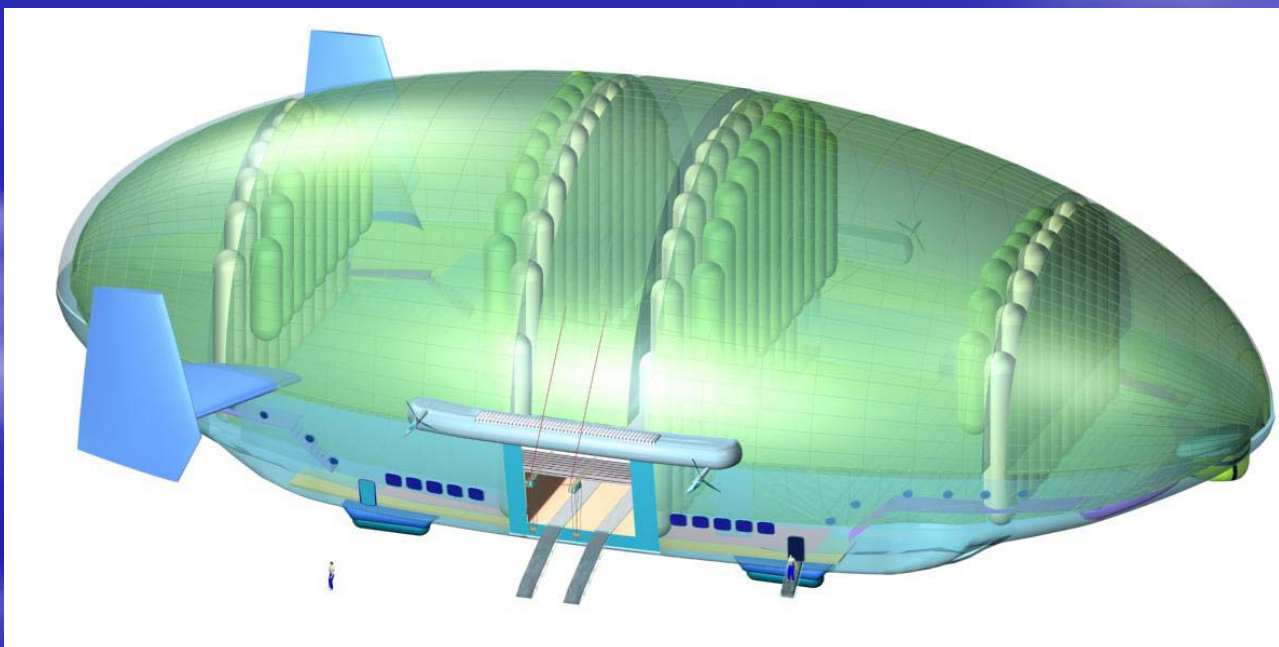






## ATLANT Active Ballasting System

Fuel compensation  
Partial load discharge compensation  
Heavy mooring  
Pitch control  
Anti-aging actions  
Minimizing baloney volume

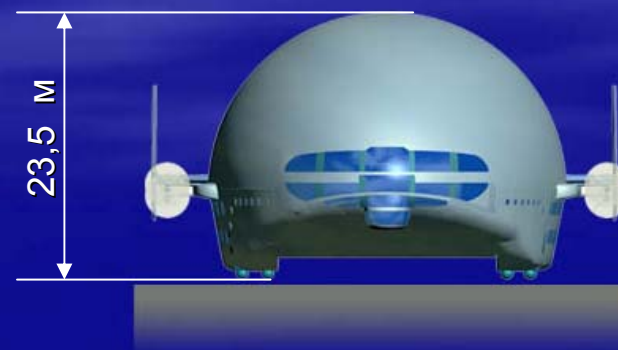
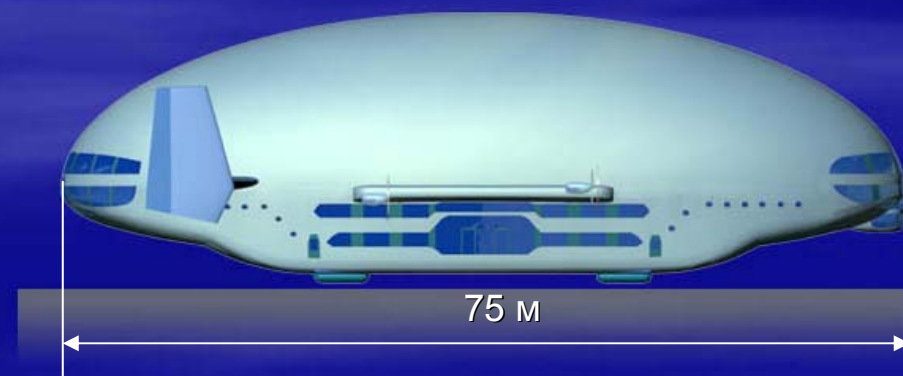
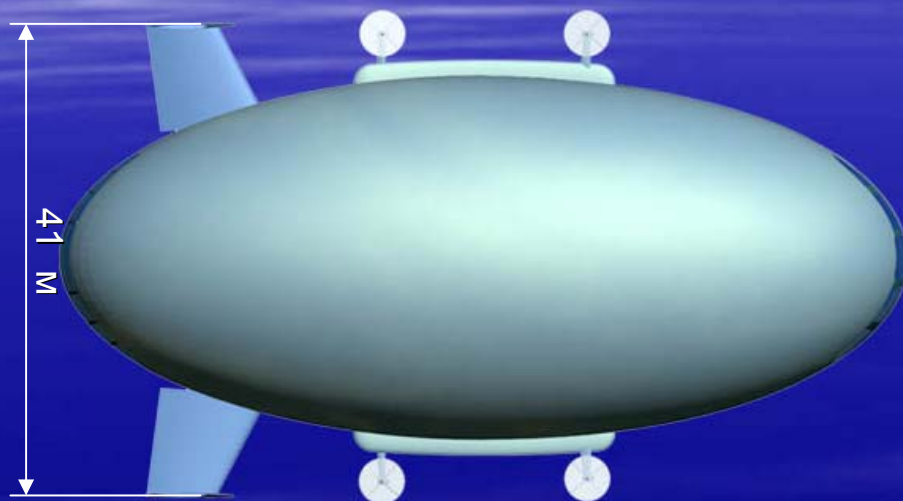




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## Technical data

Main geometry and engineering data	Version	
	cargo	passenger
Envelope volume, thousand cub. m	30	
Helium volume, thousand cub. m	20,4	
Airship takeoff weight, tons	32,7	26,7
Payload weight, tons	14	3
Active ballast systems, tons	9	9
Maximum flight altitude, m	3500	3500
Piston cruise engines power, h.p.	4 x 625	4 x 625
Cruise speed range, km/h	90 - 140	90 - 140
Flight range at cruise speed, km	2000	2000







**Augur - RosAeroSystems**

**Landing on water surface**



*Unique underwater  
balances can keep  
ATLANT safe on water  
at 1.5 meter waves*



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ATLANT opens new era in arctic exploration and development







Авгурь - РосАэроСистемы

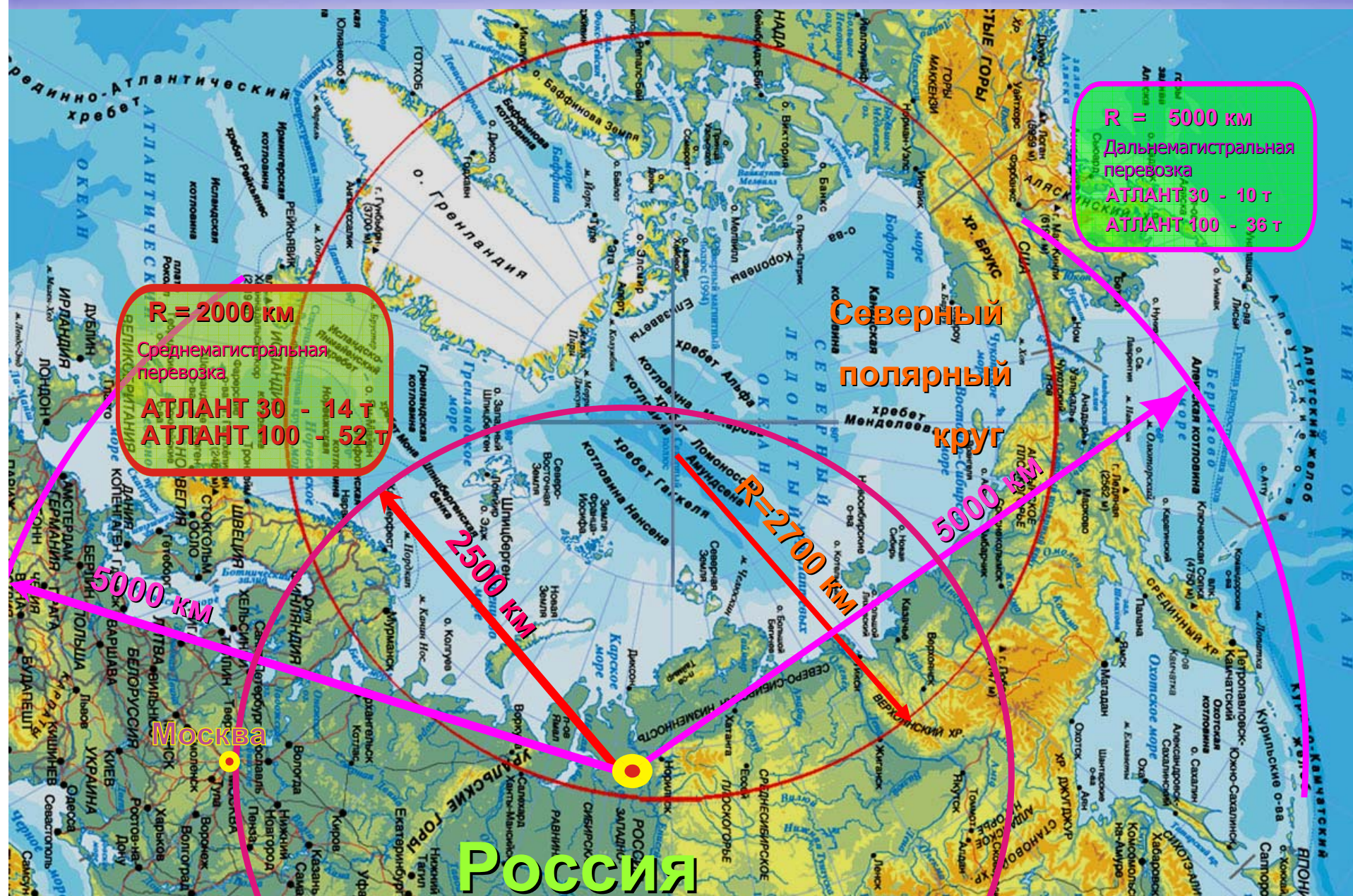
## ATLANT UNIQUE POSSIBILITY TO LAND ON ICE







# Авгурь - РосАэроСистемы







Авгурь - РосАэроСистемы

Transportation of up to 15 tone cargo, including oversized





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ATLANT in passenger (cruise) version

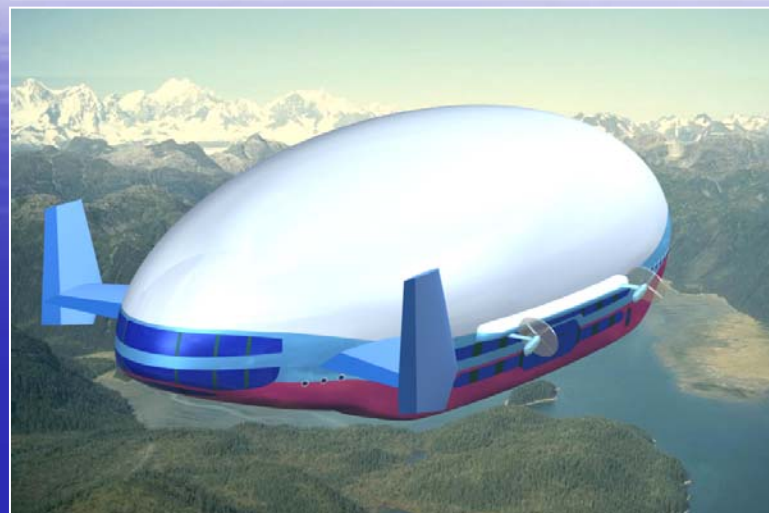






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*Vast inner space*



3 floor

Helideck

2 floor

1 floor

Aisles and stairs

Multifunctional hall

Exclusive luxury cabins

VIP cabins

Passenger cabins

saloon – bar

Observation deck





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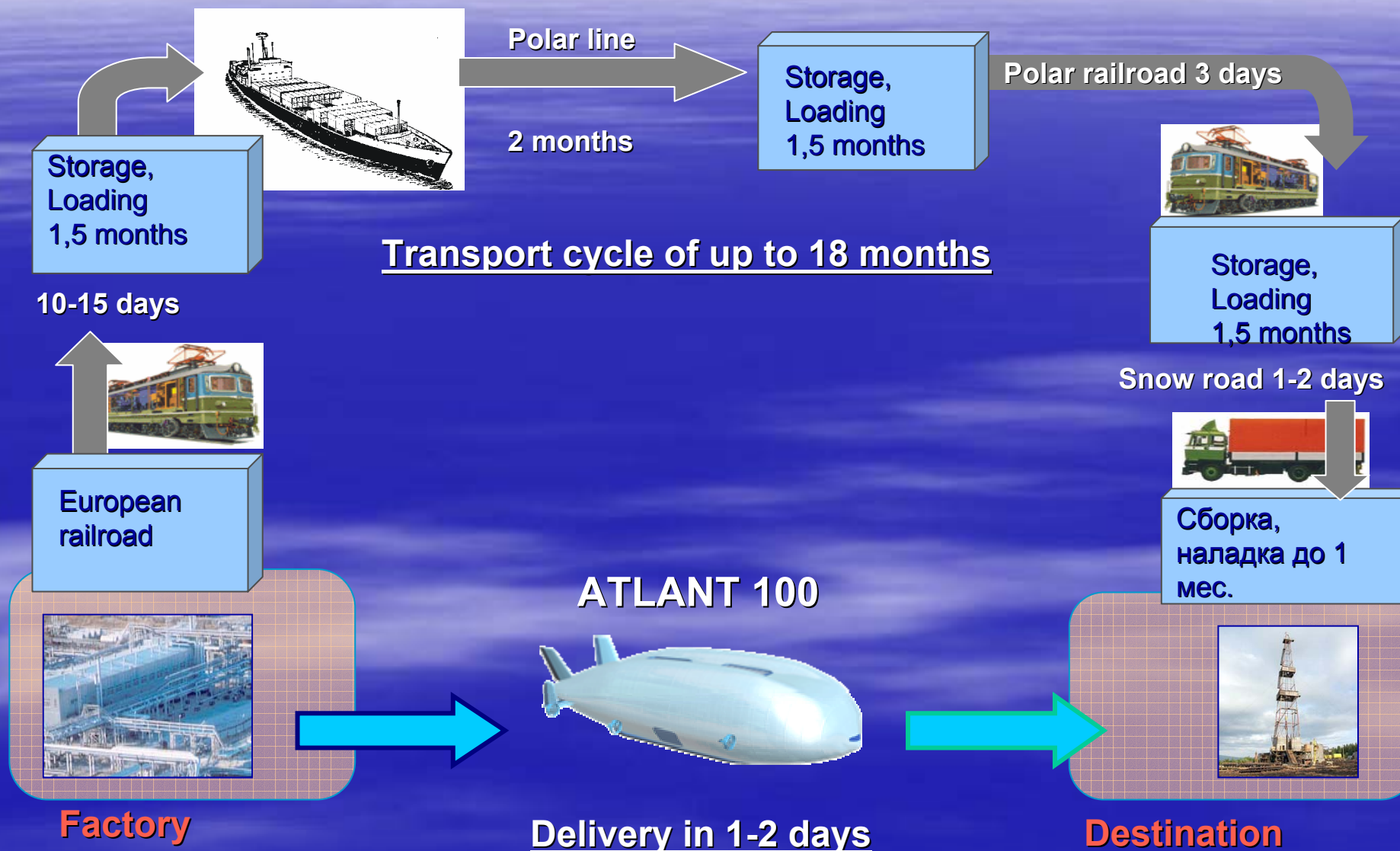
## **ATLANT family aircrafts economic indicators**

	<b>ATLANT – 30</b>		<b>ATLANT - 100</b>	
	cargo	passenger	cargo	passenger
1. Aircraft R&D cost, million EUR	23	29	51	79
2. Production aircraft cost, million EUR	17	22	40	56
3. Flight hour cost, EUR	1012	-	2400	-
4. 1 ton-kilometer cost, Euro cent	51,5	-	32,9	-
5. 1 passenger-kilometer cost, Euro cent	-	41,3	-	5,3





## ATLANT TIME EFFICIENCY





Авгурь - РосАэроСистемы

## ATLANT ECONOMIC EFFICIENCY



ATLANT 30 replaces 5 MI-8 helicopters and saves 8 million \$ a year due to different cost of flight hour







## Авгурь - РосАэроСистемы



ATLANT can speed up  
Eastern Siberia development  
In 1.5-2 times!!!





Авгурь - РосАэроСистемы

## STEP BY STEP DEVELOPMENT STRATEGY

RD 2

1995 г.



Au 11

2001 г.



Au 12

2003 г.



Au 30

2006 г.







Авгурь - РосАэроСистемы

All RosAeroSystems airships are thrust vectored





EXPECTED DEVELOPMENT TIME

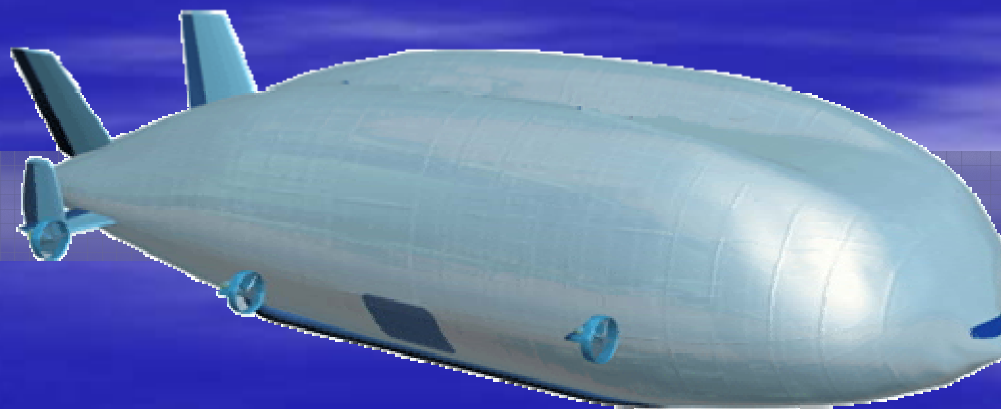
ATLANT 30

2014



ATLANT 100

2016







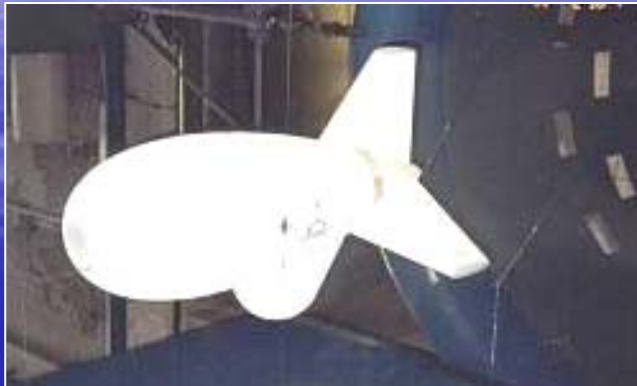
**Augur - RosAeroSystems**

**RosAeroSystems is the leading Russian manufacturer of LTA products.**





## Augur - RosAeroSystems



The major advantage we have over our competitors is that of access to the Russian aerospace activities with the attendant benefits including all of the technological possibilities and intellectual potential inherent in such an industry.





## Augur - RosAeroSystems

RosAeroSystems today is one of the few companies in the world and only company in Russia which has its own completed envelope production. This subdivision has a computerized cutting and welding HF equipment.





# Augur - RosAeroSystems

## Airship Au 12



In November 28, 2006 for the first time in the history of Russian aeronautics, manned airship has been Type certified.







# Augur - RosAeroSystems

Operation in Moscow





# Augur - RosAeroSystems

Advertising campaign in Thailand







**Augur - RosAeroSystems**

*Multipurpose airship Au 30 at -40 degree C*





# Augur - RosAeroSystems

## Technical data



Envelope volume:	5250,0 cu.m
including air ballonets, up to:	1266 cu.m
Length/diameter ratio:	4
Diameter:	13.5 m
Length:	54.0 m
Min. hangar size (inside)	66x35x20m
Construction height:	up to 18 m
Payload:	1400 kg
Cruising speed	40...80 km.p.h
Max. speed:	100 km.p.h
360 deg. rotation time at zero speed:	up to 180 sec.
Power :	2x170 H.p
Fuel tank:	650 liters
Flight endurance at cruising speed 60 kmp.h	24 hrs
Flight endurance at max. prolonged speed	7 hrs
Flight range at cruising speed 60 kmp.h:	1500 km
Change-of-location flight range:	3000 km
Max. altitude:	2500 m
Working altitude:	up to 1500 m
Crew/Ground crew:	2 pilots / 4-6
Passengers	up to 8
Max. wind speed at take off and landing	up to 12 m/s
Max. wind speed at fly	up to 20 m/s





## Augur - RosAeroSystems

*Advanced flight fly-by wire and navigation systems*

- IFR flights - Most contemporary autopilot system - Car fuel availability - Thrust vectoring





# Augur - RosAeroSystems

*Ergonomic cabine*



← The cockpit provides a wide field of vision. →





## Augur - RosAeroSystems

*Ground maintenance facilities*



Master truck can serve airship at any available field.



# Augur - RosAeroSystems

## Application



- Aerial photography and laser scanning
- Electrical lines monitoring
- Pipe lines diagnostic
- Mapping
- Ecological monitoring
- Gravity measurements
- Mine detection
- Long time patrolling
- Accident prevention
- Advertising
- Elite tourism





# Augur - RosAeroSystems

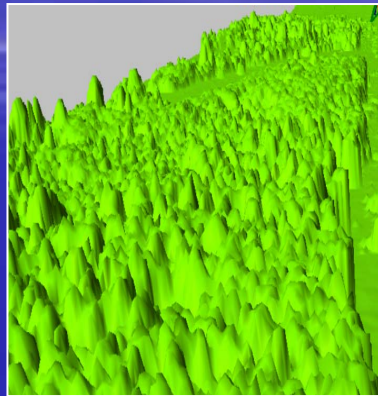
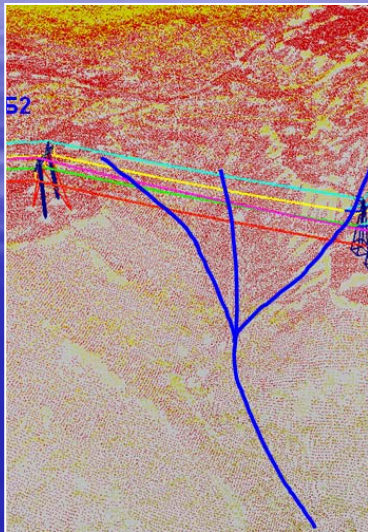
*Electrical lines monitoring*



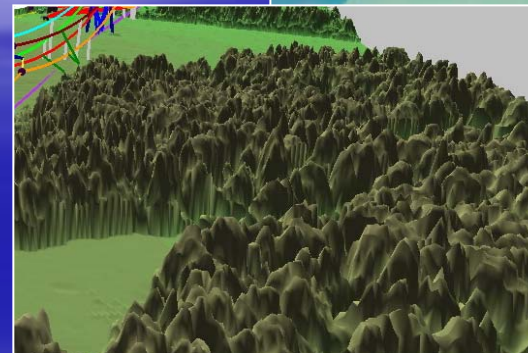
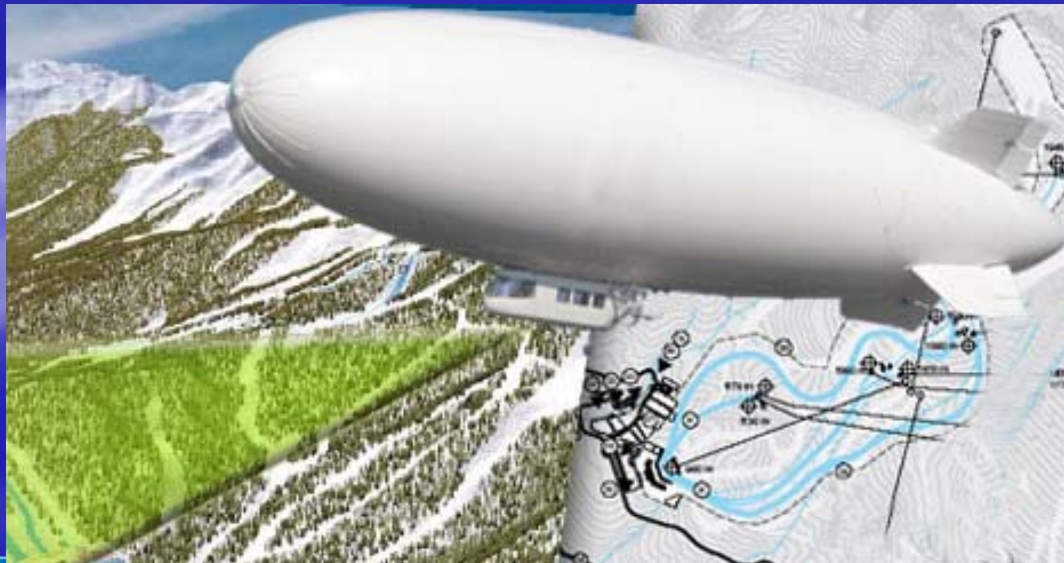


# Augur - RosAeroSystems

*Landscape mapping employing 3D laser scanning techniques*



- Relief grade estimation
- Water drain directional survey
- Flooding zone calculation
- Natural objects modeling and geometrics calculation







## Augur - RosAeroSystems

### *Ecological monitoring*

AU-30 airship is a perfect flying laboratory specified for ecological monitoring:

- Atmospheric air pollution
- Industrial pollutant emissions evaluation
- Ecological damage identification





## Augur - RosAeroSystems

*Universal carrier of special equipment*

Low speed gravity measurements performance with low vibration and acceleration provide great accuracy profit!



Airship mounted gravimetric equipment gives wide opportunities to prompt and precise minerals mapping and thereby reduce geological exploration well-boring expenses.

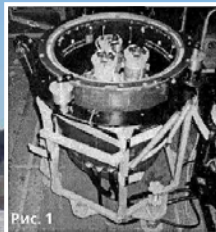


Рис. 1

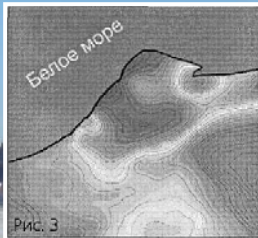


Рис. 3







# Augur - RosAeroSystems

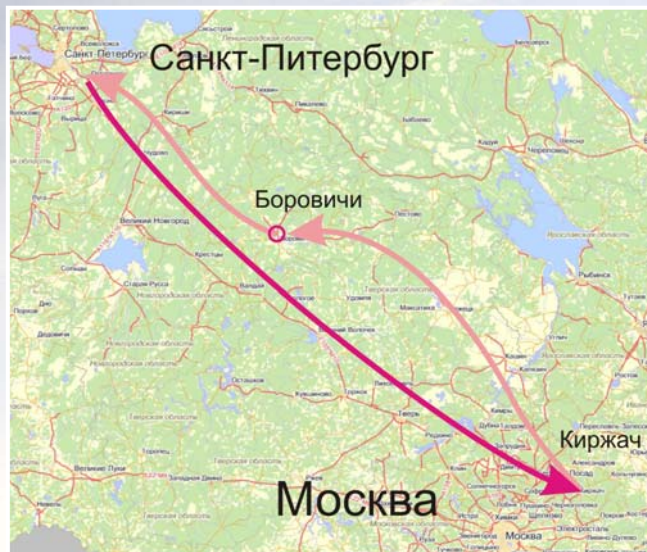
*Two years of successful operation*





# Augur - RosAeroSystems

*Record flight*



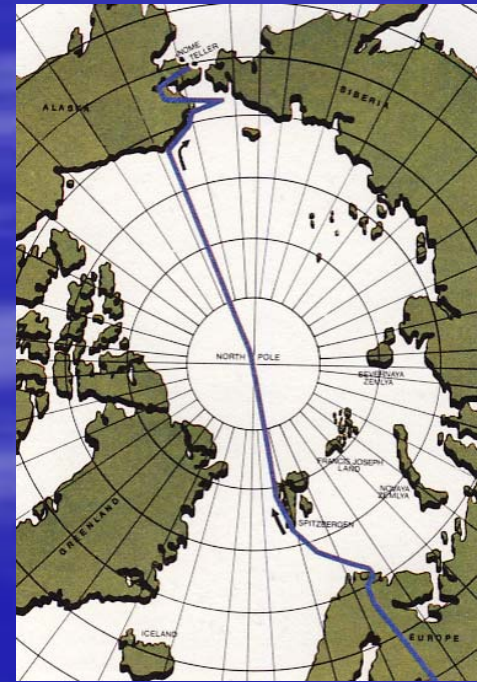
**World's Record in flight distance for a non-rigid airship has been beaten twice!**

**September 12 – 14th the largest Russian AU-30 airship has successfully performed the record flight across Kirzhach (Moscow Region)-Borovichi (Nizhny-Novgorod Region) – Manushkino (Saint-Petersburg) – Kirzhach covering about 1300 km in total.**





## Airship polar flights in 1926-1928

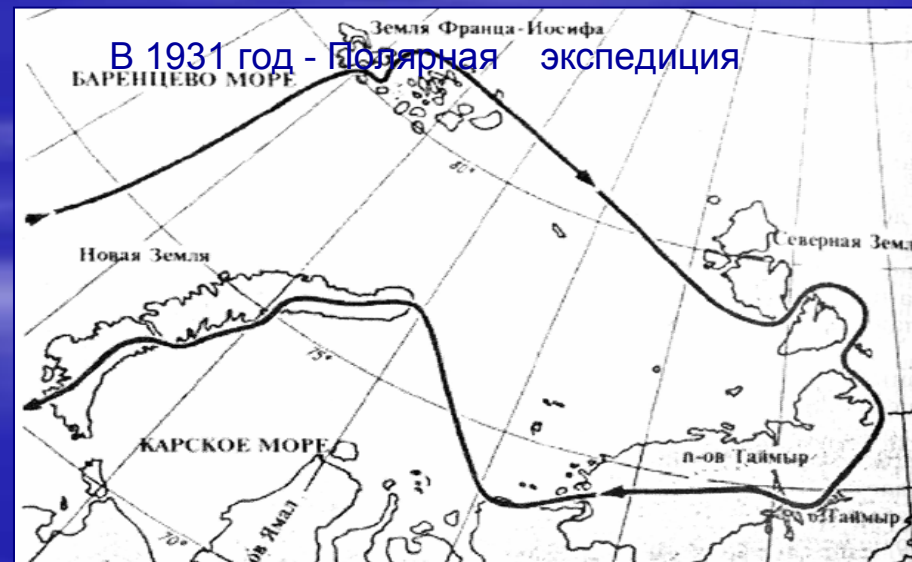


## Zeppelin polar mission in 1931



## LZ-127 " Graf Zeppelin " (1928).

Length	- 250 m
Height	- 30 m
Volume	- 105000 cub.m
Total power	- 3600 h.p.
Payload	- 23 tonnes
Cruising speed	- 125 km/h
Range	- 11250 km







# *RosAeroSystems*

*Multipurpose airship Au 30*





# RosAeroSystems

*Multipurpose airship Au 30*

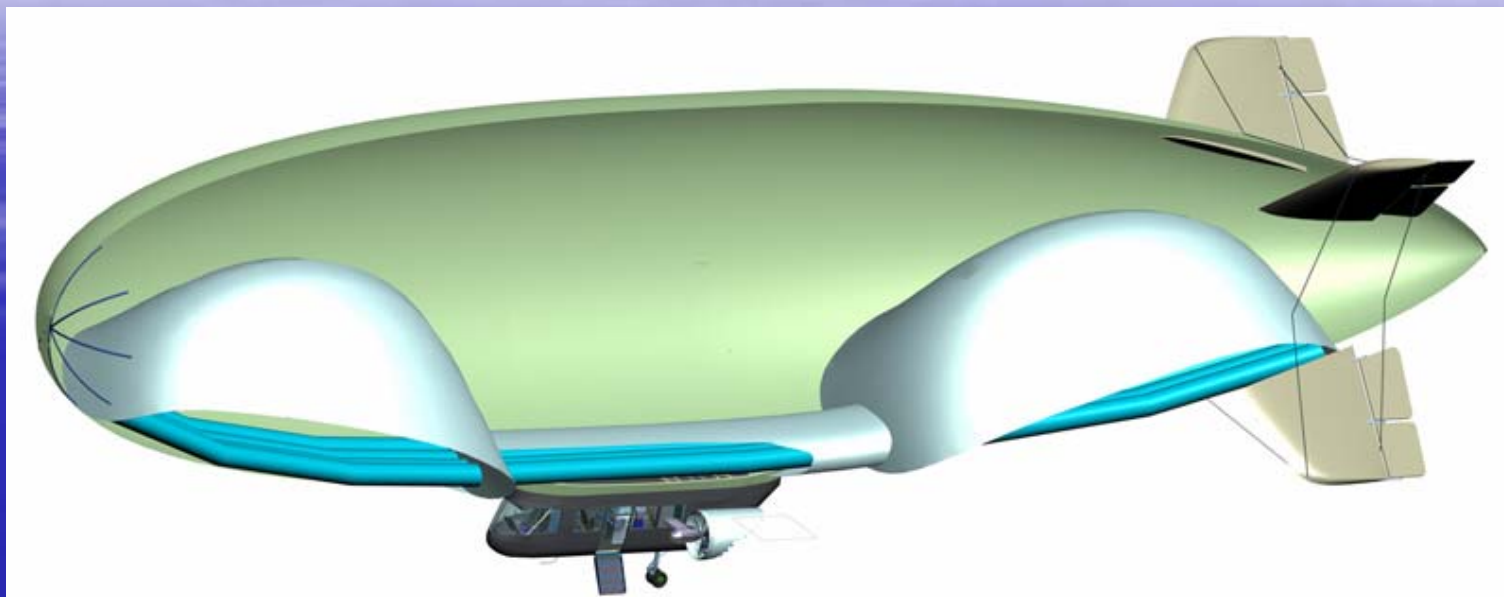




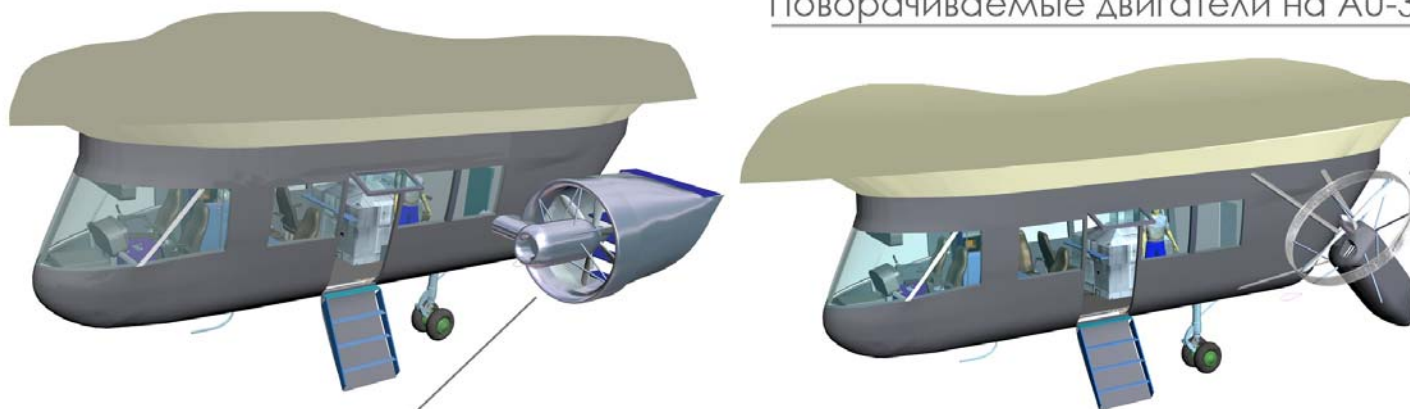


# RosAeroSystems

*Multipurpose airship Au 30*



Поворачиваемые двигатели на Ау-30



Система Управления Вектором Тяги (СУВТ) на АТЛАНТ - 6



# RosAeroSystems

*Multipurpose airship Au 30*



АТЛАНТ-6

Объем дирижабля 6000 м<sup>3</sup>



Au-30

Объем дирижабля 5250 м<sup>3</sup>





# RosAeroSystems

*Multipurpose airship Au 30*

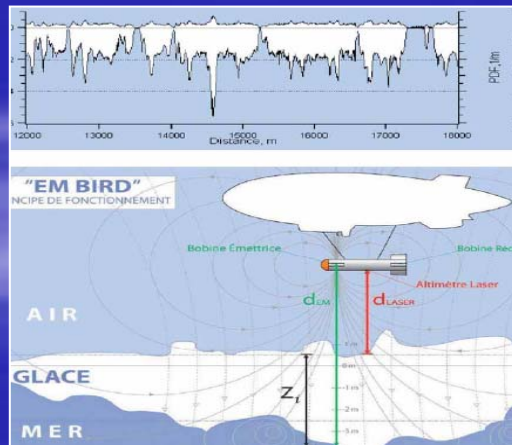
## AU-30 vs ATLANT-6

	Au-30	ATLANT - 6
Envelope volume, cub.m	5250	6000
Length, m	55	60
Payload, kg	1400	1700
Heaviness, kg	500	800
Fuel, kg	500	1150
Compensation of fuel consumption, kg	-	350
Max. speed, km/h	90	100
Cruise speed, km/h	60	80
Range at cruise speed, km	750	1500
Engines power, h.p.	2*160	2*230



# RosAeroSystems

Multipurpose airship Au 30



AU-30 technical characteristics allow outstanding scientific mission performing like Arctic pack ice thickness measurements.