Russian Market Update

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Overview of RF Aerospace Sector

• Much of the RF Aircraft Production has been Consolidated Under OAK Joint Aviation Company (JAC)
  – Goal is to achieve 10% World Civil Aviation Market Share

• Aero Engine Work has been consolidated into the Joint Engine Manufacturers Corporation (JEMC)
  – Goal is to be a Top 5 World Jet Engine Producer
  – Contains 80% of Russia’s assets in this industry
Between 2010 and 2015 the aircraft manufacturing sector in Russia and CIS countries is expected to recover to previous levels of titanium consumption.
New Regional Jet Programs

- **AN – 148** – Designed by Antonov
  - Produced in Russia and Ukraine
  - Geared to RF and CIS Market
  - Handles Less Developed Airports
  - 276 orders placed / Deliveries Underway

- **Sukhoi Superjet Family** –
  - Geared to Long Range RF and International Markets
  - Developed by Sukhoi / Alenia
  - Expected Cost Savings of 6% - 10% Compared To Competitive Aircraft
  - 122 orders placed / 70 per year Delivered After 2012 / First Delivery Late 2010

**AN – 148**
Seats up to 80
Range: 2,100 – 3,500 km

**Sukhoi Superjet 100**
Seats up to 98
Range: 4,500 km
New Single Aisle Program

MS 21: Designed by Irkut and Yakolev Design Bureau Manufacturing to be Performed by United Aircraft Group - Russia

- Will Replace Tu – 154 in RF Fleets, compete with 737 and A320 Families of Aircraft
- Planned Fuel Economy 25% Below Competition
- Planned Operating Costs 15% Below Competition
- Engine Choice Includes PW1400 GTF and Aviadvigatel PD-14A
- Certification is planned to both Russian and International Standards

Seats: 150 - 212
Range: 5,000 km
Planned First Flight: 2014
Planned Service Entry: 2016
RF and CIS Total Aerospace Market

Metric Tons


Engines
Airframe
Major Industrial Markets

Similar Demand Drivers to the Rest of the World

• Power Generation: Modernization of existing nuclear plants with new structural materials as well as completion of plants presently under construction and new projects.

• Chemical: Increasing demand for production of sulphate, chlorine and chlorine compounds, organic derivatives, fertilizers in line with economic growth.

• Non-Ferrous Metallurgy: Increased demand for Cu, Co and Ni metals which requires titanium for processing.

• Shipbuilding – used primarily in military applications

• Emerging: New oil and gas platforms on the Caspian, Barents and Okhotsk sea continental shelves will require significant volumes of titanium in various applications.
Industrial Market Outlook

![Graph showing industrial market outlook from 2005 to 2015 with different categories: Emerging market, Equipment, Non-Ferrous Metallurgy, Marine Application, Chemical Engineering, Power Generation.](image-url)
Total Market Outlook

- Industrial
- Aerospace