Iridium NEXT Generation Satellite System and Application to CNS

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Material in this presentation has been approved for public release
Agenda

- Overview of Iridium
- Iridium Aviation
- New Iridium services
- RTCA Efforts
- Iridium NEXT (Next Generation Satellites)
Iridium Today - Global LEO Network Providing a Unique Capability

Global communications on the move – people, vehicles, aircraft, assets

- 66 satellite global constellation
- A single subscriber device works worldwide
- Ubiquitous coverage
  - Over all oceans
  - Polar routes
  - Any terrain with clear sky view
  - Where terrestrial infrastructure is unavailable or undesirable
  - Satellite-to-satellite links securely route voice or data around the earth to gateway or Iridium mobile user
- Low time latency worldwide

Strong financial performance since restart in 2000

- Dec 2006 cumulative subscribers ~175,000
- 2006 revenue - US$212M
- 2006 EBITDA – US$53.9M
Significant Growth of Aviation Subscribers

Note: Figures are for 9522A LBT (L-band transceivers) and do not include 9505 or 9505A handsets, or 9601 modems.
There are a number of avionics and antenna manufacturers of Iridium avionics equipment

- All avionics are based upon Iridium developed and manufactured L Band Transceiver (LBT) and L Band Transceiver Data Modem (9601)
- Avionics range from single channel voice to multi-channel voice and data units
- Integrated ACARS units are available (ARINC integration)
- Omni-directional, low drag, low cost, top mounted antenna
- Low weight, low cost, truly global communications equipment
ICAO, AEEC and RTCA Efforts

- Approval of Safety Services for Air Traffic Control Communications
  - FAA-sponsored International Civil Aviation Organization (ICAO) working group
  - FAA and International participation
  - Revisions of ICAO SATCOM Standards and Recommended Practices (SARPs) adopted by ICAO Council February 2007
  - Iridium Implementation and Technical Manual and Validation Report for AMS(R)S in final review/approval process
  - Aeronautical Communications Panel (ACP) approval of Manual and Report expected in May ’07

- Airline Electronic Engineering Committee (AEEC)
  - ARINC 761, 429, 619, and 620 revised to include Iridium provisions, 10/06 – General Session
  - ARINC 758 revision, in-work

- RTCA
  - Meeting held with FAA, Aircraft Certification Services and Flight Standards representatives to discuss next steps for approval for use of Iridium for aviation safety services
  - Determined the best approach to revise, as needed, RTCA documents related to the Next Generation Satellite Systems (DO-262 and DO-270)
Aviation Datalink via Iridium

Aircraft Avionics | Iridium Satellite | Safety Services Partner | Existing Aviation Terrestrial DLK SP | Flight Ops/ATC

Flight Crew Entry → Aircraft Terminal Equipment → Processor → LBT → SDU → Gateway → Ground Service Processor → Existing Aviation Terrestrial Network(s) → Flight Ops/ATC

ATC

Flight Ops
Netted Iridium

Provides a global *push-to-talk* netted voice and data capability that:

- Provides near- to mid-term implementation
- Makes effective use of existing commercial satellite infrastructure
- Provides a secure netted architecture which is **reliable** and will **scale** to support the demand for **tactical** PTT communications

**Phase I (Demonstrated)**
- Up to 250 nets w/in single satellite footprint
- Up to 500 users/net

**Phase II (In development)**
- Hundreds of nets worldwide
- Unlimited users/net
Iridium NEXT

- Iridium’s next-generation satellite constellation
  - Seamlessly replaces current constellation; ensures mission continuity
  - Backward compatible with present applications and equipment
  - Maintains attributes which make Iridium unique: global coverage, security, availability, LEO architecture
  - Provides new and enhanced capabilities -- speed, bandwidth, flexibility – and enables new generation of user equipment
  - Potential for new applications beyond mobile communications

- Provision for government and commercial partnerships which leverage NEXT’s unique architecture
**NEXT Communications Services**

<table>
<thead>
<tr>
<th>Core Voice and Data Services</th>
<th>High Speed Data Services</th>
<th>Private Network Gateways</th>
<th>Wide Area Broadcast Services</th>
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<tbody>
<tr>
<td>Flexible delivery of bandwidth</td>
<td>Up to 10 Mbps to a portable terminal</td>
<td>Dedicated gateway</td>
<td>Two broadcast channels</td>
</tr>
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<td>From existing 2.4 kbps to 1.5 Mbps</td>
<td>Up to 30 Mbps to a transportable terminal</td>
<td>Private Network on Iridium system</td>
<td>Dedicated continuous global broadcast channel</td>
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<td>Voice and data</td>
<td>Ka-Band service</td>
<td>Subscriber group “homed” to private Gateway</td>
<td>Demand assigned channels for location specific data broadcast</td>
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<tr>
<td>L-Band service</td>
<td></td>
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<td>Backward compatibility</td>
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**NEXT offers new high performance global services, enabling cost effective and flexible allocation of bandwidth to the user**
NEXT Partnership Opportunities for Space Applications

**Independent Nodes**
- Independent Satellites
- Imaging High Resolution
- Continuous Earth View
- Content

**Secondary Payloads**
- Imaging and Sensor Applications
- Climate Change, Science

**Operationally Responsive Bus**
- Access to large production line of SVs for other missions

**C3**
- Global Command, Control and Communications for Independent Satellites

**Unique Global Opportunity for Space Assets Leveraging NEXT Communications Backbone**
NEXT Deployment Schedule

- Schedule is driven by the commercial plans of ISLLC
- Customer requirements inputs needed by end of CY2007
- Interactive design phase with PDR in early 2010
- First launch in CY2013 on expected case timeline

Project timeline will be managed to ensure service continuity
Aviation Applications Enabled by NEXT

- Reliable, long-term ATC infrastructure for polar and ocean routes
- Netted capability enables efficient use of Iridium for ATC (potentially even as back-up for low density terrestrial areas)
- Higher bandwidth increases breadth of applications
- Broadcast capability will allow wide area weather data and alert updates
- And maybe?? ….Earth Observation will provide higher resolution weather data and forecasting
Iridium is a unique, time tested, operationally proven and secure interlinked LEO satellite system

Iridium is currently making new investments in infrastructure, services and devices that will maintain its leadership position

Aviation is an important market for Iridium service

Iridium is launching the next generation satellite replacement program that will extend the value of Iridium to new, more robust aviation services

Iridium – the Global MSS Leader