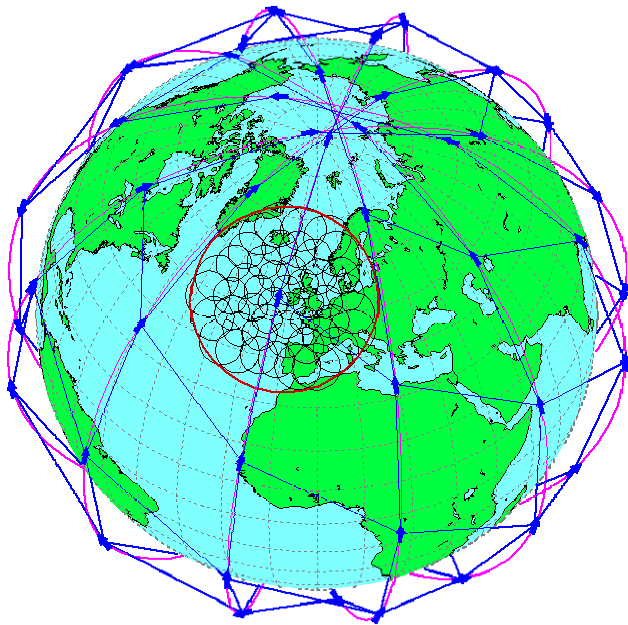


IRIDIUM

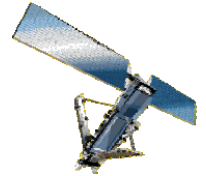
How Satellite-based Communications Can Be Used During Natural Disasters



*Presentation Before the
Industry Workshop on Satellites for
Disaster Communications
At the
United Nations-Vienna*

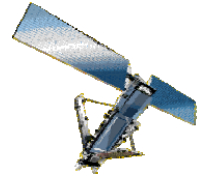
June 7, 2004

MSS Solutions for Natural Disasters

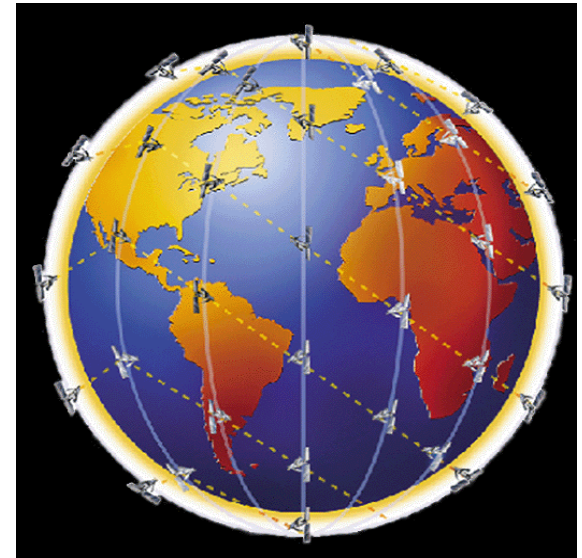


- **Communications are essential for emergency and disaster relief operations**
 - To report emergencies
 - To warn personnel of dangers
 - To keep families informed
 - To coordinate First Responder activities
- **MSS Satellites are uniquely able to provide services during natural disasters**
 - They provide ubiquitous coverage
 - They can provide services in the absence of terrestrial infrastructure
 - They complement existing terrestrial services

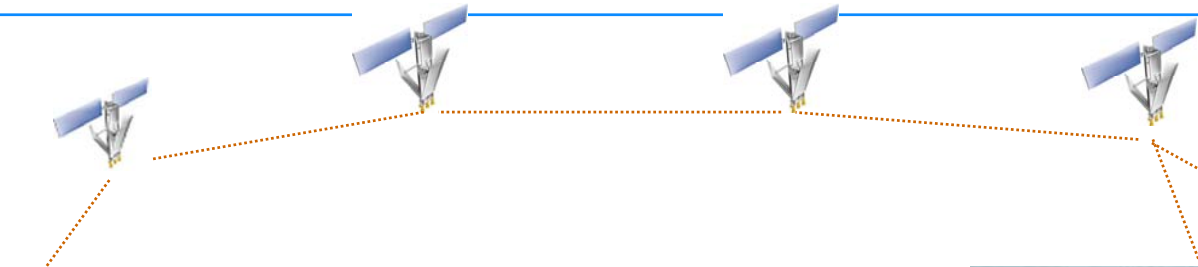
The Iridium System



- The only commercial provider of completely global voice, data, and paging services
- Constellation of 66 LEO mobile satellites in polar orbit
 - **Global pole to pole coverage**
- Intersatellite links
 - **System not susceptible to disaster affecting terrestrial infrastructure**
- Constellation fully operational with sufficient (13) in-orbit spares for high reliability
 - **Projected EOL 2014**



Iridium Calls



- **No terrestrial infrastructure dependency**
 - Not vulnerable to natural disaster
- **Secure communications capability, no interception**
- **Mobile to mobile, mobile to fixed & fixed to mobile**
- **Interoperable with other fixed and wireless systems**



Gateway

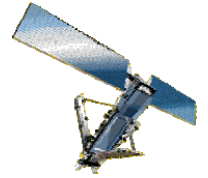


Headquarters

PSTN

International Carrier

Operational Usage

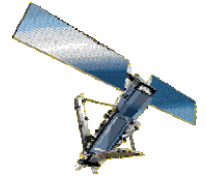


• Voice and Data services

- SBD and circuit-switched data
 - Fixed and mobile
- Use Iridium handset with laptop or PDA
 - Wired and wireless connectivity to handset
 - Internet access
- Integrate Iridium modem into multiple sensor platforms
 - Vehicle mounted
 - Sonobuoy
 - Demonstrated on UAV, P-3, etc.



Iridium Data Services



- Iridium can provide a range of reliable data services allowing customers to:

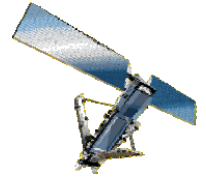
- Transfer files
- Check email
- Browse the web
- Access remote LANs

- **Connectivity from**

- 9500, 9505, and LBTs
 - Aviation & Maritime units
- Portable Docking Stations



Voice & Data Products/Services



Services

- Voice
- Direct-Dial Data
- Direct Internet
- Messaging

Products

9505 Handset



Eurocom Marine or Fixed Site Unit



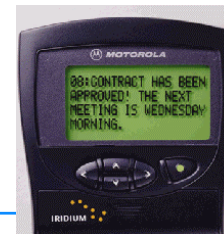
Multi-Channel Unit



Accessories



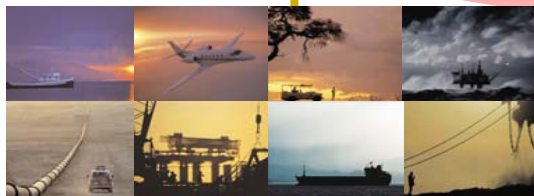
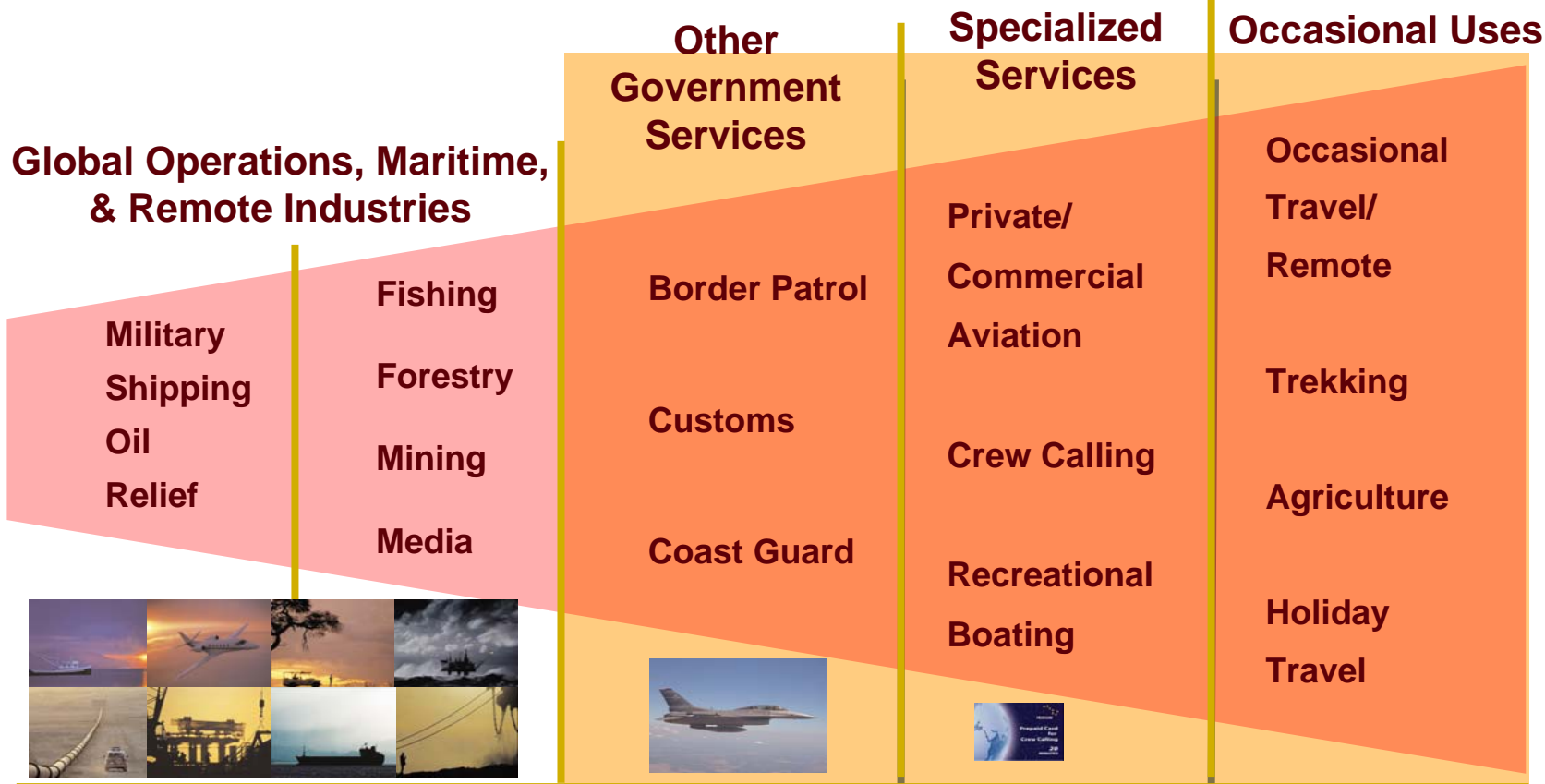
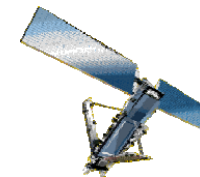
Pager



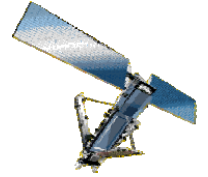
Blue Sky Network C-1000 Aviation Unit



Key Iridium Satellite Services



Disasters and Emergencies



When local/terrestrial infrastructure disappears or service is disrupted, it is the only way to contact others in an emergency

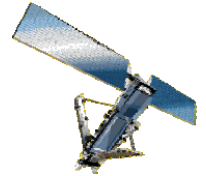
➤ From member of medical team traveling throughout Kenya:

“All members of the medical team used the phone, and it was especially helpful when we were at the equator, and more importantly, to call home when the Israeli Hotel was bombed in Mombasa, and normal cell phone links and phone lines from Kisumu to the U. S. were blocked.”

➤ From shipwrecked customer of Iridium service provider:

“Our ship purchased Iridium service prior to departure gulf coast USA. Our ship sank 75 miles SW Cuba and we were able to speak with our families and agent from the life raft. All is well. Everyone survived. Great Service.”

Medical Emergencies



- **Critical Care Emergencies**

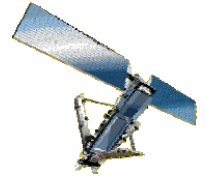
- **Sky Connect TRACKER, aircraft tracking services, supports EagleMed of Wichita, Kansas, renowned for its critical care transport service in the central U.S. From Sky Connect PR Newswire:**

“EagleMed missions are often performed in remote, rural areas of their territory, so the flight crews currently experience difficulties in maintaining contact with the dispatch centers. Because Sky Connect TRACKER operates everywhere on Earth using the Iridium satellite network, it will immediately provide new consistently reliable communications capabilities to EagleMed’s fleet now and as EagleMed expands service to other regions.”

- **Iridium Phones used by Medical Brigade providing free medical care and supplies to needy families in Tegucigalpa, Honduras when a critical member of the medical team developed severe neck pain. An Iridium satellite phone was used to call an orthopedic surgeon in Arlington, Virginia, get his expert advice about how to manage the injury and care for the injured team member. Medical Brigade offered:**

“Many thanks to Iridium for their support of our team as we provided critical medical care to over 4,000 needy Hondurans and distribute hundreds of thousands of dollars worth of medicines and medical supplies.”

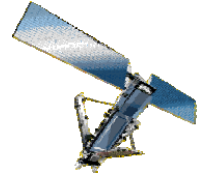
Medical Emergencies



- **Use in Rescues**

- Iridium played a critical role in the successful rescue of Ronald S. Shemenski from the South Pole. In 2001, Shemenski, the doctor who had been caring for the 50 researchers and others working at the Amudsen-Scott South Pole station, was diagnosed by satellite as having a potentially life-threatening case of pancreatitis. With the end of the flying season fast approaching and the onset of extreme weather threatening both flight operations and communications, the NSF turned to the USAF for assistance. There was concern of total radio blackouts on the polar cap, negating any communications equipment available. In preparation for blackouts, a NSF support contractor worked with Iridium to ensure reliable communications throughout this rescue mission.
- The phones were in place and ready to provide service at Rothera, Antarctica, the in-field base camp, South Pole station, Raytheon Polar's Denver corporate headquarters, the 24X7 command watch center, and at the McMurdo Station, the provider of air control and weather forecasting support. The Iridium service was used extensively in communications with the South Pole station, in the origin of the Antarctic flight leg, and with the command elements. The aircraft also used Iridium for private communications with its home office.

Disasters and Emergencies



When local/terrestrial infrastructure disappears or service is disrupted, it is the only way to contact others in an emergency

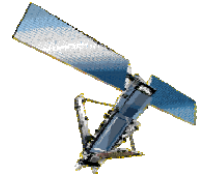
➤ From Iridium customer after 911:

“Shortly after the World Trade Towers were struck,...my concern was for my co-workers and friends. My cell phone was essentially useless, as was our landline home line. I walked out to a clear area on our street and turned on my Iridium handset....I called the main number and one of my co-workers answered the call, the call went through! It meant more than I can say to have that call go through at that moment.”

➤ **New York and East Coast Blackout in 2003 Resulted in Increased Iridium Usage**

Iridium satellite phone usage increased over 377% in the New York region when the terrestrial networks and cell phone networks failed due to the 2003 electrical power outage. Even the designated “Emergency Backup” system failed, while Iridium service continued without any disruption because of its independence of terrestrial infrastructure networks.

Applications for Natural Disasters



- **Fighting Wildland Fires**

- **Fire Department Experience:**

“In emergency situations, such as the forest fires in Arizona, constant communication is vital to our firefighting efforts. While reliable communication is key, we often find that landline and cellular coverage in forested regions is spotty or even non-existent.”

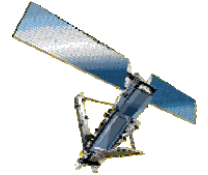
“The Iridium phones allowed our fire fighters to communicate in remote areas, without having to rely on any cellular or terrestrial infrastructure. The phones were an excellent safety tool since our crews were in places where, at times, cell phones could not get reception.”

- **Police Department Experience:**

“In June of 2002 the Rodeo-Chediski Fire and again in July of 2003 the Kinishba Fire threatened the town of Pinetop-Lakeside. As in both events the local telephone and cellular phone companies were "overloaded" with telephone users which hindered the police department's ability to effectively communicate with other public safety agencies. The Pinetop-Lakeside Police Department needed a reliable communication system that it could depend on. With assistance from Iridium Satellite LLC, satellite telephones were used by our Police Department's command staff to exchange vital information.”

“The satellite phones operated effectively and were a valuable communication resource for the police department.”

Public Safety Applications



- **Examples of Specific Iridium Public Safety Programs**

- Alaskan Beacon System 2004

- Alaska Search and Rescue

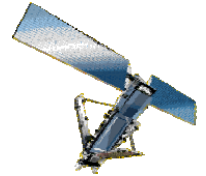
- Wildland Fire Suppression

- Iridium working with US Department of Agriculture, Forest Service, and Department of Interior to provide tracking capabilities for fleet of owned/leased aircraft and aircraft ground support equipment primarily used for mission support for Wildland Fire Suppression

- Support of State Governments Rural/Remote Communications Needs

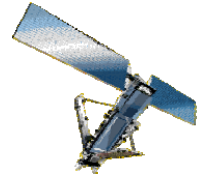
- Iridium voice and data services supplied to all Alaska state agencies

Government Uses



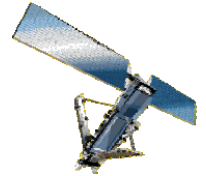
- The Iridium System is a commercial system that is available and uniquely able to provide services to meet the National Security, Homeland Security, and Public Safety Communications Needs of Most Countries
 - It provides ubiquitous coverage
 - It can provide services in the absence of terrestrial infrastructure
 - It is not vulnerable to natural disasters
 - It offers communications from virtually anywhere to anywhere
 - It offers voice, SMS, data, and paging services with versatile equipment that can be deployed rapidly
 - It complements existing terrestrial services

National Security Uses



- Support of Critical Military and Government Missions
 - Global secure capability
 - Small, lightweight, mobile handset highly effective for rapid coordination and control in dynamic and evolving theaters of operations
 - Covers all operating areas, including rural and open seas
 - Ground station on US soil and inter-satellite links provide instant infrastructure and increased security

Satellite-based Communications During Natural Disasters



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