



# Satellite Services Inmarsat

Communications for Disaster and Emergency  
Response

UIT – Forum Role of Telecommunications in  
Disaster Management

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# Agenda

- ➔ Introduction to Inmarsat
- ➔ Inmarsat Satellites
- ➔ Coverage/Services/Applications
- ➔ BGAN - terminals/services
- ➔ IsatPhone – terminals/service
- ➔ Requirements/Solutions/Applications for Emergency Communications
- ➔ Summary



  
**inmarsat**

# Inmarsat: safe, reliable, proven

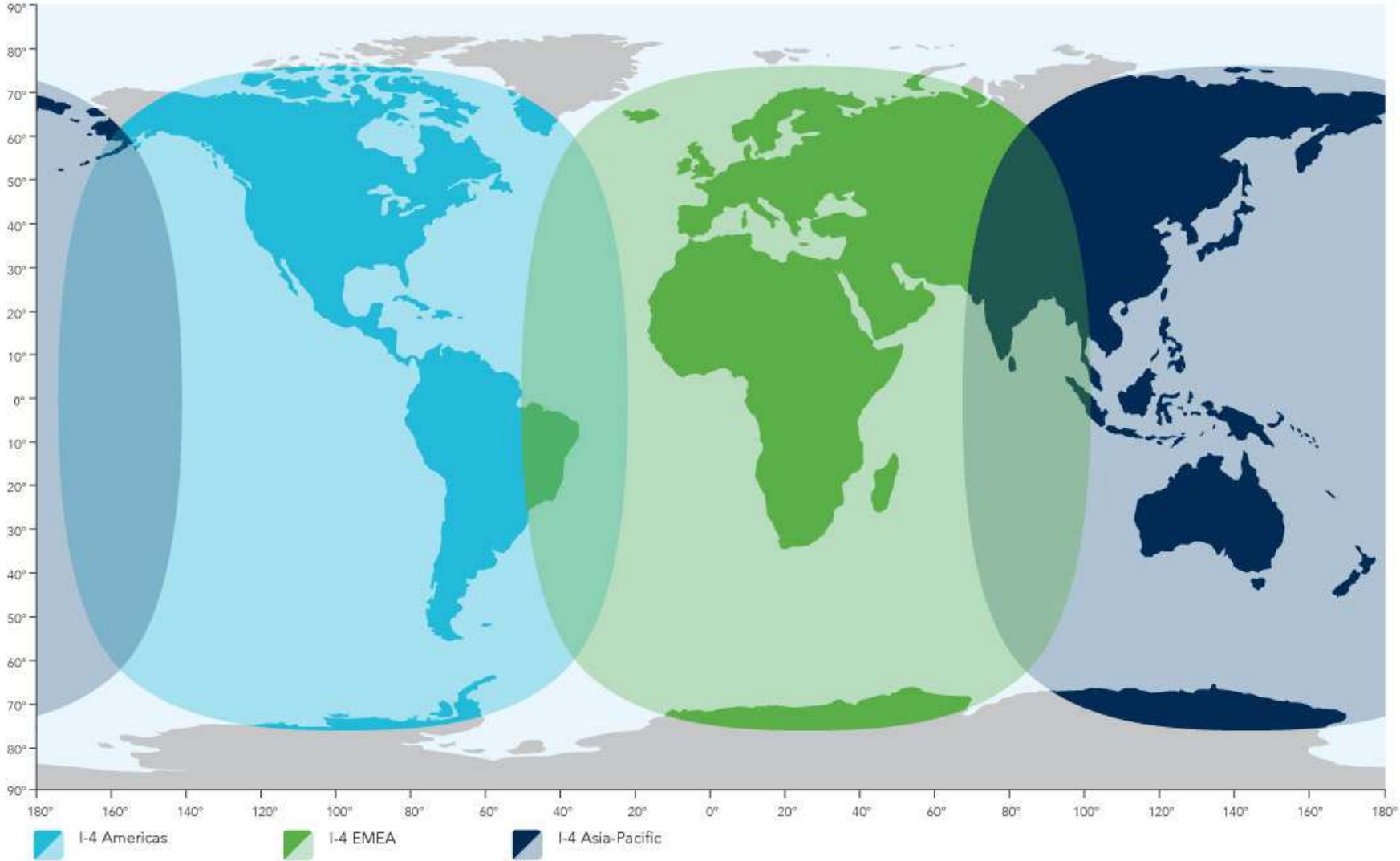
- ➔ For 30 years, the world's leading mobile satellite company
  - Inmarsat owns and operates fleet of 10 geostationary satellites
  - Voice, video and data services on land, at sea and in the air
  - Three 4th generation satellites operational
    - Commercial life 2020+
    - 193 beams per satellite
  - Satellite capacity can be redeployed real-time to service areas of high demand
- ➔ Trusted provider of worldwide voice and data satellite communications for government mobile users
  - Proven reliability for disaster response, coalition operations and VIP communications
  - 100 years life in orbit with no operational failure
  - 99.99% average recorded satellite and network availability

## I-4 capable, flexible and really big !

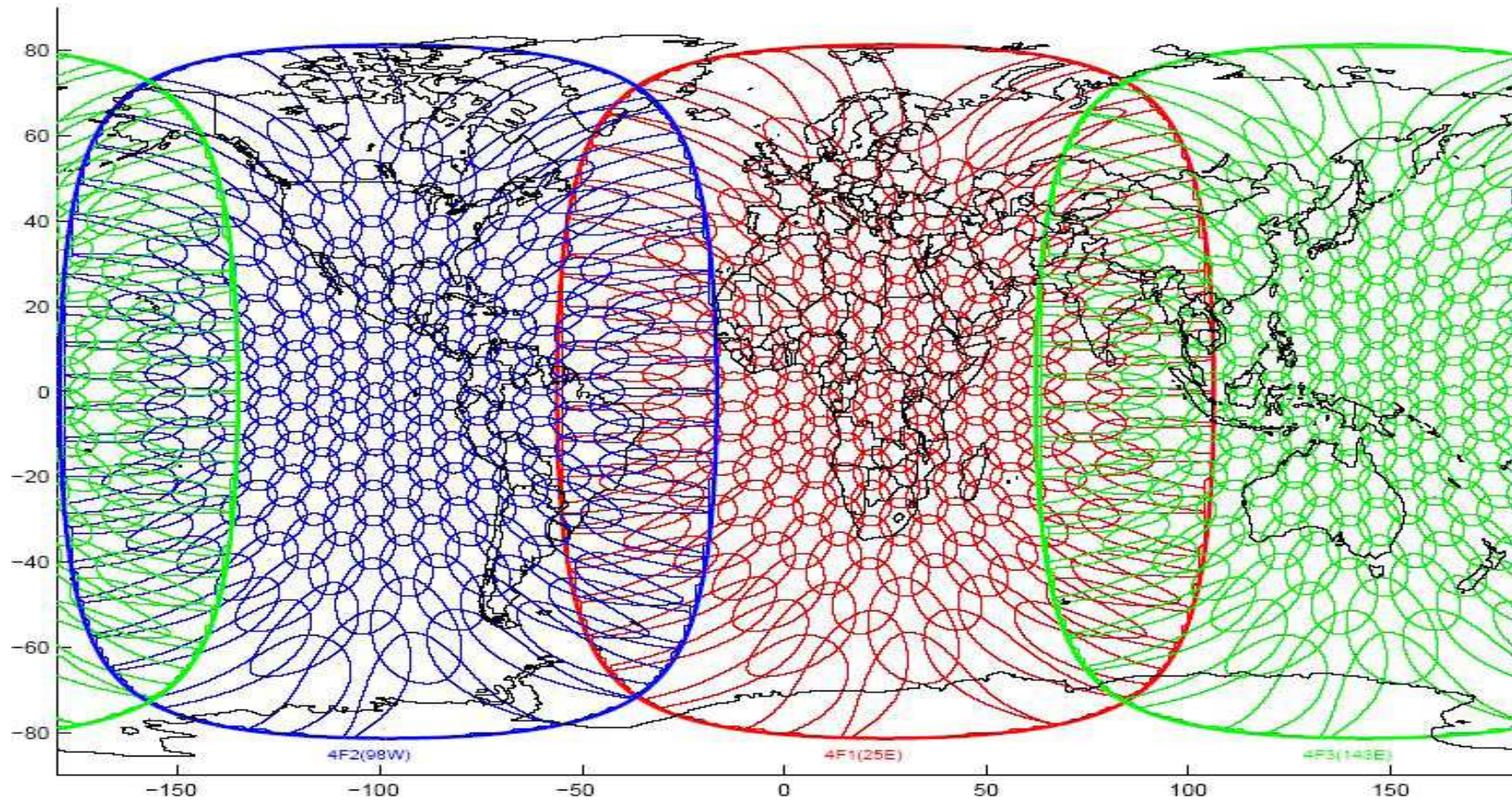


- ➔ Launch Mass - 6 tons
  - Among the largest commercial satellites launched
- ➔ Spacecraft Power - 13 kW
- ➔ Solar Array Span - 48 meters (~160 feet)
- ➔ Satellite Capabilities:
  - Effective Isotropic Radiated Power (EIRP) 60 times more capable than I-3 satellites
  - Channelization – 630 channels at 200 kHz
    - Each satellite ~ 432 Mbps
  - Antenna Beams
    - 193 Narrow spot beams for BGAN services
    - 1 Global beam
    - Quickly redeployed to provide extra capacity
- ➔ 3 Satellites -Worldwide capacity ~ 1.3 Gbps
- Support latest generation mobile broadband services

# Current Coverage I-4



# Inmarsat I-4 Satellites (Spot beams)



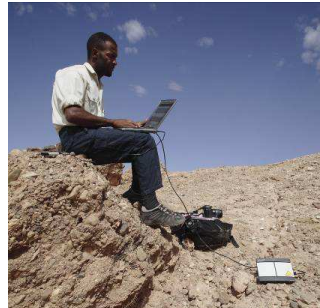
# Inmarsat Markets

## Maritime



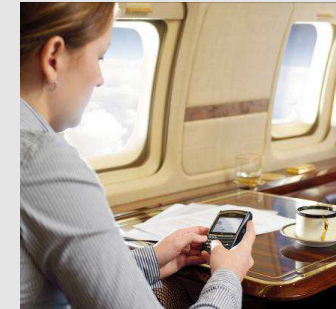
- ➔ 177,000 terminals,
- ➔ Only GMDSS provider
- ➔ Driver : vessels management, automation, well being of crew, new ships
- ➔ Main services: FleetBroadband, voice and data simultaneous up to 432kbps
- ➔ Small vessels need to expand their market

## Land mobile



- ➔ 80,000 terminals
- ➔ 60-65% government business
- ➔ Driver: government/military activities, relief agencies, media reports in situ
- ➔ Main services: BGAN, voice and data up to 492kbps
- ➔ New portable satellite phone – ISatPhone - service started June, 2010

## Aeronautical



- ➔ 11,700 terminals
- ➔ 65-70% government business
- ➔ Driver: government aircrafts, business jets
- ➔ Main service: SwiftBroadband, voice and data simultaneous
- ➔ AM(R)S

# Satellite Mobile Broadband Can Support Basic Applications:

## ➔ Public Safety and Disaster Response

- Emergency preparedness/disaster relief communications when terrestrial networks are unreliable or fail
- Restore and backhaul terrestrial communications (pico cell provides IP connectivity for LMR and mobile phones)
- Humanitarian aid/support (Earthquakes, Tsunamis, etc.)



## ➔ Telemedicine

- Ambulances: perform lifesaving procedures and diagnostic tests in the field or 'on the move'
- Mobile clinics: deliver primary and specialty care in rural communities
- Hospice and homecare: access to electronic medical records and support



## ➔ Remote Communications including emergencies

## ➔ Critical Infrastructure support

- Utilities (smart grid), oil, gas, mining applications





# Disasters Are Communications Events

## ➔ Emergency communications save lives and protect property:

- Restore operability
- Provide communications among non-interoperable groups
- Restore lifeline service
- Situational awareness
- Damage and needs assessment
- Continuity of Government
- Evacuation and mass care management



# Emergency Communications Requirements

- ➔ What First Responders need
  - Rapidly/easily deployable Voice, Video and Data
- ➔ Preferred characteristics of first responder communications
  - Independence from terrestrial networks
  - Reliability
  - Portability
  - Scalability
  - Ease of Use

# Emergency Preparedness/ Disasters/Emergency Plans

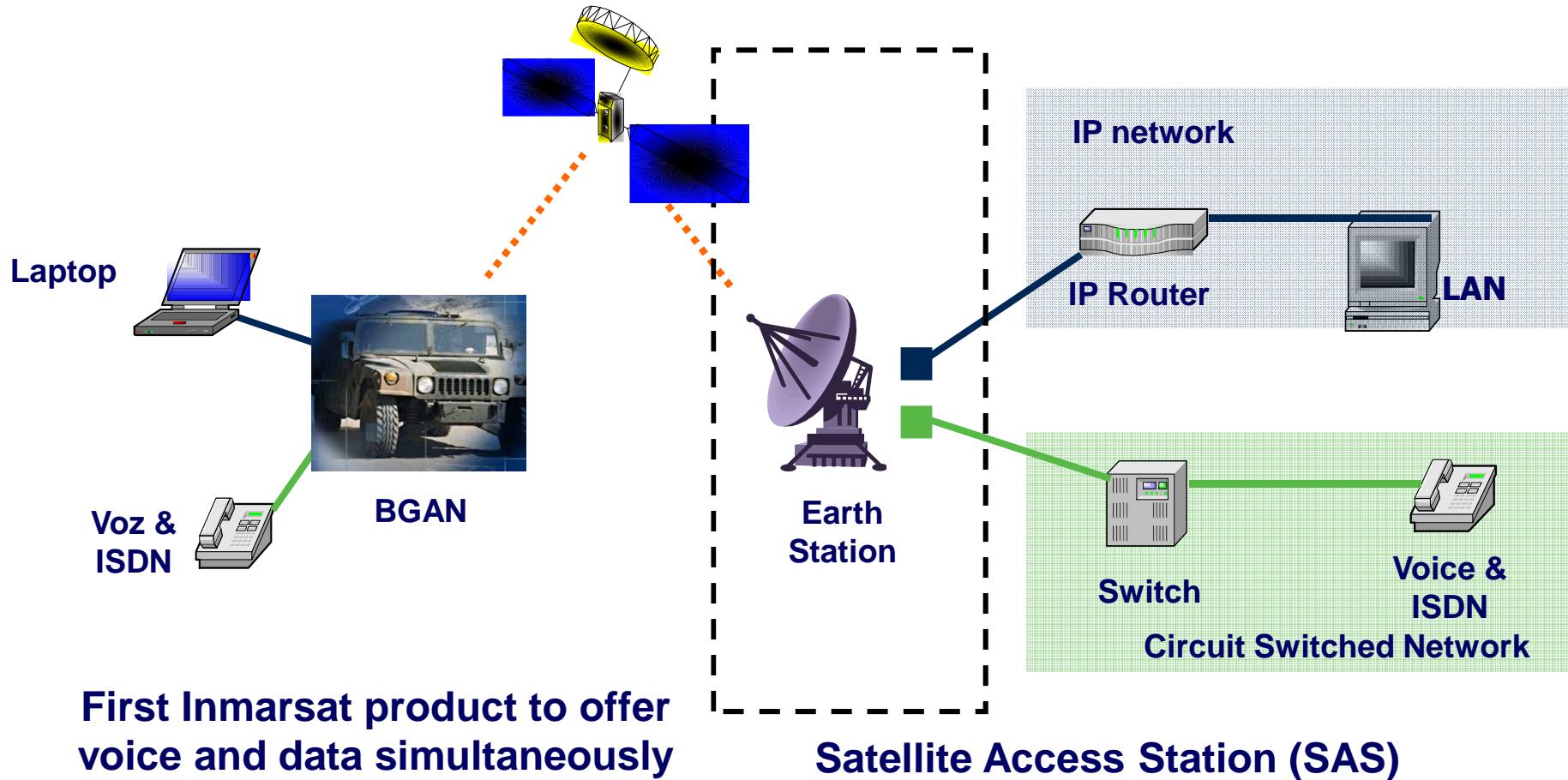
## ➔ ITU MOU

- Partnered with ITU Development Sector to provide BGAN terminals and service for use in disasters
- ITU keeps inventory of terminals
- ITU sends the equipment to the government of the country in emergency which will decide how to distribute it domestically

## ➔ National Telecommunications Emergency Plan: a necessity

- Communications for public safety, prevention and emergency attention are of vital importance
- Contributes to strengthen management risk and the population well being

# BGAN: One Device, Two Networks



First Inmarsat product to offer voice and data simultaneously

Satellite Access Station (SAS)

# BGAN Land-portable Terminals

- ➔ Smaller, Lighter, Faster, Easier, Cheaper and Mobile
- ➔ Common Man Machine Interface (MMI)
- ➔ Range of devices differing by:
  - Size and weight
  - Bandwidth
  - Functionality
  - Single/multi-user
  - Degree of ruggedness
- ➔ Working to satisfy the needs of all users
  - The terminal has to be easy enough to use that every user becomes a communicator

# BGAN Services

## 3G Internet Protocol Data

1. Standard IP service up to 492 kbps
  - Variable bit rate (dependent on traffic)
    - Web access, file transfer, email
    - Pay for data sent and received
  
2. b. Streaming IP service
  - Reserved capacity – guaranteed bit rate over the satellite
    - 32, 64, 128, 256, 384 kbps (send and receive)
    - Available “on demand”
    - Pay for duration of connection
    - Ideal for time critical data; streaming video

# BGAN Services (cont.)

## VOICE

- a. Direct dial voice service: landline quality voice, 4kbps + voice compression. To and from mobile calls
- b. One number accessible globally  
Inmarsat subscriber number range: +870 77 \*\*\*\*\*
- c. Supplementary services (3G network): Call forwarding, Call waiting, Call barring, Call hold/retrieve
- d. ISDN: Supported by select terminals only, 64 kbps service – identical to Inmarsat GAN service
- e. SMS: Send and receive text messages from a PC/PDA connected to a BGAN device or from the handset keypad, send/receive SMS to/from terrestrial mobile phones
- f. Voicemail: Shortcode to access

# Global Satellite Phone Service (GSPS)



ISATPhone Pro

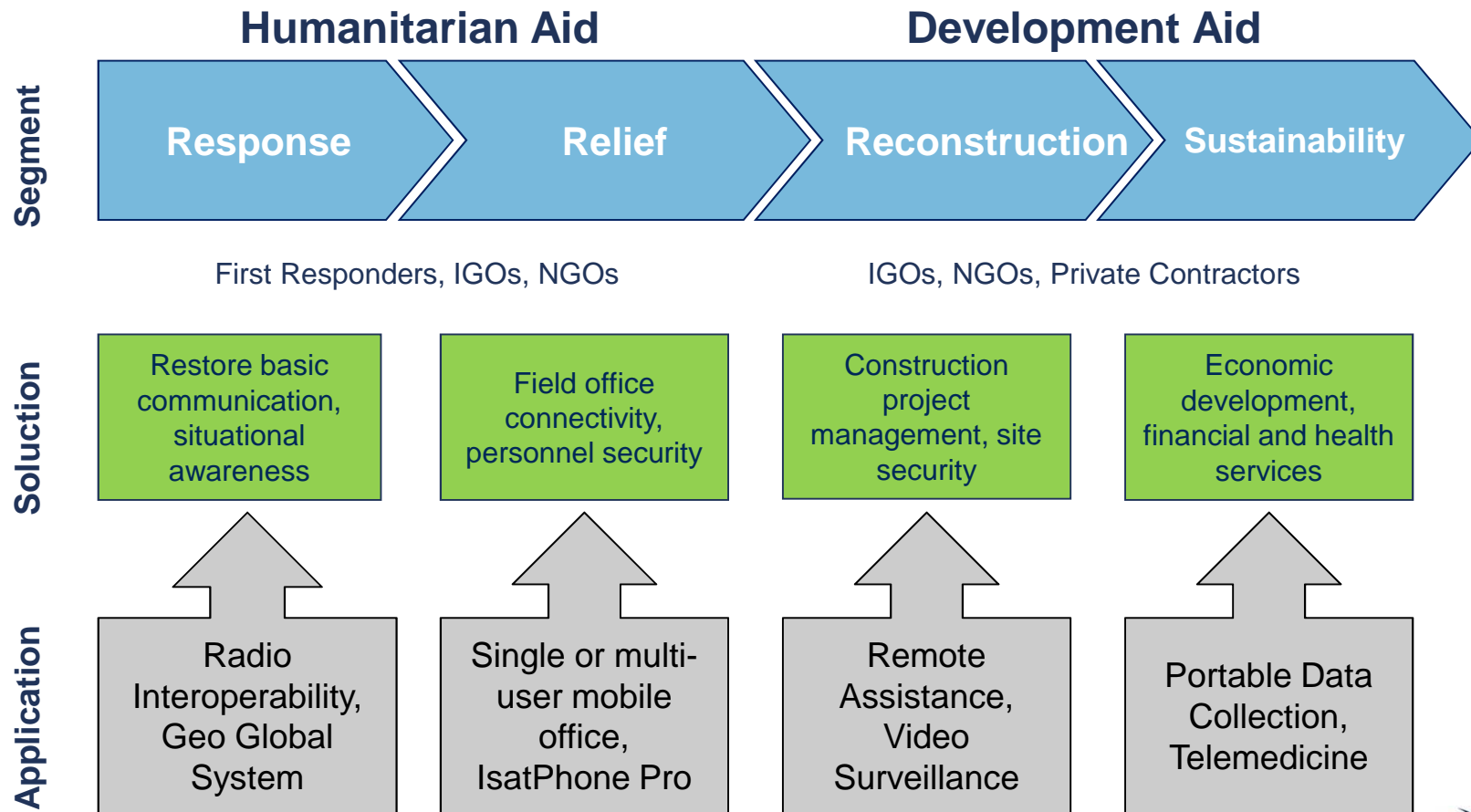
- Global coverage
- Robust handset : operates at  $-20^{\circ}$  C up to  $+55^{\circ}$  C; dust, splash and shock resistant; humidity tolerance from 0 to 95 per cent;
- Clear voice quality
- Reliable network connection
- Long battery life up to 8 hours
- Easy to use
- Highly competitive handset, accessories and airtime pricing



# GPS Services- IsatPhone

- ➔ Satellite telephony
- ➔ Voice mail
- ➔ Supplementary services: call holding, conferencing, call barring, speed dialing, call divert
- ➔ Text and mail messages
- ➔ GPS location data

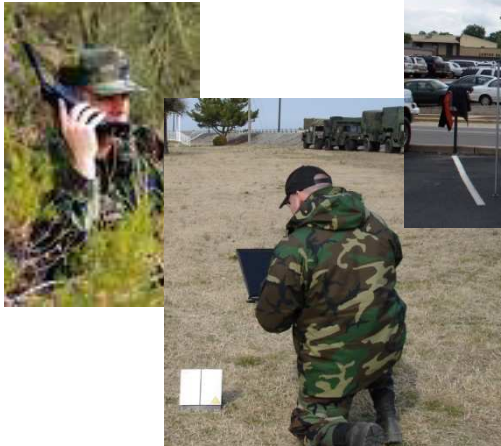
# End-user requirements Solutions and Applications



# Communications for disasters

First 4-24 Hours

Disaster inventory  
rescue  
Command and  
Control



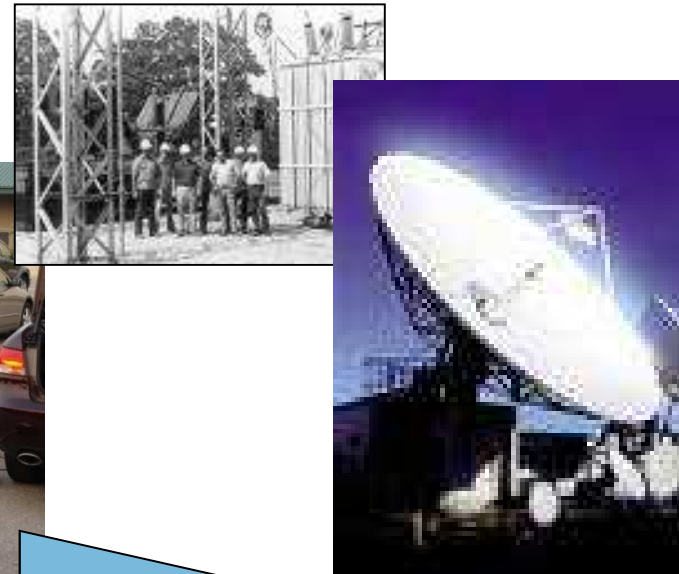
First 24-48 Hours

Humanitarian calling,  
Rescue, recovery, news



First 5-10 days

Restoration  
Recovery operations



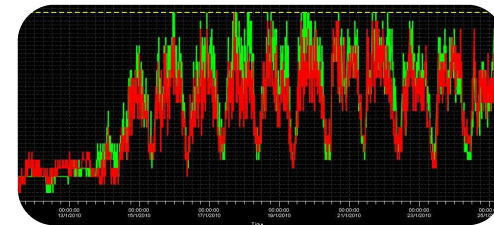
Increasing bandwidth requirements as response expands over time



# Earthquake in Haiti

## What worked

- ➔ Inmarsat had capacity to support surge in demand
- ➔ NOC monitoring of Haiti spot beam began immediately following earthquake
- ➔ Channel prepared to support customers' commercial and technical requirements
- ➔ Effective communication between Inmarsat, channel, and customers
- ➔ Improved coordination and efficient network sharing among NGOs and other end-user groups
- ➔ First-in responders and media were well trained on Inmarsat products and services
- ➔ Long history providing disaster communications



# Emergency Preparedness/Disaster Relief

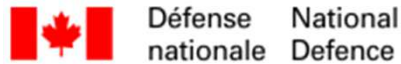


- ➔ China , Haïti, Chile, Japan, Pakistan (earthquakes)
  - ➔ El Salvador, Thailand (hurricanes, flooding)
  - ➔ Lybia (medical relief)
  - ➔ Kenya (famine)
- Provided BGAN service via TSF, other NGOs and USG and foreign militaries



- For aid, medical and logistics support and humanitarian calling





# Worldwide Users:



➔ International relief agencies (International Red Cross, Télécoms Sans Frontières, United Nations)



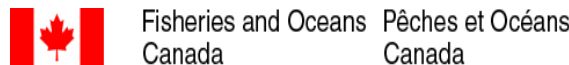
➔ Governments, including Canadian and U.S. Departments of Defence



➔ Media (CNN, CBC, BBC, NBC, Reuters)



➔ Critical Infrastructure (utilities, oil, gas, electricity, mining)



## Summary: Why are BGAN and IsatPhone Pro perfect for the Aid sector?

<b>Flexible</b>	<ul style="list-style-type: none"><li>➔ Ideal for rapid deployment</li><li>➔ Instant set-up on site as soon as a disaster happens</li></ul>
<b>Portable</b>	<ul style="list-style-type: none"><li>➔ Compact terminals ideal for anyone travelling alone and moving from site to site</li></ul>
<b>Easy to use</b>	<ul style="list-style-type: none"><li>➔ No specialist technical expertise required to set up and use</li></ul>
<b>Global coverage</b>	<ul style="list-style-type: none"><li>➔ Remote site connectivity</li><li>➔ Extended team coverage</li></ul>
<b>Simultaneous voice &amp; broadband data</b>	<ul style="list-style-type: none"><li>➔ Send status reports while joining conference calls</li><li>➔ Accessing GIS data for situational awareness</li></ul>
<b>Reliable</b>	<ul style="list-style-type: none"><li>➔ Maximum reliability for critical data</li><li>➔ Emergency response</li><li>➔ Disaster recovery</li></ul>

# New Generation- Inmarsat Global Xpress

- ➔ A new generation of mobile broadband at Ka-band
  - Worldwide coverage via three satellites
    - Capacity global system capacity → 20x Inmarsat-4 generation
    - Throughput – up to 50 Mbps fwd/5 Mbps rtn to a 60cm dish
  - Independent from L-band constellation, but integrated as a service
  
- ➔ L-band to remain a major component of Inmarsat services
  - Overlays Ka-band network to ensure high availability, continuity and safety services for SwiftBroadband and FleetBroadband
  
- ➔ Supports remote communications for health, education, public safety, disasters/emergencies
  
- ➔ Commercial service introduction: 4Q 2013, global fleet 4Q 2014



# Facilitation of Quick Telecommunications Response during Emergencies

- ➔ Reduction of regulatory barriers:
  - Exemption/temporary waiver of the application of regulations that might restrict the use of telecommunications equipment/radio frequencies during the use of such resources for disaster mitigation and relief.
  - Recognition of foreign type-approval of telecommunication equipment and/or operating licenses
- ➔ Exemption of the application of regulations that might restrict import/export of telecommunications equipments
- ➔ Facilitate the transit into, out of and through its territory and disaster area of personnel, equipment, materials and information involved in the use of telecommunication resources for disaster mitigation and relief.