

APSCC – Asia-Pacific Satellite Communications Council



MEASAT Satellite Systems Sdn. Bhd.

Disaster Recovery: The Role of Satellites

November 2008



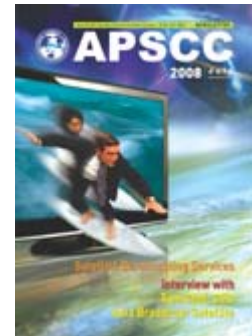
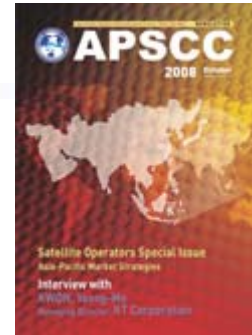
APSCC



APSCC Asia-Pacific Satellite Communications Council

Overview

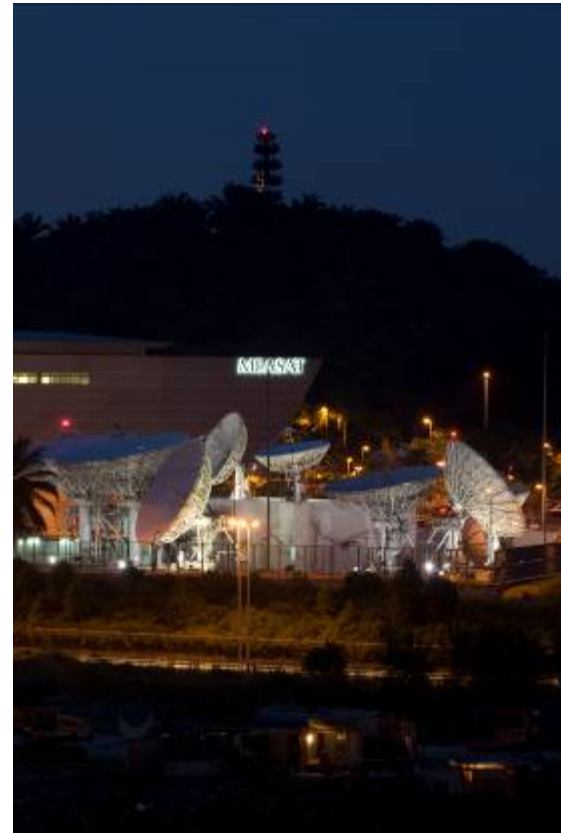
- October 1994, APSCC's Inauguration Council Meeting
- Dr. Nongluck Phinaitisart President Thaicom Public Company Limited is serving as the president of APSCC
- Non-profit, International association representing all sectors of satellite and space related industries within the Asia-Pacific region.
- APSCC membership open to any government body, public and private organizations, associations or corporations in satellite and space related industries.
- APSCC serves the satellite community by;
 - Collecting , distributing and producing information and literature
 - Organizing conferences, forums, summits, workshops
 - Providing expert technical assistance and consultation
 - Development of international standards
 - Encourage deregulation of satellite and space related industries



MEASAT is a Malaysian based Asia-Pacific satellite operator

Company Overview

- Regional satellite operator with prime operations center located just outside of Kuala Lumpur
- Three operational satellites providing satellite capacity across Asia-Pacific and African regions.
- Fourth satellite (MEASAT-3a) to be located in Group's key 91.5E 'hotslot' location, increasing capacity, providing in-orbit redundancy and extending organizations reach
- A strong and profitably customer base based around (i) Malaysian ICT (ii) Regional DTH and (iii) Regional Video Distribution services
- Access to 16 orbital slots around the globe for future growth
- Named Regional Satellite Operator of the Year, at the World Summit of Satellite Financing, Paris, Sept 08



The Role of Satellites in Disaster Recovery

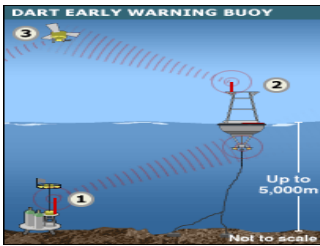
Following:

- Asian Tsunami
- Earthquake in Pakistan
- 9/11 Terrorist attacks
- Earthquake in Taiwan

Satellite Communications Stepped in to fill the Communications and Command gap created by the devastation of the terrestrial network

**WHEN TERRESTRIAL COMMUNICATIONS
INFRASTRUCTURE IS DAMAGED, DESTROYED
OR OVERLOADED,
SATELLITES = OPERABILITY**

Satellites have been used to support a variety of disaster recovery and emergency communication services



Tsunami Warning



Logistics



Video Conferenc



Coastal Patrols



Emergency Response



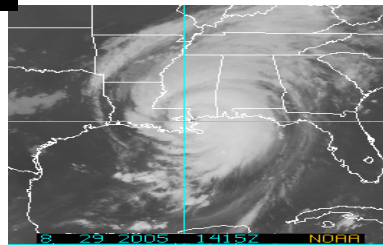
Telemedicine



Remote VSAT Stations



Search & Rescue



Imaging



GPS

Satellites provide the ideal communication platform for disaster recovery services

Wide coverage area

Able to reach urban and rural populations across archipelago's, entire country or region

Immediate Coverage

Provide immediate coverage on launch enabling rapid rollout of network while overcoming the "last mile" problem

Cost effective

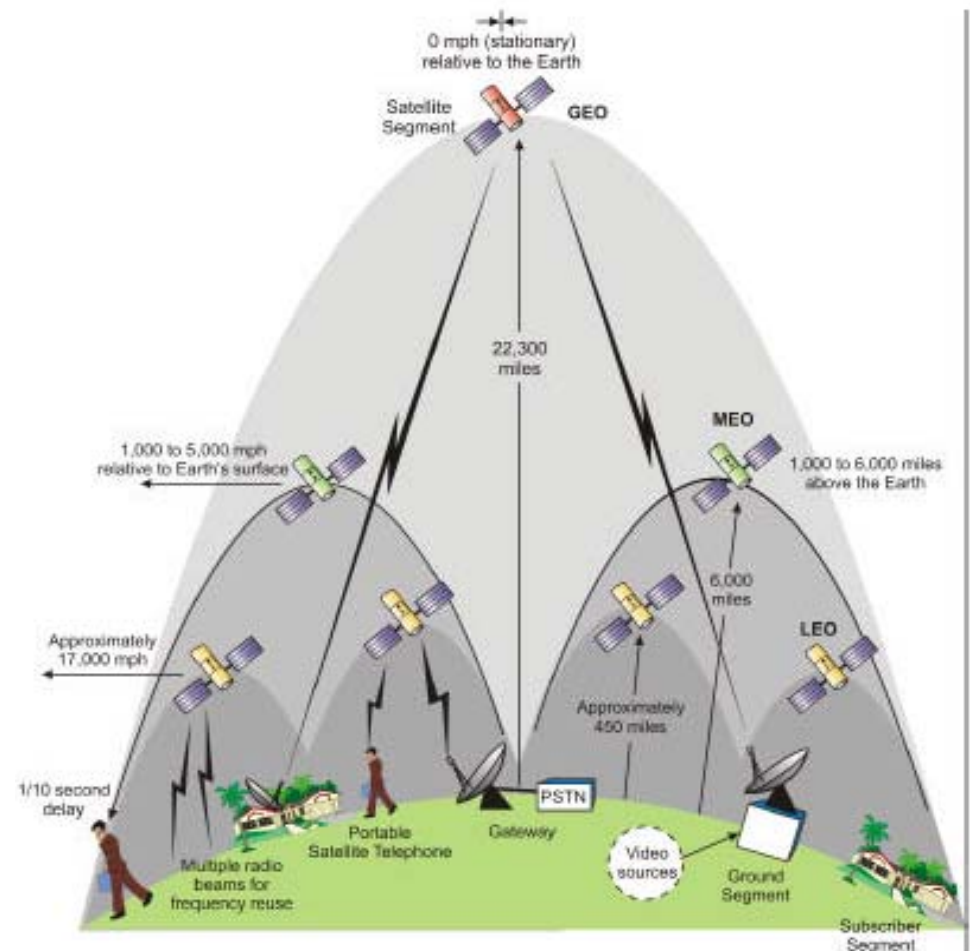
Provide a platform that facilitates communication in cost effective manner irrespective of distance

Reliable

High signal availability with less points of failure compared to terrestrial networks

High Capacity

Systems are able to provide capacity for hundred channels



Types of Satellite Orbits

	Geostationary	Medium-Earth Orbit	Low-Earth Orbit
Orbit (above Earth's surface)	<ul style="list-style-type: none"> • 36,000 km 	<ul style="list-style-type: none"> • 2000-15000 km (depending on system) 	<ul style="list-style-type: none"> • 780-1500 km (depending on system)
Satellites Needed for Global Coverage	<ul style="list-style-type: none"> • 3-4 	<ul style="list-style-type: none"> • 10-15 	<ul style="list-style-type: none"> • 40+
Service	<ul style="list-style-type: none"> • Voice • Video • Broadband Data 	<ul style="list-style-type: none"> • Voice • GPS • Low-speed data communication 	<ul style="list-style-type: none"> • Voice • Low-speed data communication
Space Segment Cost	<ul style="list-style-type: none"> • Medium 	<ul style="list-style-type: none"> • Low 	<ul style="list-style-type: none"> • High
Disaster Recovery Applications	<ul style="list-style-type: none"> • Seismic Sensing • Flood Sensing • Disaster Warning • Communication 	<ul style="list-style-type: none"> • Location coordinates • Communication 	<ul style="list-style-type: none"> • Geophysical and Atmospheric studies • Communication



Source: "Why Satellite Communications are an Essential Tool for Emergency Management and Disaster Recovery" – GVF and Futron Corp. & "Broadband Satellites"
<http://www.satelliteonthenet.co.uk/white/bband.html>



O3b Networks: New kids on the block? May change the way we think during disasters....



- **Company Background**
 - New satellite company funded by Google Inc, Liberty Global Inc, HSBC Principal Investments.
 - The aim of bridging digital divide by providing global internet backbone for telecoms and ISPs in emerging markets.
- **Satellite fleet**
 - Constellation of 16 MEO satellites operating in Ka-Band
 - Ultra Low-latency, Fibre speed satellite network
 - 8-12 steer-able antenna beams with 500km footprint coverage
 - Low cost space segment
 - Target service activation 2011
- **Disaster Recovery benefits**
 - Worldwide coverage within latitudes 43°N & 43°S
 - Flexible topologies can be implemented using the steer-able antennas
 - 500km steer-able spot beams easily encompasses any major city.
 - Instant availability of 1.2Gbps of throughput



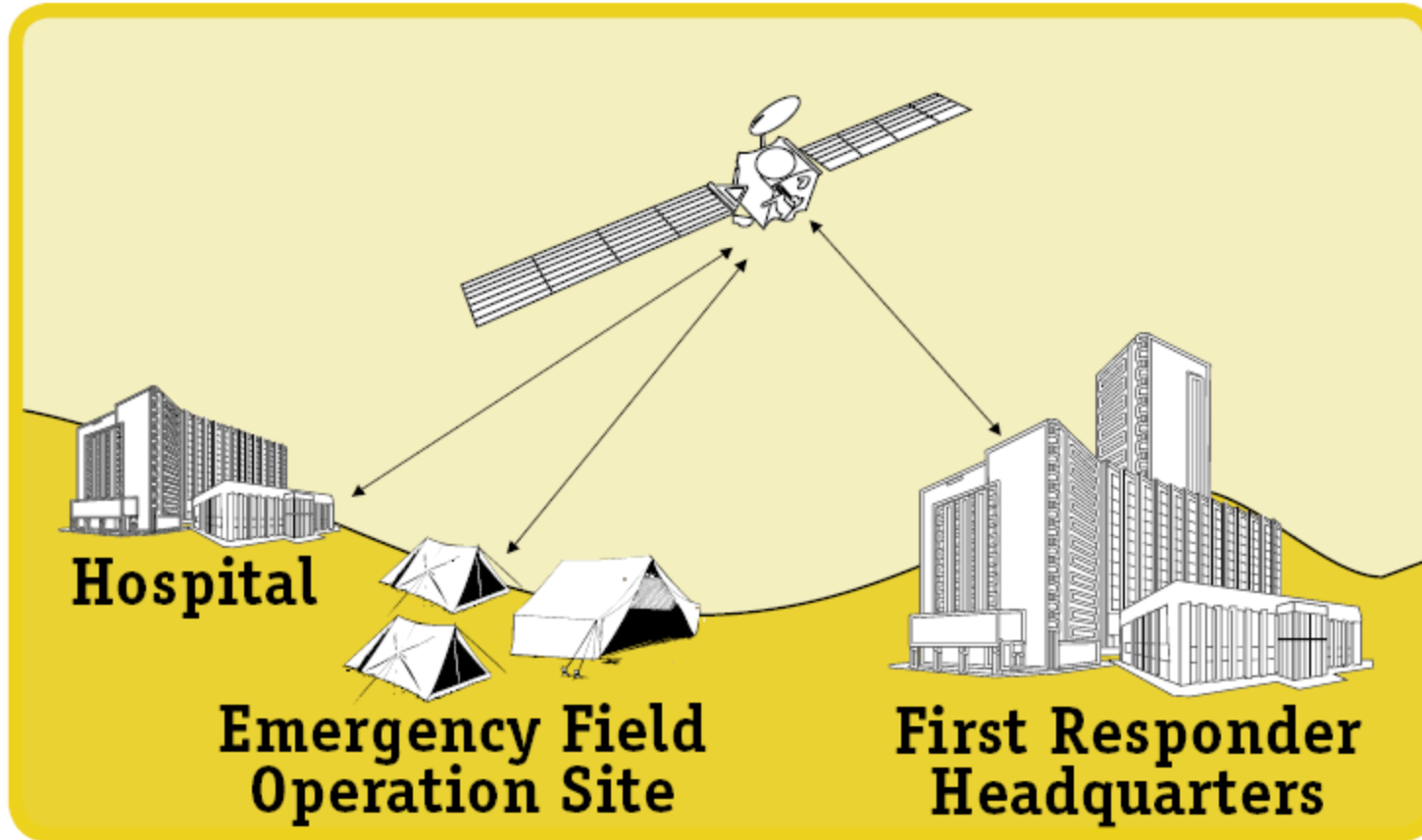
Source: "New communications system to enable low-latency trunking for emerging markets" http://www.o3bnetworks.com/press_o3blaunch.html



CAPABILITIES

Satellites = Ubiquity + Reliability + Operability

FIXED-TO-FIXED

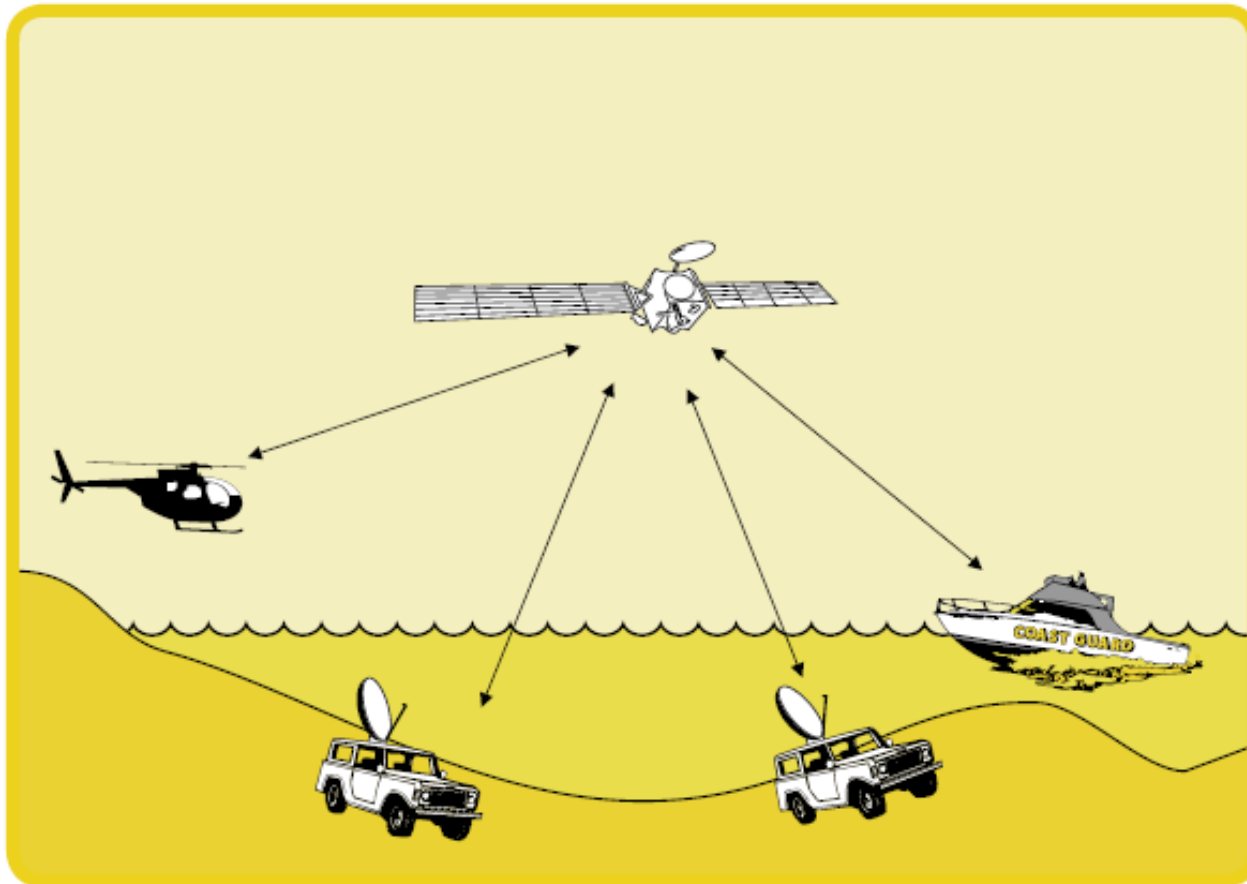


Source: *First Responders Guide to Satellite Communications*

CAPABILITIES

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MOBILE-TO-MOBILE

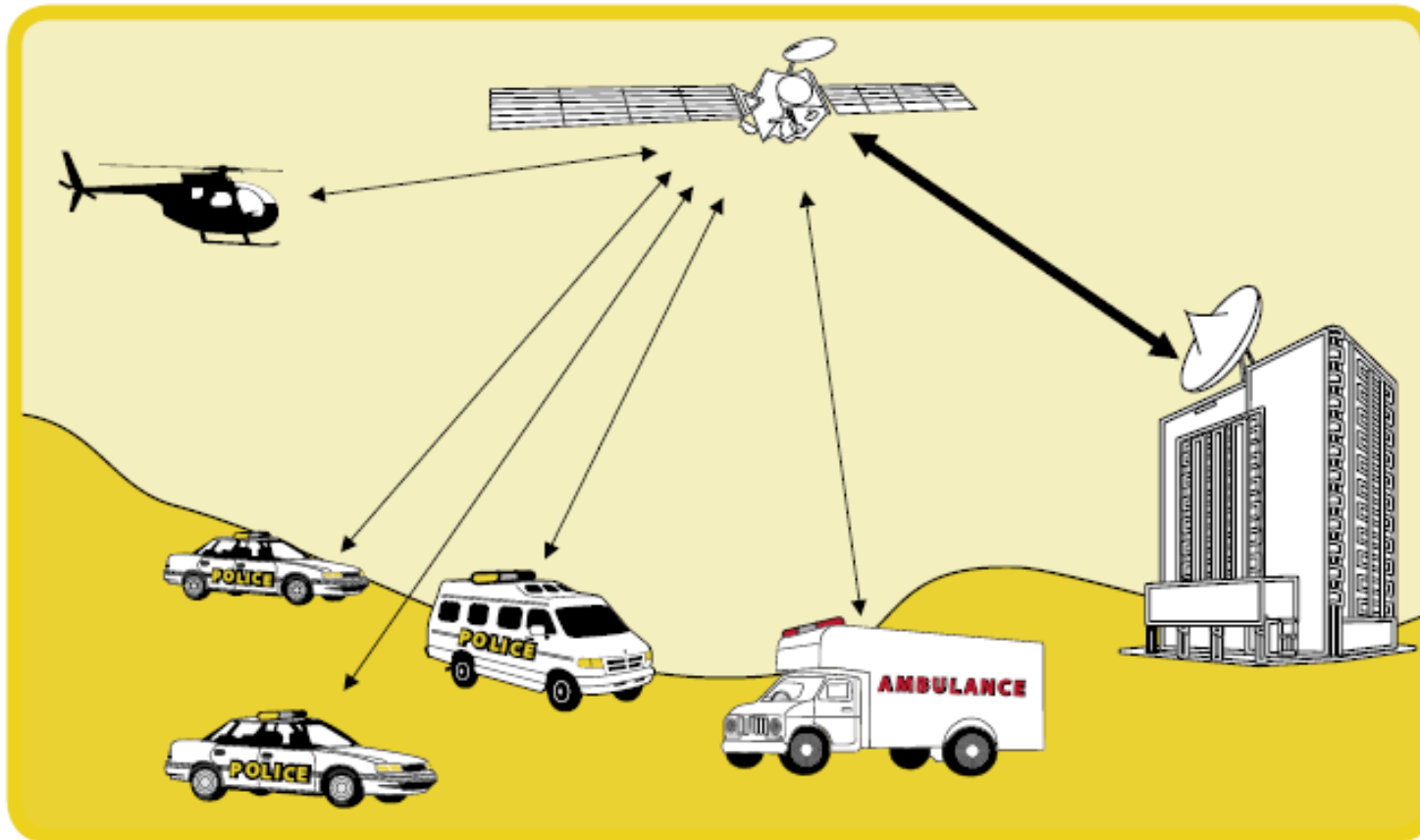


Source: *First Responders Guide to Satellite Communications*

CAPABILITIES

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FIXED-TO-MOBILE

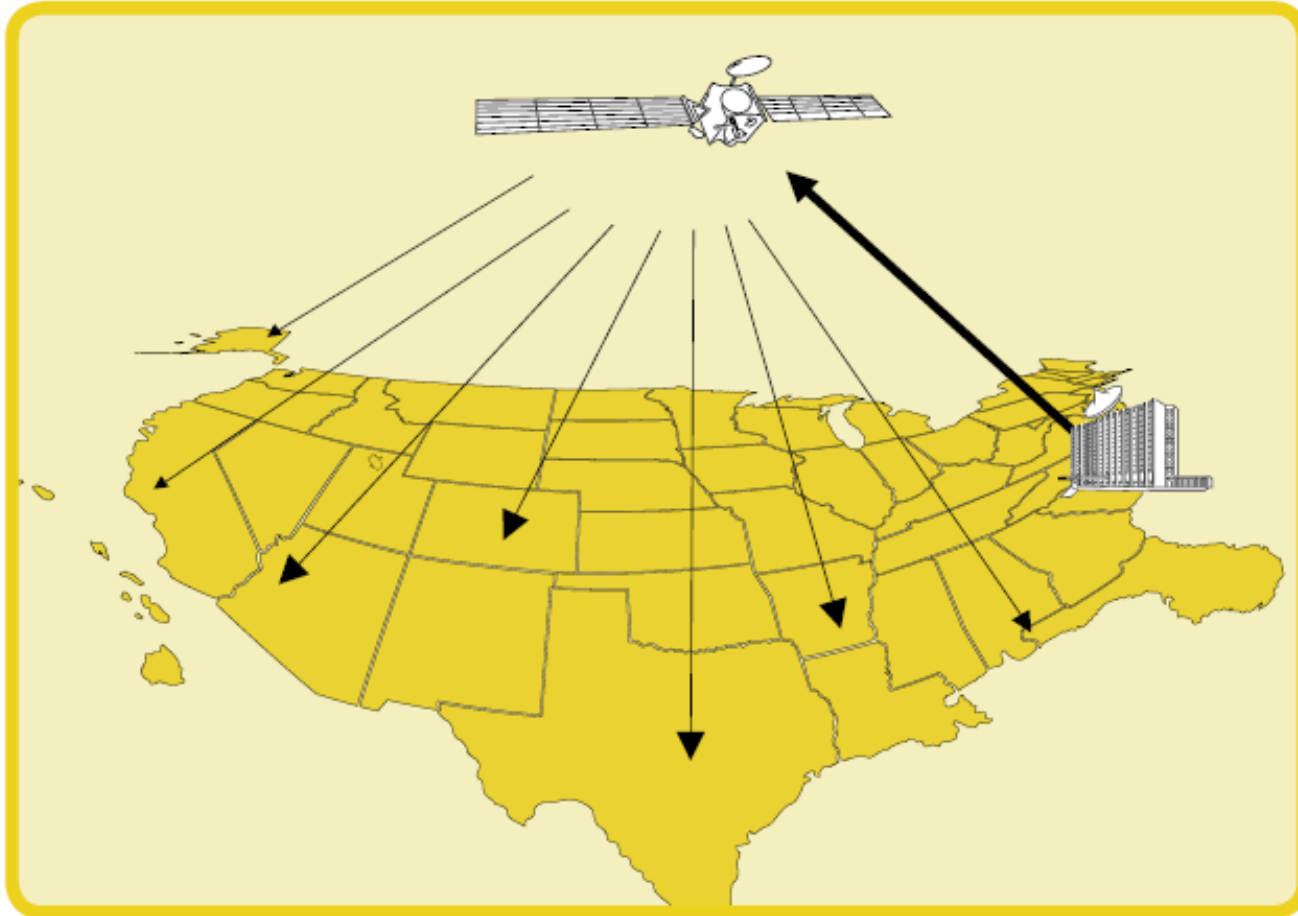


Source: *First Responders Guide to Satellite Communications*

CAPABILITIES

Satellites = Ubiquity + Reliability + Operability

POINT-TO-MULTIPOINT



Source: *First Responders Guide to Satellite Communications*



What is an MSS and What is a FSS?

- **Mobile Satellite Service (MSS)**
 - Typically L-band, X-band
 - Used for Mobile services, GPS
 - ex. Iridium, Inmarsat, Thuraya
- **Fixed Satellite Service (FSS)**
 - Typically C-band, Ku-Band & Ka-band
 - Used for Data, IP & Video
 - ex. MEASAT, AsiaSat, Thaicom.

In times of disaster recovery, solutions provided via satellite are more reliable than communications utilizing land-based connections.

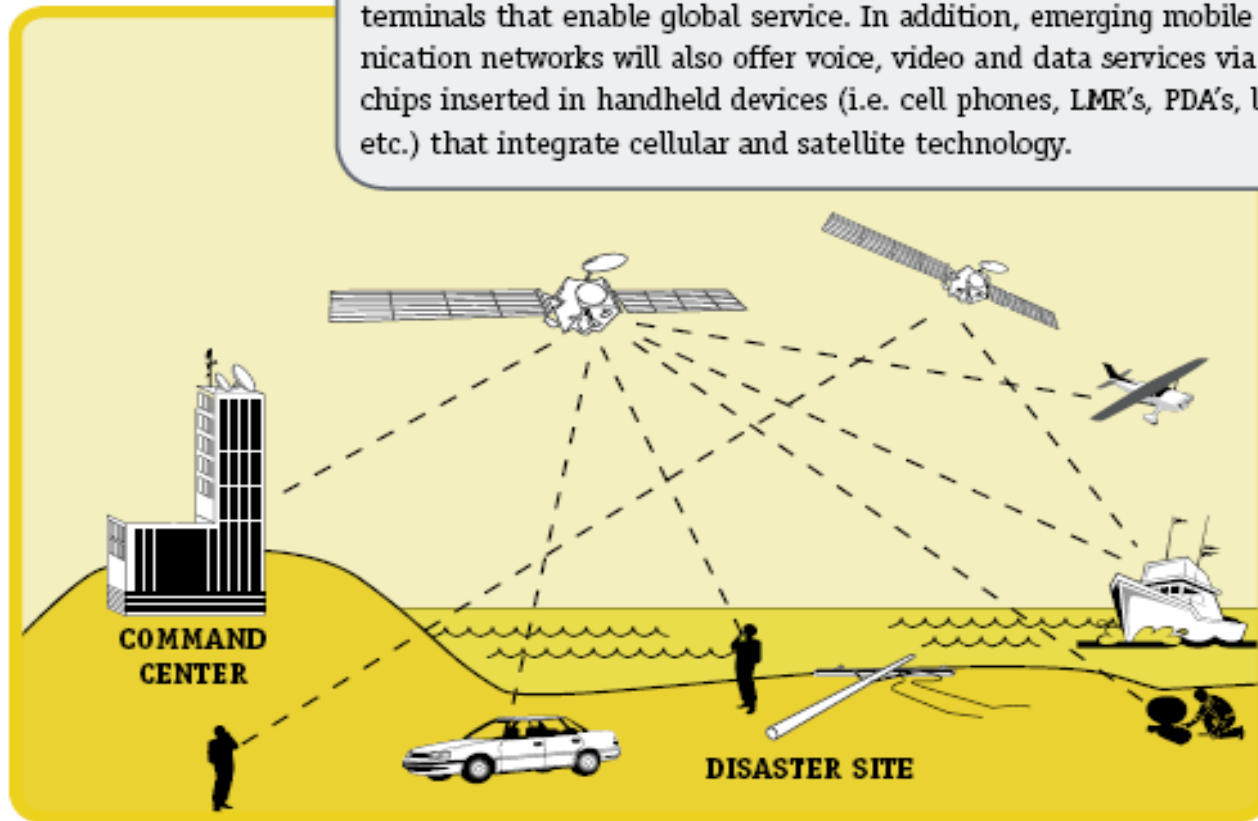
Mobile Satellite Services



Mobile Satellite Services: MSS

MSS

Mobile Satellite Service (MSS) uses portable satellite phones and terminals. MSS terminals may be mounted on a ship, an airplane, truck, or an automobile. MSS terminals may even be carried by an individual. The most promising applications are portable satellite telephones and broadband terminals that enable global service. In addition, emerging mobile communication networks will also offer voice, video and data services via "smart" chips inserted in handheld devices (i.e. cell phones, LMR's, PDA's, laptops, etc.) that integrate cellular and satellite technology.



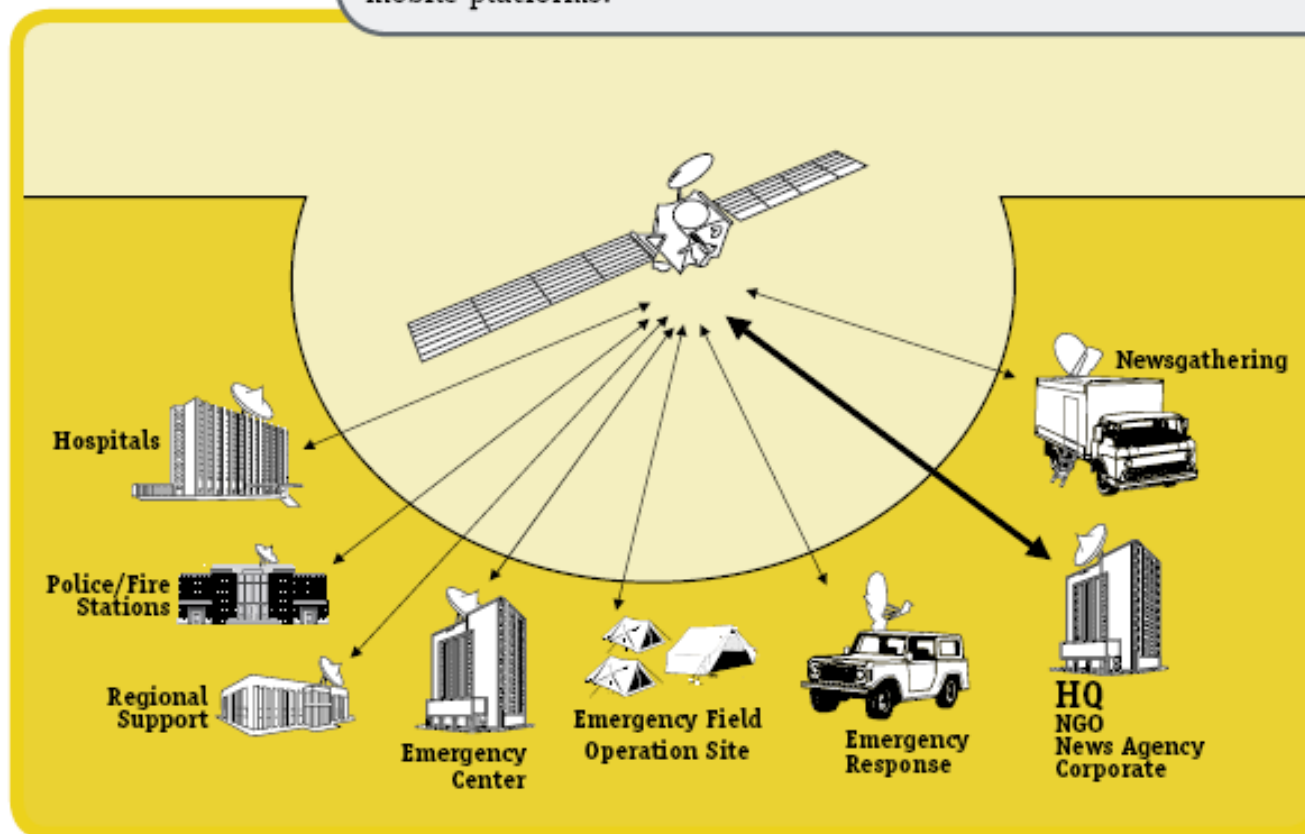
Fixed Satellite Services



Fixed Satellite Services: FSS

FSS

Fixed Satellite Service (FSS) has traditionally referred to a satellite service that uses terrestrial terminals communicating with satellites in geosynchronous orbit. New technologies allow FSS to communicate with mobile platforms.

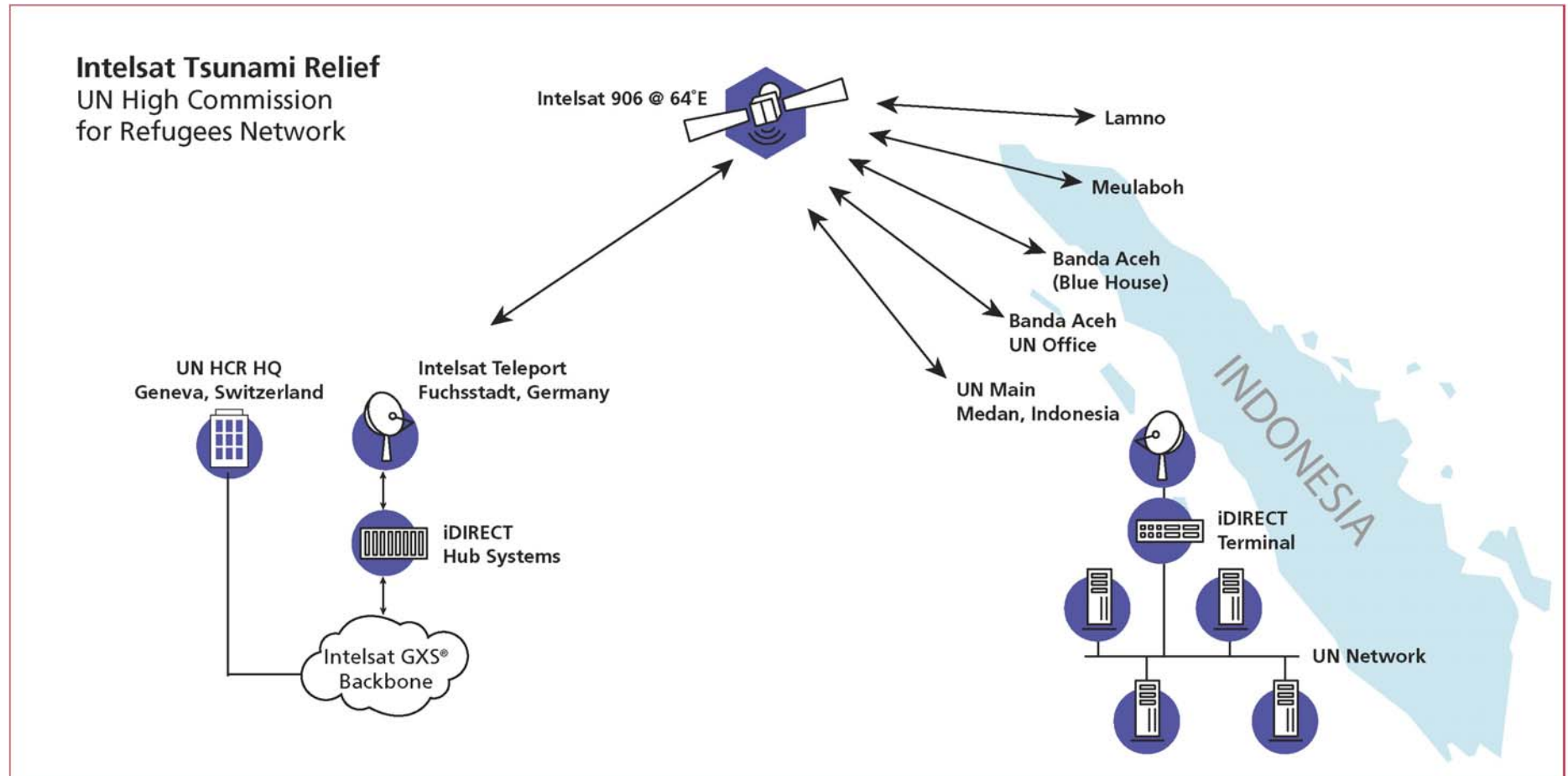


Disaster Recovery Stages

- **1st Stage (Days to a week)**
 - Initial setup in uncertain conditions
 - Handheld and small terminals (BGAN), Quick deployment
 - Low throughput, MSS
 - ex. Iridium, Thuraya, Inmarsat
 - **2nd Stage (2-3 weeks)**
 - Camps require “Thin route” data/voice connectivity
 - MSS, FSS
 - Fly-away antennas
 - **3rd Stage (3 weeks to a month)**
 - Camps grow bigger, bandwidth requirement increases
 - Data/voice/video, FSS
 - Telemedicine, Video-conference, SNG
- VSAT antennas (1.8m – 3m)

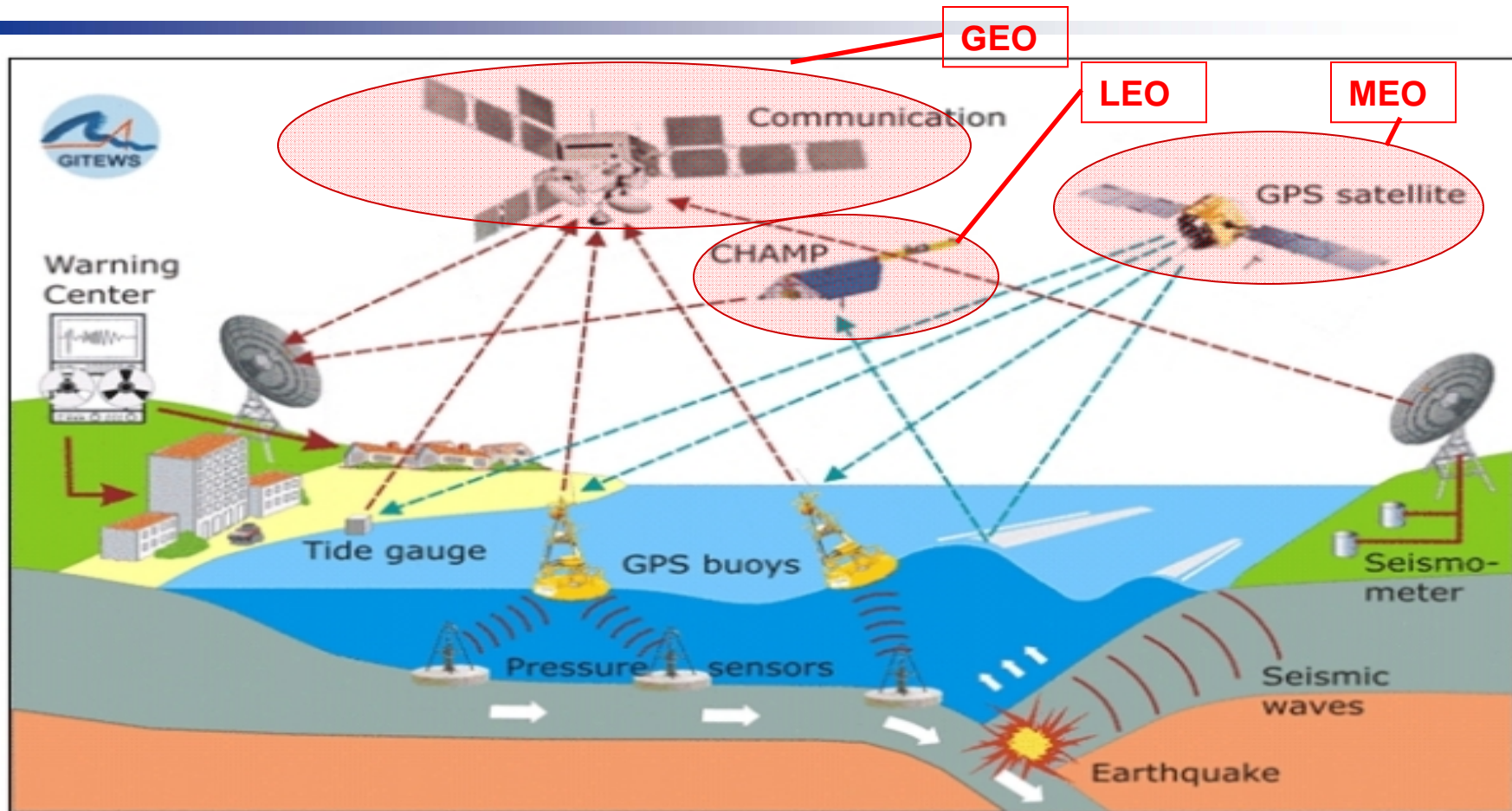


Intelsat disaster recovery deployment for UN HCR during the Sumatera Tsunami disaster



Source: "Satellite Communication and Disaster Recovery" Presentation to UNESCAP June 2005 - Faiz Somji Regional Marketing Manager Asia Pacific Intelsat

Indian Ocean Tsunami Warning System



Source: International Federation of Surveyors (Publication No.38)

Back to the drawing board – How do regional operators become more involved in disaster recovery operations....

- **The Facts;**
 - 23 Satellite Operators throughout Asia-Pacific
 - Myriad of Satellite equipment vendors and service providers
 - Typical FSS business case does not promote reserve capacity for emergencies
 - There is no governing body that promotes co-ordination between commercial FSS operators during emergencies
- **The challenge: Ideas to work towards.....**
 - Convergence between Satellite operators, Equipment vendors, Service providers and NGOs during Disaster for faster response
 - Maybe create an International Disaster Recovery Body that;
 - Leases permanent bandwidth
 - Have an inventory of of VSATs ready for deployment
 - Located at a regional Hub for fast response (ex. Singapore)
 - Educational courses on Basic Communication & VSAT deployment



Thank You



**Regional Satellite Operator of the Year
Excellence in Satellite Management, September 2008**