UN/South Africa Training Course on Satellite Aided Search and Rescue

Cape Town, South Africa

20-24 November 2006

System Status, Statistics and Regulatory Measures

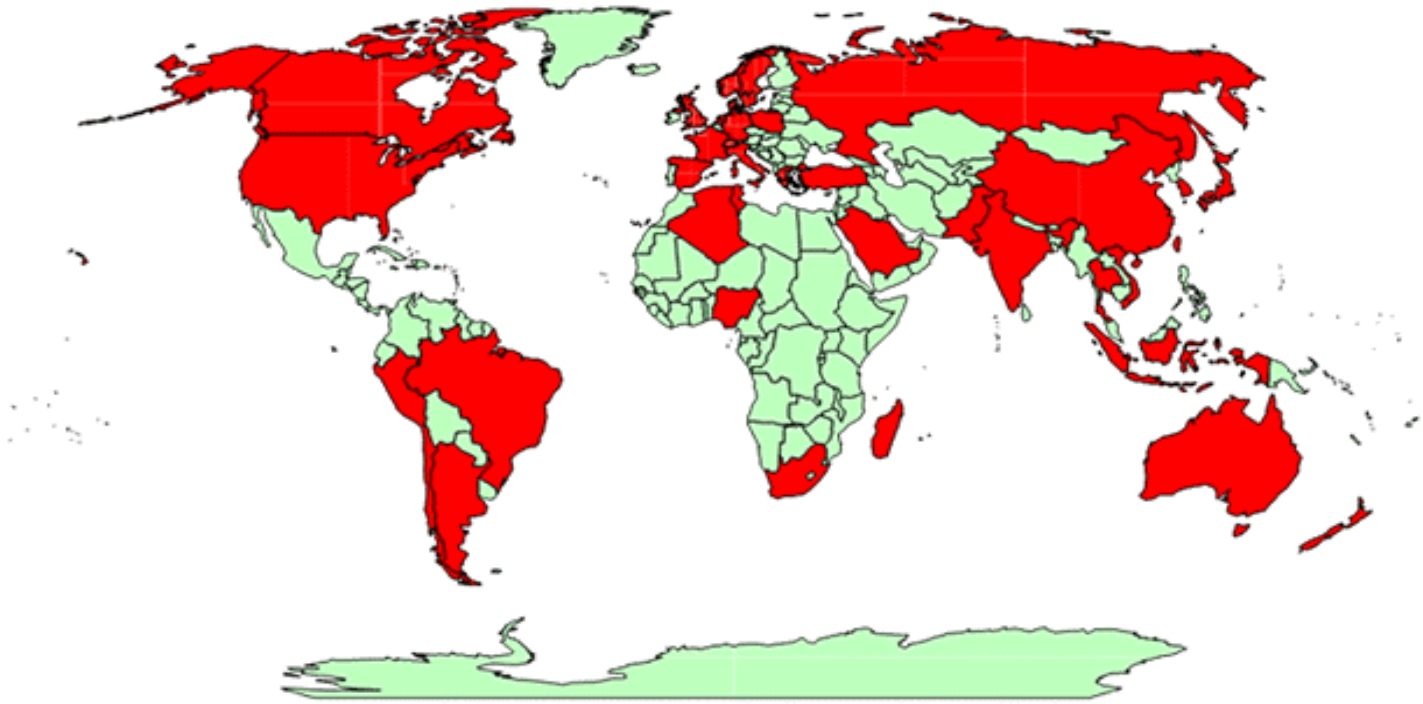
Cheryl Bertoia

Cospas-Sarsat Secretariat

Montreal

Source: CNES – D. Ducros

Cospas-Sarsat Participants (2006)



- 38 countries and 2 organisations participate (October 2006)
- 25 Ground Segment Providers operate 64 ground receiving stations (the Local User Terminals (LUTs)) and 26 Mission Control Centres (MCCs) for the worldwide distribution of distress alerts

Participating States & Organizations (2006)

Algeria
Brazil
China (P.R. of)
France
Hong Kong
Italy
Korea (Rep. of)
New Zealand
Pakistan
Russia
South Africa
Switzerland
Tunisia
United States of America

Argentina
Canada
Cyprus
Germany
India
ITDC
Madagascar
Nigeria
Peru
Saudi Arabia
Spain
Thailand
United Kingdom

Australia
Chile
Denmark
Greece
Indonesia
Japan
Netherlands (The)
Norway
Poland
Singapore
Sweden
Turkey
Vietnam

Space Segment Status

6 LEO

Status of Cospas-Sarsat LEOSAR Payload Instruments

(Last Updated 21 July 2006)

Satellite	Repeater Instruments			SARP		Comments
	121.5 MHz	243 MHz	406 MHz	Global	Local	
Sarsat-6	F	F	F	NO	NO	
Sarsat-7	F	L	F	F	F	Intermittent loss of the 243 MHz service, which may affect an entire or partial satellite pass.
Sarsat-8	L	NO	F	F	F	Intermittent loss of the 121.5 MHz service, which may affect an entire or partial satellite pass.
Sarsat-9	F	F	F	F	F	
Sarsat-10	F	F	F	F	F	
Cospas-4	NO	NA		NO	NO	
Cospas-9	F	NA		NO	NO	

5 GEO

Status of Cospas-Sarsat GEOSAR Payload Instruments

(Last Updated 21 July 2006)

Satellite	Status	Gain Control	Comments
GOES 9 (160° E)	F	Fixed	
GOES-East (75° W)	F	AGC	
GOES-West (135° W)	F	Fixed	
INSAT 3A (93.5° E)	L	TBD	
MSG-1 (3.4° W)	F	Fixed	

Legend					
F	Fully Operational	L	Limited Operations	AGC	Automatic Gain Control
NO	Not Operational	NA	Not Applicable	TBD	To Be Determined
		UT	Under Test		

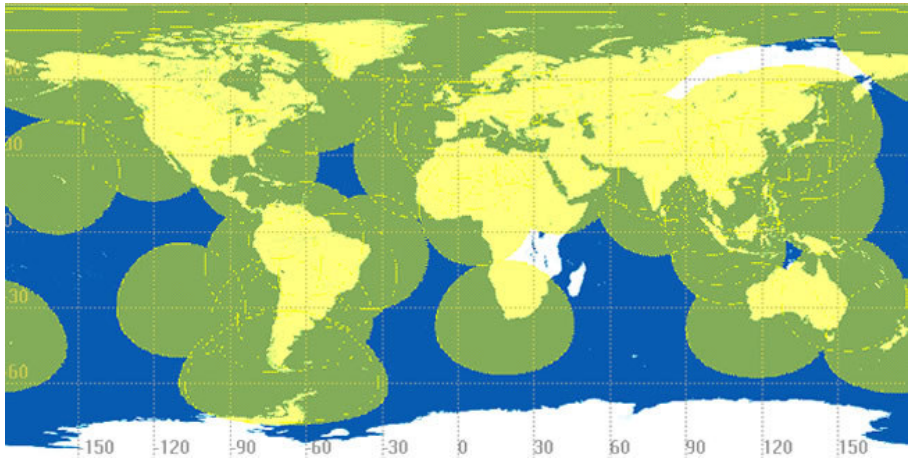
121.5 MHz Satellite Processing Availability

Satellite/Year	01	02	03	04	05	06	07	08	09
S4 (NOAA-11)	----------	----------	----------	----------	D				
C4* (Nadezhda-1)	~~DR~~	----------	----------	----------	----------	----------			
S6 (NOAA-14)	▲	----------	----------	----------	----------	----------			
S7 (NOAA-15)	▲	----------	----------	----------	----------	----------			
S8** (NOAA-16)	----------	----------	▲	----------	----------	----------			
C9 (Nadezhda-6)	----------	----------	----------	----------	▲	----------			
S9 (NOAA-17)		----------	----------	----------	▲	----------			
C10 (Nadezhda-7)		----------	----------	----------	D				
C11 (TBD)						X	----------	----------	
S10 (NOAA-N)					----------	----------	----------	▲	
S11 (Metop-A)						X	----------	----------	
S12 (NOAA-N')								X^+	----
Year	01	02	03	04	05	06	07	08	09
Maximum Number of Payloads Available	6	8	8	6	6	9	3	4	3

February 2009

http://www.cospas- sarsat.org/DocumentsRSeries/R10Nov05.pdf

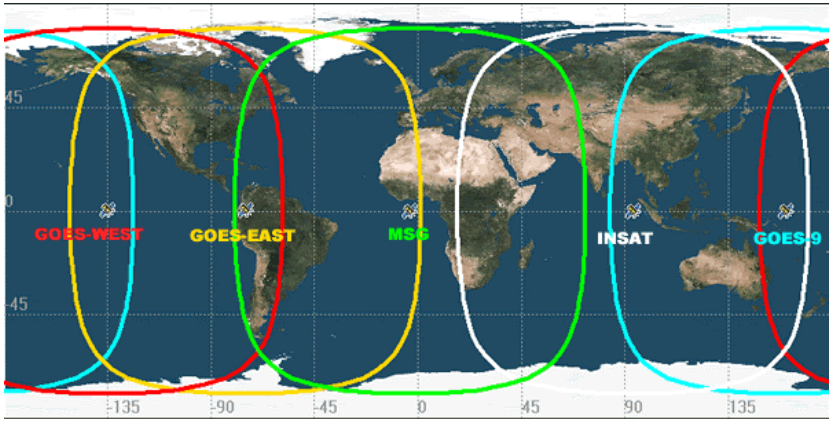
Ground Segment Status



46 LEOLUTs track the Cospas-Sarsat polar-orbiting satellites

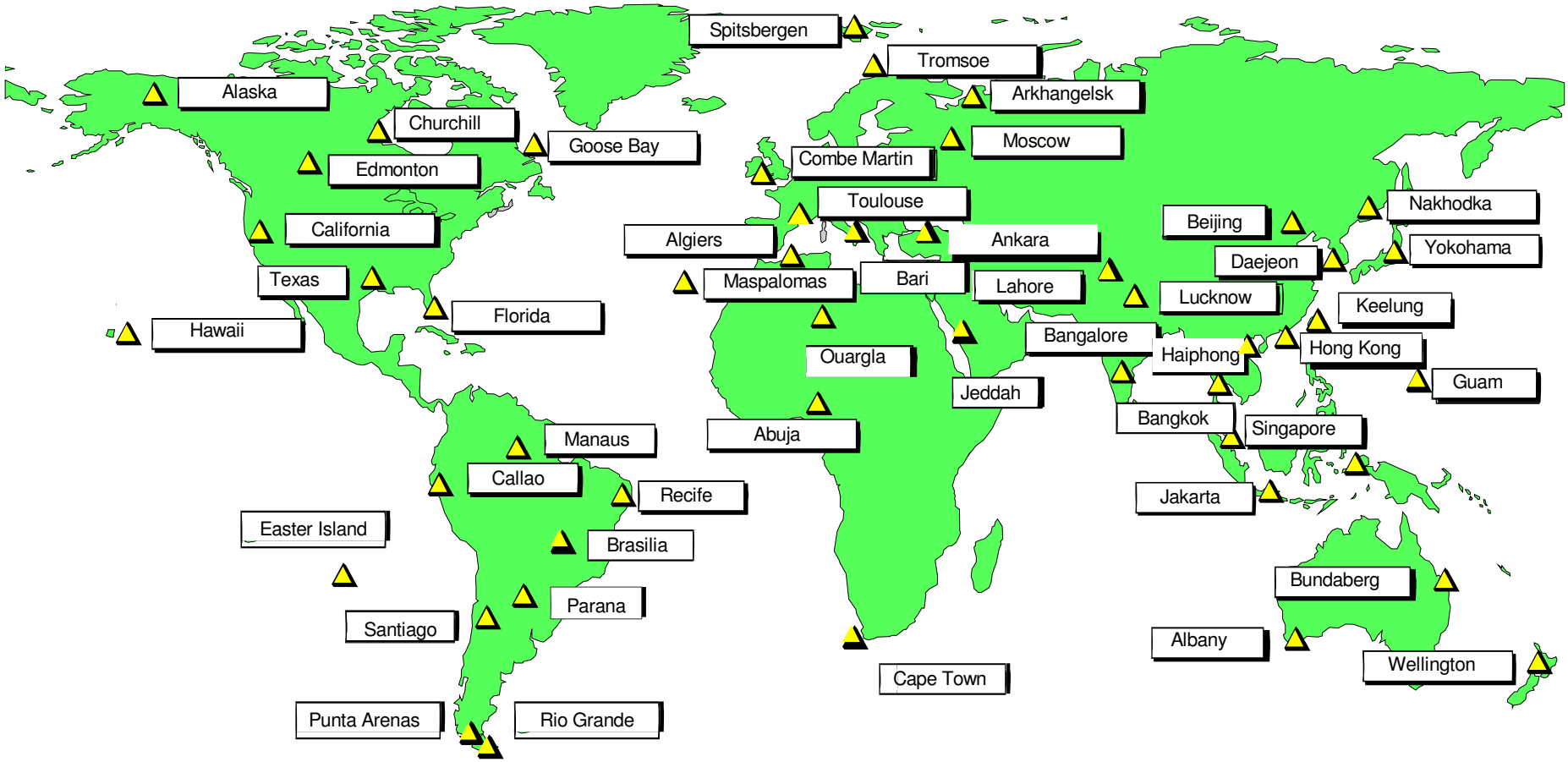
Note: Green areas – 121.5 and 406 MHz coverage, other areas 406 MHz only

18 GEOLUTs track the geostationary satellites



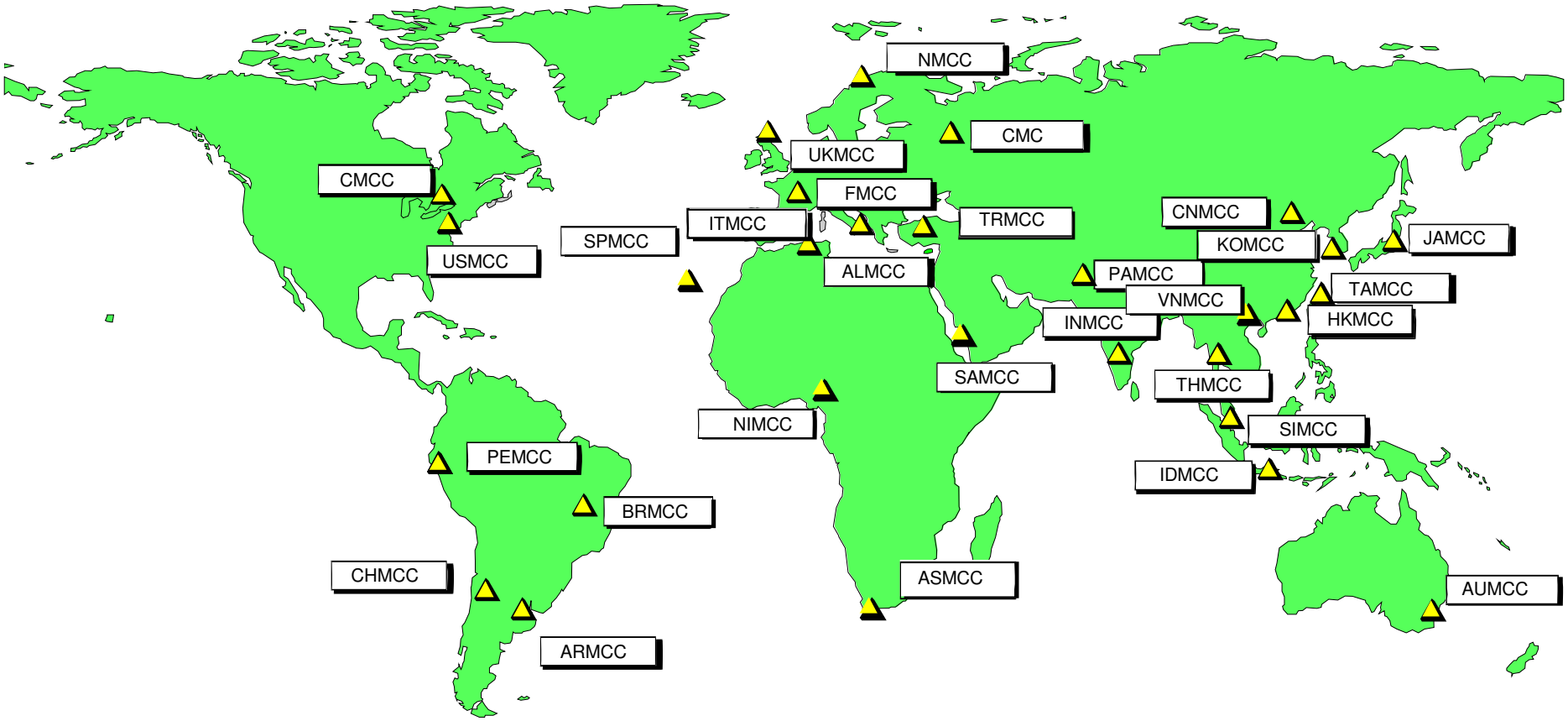
26 Mission Control Centres distribute Cospas-Sarsat alert data to worldwide search and rescue services

LEOLUT Locations
October 2006

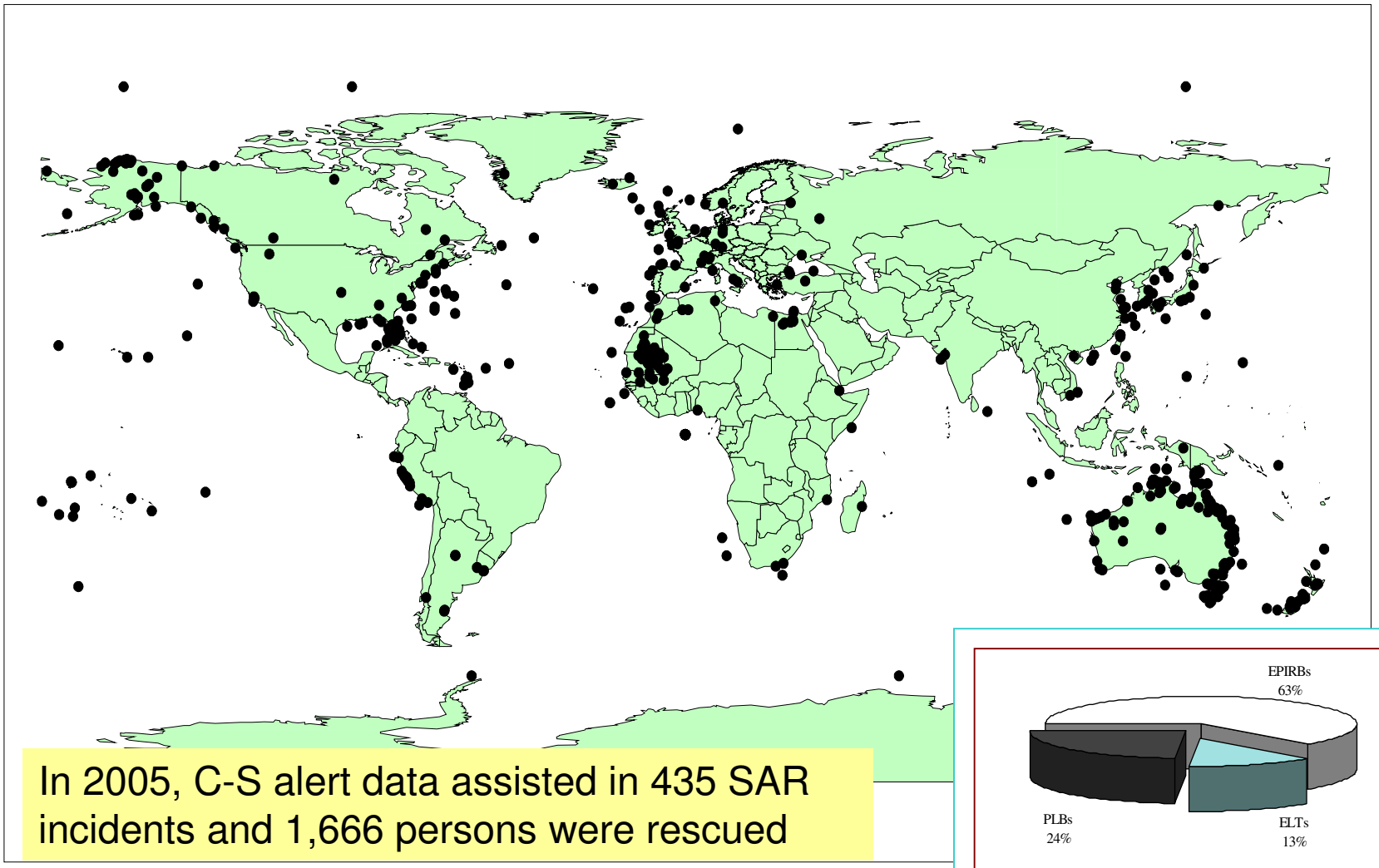


MCC Locations

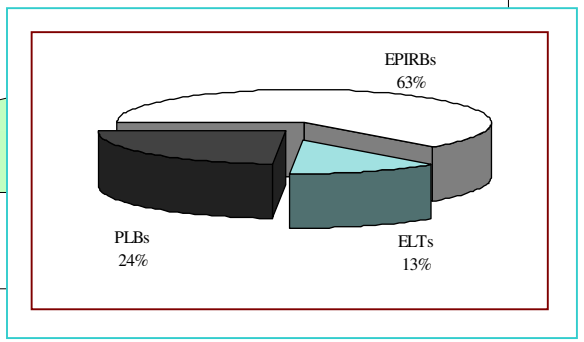
October 2006



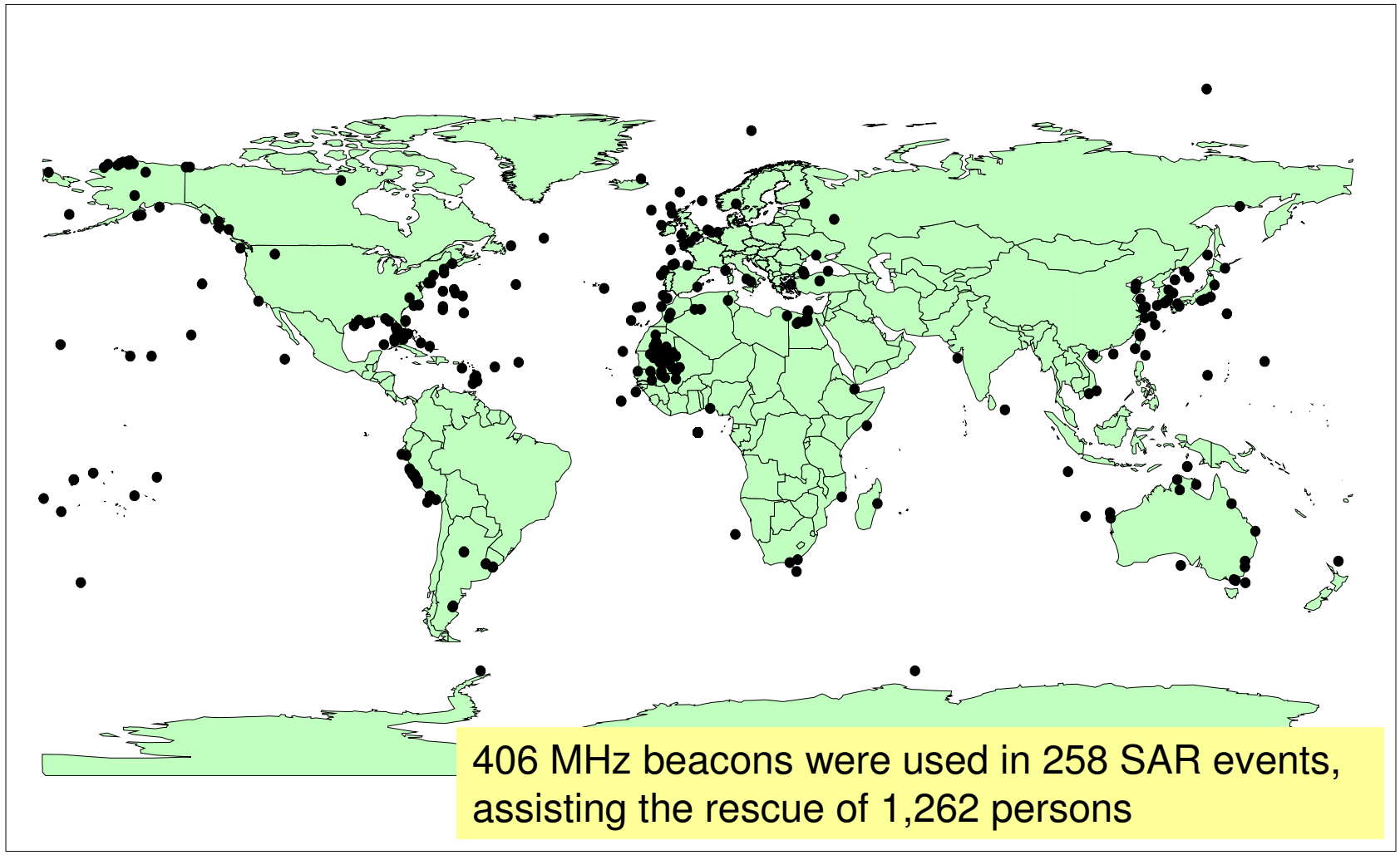
SAR Events Assisted by C/S alert data in 2005



In 2005, C-S alert data assisted in 435 SAR incidents and 1,666 persons were rescued

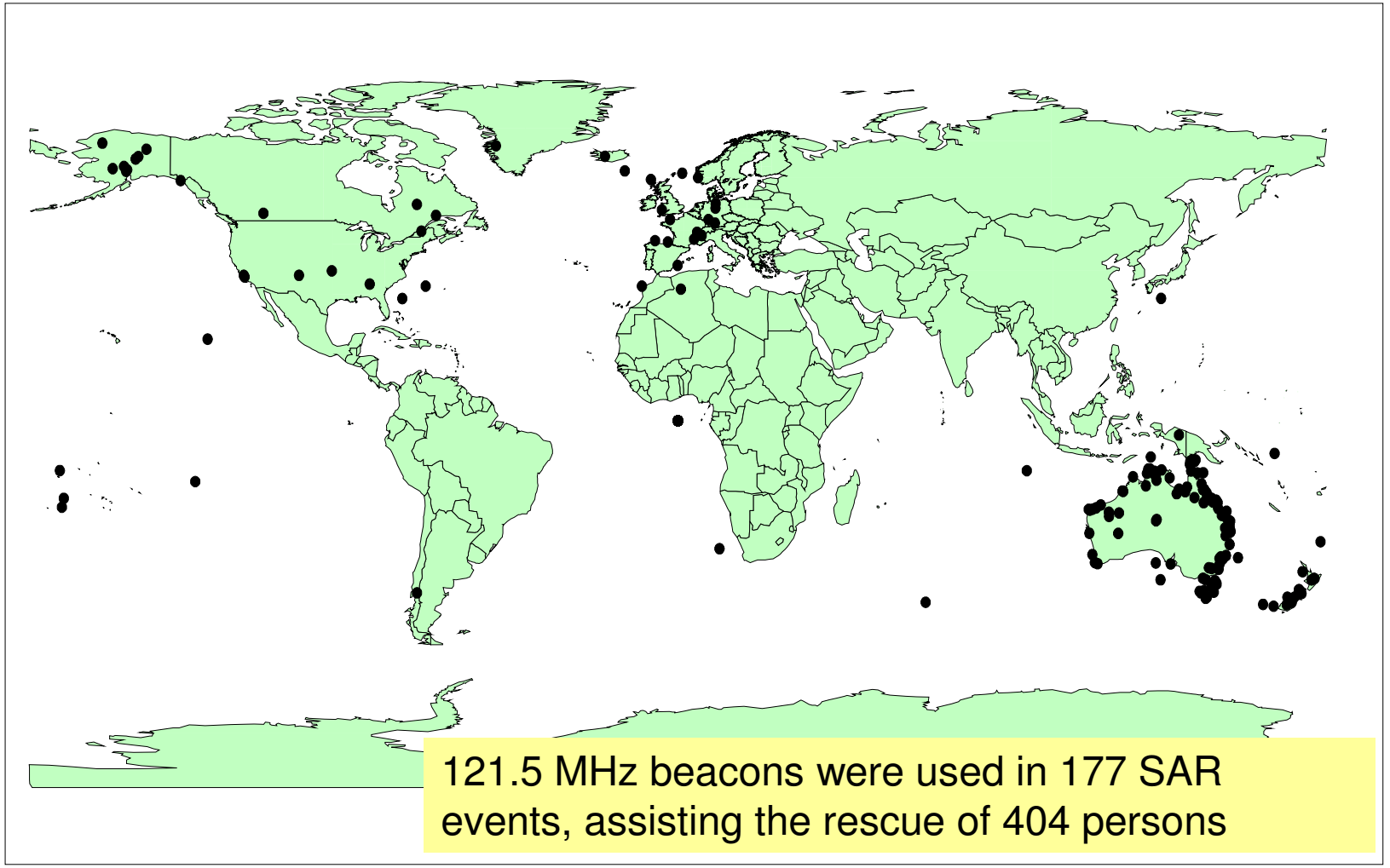


406 MHz SAR Events Assisted by C/S alert data in 2005



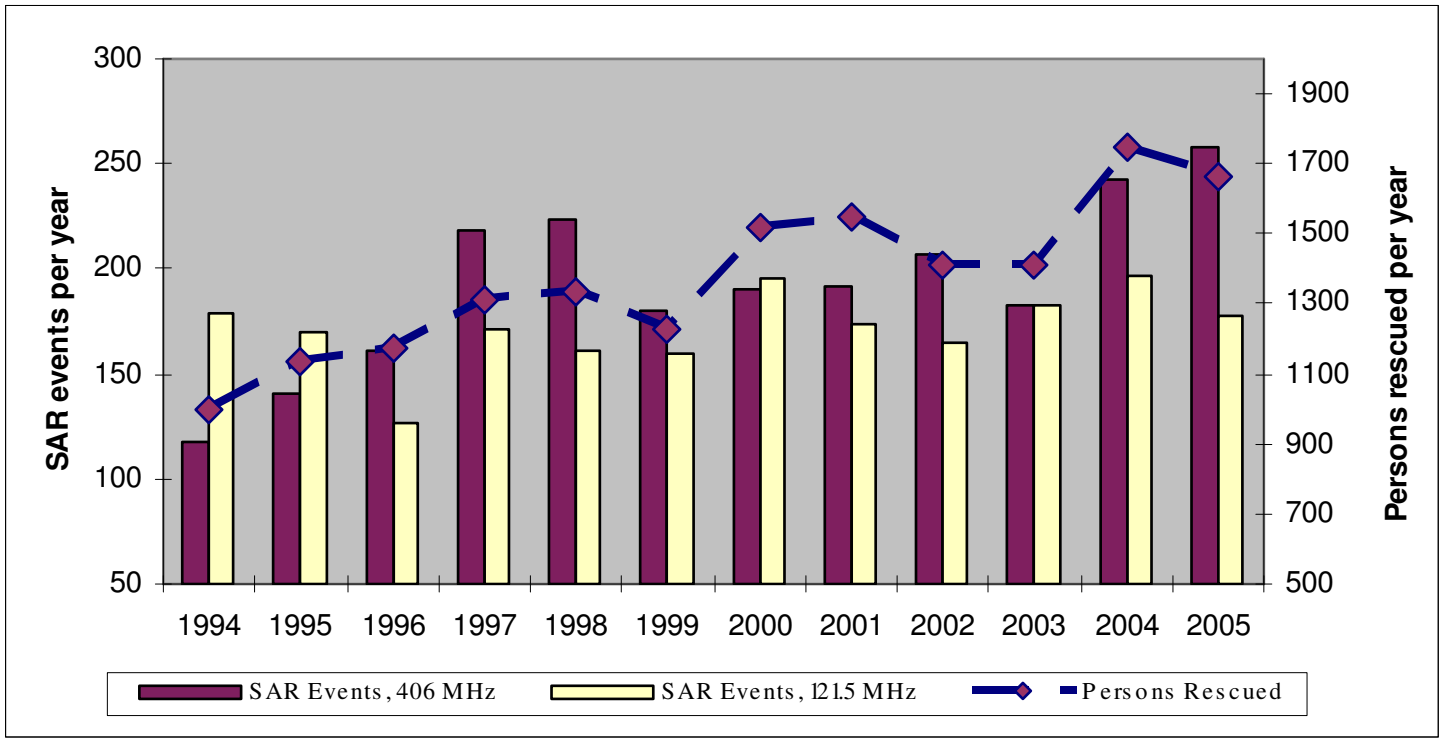
406 MHz beacons were used in 258 SAR events, assisting the rescue of 1,262 persons

121.5 MHz SAR Events Assisted by C/S alert data in 2005



121.5 MHz beacons were used in 177 SAR events, assisting the rescue of 404 persons

SAR Events & Persons Rescued With C/S Alert Data



Since inception (1982) over 20,000 persons were rescued in about 5,800 SAR events

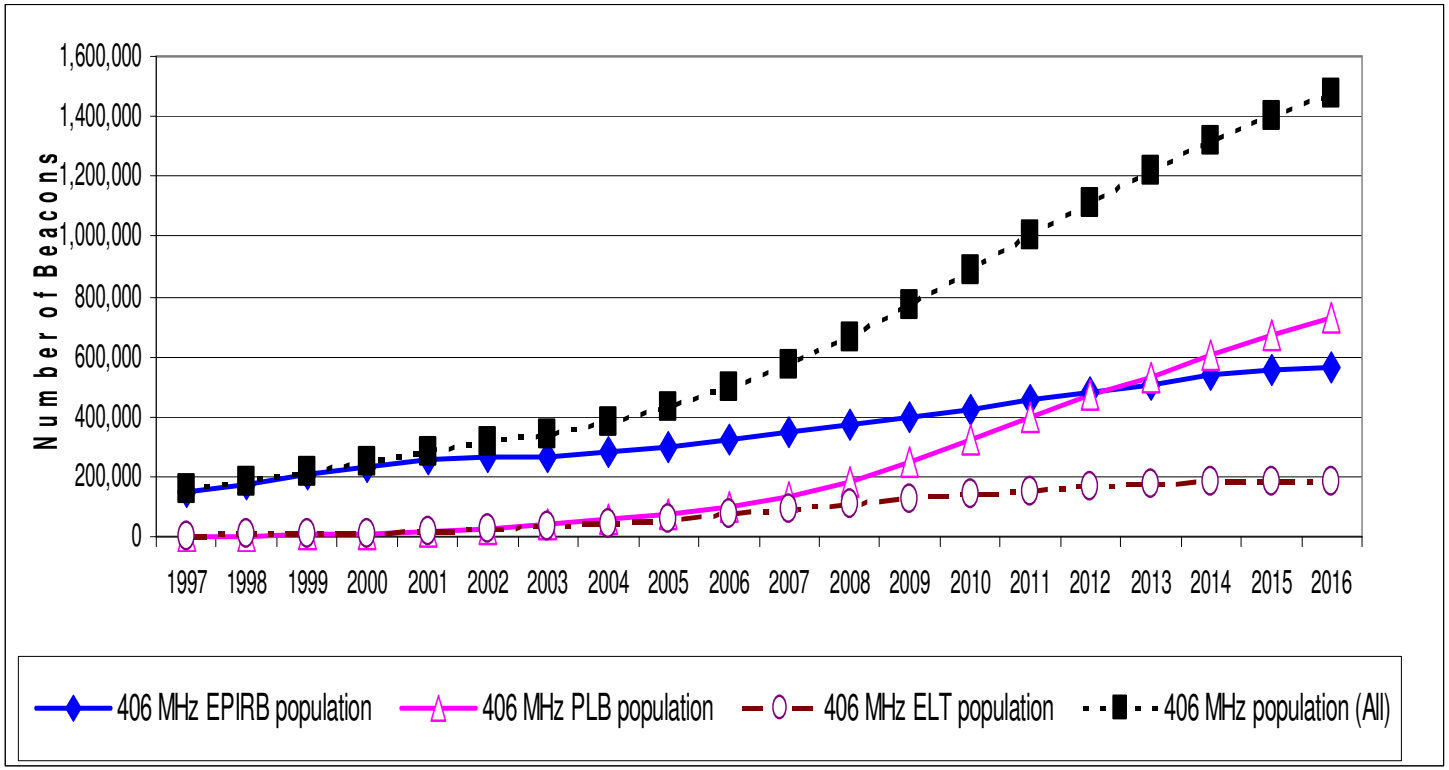
False Alert Rate

Year / Beacon Type	EPIRBs	ELTs	PLBs	Total
1999	2.7% (no USA data)	15.1% (no USA data)	0% (no USA data)	4.0% (incl. USA data)
2000	2.6% (no USA data)	11.2% (no USA data)	0.8% (no USA data)	2.8% (incl. USA data)
2001	1.2% (no USA data)	9.8% (no USA data)	0.9% (no USA data)	2.8% (incl. USA data)
2002	3.0% (no USA and New Zealand data)	11.0% (no USA and New Zealand data)	1.2% (no USA and New Zealand data)	2.7% (incl. USA* and New Zealand data)
2003	2.6% (no USA and New Zealand data)	8.9% (no USA and New Zealand data)	1.0% (no USA and New Zealand data)	2.9% (incl. USA* and New Zealand data)
2004	2.2% (no USA data)	9.3% (no USA data) (9.2%)**	2.1% (no USA data)	2.7% (incl. USA* data) (2.1%)**
2005	1.8%	**6.8%** **(6.6%)****	0.5%	1.6%

Note: * US data for USMCC service area only.

** Non-registered beacon included.

406 MHz Beacon Population Survey Results and Forecast to 2016

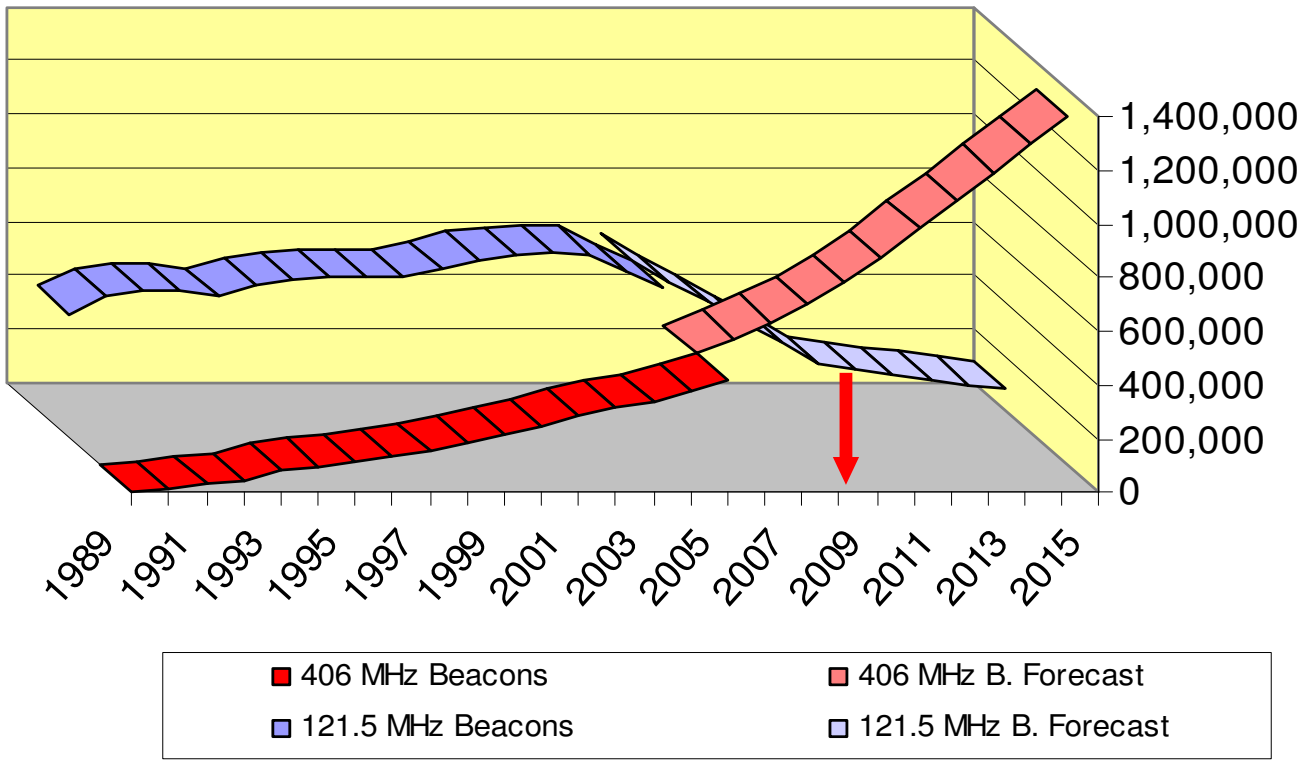


At the end of 2005, the estimated number of 406 MHz beacons in use worldwide was over 429,000 → a 13.3% increase over 2004

Growth of the 406 MHz Beacon Population

- 1988 IMO accepts 406 MHz EPIRBs for GMDSS (Ship to Shore Alerting) : about 2,000 EPIRBs are in use
- 1993 Satellite EPIRBs mandatory on SOLAS ships
- 1999 GMDSS operational : about 220,000 EPIRBs; 4,000 ELTs and 3,000 PLBs (406 MHz)
- 2005 Over 420,000 beacons : 296,000 EPIRBs, 57,600 ELTs, 73,400 PLBs
- 2015 Forecast = 1.4 Million 406 beacons

406 MHz Beacon Population



406 MHz beacon growth on average +25% per a. between 1989 and 1999,
+16% per a. from 2000 to 2005.

2006 to 2015 Forecast corresponds to +13% per a. on average

Regulatory Measures

International Telecommunication Union

International Civil Aviation Organization

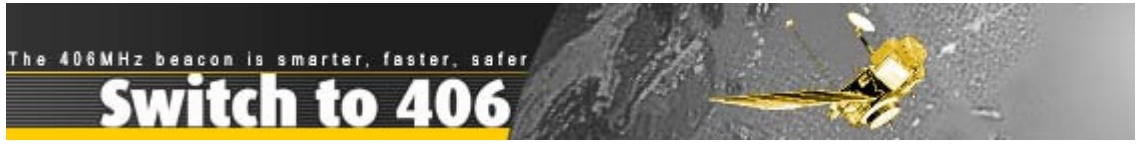
INTERNATIONAL MARITIME ORGANIZATION

Cospas-Sarsat document S.007 Handbook of Beacon Regulations

- Summary status of Cospas-Sarsat Participant regulations regarding the carriage of beacons
- 406 MHz EPIRB and ELT coding methods authorised for use in each country
- 406 MHz beacon models type approved for national use by Cospas-Sarsat Participants
- Examples of 406 MHz beacon registration cards
- Points of contact for 406 MHz beacon matters (coding, registration and type approval)
- Information on 406 MHz beacon test facilities
- International regulations on 406 MHz and 121.5 MHz beacons

International Telecommunication Union (ITU)

- IMO/ITU Experts' Working Group on Maritime Radiocommunication matters
- July 2006 - prepared an IMO position for the 2007 World Radio Conference (WRC 2007) agenda concerning maritime services
- Agreement to put forward to WRC 2007 amendments describing the discontinuation of 121.5/243 MHz satellite processing services by Cospas-Sarsat



ICAO 406 MHz ELT Carriage Requirements

- Effective 1 Jan 2005*
- Required aircraft operated on long-range over-water flights or over designated land areas to be equipped with ELTs which:
  - Transmit 121.5MHz and 406 MHz simultaneously
  - Feature automatic activation on at least one of the installed ELTs

ICAO 406 MHz ELT Carriage Requirements

- Proposed amendments to Annex 6 are suggested for applicability on 1 July 2008

- General agreement of ELT Task Force that:
  - designated areas need not be a determining factor in ELT carriage requirements,
  - no retrofit should be required for older aircraft,
  - regard should be paid to the number of passengers (19) carried

OLD AIRCRAFT				NEW AIRCRAFT			
> 19 Pax	≤ 19 Pax	LROW	Desig-nated Areas	> 19 Pax	≤ 19 Pax	LROW	Desig-nated Areas
EXISTING PROVISIONS							
ALL AIRCRAFT SHOULD CARRY AN AUTOMATIC ELT							
		6.17.3 1 AUTO +1 ANY After 1 Jan 2005	6.17.6 1 AUTO			6.17.2 1 AUTO +1 ANY After 1 Jan 2002	6.17.5 1 AUTO
PROPOSAL							
ALL AIRCRAFT SHOULD CARRY AN AUTOMATIC ELT							
6.17.2 1 AUTO or 2 ANY After 1 July 2008	6.17.4 1 ANY After 1 July 2008			6.17.3 1 AUTO +1 ANY After 1 July 2008	6.17.5 1 AUTO After 1 July 2008		

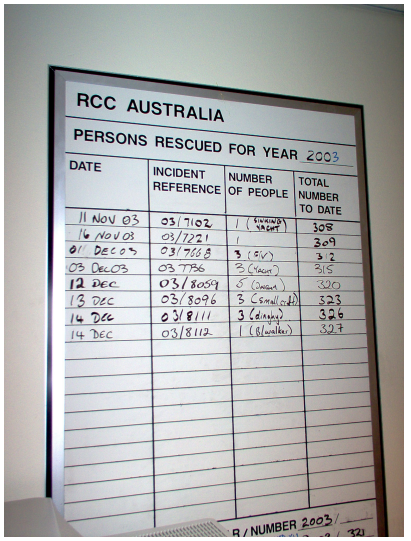
Closure of Inmarsat E

- At 31 August 2004, about 1300 L-band EPIRBs were registered

- Inmarsat replacing L-band EPIRBs with Cospas-Sarsat 406 MHz beacons

Inmarsat will close Inmarsat E service 1 Dec 2006

Cospas-Sarsat saves lives…



… on average four lives per day

in at least one SAR incident per day!

For More Info…

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