



**G**LOBAL  
**M**MARITIME  
**D**DISTRESS and  
**S**SAFETY  
**S**SYSTEM

**Δ**ΔΟΡΥΦΟΡΙΚΑ  
**Σ**ΣΥΣΤΗΜΑΤΑ

**IRIDIUM**

# ΔΟΡΥΦΟΡΙΚΟ ΣΥΣΤΗΜΑ IRIDIUM

Το μοναδικό δορυφορικό σύστημα GMDSS παγκόσμιας κάλυψης.



# ΤΟΜΕΙΣ ΤΟΥ ΣΥΣΤΗΜΑΤΟΣ

Δορυφορικός Τομέας (Satellite Constellation)

Υποδομή εδάφους (Ground Infrastructure)

Τερματικά χρηστών (Users Terminal).

# ΔΟΡΥΦΟΡΙΚΟΣ ΤΟΜΕΑΣ

Αποτελείται από 66 δορυφόρους οι οποίοι κινούνται σε χαμηλές διασταυρούμενες πολικές τροχιές (LEO).

Οι δορυφόροι κινούνται σε 6 επίπεδα τροχιών σε ύψος 780 Χλμ με χρόνο περιστροφής 100 περίπου λεπτών.

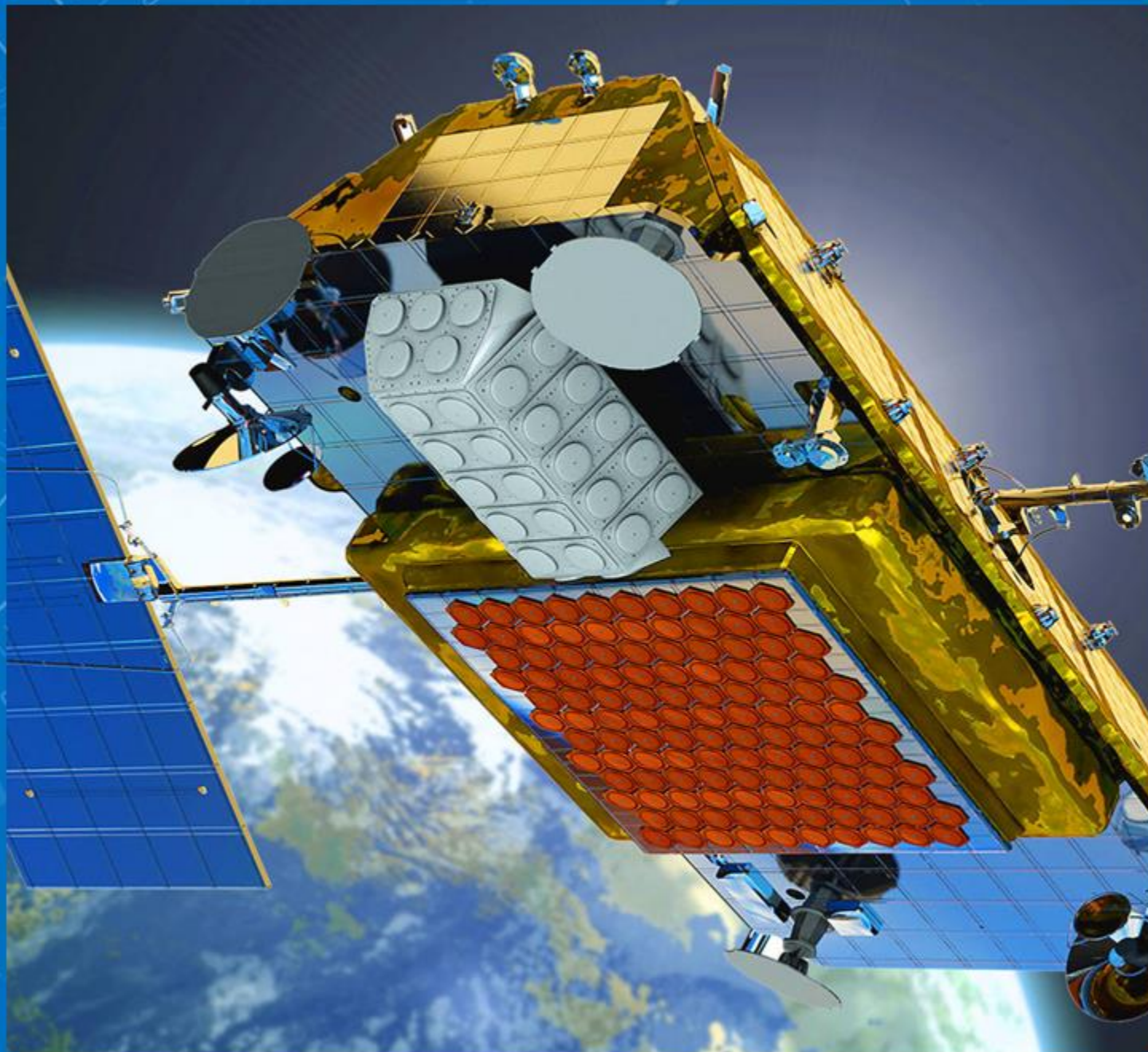
Κάθε δορυφόρος διαθέτει 48 σημειακές δέσμες.



The background is a solid blue color with a complex graphic overlay. It features several concentric circles and arcs of varying sizes and colors (white and light blue). A prominent feature is a large circular scale on the left side, with numerical markings from 140 to 260 in increments of 10. The scale is partially obscured by other circular elements. The overall aesthetic is technical and futuristic.

# IRIDIUM NEXT GENERATION











VANDENBERG  
SPACE FORCE BASE

A stone sign for Vandenberg Space Force Base. The sign is made of light-colored, irregularly shaped stones and features two black rectangular panels with white text. The top panel reads "VANDENBERG" and the bottom panel reads "SPACE FORCE BASE". The sign is set against a background of green trees and a clear blue sky. In the foreground, there are purple flowers and a green lawn.



| Launch Date | Launch Site | Launch Vehicle | Satellite Number                                 |
|-------------|-------------|----------------|--|
| 14-01-2017  | Vandenberg  | Falcon 9 FT    | 102, 103, 104, 105, 106, 108, 109, 111, 112, 114 |
| 25-06-2017  | Vandenberg  | Falcon 9 FT    | 113, 115, 117, 118, 120, 121, 123, 124, 126, 128 |
| 09-10-2017  | Vandenberg  | Falcon 9 B4    | 100, 107, 119, 122, 125, 129, 132, 133, 136, 139 |
| 23-12-2017  | Vandenberg  | Falcon 9 FT    | 116, 130, 131, 134, 135, 137, 138, 141, 151, 153 |
| 30-03-2018  | Vandenberg  | Falcon 9 B4    | 140, 142, 143, 144, 145, 146, 148, 149, 150, 157 |
| 22-05-2018  | Vandenberg  | Falcon 9 B4    | 110, 147, 152, 161, 162                          |
| 25-07-2018  | Vandenberg  | Falcon 9 B5    | 154, 155, 156, 158, 159, 160, 163, 164, 165, 166 |
| 11-01-2019  | Vandenberg  | Falcon 9 B5    | 167, 168, 169, 170, 171, 172, 173, 175, 176, 180 |

## CONSTELLATION

|                               |                               |
|-------------------------------|-------------------------------|
| SATELLITES                    | 66                            |
| ORBITAL PLANES                | 6                             |
| INCLINATION OF ORBITAL PLANES | 86,4 Degrees                  |
| ORBIT HEIGHT                  | 780 Km (421,5 Nautical Miles) |
| ORBITAL PERIOD                | 100'28"                       |

## FREQUENCY BANDS

### USER TERMINAL

Uplinks 1616 – 1626,5 MHz (L Band)

Downlinks 1616 – 1626,5 MHz (L Band)

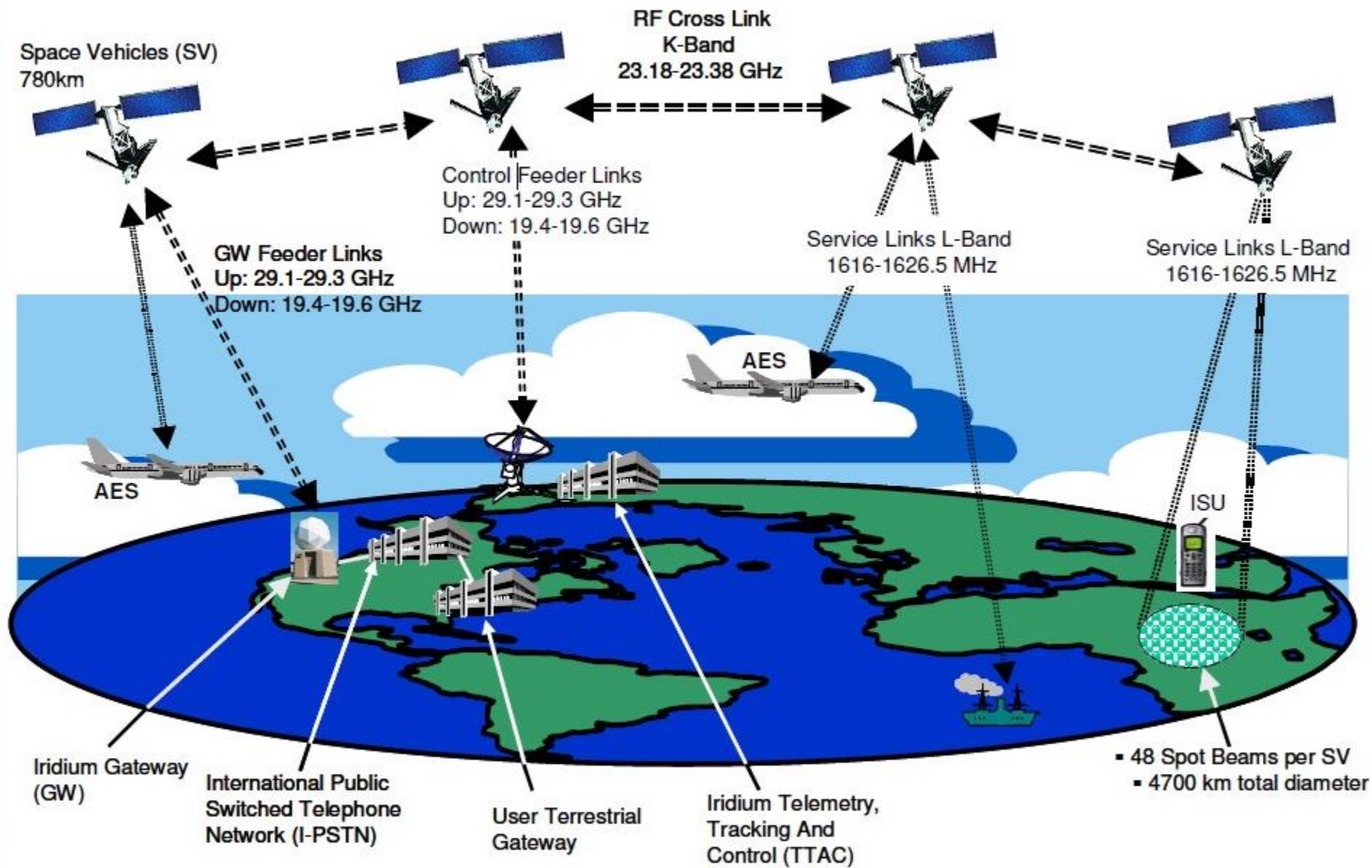
### INTERSATELLITE LINKS

23.18 – 23.38 GHz (Ka Band)

### GATEWAY LINKS

Uplinks 29.1 – 29.3 GHz (Ka Band)

Downlinks 19.4 – 19.6 GHz (Ka Band)



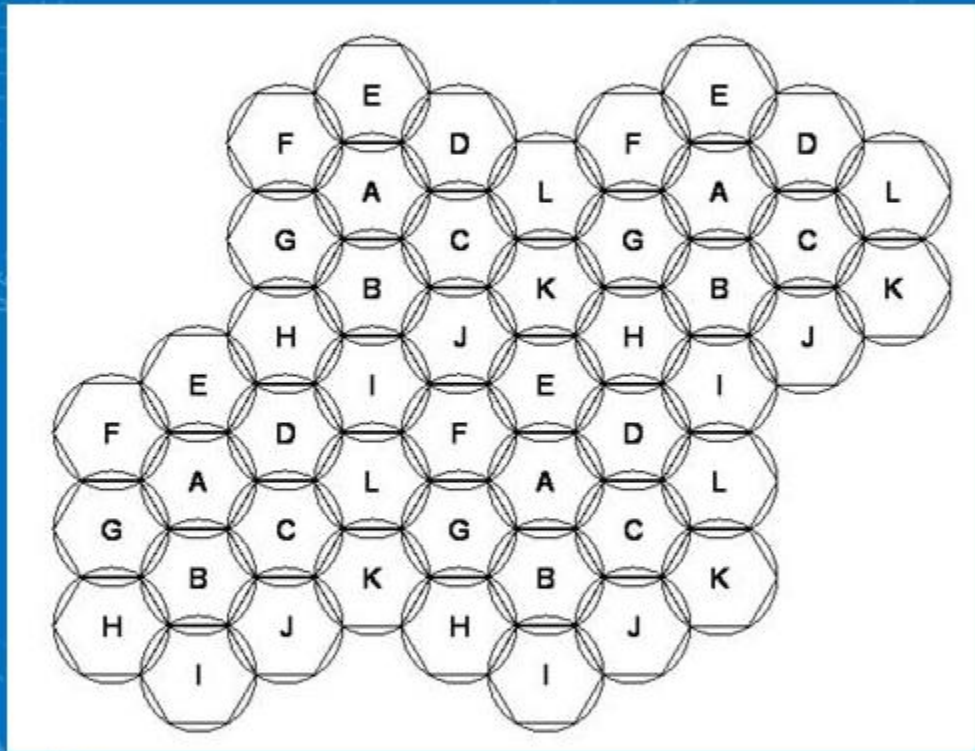
Κάθε δορυφόρος διαθέτει 11 κεραιές :

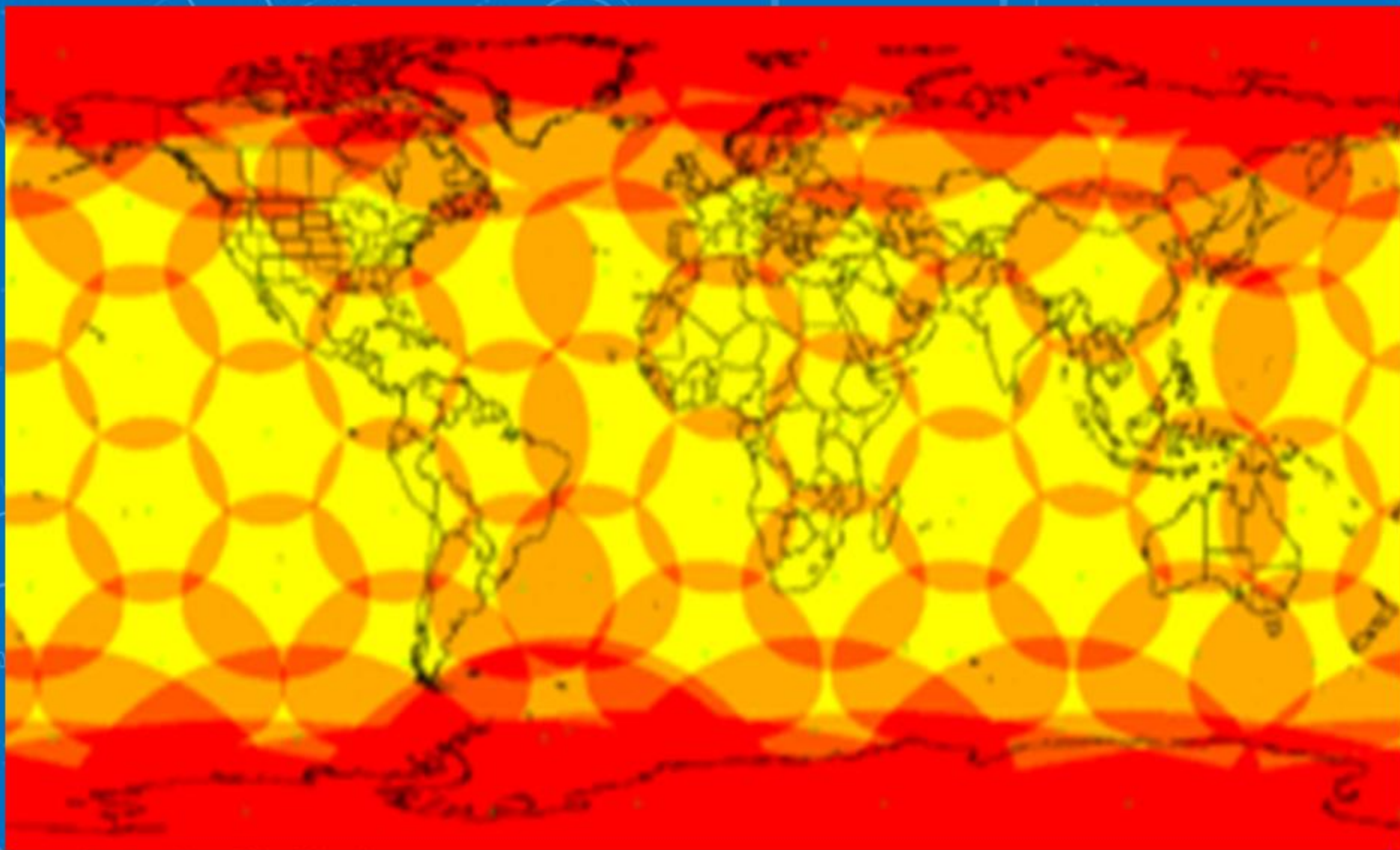
- Δύο κεραιές για επικοινωνία με κοντινούς δορυφόρους της ίδιας τροχιάς
- Δύο κεραιές για επικοινωνία με κοντινούς δορυφόρους κοντινής τροχιάς
- Τρεις μεγάλες κεραιές για επικοινωνία με τους χρήστες
- Τέσσερις κεραιές για επικοινωνία με τα Κέντρα Ελέγχου (Teleports)

Κάθε μία από τις τρεις μεγάλες κεραιές διαθέτει 48 μικρότερες οι οποίες  
Καλύπτουν κυκλική επιφάνεια διαμέτρου 250 Km στη Γη









# SNOK – Satellite Network Operating Center





# GATEWAYS

# TEMPE ARIZONA



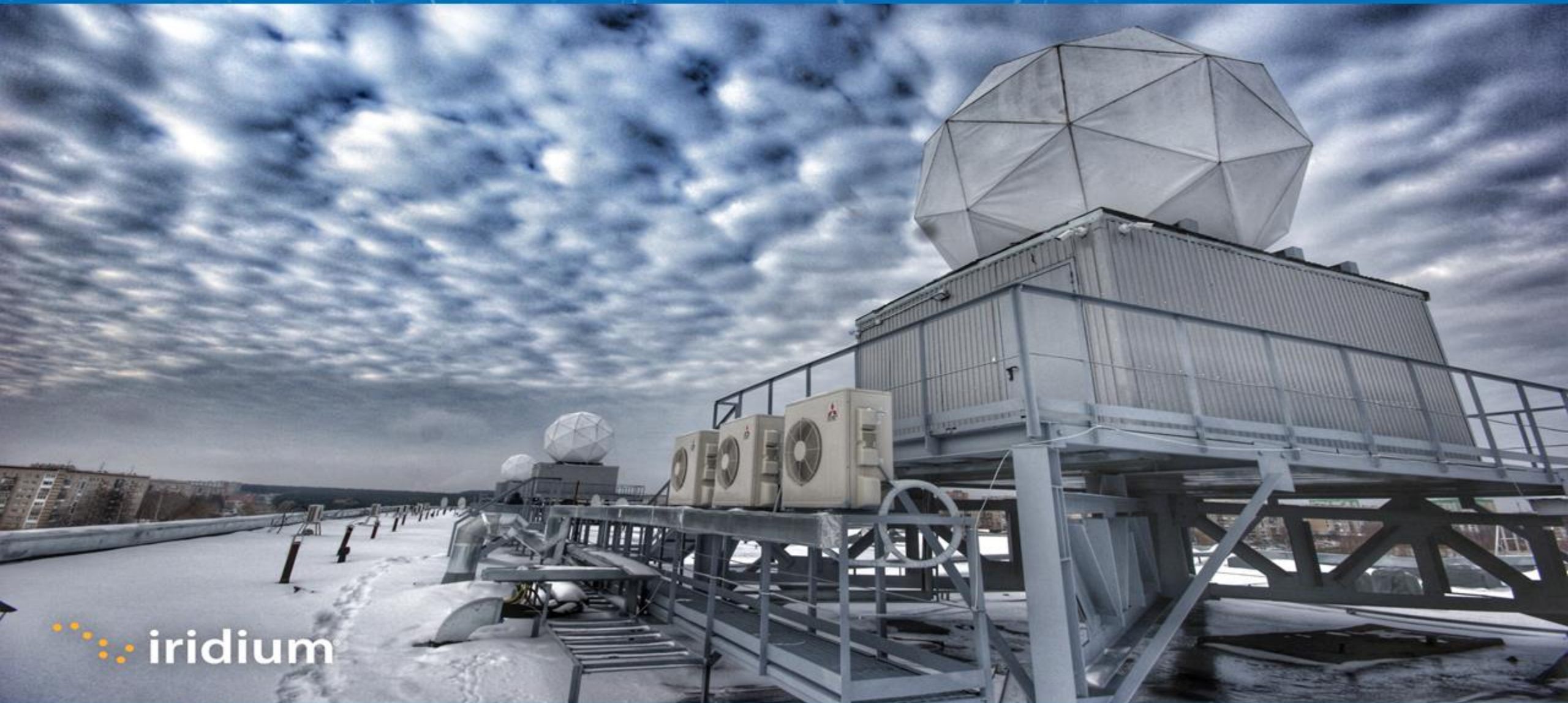
# FAIRBANKS ALASKA



# PUNTA ARENAS CHILE



# IZHEVSK MOSKOW RUSSIA



 iridium



# SVALBARD NORWAY





# USER TERMINAL











# MSISDNM (Mobile Subscriber Identity Number)

MIDXXXXX

# SNAC (Single Network Access Code)

881





# IRIDIUM CERTUS



# Iridium Certus<sup>SM</sup>

Reliable. Everywhere.



22 kbps

## Iridium Certus 20

- Global Maritime Distress & Safety System (GMDSS)
- ACARS
- Asset Tracking
- eLog Book
- Telemetry
- Remote Monitoring



88 kbps

## Iridium Certus 100

- Internet/VPN
- Email
- Graphical Weather (WX)
- Photo Transfer
- Credit Card Validation



1408 kbps

## Iridium Certus 1400

- High Definition Video
- Video Conferencing
- Multi-User Internet / VPN
- Telemedicine

704 kbps

## Iridium Certus 700

- Standard Definition Video
- Video Conferencing
- Multi-User Internet / VPN
- Telemedicine

352 kbps

## Iridium Certus 350

- Flight Data Recorder Streaming
- VSAT Redundancy
- Low Resolution Video

176 kbps

## Iridium Certus 200

- ECDIS Updates
- Aeronautical Charts
- Streaming Audio

**iridium**  
Everywhere

# Iridium Certus® for Merchant Shipping

**Crew Communications**

- Multiple High-Quality Voice Lines
- Smartphone Access
- Messaging Apps
- Prepaid Platform



**Connected Ship**

- Fuel Monitoring
- Engine Monitoring
- Cargo Tracking
- Remote Diagnostics

**Safety Communications**

- GMDSS\*
- Safety Alerting
- Safety Calling

**Bridge Communications**

- Weather Data
- Email & Web Access
- File Transfer
- Database Sync
- Hybrid Cellular/VSAT System

\*Formal authorization received in 2019. Expected service introduction in 2020.



# DISTRESS ALERT

Ενεργοποιείται με το κόκκινο πλήκτρο DISTRESS και οι πληροφορίες αποστέλλονται σε ένα RCC.

- ID
- Distress Nature
- Position



# SAFETY VOICE

Δυνατότητα σύνδεσης με ένα RCC ή/και με άλλες ναυτιλιακές αρχές, μέσω τηλεφωνικής κλήσης του δικτύου του IRIDIUM, για παροχή πρόσθετων πληροφοριών σχετικά με την κατάσταση κινδύνου.

Επίσης δυνατότητα :

- High Priority Calling
- Hydrographic Reporting (Navigational Dangers)
- Medical Advice and Assistance

# OTHER FEATURES

- Distress Alert Relay
- Shore-to-Ship Distress Calling
- Maritime Assistance
- Standard Maritime Calling and Messaging

# RESCUE COORDINATION CENTERS

| Rescue Coordination Center                | Mode      | Operational |
|---|-----------|-------------|
| RCC Atlantic Area Command – United States | Automatic | X           |
| RCC Pacific Area Command – United States  | Automatic | X           |
| RCC Fareham – United Kingdom              | Manual    | X           |
| RCC Stavanger – Norway                    | Manual    | X           |
| RCC New Zealand – New Zealand             | Manual    | X           |
| RCC Australia – Australia                 | Manual    | X           |
| JRCC Bodø (North Norway) – Norway         | Manual    | X           |
| JRCC Piraeus – Greece                     | Manual    | X           |
| MRCC Torshavn – Faroe Islands             | Manual    | X           |
| RCC Bremen - Germany                      | Manual    | X           |



# Iridium SafetyCast<sup>SM</sup> MSI Broadcast



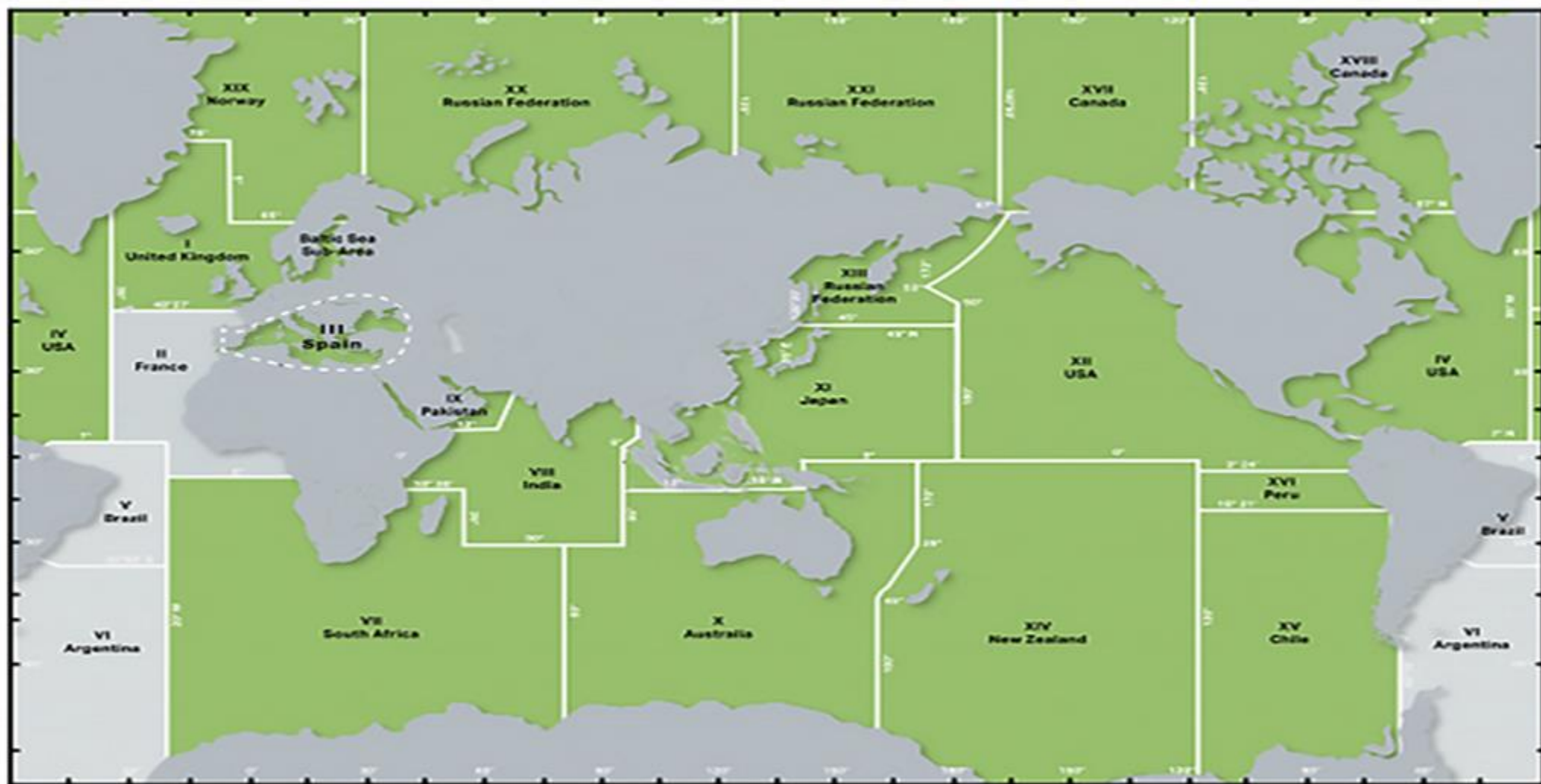
## METAREAS SENDING INFORMATION TO IRIDIUM SAFETYCAST<sup>SM</sup>



| AREA         | COUNTRY        | ATTENDED TRAINING SESSION | COMPLETED AGREEMENT | SENDING INFORMATION TO IRIDIUM (OPERATIONAL OR TEST DATA) |
|--------------|----------------|---------------------------|---------------------|---|
| METAREA I    | UNITED KINGDOM | X                         | X                   | X   |
| METAREA II   | FRANCE         |                           |                     |   |
| METAREA III  | GREECE         | X                         | X                   | X   |
| METAREA IV   | UNITED STATES  | X                         | X                   | X   |
| METAREA V    | BRAZIL         |                           |                     |   |
| METAREA VI   | ARGENTINA      | X                         | X                   | X   |
| METAREA VII  | SOUTH AFRICA   | X                         |                     | X   |
| METAREA VIII | INDIA          | X                         |                     |   |
|              | MAURITIUS      |                           |                     |   |
| METAREA IX   | PAKISTAN       | X                         | X                   | X   |
| METAREA X    | AUSTRALIA      | X                         | X                   | X   |

| AREA          | COUNTRY            | ATTENDED TRAINING SESSION | COMPLETED AGREEMENT | SENDING INFORMATION TO IRIDIUM (OPERATIONAL OR TEST DATA) |
|---------------|--------------------|---------------------------|---------------------|---|
| METAREA XI    | JAPAN              | X                         | X                   | X   |
|               | CHINA              | X                         | X                   | X   |
| METAREA XII   | UNITED STATES      | X                         | X                   | X   |
| METAREA XIII  | RUSSIAN FEDERATION | X                         |                     | X   |
| METAREA XIV   | NEW ZEELAND        | X                         | X                   | X   |
| METAREA XV    | CHILE              | X                         | X                   | X   |
| METAREA XVI   | PERU               | X                         | X                   | X   |
| METAREA XVII  | CANADA             | X                         | X                   | X   |
| METAREA XVIII | CANADA             | X                         | X                   | X   |
| METAREA XIX   | NORWAY             | X                         | X                   | X   |
| METAREA XX    | RUSSIAN FEDERATION | X                         |                     | X   |
| METAREA XXI   | RUSSIAN FEDERATION | X                         |                     | X   |

## NAVAREAS SENDING INFORMATION TO IRIDIUM SAFETYCAST<sup>SM</sup>



| AREA         | COUNTRY        | ATTENDED TRAINING SESSION | COMPLETED AGREEMENT | SENDING INFORMATION TO IRIDIUM (OPERATIONAL OR TEST DATA) |
|--------------|----------------|---------------------------|---------------------|---|
| NAVAREA I    | UNITED KINGDOM | X                         | X                   | X   |
| NAVAREA II   | FRANCE         |                           | EXPIRED             |   |
| NAVAREA III  | SPAIN          | X                         |                     | X   |
| NAVAREA IV   | UNITED STATES  | X                         | X                   | X   |
| NAVAREA V    | BRAZIL         |                           |                     |   |
| NAVAREA VI   | ARGENTINA      |                           |                     |   |
| NAVAREA VII  | SOUTH AFRICA   | X                         |                     | X   |
| NAVAREA VIII | INDIA          | X                         |                     | X   |
| NAVAREA IX   | PAKISTAN       | X                         | X                   | X   |
| NAVAREA X    | AUSTRALIA      | X                         | X                   | X   |

| AREA          | COUNTRY            | ATTENDED TRAINING SESSION | COMPLETED AGREEMENT | SENDING INFORMATION TO IRIDIUM (OPERATIONAL OR TEST DATA) |
|---------------|--------------------|---------------------------|---------------------|---|
| NAVAREA XI    | JAPAN              | X                         |                     |   |
| NAVAREA XII   | UNITED STATES      | X                         | X                   | X   |
| NAVAREA XIII  | RUSSIAN FEDERATION | X                         |                     | X   |
| NAVAREA XIV   | NEW ZEELAND        | X                         | X                   | X   |
| NAVAREA XV    | CHILE              | X                         | X                   | X   |
| NAVAREA XVI   | PERU               | X                         | X                   | X   |
| NAVAREA XVII  | CANADA             | X                         | X                   | X   |
| NAVAREA XVIII | CANADA             | X                         | X                   | X   |
| NAVAREA XIX   | NORWAY             | X                         | X                   | X   |
| NAVAREA XX    | RUSSIAN FEDERATION | X                         |                     | X   |
| NAVAREA XXI   | RUSSIAN FEDERATION | X                         |                     | X   |

- Ships Security Alert System (SSAS)
- Long-Range Identification Tracking (LRIT)
- Search and Rescue (SAR)
- Fisheries VMS and Catch Reporting
- Emissions Monitoring (MRV)
- E-Navigation
- Anti-Piracy and Citadel Solutions
- Ice Navigation