

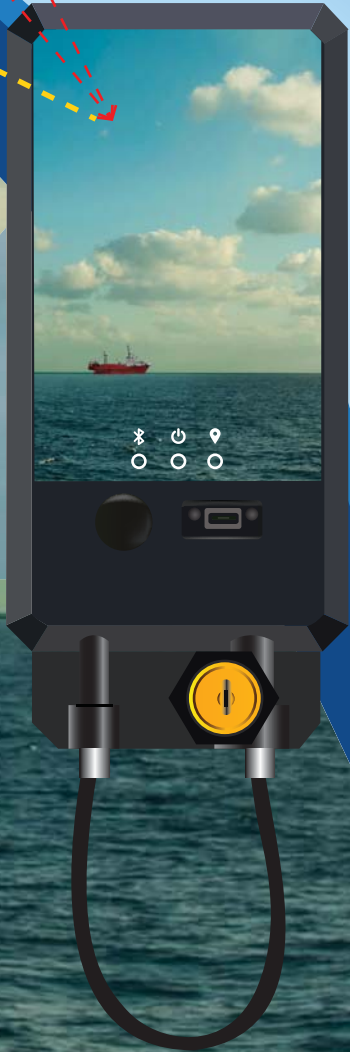
- 1. Potential Fishing Zone Advisory
- 2. Oceanic Weather Alerts
- 3. Navigation



Marino 

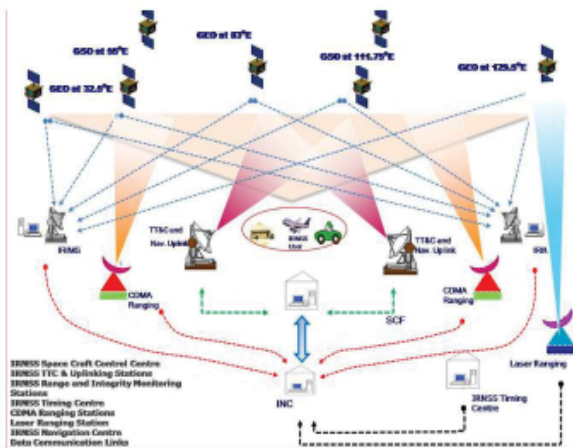


NavIC BASED MESSAGING RECEIVERS



About IRNSS (Indian GPS)

IRNSS is an independent regional navigation satellite system being developed by India. It is designed to provide accurate position information service to users in India as well as the region extending up to 1500 km from its boundary, which is its primary service area. An Extended Service Area lies between primary service area and area enclosed by the rectangle from Latitude 30 deg South to 50 deg North, Longitude 30 deg East to 130 deg East.



IRNSS Architecture

IRNSS provides two types of services, namely, Standard Positioning Service (SPS) which is provided to all the users and Restricted Service (RS), which is an encrypted service provided only to the authorised users. The IRNSS System is expected to provide a position accuracy of better than 20 m in the primary service area.

Some applications of IRNSS are:

- Terrestrial, Aerial and Marine Navigation
- Disaster Management
- Vehicle tracking and fleet management
- Integration with mobile phones
- Precise Timing
- Mapping and Geodetic data capture
- Terrestrial navigation aid for hikers and travellers
- Visual and voice navigation for drivers

Marine Navigation and Disaster Management functionalities of IRNSS.

IRNSS: INDIAN REGIONAL NAVIGATION SATELLITE SYSTEM

7

SATELLITES

3

GEOSTATIONARY

36,000

KM

4

GEOSYNCHRONOUS

₹1,420

CRORES

Covers India and up to **1,500** km beyond its borders

3 extremely accurate rubidium atomic clocks in each satellite

GPS receivers will not work; need special receivers (yet to be developed)

IRNSS provides Standard Positioning Service

Open to all users

Accuracy better than 20 metres

4 satellites in geosynchronous orbit – in pairs, move in two inclined orbits – appear from ground to travel in figure '8' – assist in accurate position determination

3 satellites in geostationary orbit – appear from ground to be at fixed

The operational name of IRNSS is NavIC ("sailor" or "navigator" in Sanskrit, Hindi and many other Indian languages and also standing for NAVIGATION with Indian Constellation).



Technology Solution for Fishermen Community

Problem areas

The fishing community uses traditional methods of locating fishing grounds using Bird Congregation, Colour of water, Bubbles breaking on sea surface, Waves and currents, and even smell. These obviously are not accurate.

Moreover, there is No Telecom connectivity at deep sea.

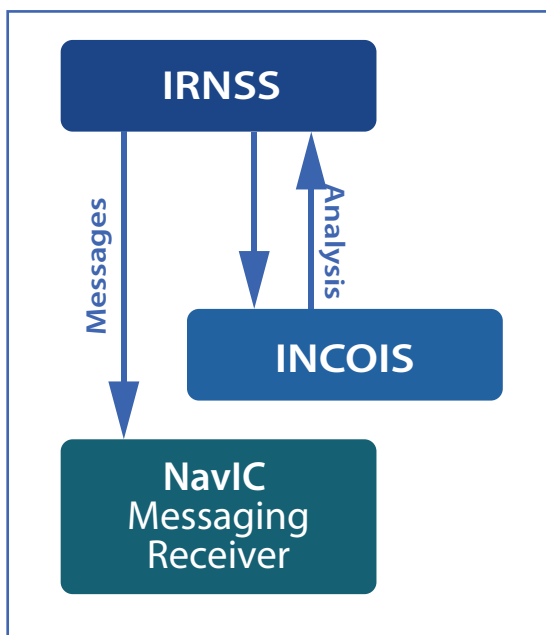
Advisories on Potential Fishing Zone using Satellite Communications

Indian National Centre for Ocean Information Services (INCOIS) under Ministry of Earth Sciences (MoES) provides ocean information services for the benefit of various user communities in the country. The services are more fruitfully utilized when the advisories reaches the end user in timely manner and in user readable format. INCOIS has adopted the state-of-the-art technologies and tools available in the country for the timely dissemination of Ocean Information and Advisory Services that includes

- Potential Fishing Zone (PFZ) advisories,
- Ocean State Forecast (OSF),
- High Wave Alerts and Tsunami early warnings.

These advisories and Alerts cannot reach the fishermen as there is no Telecom Connectivity at Deep Sea, and Satellite Phones are exorbitantly priced.

The Advisories would reach the fishermen through the NavIC Messaging System.



The NavIC Mobile application on Android Mobile Phones would work totally offline and display areas for potential fishing zones. The App would also provide the facility for waypoint navigation from the fisher's current position to the selected area of potential fishing. Through INCOIS, the App would also generate **Emergency Alert Messages** for extreme or adverse weather conditions – **cyclones, tidal waves, high tides, Tsunamis** etc.





The NavIC application would provide:

- Any emergency alert would be easily available to the fishermen, as a result a lot of lives would be saved
- Facility to receive emergency messages - high tide wave, cyclone, etc. from INCOIS
- Way point Navigation from current location to Selected Potential Fishing Zone
- Alert messages on nearing or crossing the International borders or nearing or entering foreign country borders.

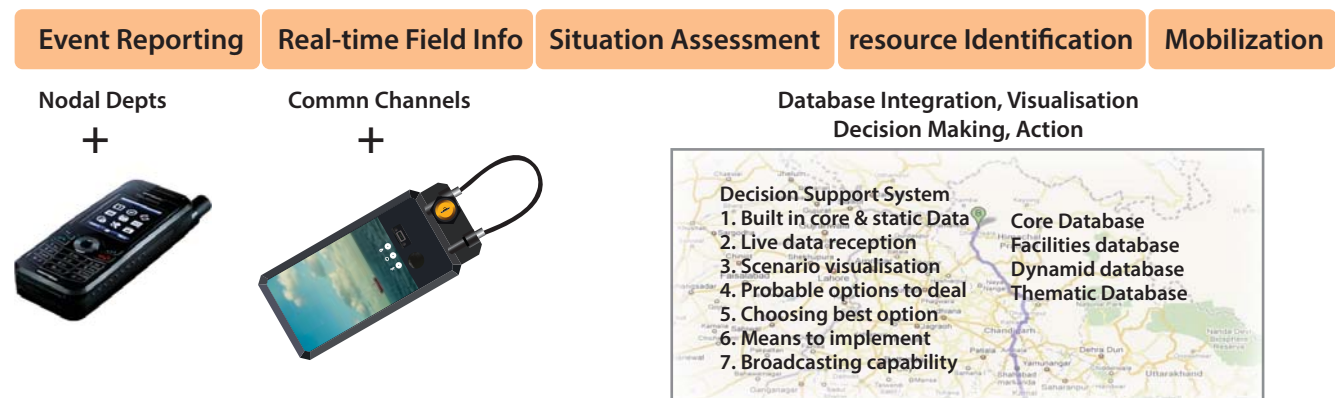
Technology Solution for Disaster Management

Problem areas

Natural Disasters like floods, cyclones are not very uncommon in India. Odisha Government has done tremendous work in Disaster Management and saving lives. During such disasters, communication becomes a big challenge as the Telecom Networks are unreliable and Radio Messaging work only in a very limited distance. Satellite phone are extremely costly.

- Way point Navigation from current location to Selected Potential Fishing Zone
- Alert messages on nearing or crossing the International borders or nearing or entering foreign country borders.

NavIC based Disaster Relief Services



NavIC based Messaging Receivers are the tools that would come handy during the emergency situations where disaster relief is urgent and important, as there can be Satellite based communication and messages to remote areas and each up to the Village Panchayat level. Weather advisories can be transmitted through this channel, and also potential hazards due to inclement climatic changes can be communicated too. In addition, various remote sensing based modeling to estimate storm water surge estimation is continuously disseminated, which can now reach to each village through NavIC Messaging Receivers.

NavIC Messaging Receivers

The NavIC Messaging Receiver is designed and developed in collaboration with the Space Applications Centre (SAC), ISRO, Ahmedabad for reception and display of Satellite messages. The receiver transmits raw data over to display units like Mobile Phones using Bluetooth link. An application running on a smart device like mobile phone or tablet having Bluetooth connectivity can decode and display the messages for users. This receiver is designed as battery operated low power device.

The Mobiles Phones with the Android Apps being developed in collaboration with ISRO would get and display the Emergency Alert messages from the NavIC Messaging Receivers developed again in collaboration with ISRO. The Android Mobile Phones would remain connected with the NavIC Messaging Receivers via Bluetooth and even if there is no Telecom Network available at the deep sea or during emergencies, the Android Mobile Apps would receive the Messages from the NavIC Messaging Receivers via Bluetooth and Display on the Mobile Phone Screen.

Detailed Specifications – NavIC Messaging Receivers

MCU: 8-bit MCU
OS: built-in OS
Flash: 2 kB SRAM, 32 kB Flash, 1 kB E2PROM
Ports: Mini USB – For charging (Power Bank)
Battery: Rechargeable 3.7V, 10000 mAh Battery
Wireless: Bluetooth®
GPS/IRNSS : NavIC Receiver compatibility and built-in Antenna
 L5 Band Support
 High-sensitivity GPS/ IRNSS/GLONASS/BeiDou/Galileo and QZSS
 SBAS Supports (WAAS/EGNOS/MSAS/GAGAN)
 Cold Start: <120s
 Hot Start: <1s
Power : Key Button to On/Off
Accessories : 10000mAh battery
 AC charger
 Power Bank
 Quick Start Guide
 Shipping box
 1-Year warranty Card

Marino[®]



The PFZ advisories help in increased fish catch (2-5 times) and reducing searching time (about 30-70%), which leads to savings towards cost of fuel.

An original research product from Stesalit

Manufactured by:

Skycube Networks Pvt. Ltd.

Om Chambers, No. 648, Unit No. A8, 3rd Floor Binnamangala, 1st Stage, Hoysala Garden,
100 Feet Road Cross, Indira Nagar, Bengaluru - 560038, Karnataka,
Phone: +91 80 4851 8391, www.skycube.in