Advances in NavCom for Societal and Strategic Applications
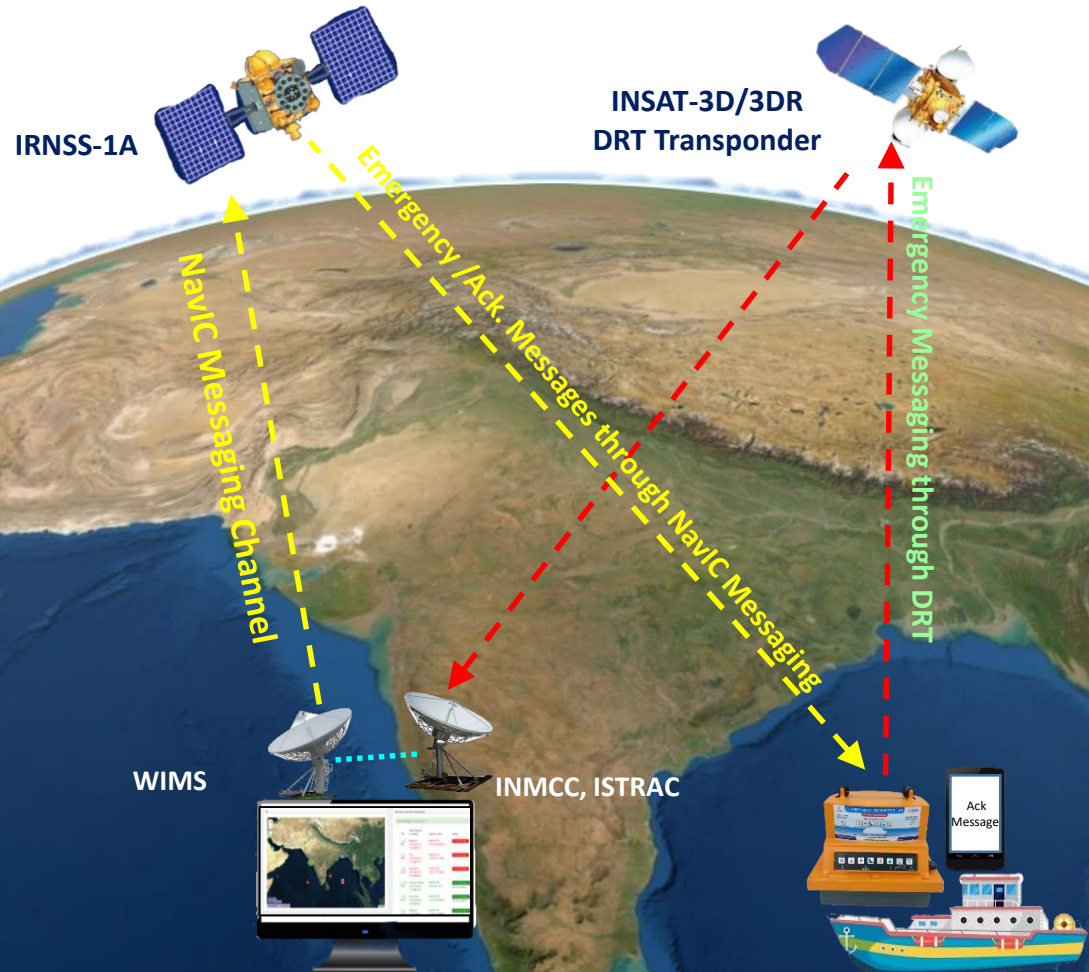
Dr. Chandra Prakash
Head-Satellite Communication Technology Division
Space Applications Centre, ISRO, Ahmedabad, India

DISTRESS ALERT TRANSMITTER-SECOND GENERATION

ISRO / इसरो

NavIC

Salient Features

- ✓ Distress Alert Messaging with Ack.
- ✓ Continuous Weather, PFZ Alerts
- ✓ Emergency Message Broadcast
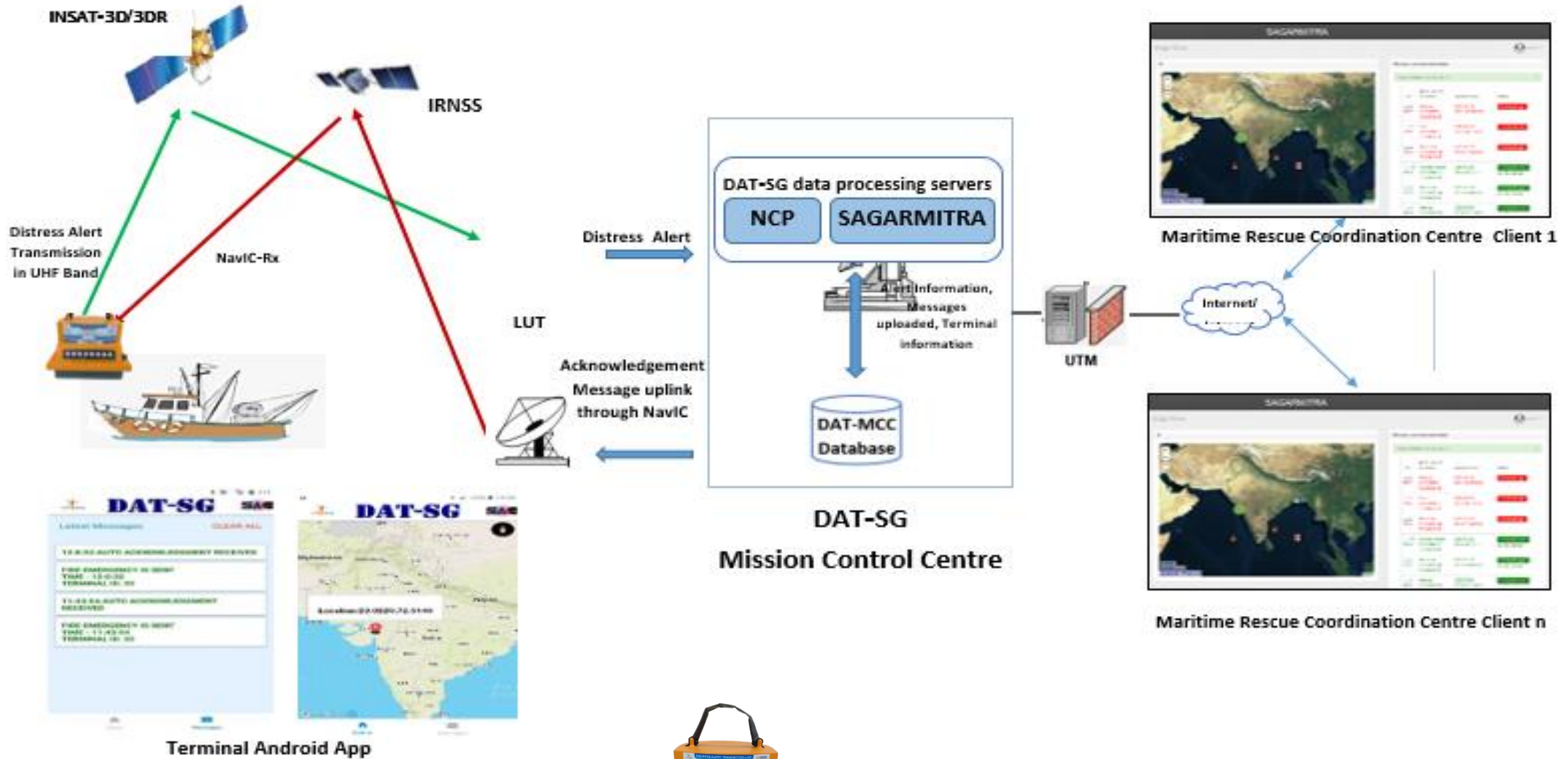- ✓ Alert monitoring and rescue coordination by Indian Coast Guard

IRNSS-1A

INSAT-3D/3DR
DRT Transponder

Emergency /Ack. Messages through NaviC

NaviC Messaging Channel

Emergency Messaging through NaviC Messaging

Emergency Messaging through DRT

DAT-SG

Distress Alert Transmitter-Second Generation (DAT-SG)

WIMS

INMCC, ISTRAC

Ack Message

Distress Alerts

- ➕ **Medical**
- 🏊 **Man Overboard**
- 🔥 **Fire**
- 🚢 **Boat Sink**
- 🥷 **Terrorist Attack**
- 👍 **All OK**

SAGARMITRA : An operational web-based Network Management System to support emergency messaging by Fishermen while fishing at Deep Sea

National Network for Emergency Messaging by Fishermen
(Distress Alert Transmitter-Second Generation)

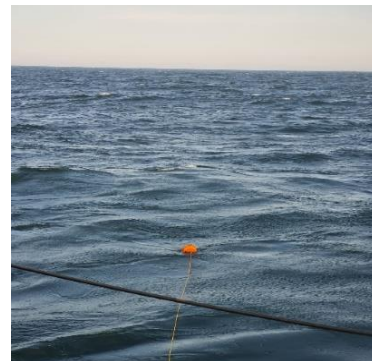# Sagarmitra: Web-Based Network Management System

Action and Control menu

Alert location display on GIS map with descriptive logo

- Alert Information Table to display Terminal Id, Alert type, Location, Time, Acknowledgement Status
- Clicking on Ack. button will send Ack. message to terminal

DAT-SG Trials at Porbandar


DAT-SG Trials at Chennai

National MSS Network for Vessel Monitoring and Emergency Communication

Network Features:

- Satellite based automatic periodic tracking of boats/ships
- Two-way Messaging from boat/ship to Control Station
- SoS from Boat/Ship to Control Station
- Emergency Broadcast from Control Station to Boats/Ships
- Weather alerts, PFZ messages to users, IMBL Alerts

Tracking of sub-20m boats
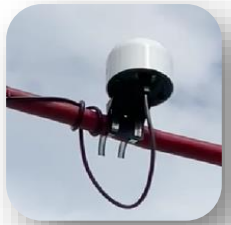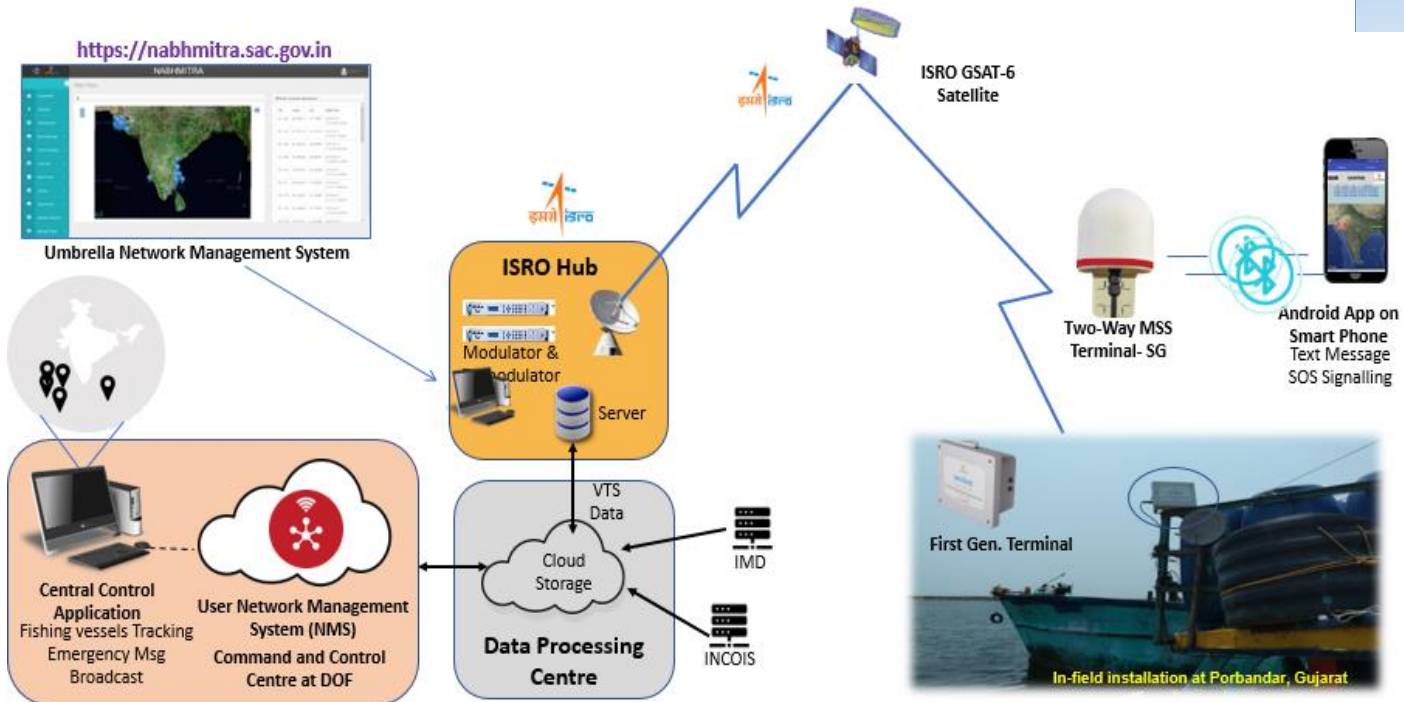
National roll-out with 100K+ Xponders in Progress ...

NavCom Xponders
(Multiple OEMs)

MSS Network for tracking of sub 20m boats

- **Features:**

- Position Reporting
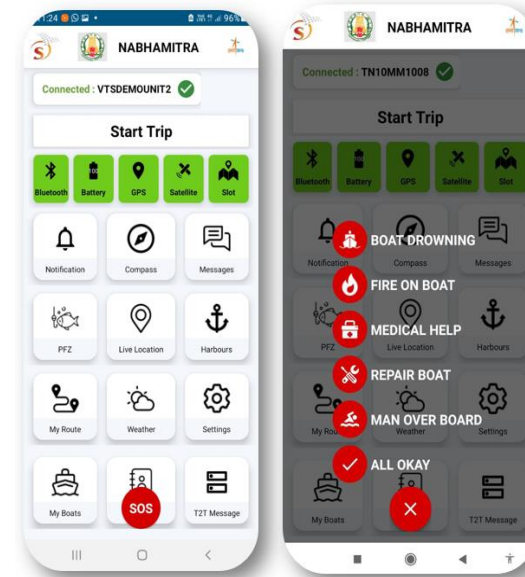 - NavIC enabled GNSS for position determination and periodic tracking of boats/ships

- Emergency Messaging
  - SoS Messaging ; Distress Alert Messaging
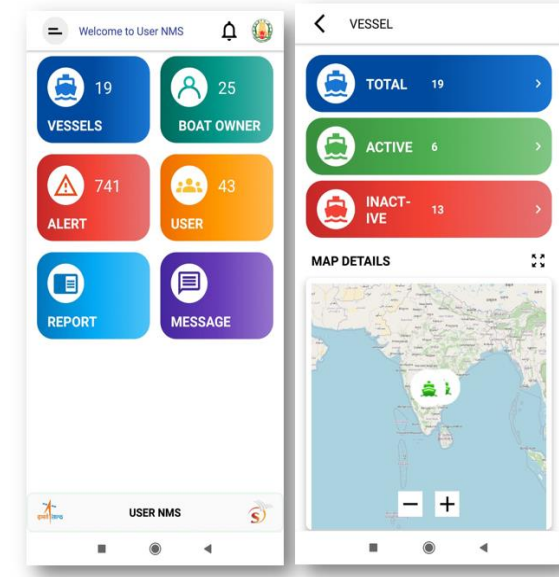 - Emergency Broadcast Supported

- Advance NavCom features
  - Weather alerts, Potential Fishing Zone messages
  - International Maritime Boundary Alerts
  - Custom Geo-Fencing Alerts
  - Mobile App for users

FISHERMEN APP

OWNER MOBILE APP

~2000 terminals are installed in Tamil Nadu and being monitored in real-time and network is operational on 24 x7 basis. 100K+ more devices are to be added in network by 2024.

Real-Time Aircraft Tracking System

Real Time Aircraft Tracking System (RTATS) is a NavIC enabled MSS transponder, conceptualized and implemented for real-time tracking and emergency communication of User Air-crafts.
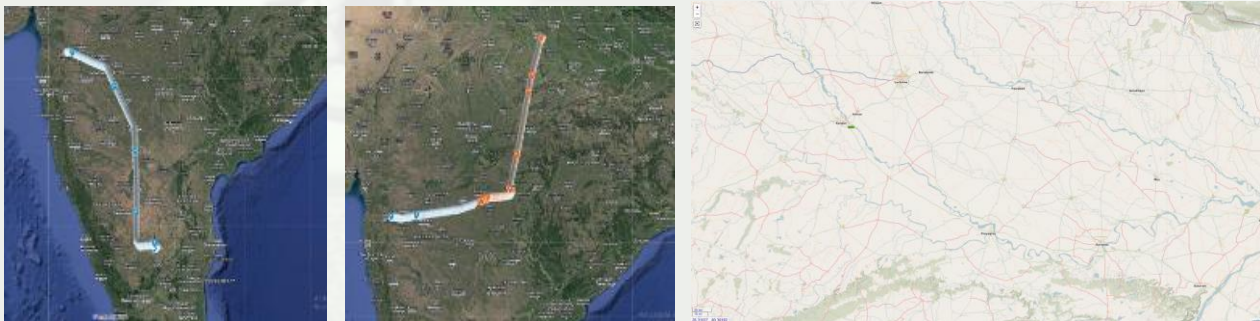
Features

- Position reporting every 4 secs
- Real time Tracking (GIS-based)
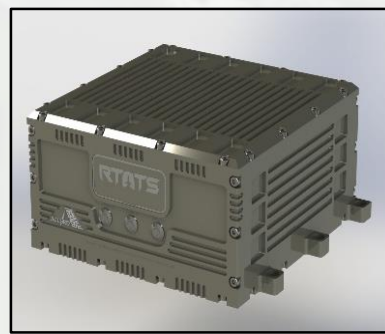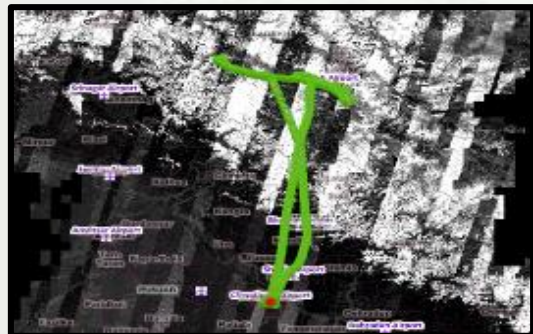- Capable of Short t

MSS Terminal with NavIC Rx

Equipment Bay

Aircraft Cockpit
NavIC Antenna
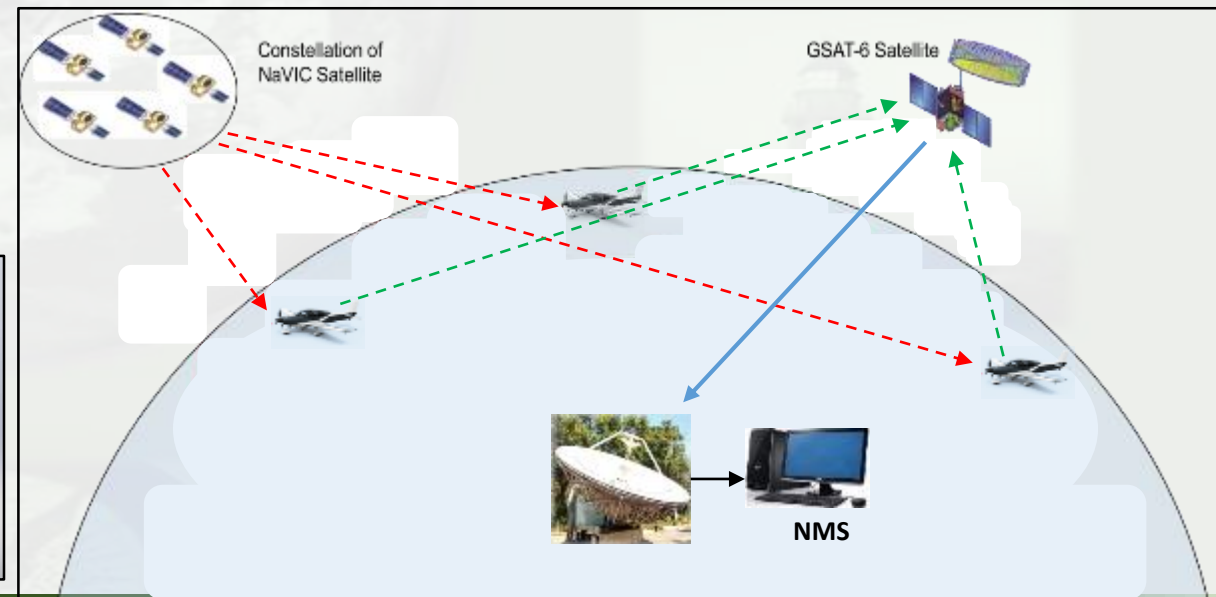**Antenna**
S-Band

Snapshots of the Proof of Concept testing of RTATS

Real time tracking information received at control station from RTAT Terminal installed on User Aircraft during Aero India 2023

Air-Sortie-2022 (Northern Border)

Snapshots of the RTAT Terminal

Constellation of NaVIC Satellite

GSAT-6 Satellite

NMS

Network Diagram

THANK YOU ....