



**Comprehensive application of RNSS+RDSS**

# **A New BDS-based Method on Disaster Relief and Rescue**

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# 1. BDS Featuring RNSS+RDSS(3-1)

The unique characteristics of BDS:

## RNSS+RDSS

There are unique advantages in areas where both positioning and position reporting are needed, especially in disaster relief.

\*RNSS: Radio Navigation Satellite System

\*RDSS: Radio Determination Satellite Service



GPS



GLONASS



BDS



GALILEO

# 1. BDS Featuring RNSS+RDSS(3-2)

Low cost space-based positioning and communications services  
**BDS RNSS+RDSS**

## Monitoring

wind force,  
temperature,  
humidity, pressure,  
precipitation,  
water level, etc.

## Reporting

Abnormal  
automation and  
man-made  
disaster reporting

## Broadcasting

Position-based  
disaster  
broadcasting

## Commanding

Rescue worker  
dispatch, vehicle  
scheduling and  
material  
distribution

Disaster Relief and Rescue System

# 1. BDS Featuring RNSS+RDSS(3-3)

- **15 years of service, widely used in disaster-prone areas such as oceans, seismic zones and other disaster-hit areas.**

Marine fishery



Earthquake rescue operations



Forest Fire Prevention



Floods



Blizzards



Construction monitoring



- **Over 1.2 million ships and 10 million workers involved in shipping & fishery in china. It is a high-risk, accident-prone industry.**
- **Based on a case of the application of RDSS service in marine fishery, This Presentation describes the applications of RDSS in disaster relief and rescue.**

## 2. Requirements of Marine Fishery (5-1)

- Disasters such as windstorms, fire, etc. and accidents such as collision and piracy are commonly seen in the marine fishery. Therefore, a low-cost satellite navigation & communications services are desperately needed to ensure that ship crew's life and property

Traditional Radio System	BDS-based Management system
Unable to meet the needs, fishing vessel monitoring lack of low-cost and effective communication facilities	With positioning and communications, all-weather, no blind spots, the advantages of good confidentiality, and is Suitable for large-scale group user applications

- Expensive
- Lack efficient management
- Unable to effectively come to victims' rescue timely when a disaster or accident happens

- SOS Emergency Call
- Timely and effective rescue
- Low-cost communications services
- Boat tracking

### Application Requirements-Fishery (2)

- Administration of marine fishery ship is currently facing the following issues:
  - How to get accurate information about the situation and distribution of fishing vessels?



## 2. Requirements of Marine Fishery (5-3)

### Application Requirements-Fishery (3)

- How to get the positions of vessel in distress and know the type of the distress timely?
- How to organize effective search and rescue or mutual rescue among the vessels timely ?





## 2. Requirements of Marine Fishery (5-4)

### Application Requirements-Fishery (4)

- How to implement effective administration and lower costs of law enforcement
- How to release the weather forecast and sea conditions forecast to the vessels?

(For example: the typhoon's path etc. )





## 2. Requirements of Marine Fishery (5-5)

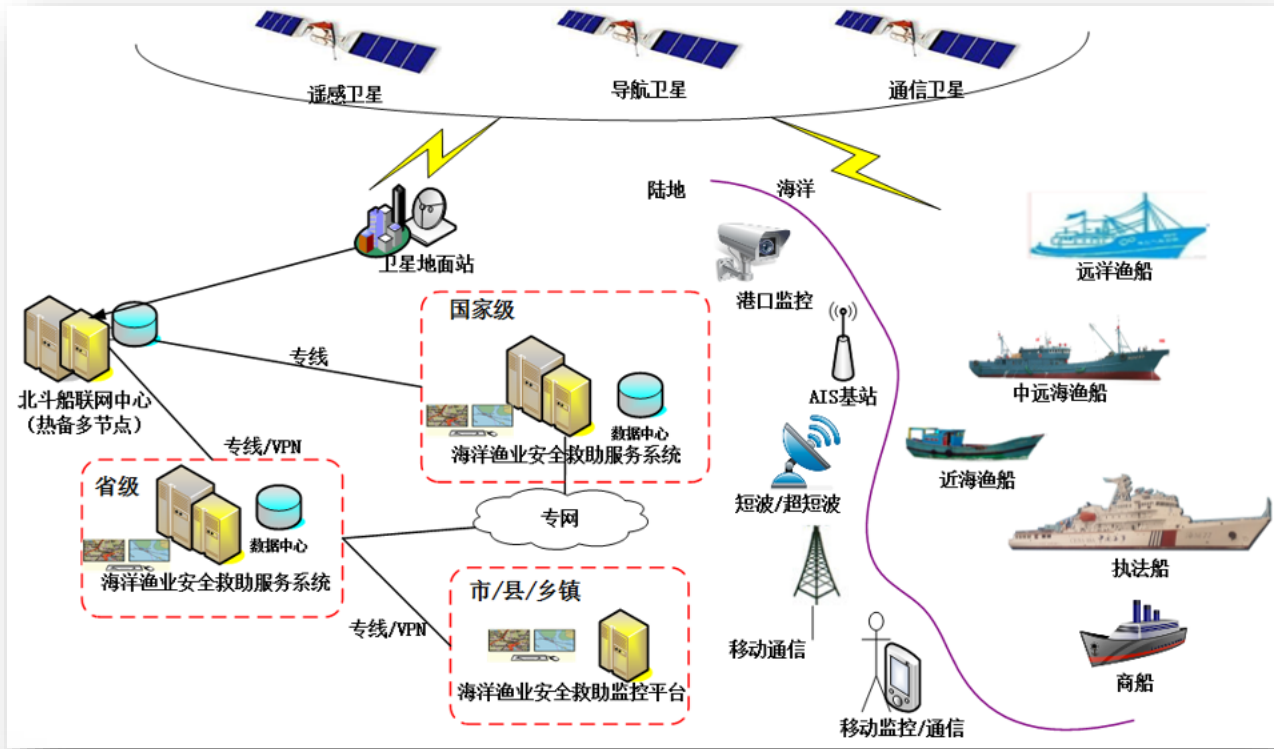
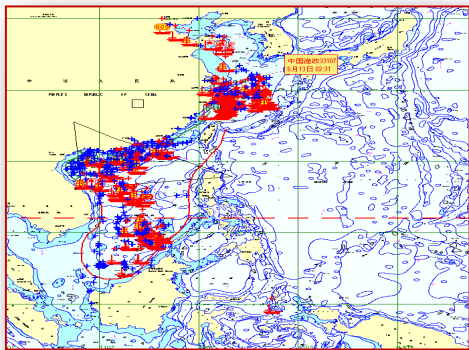
### Application Requirements-Fishery (5)

- How can we help families of fishermen understand their situation and location at sea in the harsh conditions of the sea? (To typhoon coming)

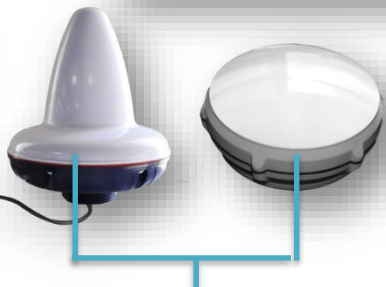


# 3. BDS-based Boat Management & Disaster Relief Process and Case Study Analysis (5-1)

BDS-based Networks of ships makes full use of the RNSS and RDSS services provided by BDS.

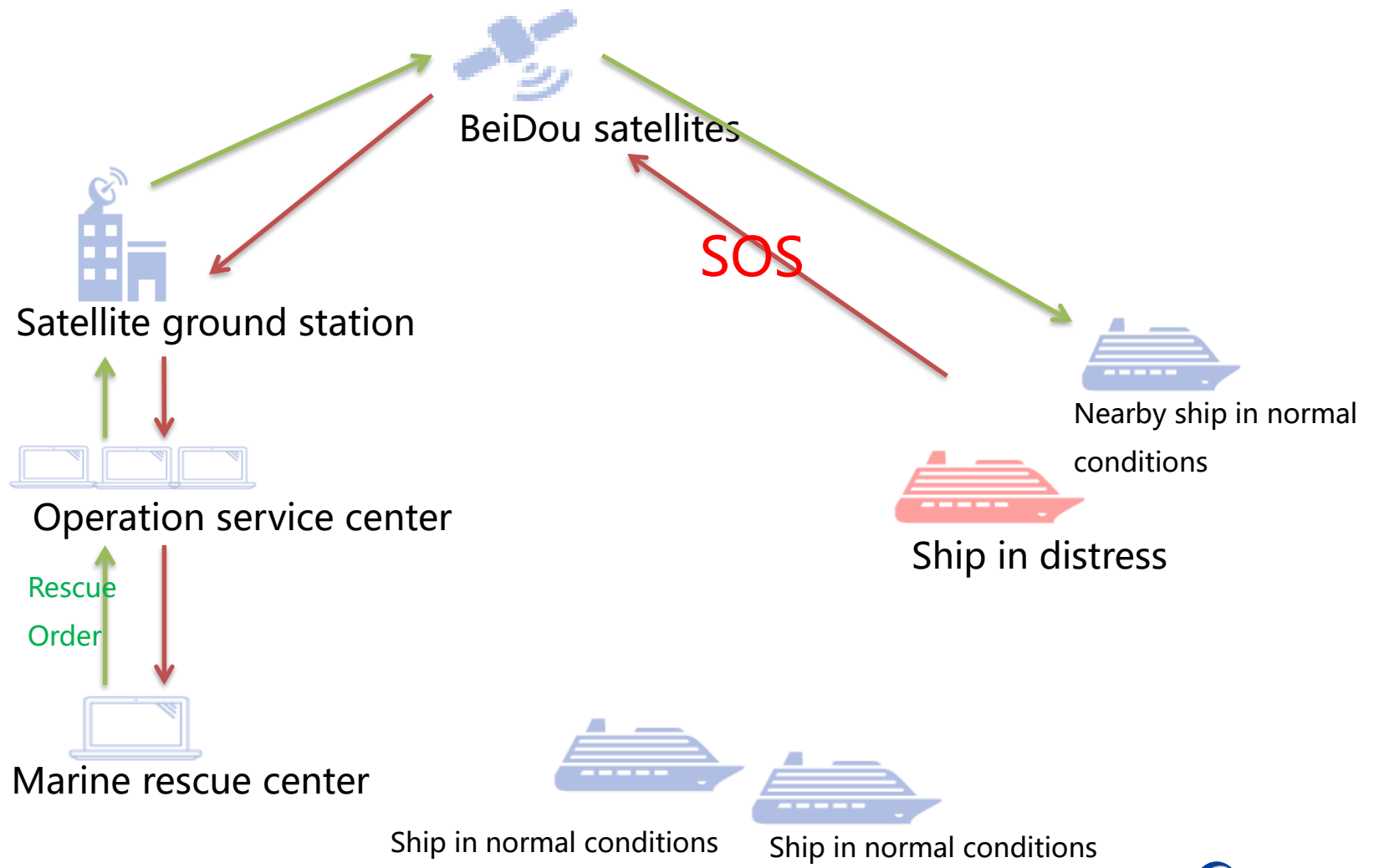


Display & Control Units



Positioning & Communications Units

## BDS-based Boat Management & Disaster Relief Process :



#### Case 1 :

- On 13 October 2016, a fishing boat sunk in waters in Hainan Province. The crew member sent a SOS message instantly through BDS.
- The Command Center immediately sent a rescue order to all ships within 50 nautical miles of this boat. Thanks to the timely rescue efforts, the 13 crew members were successfully rescued.

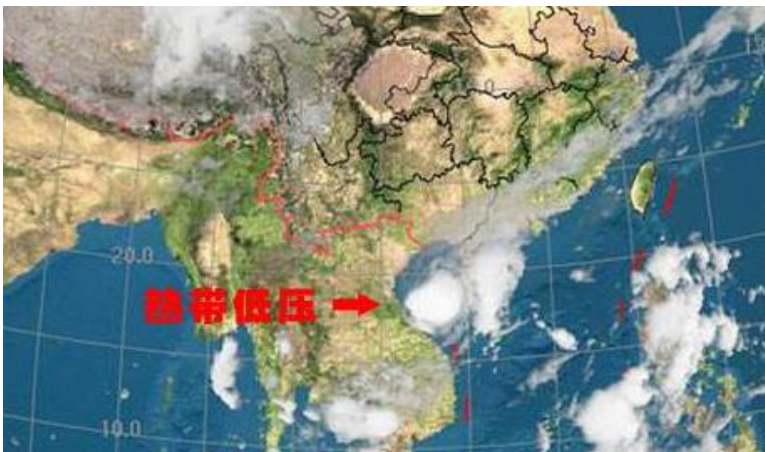




### 3. BDS-based Boat Management & Disaster Relief Process and Case Study Analysis

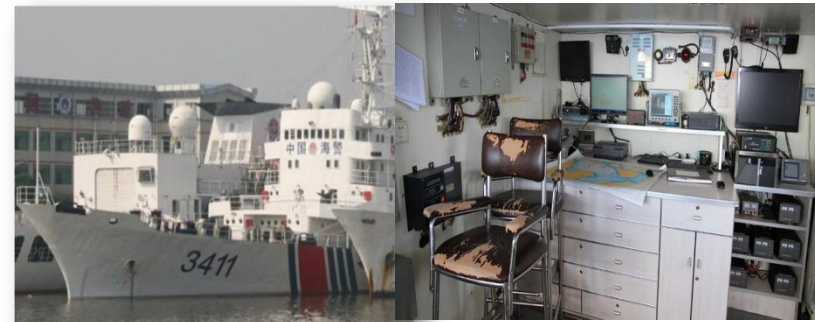
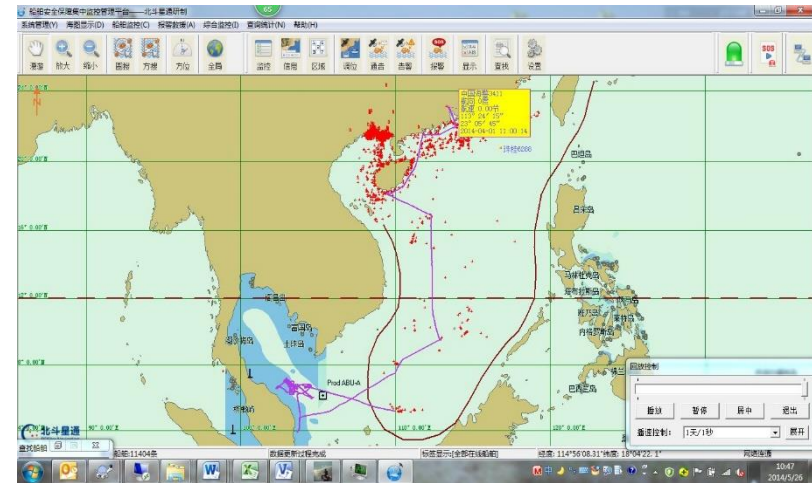
#### Case 2 :

- On 16 November 2008, a tropical depression suddenly formed in the South China Sea. The command center instantly sent a warning message to the fishing boat asking it to return to the port as quickly as possible.
- The captain steered the boat out of the dangerous zone immediately after receiving the message and send its position to the onshore command center every 10 minutes during the 15-hour return trip . An accident was therefore avoided.



#### Case 3 :

- In the early morning of 8 March 2014, Malaysia Airlines Flight **MH370** lost contact with the air traffic control at the border between Malaysia and Vietnam where it vanished from radar coverage.
- The Chinese maritime police **boat 3411** was the first Chinese vessel to arrive at the scene. With the support of BDS, it successfully finished its mission of continuously searching for 147 hours, sailing for 1527 sea miles , a sea area of 7821 square kilometers.





# 4. Other Applications of BDS in Disaster Relief Operations(4-1)

## Forest Fire Prevention :

- Send the current locations of firefighters, vehicles, helicopters to the fire command center.
- Feedback the situation of scene throught BDS.

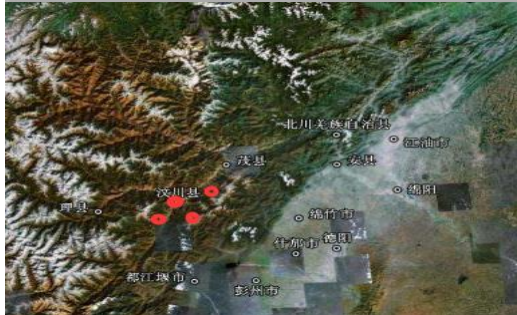


# Other Applications of BDS in Disaster Relief Operations(4-2)

## Earthquake Rescue Operations :

After the earthquake happens, ground communications network will be destroyed:

- 1.BDS can be used to **report disaster situations** to the command center for disaster evaluation and disaster rating to produce the rescue plans.
- 2.BDS can be used by command center to **get the locations of rescue workers and rescue vehicles** to do the dispatch work , coordinate the work of different rescue teams as well as report the injured and their locations.





## 4. Other Applications of BDS in Disaster Relief Operations(4-3)

### Meteorological Disaster Relief Operations (floods, snowstorm, etc.) :

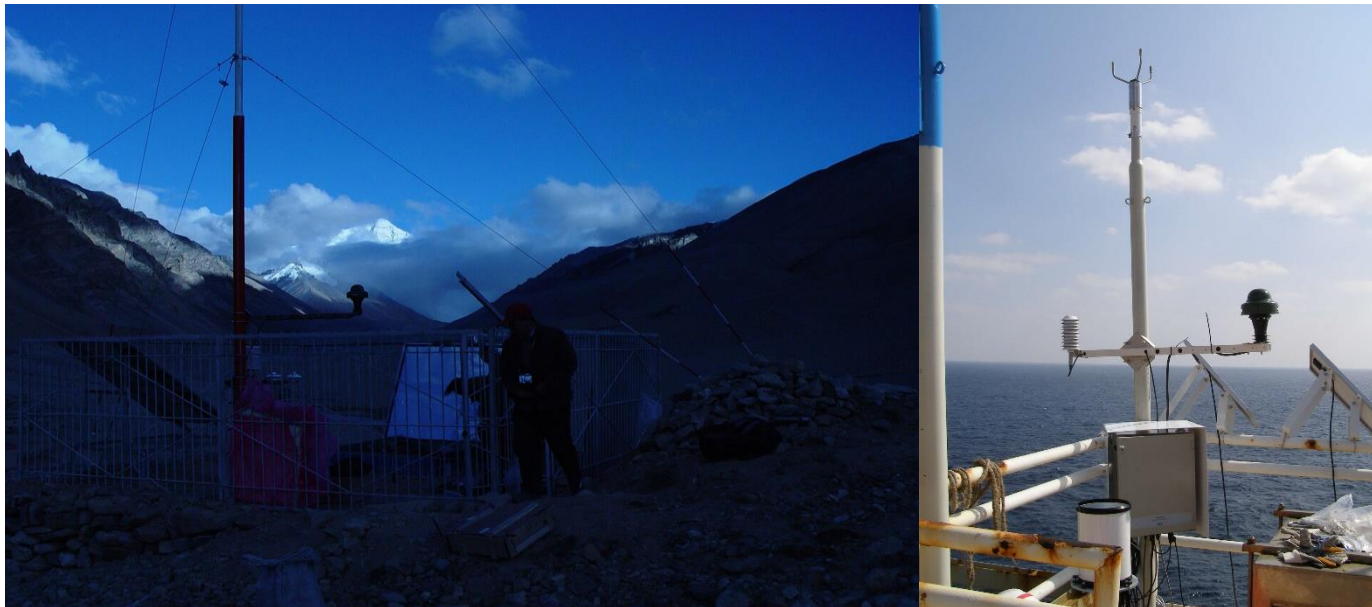
After the serious floods and snowstorms hit the regions, BDS can be used to provide communications service for the most affected areas and the command center to **help them keep in touch.**



## 4. Other Applications of BDS in Disaster Relief Operations(4-4)

### Meteorological Disaster Monitoring (windstorm, sandstorm, floods, etc.)

1. BDS is used to **remotely monitor** on the wind speed, temperature, humidity, pressure, wave, hydrology, precipitation, etc. of remote areas such as Qinghai-Tibet Plateau, desert, and oceans, etc. in China.
2. Realize the **early warning report** which can help greatly reduce the loss before the disaster



## 5. In Summary

1. The ground-based system will become inoperable when disasters such as typhoons, floods, snowstorms and earthquakes strike. Therefore, **the space-based system should be needed for disaster relief and rescue operations**, especially for the rescue operations in remote areas.
2. Such equipment and services have fewer opportunities to use and require **low prices for equipment and services**, especially in China and the three world countries.

## 5. In Summary

3. The unique RNSS+RDSS system of BDS effectively meets the requirements of disaster rescue for location and communication. **The system responds quickly and the application cost is low.**

4. Since the Beidou system was put into operation, it **has been widely used in offshore ships, earthquake rescue, typhoon early warning, snow disaster relief and tourist assistance** in isolated areas, which has played a huge role. Up to now, **more than 10 thousands fishermen have been saved only in the field of Marine Fisheries.**



# Thanks For your attention!



Website



Weibo



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