BDS Applications in the Transport Industry

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Brief Introduction
Introduction of CTTIC

China Transport Telecommunications & Information Center (CTTIC) is the 1st basic telecommunication service operator in China for mobile satellite communication services. CTTIC operates the Beijing Satellite Access Station and also the business of Inmarsat in China, therefore has accumulated rich experience.

**Complete Infrastructure**
Self-owned and operated high standard facilities with reliable power supply, cyber security and O&M systems, etc..

Inter-connected with terrestrial mobile communication network such as China Telecom, China Mobile and China Unicom

**Significant Duties**
Responsible for Maritime distress alert monitor and relay to SAR related agencies

Connected to CNMRCC and CRS of MOT via dedicated high-speed network

**Service Operation**
Responsible for the demonstration, promotion and internationalization of BDS applications in the transport industry

Complete, standard and orderly service system, including sale, subscription, accounting, customer service, technology development and so on
Introduction of CTTIC
Transport - Key BDS Application Industry

**Transport Industry:**
- Numerous units, long distances, wide areas and high mobility;
- Biggest civilian user of BDS;

**Ministry of Transport (MOT):**
- Competent ministry of the transport industry;
- Long-term supports for BDS application and industrialization.
Application in Road Transport
Road Safety Service

Road Transportation Safety Service System

Main Functions

- Real-time Monitoring
- Driving safety warning
- Road information distribution
- Data statistics

Nearly 8 million registered, biggest Internet of Vehicles
Over 8,500 million driving risk warnings delivered since its operation in 2013

Overspeed correction: 97%

Fatigue driving correction: 57%
Facilitating BDS applications in cross-border road transportation

- Improving custom clearance efficiency
- Improving monitoring and inspection capability in cross-border transportation
- Providing data support for border trade
- Improving public service capability
International Road Transport Management and Service Information System

- GIS map based search, inquiry and demonstration of international road transport routes;
- Direct dynamic route and track preview supporting online command and control.
- Mobile app supported.
BDS Application in Maritime
BDS Maritime Terminals

- BDMSS Maritime Mobile Terminal
- BDMSS Shipborne Terminal
- BDS Maritime Intelligent Terminal
- BDS EPIRB
The system enables active and passive alerting when distress or man overboard happens. Diverse communication connections help improve the efficiency of SAR operation.
BDS Ship Dynamic Service System
Terminal Interface
Smart Port Construction

Application demands

- High construction and maintenance cost of traditional magnetic nail navigation
- Labor costs increase the demand for automated operations in ports
- Demand in improving operational efficiency and safety
- Demand in port transformation and digitalization

Precise positioning is an essential foundation for the construction of smart ports, and location data is the cornerstone of intelligence.
BDS high precision service supports the transformation and digitalization of mechanical automation in port operations. With BDS high precision positioning terminals installed on trucks in the port area, intelligent freight transport dispatch, visual and digital monitoring and automatic loading and unloading of goods in port yards could be realized.
Automated Port Operation

BDS antennas installed in Ningbo Zhoushan Port areas

Automated operations via remote control
By building BDS based intelligent ship lockage system and installing shipborne intelligent BDS terminal, ETC intelligent ship lockage is realized with high efficiency and service quality to enable “non-stop reporting, tolling and consecutive lockage”.
BDS International Services
BDS Internationalization

To promote the application of BDS, MOT has been facilitating the internationalization of BDS under the structure of international organizations such as IMO, ICAO, IEC and Cospas-Sarsat.
MEOSAR Service Process

1. PLB, EPIRB
   - Forward link alert with RLM request in downlink 1544.21 MHz
   - Forward link alert with RLM request in uplink 406 MHz

2. Inter-Satellite Link
   - MEOSAR

3. MEOLUT
   - Transmission of distress beacon data

4. RCC
   - Distress alerting and positioning

5. MCC
   - MCCs around the world

6. BDS Operation and Control Center
   - RLM Downlink
   - Payload status monitoring in downlink 1544.21 MHz
   - RLSP sends RLMs

7. Transmitting station
   - RLM mission data

8. MEOSAR
   - Inter-Satellite Link
Ground segment in China

Beijing MEOLUT

CNMCC
BDS MEOSAR Internationalization

2019.06
The inclusion of BDS into Cospas-Sarsat entered into the assessment period.

2019.11
6 BDS MEOSAR payloads were deployed. Ground supporting system was constructed to support regular monitoring on payloads status.

2022.03
Technical review on BDS MEOSAR payloads were successfully completed at CSC 66.

2022.11
The Declaration of Intent was signed. At CSC 67, China become a space segment contributor of Cospas-Sarsat through BDS MEOSAR.

2022.06
Revisions to Cospas-Sarsat operational and technical documents to include BDS information were completed at JC 36.
In 2021, China carried out the national SAR live exercise. The functions and performance of BDS international search and rescue service in practical conditions were demonstrated and the full service and whole process of distress alerting were verified.

By October 2022, the BDS MEOSAR System had received a total of 34,212 distress alert signals (including repetitive alerts) from 1,902 beacons during its test and trial operation.
Capable of providing GMDSS compliant services for countries in the Asia Pacific region such as Cambodia, Malaysia, Philippines, Vietnam and so on.

BeiDou Message Service System
Application in multiple scenarios

- Position Report
- Meteorological Warning
- Emergency Response and Search and Rescue
- BeiDou Message Service
- Dynamic Vessel Monitoring
- Safety Information Broadcasting
- Maritime Distress Alerting
- Safety Information Broadcasting
Terminal Interface

BDMSS Maritime Mobile Terminal
Recognition of BDMSS into GMDSS

- A functional component of BDS providing message communication service with priority features, distress alerting service and Maritime Safety Information broadcast for vessels to enhance navigation safety.
- BDMSS was recognized as a GMDSS mobile satellite system at MSC 106 with CTTIC as a recognized GMDSS service provider (MSC.529(106)).
May 2018
Submitted the application for the recognition of BDMSS into GMDSS at the 99th session of MSC.

January 2020
IMO approved the self assessment and invited IMSO to conduct technical and operational assessment.

January 2022
Submitted information papers to IMSO and held online technical meetings.

February 2022
Conducted an online assessment and developed an assessment report for review by NCSR 9.

July 2020
CTTIC and IMSO signed the agreement on technical and operational assessment to initial the assessment process.

July 2022
Conducted the on-site assessment to verify BDMSS functions.

Future
To provide GMDSS services after the recognition by IMO.

June 2022
IMO NCSR 9 reviewed the assessment report.
BDMSS Application

- In service since 2003
- More than 700,000 users in total
- Serving more than 150,000 maritime subscribers
- Delivering 450,000 messages and position reports per day on average
- Single message length: 14,000 bits
- Service priority: distress, urgency, safety and routine
- Capable of MSI broadcast
Vision and Mission

China’s BeiDou, World’s BeiDou

- Modernized
- Efficient
- Intelligent
- Digital
- Green
- Safe
- Safe
- TRANSPORT

Benefiting human life!
Thank you!

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