BeiDou Navigation Satellite System
Open Service Performance Standard

（Version 2.0）

China Satellite Navigation Office

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Revision Record

Index	Document Title	Version Number	Release Time	Note
1	BeiDou Navigation Satellite System Open Service Performance Standard	Version 1.0	December 2013	
2	BeiDou Navigation Satellite System Open Service Performance Standard	Version 2.0	December 2018	

Foreword

With a baseline constellation consisting of 30 satellites, together with some in-orbit backup satellites being deployed according to the system requirements, the BeiDou Navigation Satellite System（BDS）provides open positioning, navigation and timing（PNT）services for the users worldwide.

This document defines the service performance standards of the BDS open services at the current stage. It is an upgrade of “BeiDou Navigation Satellite System Open Service Performance Standard（Version 1.0）”. The service area extends from the Asia Pacific region to the globe. On top of the B1I signal, the open signals including B3I, B1C and B2a are added.

Subsequently, this document will be updated as BDS evolves and the service performance improves.

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1 Scope

This document specifies the service performance of the B1I, B3I, B1C, and B2a signals of the BDS open services at the current stage, including single-frequency and dual-frequency services. The signals B1I or B1C are recommended for single-frequency services, while the signal combinations B1I/B3I, and B1C/B2a are recommended for dual-frequency services.

2 Reference Documents

The references are listed in Appendix A.

3 Terms, Definitions, and Abbreviations

3.1 Terms and Definitions

The BDS Open Services

The BDS open services（OS）are the radio navigation satellite services using the BDS open service signals to determine a user’s position, velocity, and time.

Signal Outages

A signal outage is defined as for a period of time, healthy signals in space cannot be broadcasted by BDS satellites, including the cases while signals cannot be broadcasted, the broadcasted signals are non-standard formats, or the state of the signals is marked as "Unhealthy". The signal outages include scheduled suspensions and unscheduled outages.

Scheduled Suspensions

A satellite suspension, when a satellite signal is expected to not meet the performance specified in this document, which will be notified in advance.

Unscheduled Outages

A satellite signal outage caused by a system failure or a maintenance event other than a scheduled suspension. An unscheduled outage should be notified to the users as soon as possible after the outage.

3.2 Abbreviations

The abbreviations used in this document are provided in Appendix B.

4 The BDS Overview

4.1 The Space Segment

Presently, the in-orbit operational BDS satellites providing open services include 5 GEO satellites, 7 IGSO satellites and 21 MEO satellites, which can be further divided as 15 BDS-2 satellites（5 BDS-2G, 7 BDS-2I, 3 BDS-2M）and 18 BDS-3 satellites（BDS-3M）. In addition to B1I and B3I signals, B1C and B2a signals are also broadcasted by the BDS-3M satellites. The constellation is shown in Figure 1, in which the respective positions are:

The GEO satellites are operating in orbit with an altitude of 35,786 kilometers and positioned at 58.75° E, 84° E, 110.5° E, 140° E and 160° E respectively.

The IGSO satellites, with an orbital height of 35786 kilometers and the orbital inclination of 55 degrees, are distributed in three orbital planes. For the three satellites in the first orbital plane, the geographical longitudes of the ascending nodes are 95° E, 112° E and 118°E; for the two satellites in the second orbital plane, the geographical longitudes of the ascending nodes are 95° E and 118° E; for the two satellites in the third orbital plane, the geographical longitudes of the ascending nodes are 95° E and 118° E.

The MEO satellites are with the orbital heights of 21528 kilometers and the orbital inclinations of 55 degrees, and are distributed in a Walker 24/3/1 constellation.

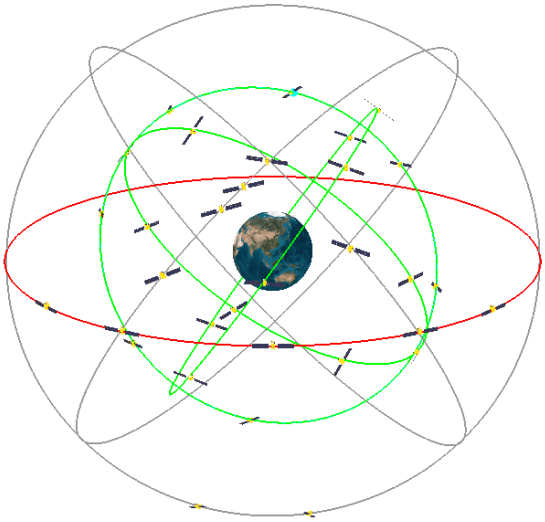

Figure 1 The Operating BDS Satellites in-Orbit

4.2 The Ground Control Segment

The ground control segment is responsible for the BDS operation and control. It mainly consists of the Master Control Station（MCS）, Time Synchronization/Upload Stations（TS/US）and Monitor Stations（MS）.

The MCS is the BDS operation and control center, its main tasks include:

a）to collect observation data of NAV signals from each TS/US and MS, to process data, to generate satellite NAV messages;

b）to perform mission planning and scheduling, to conduct system operations management and control;

c）to observe and calculate the satellite clock biases, to upload satellite NAV messages;

d）to monitor the satellite payload and analyze anomalies, etc.

The main tasks of TS/US are to measure satellite clock biases and to upload satellite NAV messages.

The main tasks of MS are to continuously observe satellite NAV signals, and to provide real-time data to the MCS.

4.3 The User Segment

The user segment consists of various types of BDS user terminals.

4.4 The BDS Open Service Area

Presently, BDS possesses the operation capability for the users worldwide, while for the Asian-Pacific area in the scope of 55° S~55° N, 70° E~150° E（AP area）, BDS provides more enhanced service.

4.5 The Coordinate System

The BDS adopts the BeiDou Coordinate System（BDCS）. The BDCS adopts the reference ellipsoid parameters defined by the China Geodetic Coordinate System 2000（CGCS2000）, which is in accordance with the International Earth Rotation and Reference Systems Service（IERS）, aligned with the latest International Earth Reference Framework（ITRF）, and is updated annually.

For more details, please refer to BDS SIS ICDs.

4.6 The Time System

The BDS adopts the BeiDou Navigation Satellite System Time（BDT）as the time reference. BDT uses the international system of units（SI）second as the base unit, and accumulates continuously without leap seconds. The initial epoch of BDT is 00:00:00 on January 1, 2006 of the Coordinated Universal Time（UTC）. BDT connects with UTC via UTC（NTSC）, and the deviation of BDT to UTC is maintained within 50 nanoseconds（modulo 1 second）. The leap second information is broadcasted in the navigation message.

4.7 The Information Interface between BDS and Its Users

The latest BDS information will be updated through the BDS official website www.beidou.gov.cn. From the official website, users can inquiry and obtain information about the satellite launch log, constellation ephemeris, monitoring and assessment results, etc. The latest version of the BDS SIS ICDs and the BDS OS PS can also be downloaded.

5 The OS SIS Characteristics

5.1 The OS SIS Interface Characteristics

5.1.1 The OS SIS RF Characteristics

Presently, the BDS provides following OS SIS:

a）Signal B1I, with the center frequency at 1561.098 MHz;

b）Signal B3I, with the center frequency at 1268.52 MHz;

c）Signal B1C, with the center frequency at 1575.42 MHz（containing the data component as B1C_data and the pilot component as B1C_pilot）;

d）Signal B2a, with the center frequency at1176.45 MHz（containing the data component as B2a_data and the pilot component as B2a_pilot）.

The other RF characteristics of each signal can be referred to the BDS SIS ICDs.

5.1.2 The OS SIS NAV Message Characteristics

5.1.2.1 The OS SIS NAV Message Structure

Presently, there are 4 types of navigation messages provided by the BDS open services. The BDS SIS NAV message is normally updated hourly. The correspondences among the 4 OS NAV message types, satellite types, signal types and message types are shown in Table 1.

Table 1 Correspondences among BDS In-Orbit Satellite Types, Signal and NAV Message Types

Satellite Types	Transmitted Signals	NAV Message Types
BDS-2M BDS-2I	B1I, B3I	D1
BDS-2G	B1I, B3I	D2
BDS-3M	B1I, B3I	D1
	B1C	B-CNAV1
	B2a	B-CNAV2

The OS SIS NAV messages are formatted in D1 and D2 based on their data rates and structures. The data rate of D1 is 50 bps, while the data rate of D2 is 500 bps. For more details of the NAV message frames, please refer to BDS-SIS-ICD-3.0 and BDS-SIS-ICD- B3I-1.0.

The B1C signal navigation（B-CNAV1）message is broadcasted on the B1C signal, and the associated NAV message data is modulated on the B1C_data component. The length of each frame is 1800 symbols, and its symbol rate is 100sps, so the transmission of one frame

lasts for 18 seconds. For more details of the NAV message frames, please refer to BDS-SIS-ICD-B1C-1.0.

The B2a signal navigation（B-CNAV2）message is broadcasted on the B2a signal, and the associated NAV message data is modulated on the B2a_data component. The length of each frame is 600 symbols, and its symbol rate is 200sps, so the transmission of one frame lasts for 3 seconds. For more details of the NAV message frames, please refer to BDS-SIS-ICD-B2a-1.0.

5.1.2.2 The OS NAV Message Information

The BDS OS NAV message information mainly consists of:

a）Satellite ephemeris parameters;

b）Satellite clock offset parameters;

c）Time group delay correction parameters;

d）Ionospheric delay model parameters;

e）Satellite health status;

f）BDT-UTC time synchronization parameters;

g）Constellation status（almanac）, etc.

For more details of the NAV message information, please refer to the BDS SIS ICDs.

5.1.3 The OS SIS Status Characteristics

5.1.3.1 The Definition of OS SIS Status

A BDS OS SIS may take two states, with the following specific meanings:

a）“Healthy”: the signal meets the minimum service performance specified in this document;

b）“Unhealthy”: the signal is not providing services or is being tested.

The service performance specified in this document applies only to the “Healthy” signals. Users can also obtain notifications of all satellite status information of the BDS constellation from the BDS official website www.beidou.gov.cn.

5.1.3.2 The SIS Status and Associated Flags

To determine the SIS status broadcasted by the BDS satellites, a user needs to ensure that the navigation information is correctly received and successfully passed the verification.

The B1I and B3I signals directly use the “Autonomous Satellite Health flag（SatH1）”

to indicate the satellite/signal status, where “0” indicates that the satellite/SIS is available, and “1” indicates that the satellite/SIS is not available.

At the present, the B1C and B2a signals use the “Satellite Health Status（HS）” to indicate the health status of the entire satellite, and “signal integrity flag（SIF）” to determine the satellite/SIS status.

For B1C or B2a single-frequency users, HS and SIF are both “0” indicating that the signal is healthy, otherwise the signal is unhealthy.

The integrity status flag of the B1C signal $SIF_{(B1C)}$ is broadcasted in the subframe 3 of the B-CNAV1, and also in the B-CNAV2. As the update frequency of B-CNAV1 messages is higher, it is recommended to use the SIF broadcasted by the B-CNAV1, for B1C/B2a dual-frequency users.

5.2 The OS SIS Performance Characteristics

5.2.1 The OS SIS Coverage Volume

The OS SIS coverage is described by the per-satellite coverage, which comprises the portion of the near-Earth region which extends from the surface of the Earth up to an altitude of 1,000 kilometers above the surface of the Earth which is visible from the satellite's orbital position.

5.2.2 The OS SIS Accuracy

The OS SIS accuracy is described by the error statistics of the “Healthy” SIS under normal operating conditions.

The SIS accuracy mainly includes four parameters:

a）The SIS Ranging Error（SISRE）, RMS;

b）The SIS Ranging Rate Error（SISRRE）, RMS;

c）The SIS Ranging Acceleration Error（SISRAE）, RMS;

d）The Coordinated Universal Time Offset Error（UTCOE）, RMS.

5.2.2.1 The SIS Ranging Error（SISRE）

The OS SISRE is represented by the statistical value of the instantaneous SISRE. The instantaneous SISRE refers to the differences between the actually measured SIS ranges and the pseudo-range values obtained from the NAV message parameters, excluding the user

receiver clock offsets or measurement errors. The instantaneous SISRE only considers the errors associated with the BDS space segment and the ground control segment（excluding ionospheric delay errors, tropospheric delay errors, multipath and receiver noise, etc.）.

5.2.2.2 The SIS Ranging Rate Error（SISRRE）

The OS SISRRE refers to the first derivative of SISRE versus time.

5.2.2.3 The SIS Ranging Acceleration Error（SISRAE）

The OS SISRAE refers to the second derivative of SISRE versus time.

5.2.2.4 The OS SIS Coordinated Universal Time Offset Error（UTCOE）

The OS SIS UTCOE refers to bias of the differences between BDT and UTC（NTSC）.

5.2.3 The OS SIS Continuity

The OS SIS continuity refers to the probability that a healthy OS SIS can continue working without any unscheduled outages within a specified time period. With a notice in advance, a scheduled suspension will not affect the continuity.

5.2.4 The OS SIS Availability

The OS SIS availability refers to the probability that a satellite in a specified orbital slot in the BDS constellation provides a healthy SIS. The availability calculation includes scheduled suspensions and unscheduled outages.

The OS SIS availability flags are shown in Table 2.

Table 2 The OS SIS Availability Flags

User Type		D1/D2	B-CNAV1		B-CNAV2		
		SatH1	HS	SIF (B1C)	HS	SIF (B1C)	SIF (B2a)
Single frequency	B1I	0	-	-	-	-	-
	B1C	-	0	0	-	-	-
	B2a	-	0	0	-	-	-
	B3I	0	-	-	-	-	-
Dual frequency	B1I / B3I	0	-	-	-	-	-
	B1C / B2a	-	0	0	0	0	0

Note :

1. Satellites can broadcast SIS without non-standard codes.

2. "-" refers that no decision is needed.

3. "0" refers that signal is healthy.

6 The BDS OS Service Performance Characteristics

6.1 User Conditions

The performance standards for positioning, navigation and timing in this specification are based on certain user conditions. The user conditions are as follows:

a）The user receivers are consistent with relevant technical requirements of BDS-SIS-ICDs, and can track and correctly process SIS for PNT calculations;

b）The elevation mask is 5°；

c）The satellite positions and geometric distances are calculated in the frame of BDCS;

d）The PNT service performance are only associated with the errors of the space and ground control segment, including satellite orbit errors, satellite clock offsets and TGD errors;

e）Dual-frequency users may mitigate the effects of ionospheric delay by using a ionosphere-free combination of carrier phase or pseudo-range measurements;

f）The pilot component for ranging is preferred for the B1C signal uses;

g）Users need to use the latest, healthy signals and NAV messages.

6.2 The Service Accuracy

The OS accuracy includes the positioning and timing accuracy.

The positioning accuracy refers to, under the specified user conditions, the statistical value of differences between the positions determined by BDS signals and the corresponding true positions, including the horizontal positioning accuracy and the vertical positioning accuracy.

The timing accuracy refers to, under the specified user conditions, the statistical value of differences between the time determined by BDS signals and BDT.

6.3 The Service Availability

The service availability refers to the ratio of the service time to the expected service time. The service time is the time at which service accuracy meets specified performance criteria in the given area.

The OS availability includes the position dilution of precision（PDOP）availability and the positioning service availability.

The PDOP availability refers to the percentage of time that the PDOP value meets its limit requirements in the specified service area, within the specified time, and under other specified conditions.

The positioning service availability refers to the percentage of time required for the horizontal and vertical positioning errors to meet the accuracy criteria, in the specified service area, within the specified time, and under other specified conditions.

6.4 Compatibility and Interoperability

BDS is compatible and interoperable with other GNSS.

a）The radio frequencies used by BDS are in accordance with and protected by the International Telecommunication Union Convention, and do not cause any harmful interferences for other GNSS. Radio frequency compatibility can be achieved between BDS and other GNSS;

b）Users can enjoy better service performance by jointly using BDS and other GNSS open service signals without significantly increasing complexity and user cost. Interoperability can be achieved between BDS and other GNSS;

c）The BDT traces back to the Coordinated Universal Time. The time offsets between BDS and other GNSS are broadcasted in the navigation messages. The BDS coordinate system is consistent with the International Earth Reference Frame（ITRF）.

7 The OS SIS Performance Standard

7.1 The OS SIS Coverage Standard

The OS SIS coverage standard is shown in Table 3.

Table 3 The OS SIS Per-Satellite Coverage Standard

Satellite Type	Coverage Standard
GEO/IGSO/MEO	100% of the OS SIS coverage volume; The minimum user-received signal power is greater than -163 dBW.
Note: The minimum received power of each satellite at any center frequency is detailed in the BDS SIS ICDs.	

7.2 The OS SIS Accuracy Standards

7.2.1 The OS SISRE Accuracy Standard

The OS SISRE accuracy standard is shown in Table 4.

Table 4 The OS SISRE Accuracy Standard

Signal Type	OS SISRE Accuracy Standard（RMS）	Constraints
B1I, B3I	SISRE≤1.0m	The elevation angle is 5° or more; Any satellite（GEO, IGSO, MEO）open service with healthy signals in space; Includes errors of satellite clocks, ephemeris and TGD; Excludes ionospheric delay errors; Excludes other transmission errors or user segment errors; Calculates the average value of total ages of data（AOD）of the constellation, with a period of time more than 30 days.
B1C, B2a	SISRE≤0.6m	

7.2.2 The OS SISRRE Accuracy Standard

The OS SISRRE accuracy is shown in Table 5.

Table 5 The OS SISRRE Accuracy Standard

Signal Type	OS SISRRE Accuracy Standard（RMS）	Constraints
Any B1I, B3I, B1C, B2a	URRE≤0.006m/s	Any healthy OS signals from any satellite（GEO, IGSO, MEO） Excludes single frequency ionospheric delay errors; Excludes the effect of the pseudo-range jump on the SISRRE caused by the navigation data switching.

7.2.3 The OS SISRAE Accuracy Standard

The OS SISRAE accuracy is shown in Table 6.

Table 6 The OS SIS SISRAE Accuracy Standard

Signal Type	OS SISRAE Accuracy Standard（RMS）	Constraints
Any B1I, B3I, B1C, B2a	SISRAE≤0.002m/s^2	Any healthy OS signals from any satellite（GEO, IGSO, MEO） Excludes single frequency ionospheric delay errors; Excludes the effect of the pseudo-range jump on the SISRRE caused by the navigation data switching.

7.2.4 The OS SIS UTCOE Accuracy Standard

The OS SIS UTCOE accuracy standard is shown in Table 7.

Table 7 The OS SIS UTCOE Accuracy Standard

Signal Type	OS SIS UTCOE Accuracy Standard（RMS）	Constraints
Any B1I, B3I, B1C, B2a	UTCOE≤20ns	Any healthy OS signals from any satellite（GEO, IGSO, MEO）; Excludes transmission errors and user segment errors.

7.3 The OS SIS Continuity Standard

The OS SIS continuity standard is shown in Table 8.

Table 8 The OS SIS Continuity Standard

SignalType		SIS Continuity Standard	Constraints
GEO	B1I, B3I	≥0.995/h	Assume that the SIS is available at each beginning of the hour. Collect the annual statistics of single operating satellite.
IGSO	B1I, B3I	≥0.995/h	
MEO	B1I, B3I	≥0.998/h	
	B1C, B2a	≥0.998/h	

7.4 The OS SIS Availability Standard

The OS SIS availability standard is shown in Table 9.

Table 9 The OS SIS Availability Standard

Satellite Type		OS SIS Availability Standard	Constraints
GEO	B1I, B3I	≥0.98	Collect the annual statistics of single operating satellite.
IGSO	B1I, B3I	≥0.98	
MEO	B1I, B3I	≥0.98	
	B1C, B2a	≥0.98	

8 The OS Service Performance Standards

8.1 The OS Service Accuracy Standard

The OS positioning accuracy standard is shown in Table 10.

Table 10 The OS Positioning Accuracy Standard

Signal Type	Positioning Accuracy Standard（95% confidence level）		Contraints
B1I, B3I, single frequency or dual frequency in the globe	Horizontal	≤10m	The users use healthy satellite signals to calculate; The statistical value of the 24-hour positioning error of all points in the globe using signals B1I and/or B3I. Excludes transmission errors and user segment errors.
	Vertical	≤10m	
B1I, B3I, single or dual frequency, in the most of Asia-Pacific area	Horizontal	≤5m	Users who meet the user's assumptions use healthy satellite signals to calculate; The statistical value of the 24-hour positioning error of all points in the most of the Asia-Pacific area using signals B1I and/or B3I. Excludes transmission errors and user segment errors.
	Vertical	≤5m	
B1C, B2a, single frequency or dual frequency in the global area.	Horizontal	≤10m	Users who meet the user's assumptions use healthy satellite signals to calculate; The statistical value of the 24-hour positioning error of all points in the global region using signals B1C and/or B2a. Excludes transmission errors and user segment errors.
	Vertical	≤10m	

The OS timing accuracy standard is shown in Table 11.

Table 11 The OS Timing Accuracy Standard

Signal Type	Timing Accuracy Standard（95% confidence level）	Constraints
B1I, B3I, single frequency or dual frequency in the global area.	≤20ns	Users who meet the user's assumptions use healthy satellite signals to conduct multi-satellite calculations; The statistical value of the 24-hour timing error of all points in the global region using signals B1I and/or B3I. Excludes transmission errors and user segment errors.

Signal Type	Timing Accuracy Standard（95% confidence level）	Constraints
B1I, B3I, single frequency or dual frequency in Asia-Pacific area.	≤10ns	Users who meet the user's assumptions use healthy satellite signals to conduct multi-satellite calculations; The statistical value of the 24-hour timing error of all points in the most Asia-Pacific region using signals B1I and/or B3I. Excludes transmission errors and user segment errors.
B1C, B2a, single frequency or dual frequency in the globe	≤20ns	Users who meet the user's assumptions use healthy satellite signals to conduct multi-satellite calculations; The statistical value of the 24-hour timing error of all points in the global region using signals B1C and/or B2a. Excludes transmission errors and user segment errors.

8.2 The OS Service Availability Standards

8.2.1 The OS PDOP Availability Standard

The OS PDOP availability standard is shown in Table 12.

Table 12 The OS PDOP Availability Standard

Service Availability	Standard	Constraints
B1I, B3I, the global PDOP availability	≥0.95	PDOP≤6; The average of all points in the globe for signals B1I, B3I, in any 24 hours.
B1I, B3I, the PDOP value in the most Asia-Pacific area	≥0.99	PDOP≤6; The average of all points in the most Asia-Pacific region for signals B1I, B3I, in any 24 hours.
B1C, B2a, the global PDOP availability	≥0.85	PDOP≤6; The average of all points in the global region for signals B1C, B2a, in any 24 hours.

8.2.2 The OS Positioning Service Availability Standard

The OS positioning service availability is shown in Table 13.

Table 13 The OS Positioning Service Availability Standard

Service Availability	Standard	Constraints
B1I, B3I, the service availability of any single or dual frequency positioning service in the global region	⩾0.95	95% confidence level, the horizontal positioning accuracy is better than 20m; 95% confidence level, the vertical positioning accuracy is better than 20m; The position calculation is conducted under the specified user conditions; The average of all points in the global region for signals B1I, B3I, in any 24 hours.
B1I, B3I, the service availability of any single or dual frequency positioning service in the most part of the Asia-Pacific region	⩾0.99	95% confidence level, the horizontal positioning accuracy is better than 20m; 95% confidence level, the vertical positioning accuracy is better than 20m; The position calculation is conducted under the specified user conditions; The average of all points in the most part of the Asia-Pacific region for signals B1I, B3I, in any 24 hours.
B1C, B2a, the service availability of any single or dual frequency positioning service in the global region	⩾0.85	95% confidence level, the horizontal positioning accuracy is better than 20m; 95% confidence level, the vertical positioning accuracy is better than 20m; The position calculation is conducted under the specified user conditions; The average of all points in the global region for signals B1C, B2a, in any 24 hours.

8.3 Outage Information Dissemination Time

The outage information dissemination time refers to the time interval during which the BDS outage information is announced prior to a scheduled event or released after an unscheduled event. See Table 14 for the specific standard for BDS to issue outage information.

Table 14 Outage Information Dissemination Time

Timeliness of the information release	Standard	Conditions and Constraints
A scheduled suspension which will affect the service, before the service is affected	⩾24hours	A notice of the scheduled suspension or a general announcement.
An unscheduled outage that will affect the service, after the service is affected	⩽72hours	A notice of an unscheduled outage.

Appendix A：References

Index	Title	Released by
[1]	BeiDou Navigation Satellite System Open Service Performance Standard（Version 1.0） BDS-OS-PS-1.0	China Satellite Navigation Office, December 2013
[2]	BeiDou Navigation Satellite System Signal In Space Interface Control Document - Open Service Signal（Version 3.0） BDS-SIS-ICD-3.0	China Satellite Navigation Office, December 2018
[3]	BeiDou Navigation Satellite System Signal In Space Interface Control Document - Open Service Signal B3I（Version 1.0） BDS-SIS-ICD -B3I-1.0	China Satellite Navigation Office, February 2018
[4]	BeiDou Navigation Satellite System Signal In Space Interface Control Document - Open Service Signal B1C（Version 1.0） BDS-SIS-ICD -B1C-1.0	China Satellite Navigation Office, December 2017
[5]	BeiDou Navigation Satellite System Signal In Space Interface Control Document - Open Service Signal B2a（Version 1.0） BDS-SIS-ICD-B2a-1.0	China Satellite Navigation Office, December 2017

Appendix B：Abbreviations

AOD	Age of Data
BDCS	BeiDou Coordinate System
BDS	BeiDou Navigation Satellite System
BDT	BDS Time
BDS-2	BDS Phase II
BDS-2G	a BDS-2 GEO satellite
BDS-2I	a BDS-2 IGSO satellite
BDS-2M	a BDS-2 MEO satellite
BDS-3	BDS Phase III
BDS-3M	a BDS-3 MEO satellite
CGCS2000	China Geodetic Coordinate System 2000
GEO	Geostationary Earth Orbit
GNSS	Global Navigation Satellite System
ICD	Interface Control Document
IERS	International Earth Rotation and Reference Systems Service
IGSO	Inclined Geosynchronous Orbit
ITRF	International Terrestrial Reference Frame
MEO	Medium Earth Orbit
NAV	Navigation （as in"NAV data" or "NAV message"）
NTSC	National Time Service Center
OS	Open Service
RF	Radio Frequency
RMS	Root Mean Square
PDOP	Position Dilution of Precision
SIS	Signal in Space
TGD	Time Correction of Group Delay
SISRAE	SIS Range Acceleration Error
SISRE	SIS Range Error
SISRRE	SIS Range Rate Error
UTC	Universal Time Coordinated
UTCOE	UTC Offset Error

Appendix C：BDS User Notice Templates

There are two templates for the BDS user notice, one for scheduled suspensions or unscheduled outages（see Attachment 1）and one for general notifications（see Attachment 2）.

Attachment 1　The Template for a BDS Outage User Notice

BDS User Notice：	YYYYNNN
Time of Occurrence（BDT）：	YYYY-MM-DD hh:mm
Notice Type：	To be filled
Notice Number：	YYYYNNN
Notice Title：	
Notice Reference：	YYYYRRR or N/A
Event start time（BDT）：	YYYY-MM-DD hh:mm
Event end time（BDT）：	YYYY-MM-DD hh:mm or N/A
Affected Satellite（s）：	Name of the satellite（s）
Satellite PRN：	Satellite PRN
Affected signal（s）：	Any single, multiple or all signal（s）
Event Description：	

Attachment 2　The Template for a BDS General User Notice

BDS User Notice：	YYYYNNN
Time of Occurrence（UTC）：	YYYY-MM-DD hh:mm
Notice Type：	
Notice Number：	YYYYNNN
Notice Title：	Free style
Notice Reference：	YYYYRRR or N/A
Event start time（UTC）：	YYYY-MM-DD hh:mm
Event end time（UTC）：	YYYY-MM-DD hh:mm or N/A
Affected satellite（s）：	Satellite name（s）or all satellites
Event description：	Free style