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Agenda item ²

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Technical Domain / Task Number ² Working Group 5 (PNT)

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Progress on the development of S-240 for DGNSS Station Information

1 SUMMARY

1.1 Purpose of the document

Regarding the S-240 that is a XML format standard to maintain and provide DGNSS Station information, IALA and KRISO introduce the research progress and suggest to organise an expert group (task group or correspondence group) for DGNSS and S-100 experts to be involved.

1.2 Related documents

- ENAV15-14.2.5 Statement of work for a Task Group on IALA DGNSS and eLoran databases
- ENAV15-14.2.6 Procedures for managing DGNSS Information

2 BACKGROUND

IALA as an international organization in charge of DGNSS relevant standards provide DGNSS station almanac on their website. Although IALA services DGNSS station almanac as a document, the distribution method can be inefficient and cause human errors. The improvement of maintenance and service method was raised by IALA members.

¹ Input document number, to be assigned by the Committee Secretary

² Leave open if uncertain

Regarding the issue of DGNSS station, an agenda named as “Procedures for managing DGNSS information” was discussed in the 15th e-Nav meeting and two alternative approaches were suggested

- Store and manipulate the information as a spreadsheet – this would make it easier to search and check for conflicts in frequencies and ID numbers.

- Encode the information as XML files, so that it can be updated online. An extension to this approach would be to provide an IALA S-100 Product Specification for DGNSS information. This would be very similar to the AtoN Information Product Specification currently being finalised.

Regarding the S-240 that is a XML format standard to maintain and provide DGNSS Station information, it's introduced the research progress by IALA and KRISO and suggested to organise an expert group for DGNSS and S-100 experts to be involved.

3 DISCUSSION

3.1 2014 IALA DGNSS DB UPDATE

IALA DGNSS DB before 2014 update had gaps between it and the then operating status worldwide, where no information had been provided, while some of the existing information was outdated. IALA carried out a complete enumeration research of all national members as well as non-member countries. IALA DGNSS update proceeded over the 3 months from September to November 2014. The update was focused on indeed which authorities managed and who were operating. A total of 406 DGNSS stations in 48 countries were shown in operation as of December 2014, according to the update result. A newly updated DGNSS DB is now published on the Radio Navigation Service section of the IALA website.

3.2 Identification of considerations for the development of S-240

Although spreadsheet can be easy method for service of DGNSS station information, S-240 standard is more appropriate from a long-term perspectives to establish an international standard of DGNSS station and exchange information between relevant systems.

The agenda submitted in the 15th e-Nav meeting expressed concern for the XML format method based on S-100 to take long time to meet the purpose, but as the size and type of DGNSS station information is not huge, it's expected that the XML format for DGNSS station information can be developed in a short time.

Considerations for the development of S-240 DGNSS Station Almanac were identified to speed up the approaches and apply the standard to the DGNSS service work by IALA.

- Identification of work process for development and application of S-240
 - Development of a Draft of S-240 document and annex
 - Verification of S-240 using Test bed system
 - Establishment and review of S-240 XML (GML) DB
 - International standard activities by cooperation between IALA and IHO
 - Initiation of service on DGNSS station almanac using S-240 XML(GML) DB

- Quality control of DGNSS station almanac
 - Needs for verification of DGNSS station almanac
 - High precision of station position coordinates included in the DGNSS station almanac
- Experts group like task group or correspondence group,
 - Organizing experts group for DGNSS and S-100 experts to be involved
 - International standard activities by experts groups

3.3 Research results of S-240 Prototype

KRISO has been involved in the development project of S-100/S-10X Test bed by IHO and has high interests in the S-2XX development of IALA. KRISO and IALA agreed with cooperation on S-240 development and have been making a progress on the development of S-240 Prototype.

KRISO and IALA identified requirements for IALA S-240 Product Specification to study S-240 Prototype

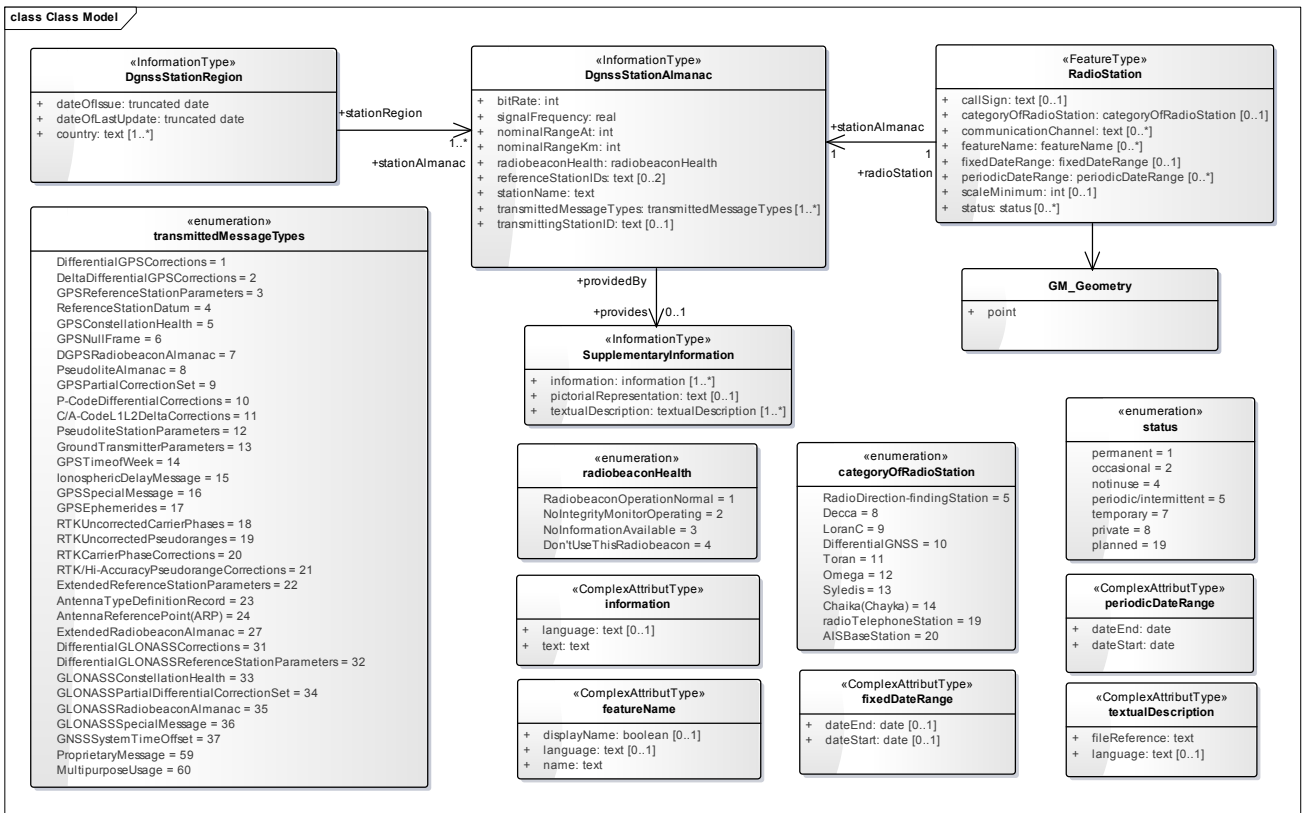
- DGNSS station almanac needs to be saved in XML format
- DGNSS station almanac can be serviced as a document form like current service method by IALA website.
- S-240 has to be developed according to the S-100 of IHO.
- S-240 information can be used with ENC(Electronic Navigational Chart)

According to the identified requirements on the S-240 product specification, the research scope of S-240 prototype include below topics.

- Draft document of S-240
- S-240 Feature / Portrayal Catalogue
- S-240 GML Schema
- S-240 GML Sample Datasets
- Style sheet to present S-240 GML Dataset to HTML format
- Demo S/W of S-240 sample dataset using ENC(Electronic Navigational Chart)

Design of UML data model is a starting point for the development of S-240 Product Specification based on the source data and user requirement for DGNSS station almanac. Two reference document were used to draft the S-240 UML data model, which is the DGNSS station almanac included in IALA website and RTCM Recommended Standards for Differential GNSS Service.

KRISO has cooperated with Jeppesen which is one of key actors in developing S-100 and S-101 of IHO. KRISO/Jeppesen data model for S-240 was drafted like Fig. 1



<Fig. 1> KRISO/Jeppesen Data model for S-240

S-240 GML Schema, GML Sample dataset and HTML document were developed according to the S-240 UML data model in this prototype study. Draft version of S-240 document was included as an annex of this document. S-240 GML sample dataset and application S/W will be demonstrated in the 16th e-Nav meeting.

S-240 XML Schema

```

<?xml version="1.0" encoding="UTF-8"?>
<gml:schema xmlns:gml="http://www.xml.org/2001/XMLSchema" xmlns:s240="http://www.kriso.org/2014/s240" xmlns:gnss="http://www.kriso.org/2014/gnss" base="http://www.kriso.org/2014/s240" targetNamespace="http://www.kriso.org/2014/s240" >
  <!-- Import namespaces -->
  <!-- Types for Complex attribute -->
  <!-- InformationType -->
  <!-- FeatureType -->
  <!-- Enumeration -->
  <!-- Complex Attribute Type -->
  <!-- Simple Type -->
  </gml:schema>

```

S-240 XML Sample

```

<?xml version="1.0" encoding="UTF-8"?>
<gml:Instance xmlns:gml="http://www.xml.org/2001/XMLSchema-instance" xmlns:s240="http://www.kriso.org/2014/s240" xmlns:gnss="http://www.kriso.org/2014/gnss" base="http://www.kriso.org/2014/s240" >
  <!-- InformationType -->
  <!-- FeatureType -->
  <!-- Enumeration -->
  <!-- Complex Attribute Type -->
  <!-- Simple Type -->
  </gml:Instance>

```

S-240 HTML Document

Station name	Reference Stations	Transmitting Station	Country	Geographical Position (Latitude/Longitude)	Nominal range (km)	Station in operation	Integrity Monitoring	Transmitted message types	Freq. (MHz)	Bit Rate (bps)	Remarks
Honggat	726	666	KOREA	37° 09' 46.91" N 129° 37' 59.98" E	185	100	Yes	Yes	3.5, 7.6, 16	310	200
Junmun	726	663		37° 52' 52.10" N 129° 59' 51.99" E	185	100	Yes	Yes	3.5, 7.6, 16	295	200
Geochang	726	664		34° 00' 27.49" N 129° 59' 20.27" E	185	100	Yes	Yes	3.5, 7.6, 16	295	200
Geomundo	724	662		34° 00' 27.49" N 129° 59' 20.27" E	185	100	Yes	Yes	3.5, 7.6, 16	287	200
Marado	726	665		37° 09' 46.91" N 129° 37' 59.98" E	185	100	Yes	Yes	3.5, 7.6, 16	290	200
Palmido	722	661		37° 31' 30.00" N 129° 23' 45.47" E	185	100	Yes	Yes	3.5, 7.6, 16	313	200
Ulleungdo	724	667		37° 31' 30.00" N 129° 18' 08.91" E	185	100	Yes	Yes	3.5, 7.6, 16	319	200
Yeosu	720	660		35° 03' 43.88" N 129° 04' 14.81" E	185	100	Yes	Yes	3.5, 7.6, 16	303	200
Socheongdo	726	669		34° 00' 27.49" N 129° 59' 20.27" E	185	100	Yes	Yes	3.5, 7.6, 16	323	200
Geopdo	726	669		34° 00' 27.49" N 129° 59' 20.27" E	185	100	Yes	Yes	3.5, 7.6, 16	298	200
Jeju	742	670		33° 33' 07.47" N 126° 58' 56.92" E	185	100	Yes	Yes	3.5, 7.6, 16	292	200
Changcheon	752	675		37° 59' 40.18" N 127° 42' 53.87" E	80	100	Yes	Yes	3.5, 7.6, 16	286	200
Chungdo	752	674		38° 48' 48.68" N 127° 45' 16.62" E	80	100	Yes	Yes	3.5, 7.6, 16	318	200
Maju	742	671		35° 54' 12.46" N 127° 34' 48.97" E	80	100	Yes	Yes	3.5, 7.6, 16	322	200

S-100 enabled Navigation System

<Fig. 2> Research results of S-240 Prototype

If S-240 as one of S-2XX specification products developed by IALA is fully developed, it's expected that maintenance and service method of DGNSS station information will be improved.

3.4 Future plan of S-240 development

IALA and KRISO have been cooperating on the development of S-240. IALA updated source DB on the DGNSS station almanac and KRISO has been studied S-240 prototype with IALA jointly. It was planned for the future work.

- Organization of expert group on the development of S-240 Task group or correspondence group)
- Review of S-240 prototype by the organized expert group
- Report the progress of S-240 development to IALA(e-Nav.) and IHO(HSSC)
- Establishment of S-240 XML(GML) DB and Preparation for S-240 Service
- Approval of S-240 as an international standard and Kick off of S-240 Service by IALA

4 ACTION REQUESTED OF THE COMMITTEE

The Committee is requested to:

- 1 review considerations for S-240 development raised in this document
- 2 provide recommendations on the S-240 prototype studied by IALA and KRISO jointly
- 3 suggest to organise expert group for DGNSS and S-100 experts to be involved and to participate by interested members of IALA

ANNEX. S-240 PRODUCT SPECIFICATIONS



**Product Specification IALA S-240
DGNSS Station Almanac**

Draft 0.0.1 – April 2015

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DGNSS Station Almanac Product Specification

Revision History

Version Number	Date	Author	Purpose

1. OVERVIEW

1.1 Introduction

The DGNSS Station Almanac is a document published and maintained by IALA, which contains information about the worldwide DGNSS stations. The DGNSS Station Almanac Product Specification provides a common structure for the exchange of information about DGNSS stations. The product contains the station name, identification numbers of reference stations and transmitting station, positions, nominal range, operation status, transmitted message types, frequency, bit rate, remarks related to a DGNSS station.

The Product Specification can be used to exchange DGNSS station information in a consistent form between IALA, Lighthouse Authorities, Hydrographic Offices and other organizations (*to include commercial and professional agencies*). This information can be also serviced as a document converted from the dataset

1.2 References

1.2.1 Normative references

IHO S-100 IHO Universal Hydrographic Data Model, January 2010

1.2.2 Informative references

IALA 2014. DGNSS Station Almanac.

IALA 2001. RTCM Recommended Standards for Differential GNSS (Global Navigation Satellite Systems) Service version 2.3.

1.3 Terms, Definitions & Abbreviations

1.3.1 Abbreviations

IALA-AISM International Association of Marine Aids to Navigation and Lighthouse Authorities

IHO International Hydrographic Organization

IMO International Maritime Organization

ISO International Organization for Standardization

1.4 IALA S-201 General Data Product Description

Title: DGNSS Station Almanac

Abstract: Name, Identification numbers, positions, operation status of DGNSS stations. Additional general information can also be included.

Content: This Product Specification is a complete description of all the appropriate features, attributes and their relationships necessary to define a DGNSS station almanac. The detailed content is documented within the Feature Catalogue and the relationships defined in the Application Schema. Details of how these features should be symbolised are contained in the associated Portrayal Catalogue.

Spatial Extent:

Description: Global, marine, inland

East Bounding Longitude: 180

West Bounding Longitude: -180

North Bounding Latitude: 90

South Bounding Latitude: -90

Temporal Extent: Not Applicable

Specific Purpose: This product specification is intended to be used for encoding and exchanging information of DGNSS station almanac.

1.5 Data product specification metadata

Title: DGNSS Station Almanac Product Specification

S-100 Version: 1.0.0

IALA S-240 Version: 0.0.1

Date: 1 April 2015

Language: English

Classification: Unclassified

Contact: IALA ENAV Committee

Producer

IALA/AISM, 10 rue des Gaudines, St Germain en Laye, 78100, France

Tel +33 1 345 17001

Fax: +33 1 345 18205

URL: <http://www.iala-aism.org/IALA-240>

Identifier: IALA S-240

Maintenance: This Product Specification is maintained by the Data Modelling WG of the IALA ENAV Committee on a 4 yearly cycle.

2. SPECIFICATION SCOPE

Level: General Scope

3. DATA PRODUCT IDENTIFICATION

A data set that conforms to this product specification will be identifiable by the discovery metadata that supports it.

Title:	DGNSS Station Almanac
Alternate Title:	IALA – DGNSS
Abstract:	Name, Identification numbers, positions, operation status of DGNSS stations. Additional general information can also be included.
Geographic Description:	Areas specific to marine and inland navigation.
Spatial Resolution:	DGNSS Station Almanac is scale independent
Purpose:	The purpose of a DGNSS Station Almanac dataset is to exchange name, identification numbers and operation status of DGNSS station. Additional general information can also be included.
Language:	English
Classification:	Unclassified
Spatial Representation Type:	Vector (Point)
Point of Contact:	Producer
Use Limitation:	None

4. DATA CONTENT AND STRUCTURE

A DGNSS Station Almanac dataset is a feature-based product. The following sub-sections contain the product application schema expressed in UML and an associated feature catalogue. The feature catalogue provides a full description of each feature type including its attributes and attribute values in the data product.

4.1 Application Schema

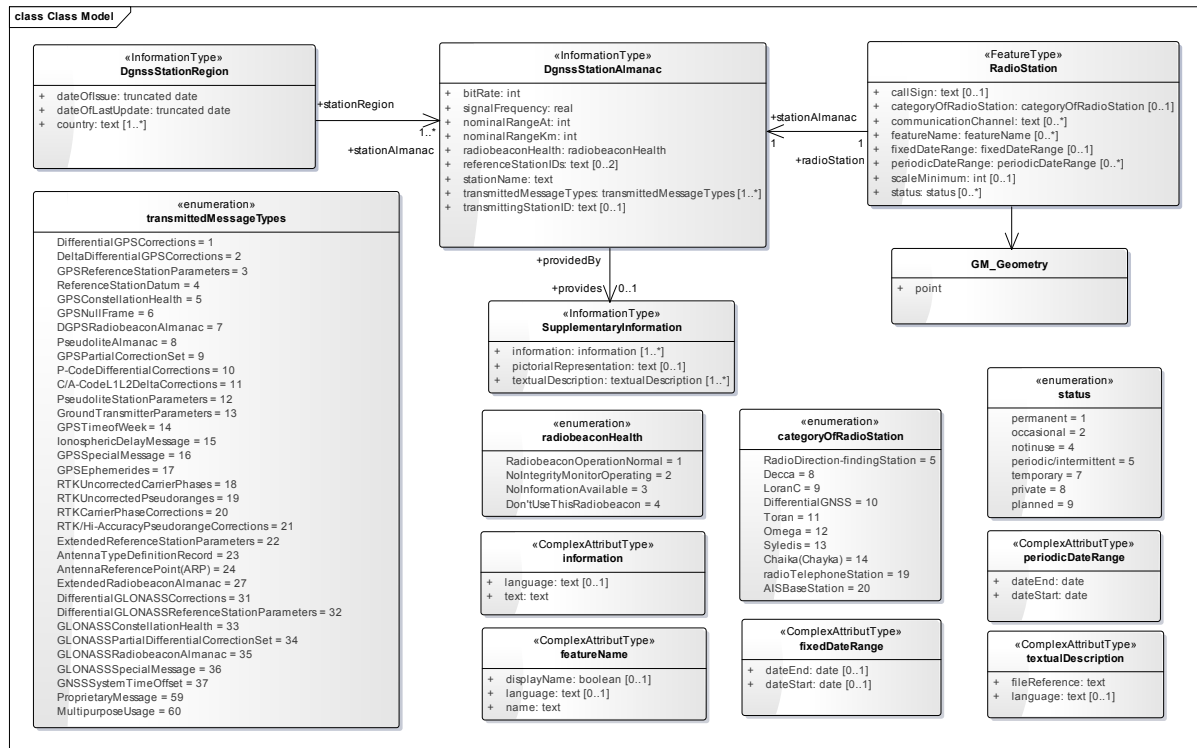


Figure 1. Application Schema of DGNSS Station Almanac

4.2 Feature Catalogue

A Feature Catalogue in XML format shall be available from IALA with an accompanying XSL Stylesheet.

Name: DGNSS Station Almanac Feature Catalogue

Scope:

Field of application:

Version Number: 0.1

Version Date:

Producer: IALA

Functional Language: English

4.3 Feature Types

4.3.1 Meta Feature Types

No Meta Feature Types are included in this product.

4.3.2 Geographic Feature Types

Geographic feature types form the principal content of the data product and are fully defined in the Feature Catalogue.

4.4 Attributes

4.4.1 Numeric Attribute Values

Floating point or integer attribute values must not be padded by non-significant zeroes.

4.4.2 Text Attribute Values

Character strings must be encoded using the character set specified in Unicode Transformation Format-8 (UTF-8).

4.4.3 Mandatory Attribute Values

Where attributes determine the display of a Feature, or essential to the overall feature type construction they may be mandatory. All mandatory attributes are identified in the feature catalogue.

5. COORDINATE REFERENCE SYSTEMS (CRS)

5.1 Introduction

The coordinate reference systems are separated into the horizontal and vertical components.

5.2 Horizontal Geodetic Datum

WGS84 (World Geodetic System of 1984) shall be used for the horizontal reference system for spatial data (EPSG code 4326).

5.3 Vertical Datum

A vertical datum attribute will be required on all relevant features and should be specified in the data set metadata.

6. DATA QUALITY

6.1 Quality, Reliability and Accuracy of Data

Attributes at the feature level indicate method of positioning and date of observation or confirmation of operation. These attributes are defined in the Feature Catalogue. In dataset metadata the overall positional uncertainty and date to which the dataset has been validated must be provided.

7. DATA MAINTENANCE

Datasets defined in this specification are maintained by the producer on an as required basis. Updating is done incrementally (change notes), including meta data.

8. PORTRAYAL

A Portrayal Catalogue defines the display rules and symbology which apply to the Features defined in this specification.

9. DATA PRODUCT FORMAT (ENCODING)

formatName	S-100 GML
version	1.0
characterSet	UTF-8
specification	S-100 GML Profile 1.0

Table 9-1— Data product format

The S-100 GML Profile 1.0 was included in the S-100 ver. 2.0. A GML application schema .XSD document is also provided to support data validation. An example of how this encoding could be implemented is shown in Annex A.

10. DATA PRODUCT DELIVERY

Item Name	Description
unitsOfDelivery	Datasets
transferSize	Undefined
mediumName	Undefined
otherDeliveryInformation	

Table 10-1— Data product delivery

10.1 Feature and Portrayal Catalogue Delivery

This specification include a Feature Catalogue and Portrayal Catalogue. The Feature and Portrayal Catalogues can be also provided on the IALA website and users informed by a change notice on that site when any changes occur.

11. METADATA

The data product specification metadata shall include the following items in Table 2 [extension to ISO 19131]:

Item Name	Description	Multiplicity	Type
title	Title of the data product specification	1	CharacterString
version	Version of the data product specification	1	CharacterString
date	Date the product specification was created / last updated	1	Date
language	Language(s) of the data product specification, e.g. translations	1..*	CharacterString
classification	Security classification code on the data product specification	0..1	MD_ClassificationCode (ISO 19115)
contact	Party responsible for the data product specification	1	CI_ResponsibleParty (ISO 19115)
URL	Online-address where the resource is downloadable	0..1	URL
identifier	Persistent unique identifier for a published version of the product specification ¹ .	1	CharacterString
maintenance	Description of the maintenance regime for the product specification.	1	MD_MaintenanceInformation (ISO 19115)

Table 11-1— Data product specification metadata

ANNEX A DGNSS STATION ALMANAC – GML SCHEMA AND SAMPLE GML

A-1. DGNSS Station Almanac – GML Schema

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:S100="http://www.iho.int/s100gml/1.0" xmlns:gml="http://www.opengis.net/gml/3.2"
xmlns="http://www.iala-aism.org/DgnssStationAlmanacSchema" targetNamespace="http://www.iala-aism.org/DgnssStationAlmanacSchema"
elementFormDefault="qualified" version="0.1">
  <xs:import namespace="http://www.iho.int/s100gml/1.0" schemaLocation="s100gmlbase.xsd"/>
  <!--<xs:import namespace="http://www.opengis.net/gml/3.2" schemaLocation="S100_gmlProfile.xsd"/>-->
  <!-- Types for Complex attribute -->
  <xs:complexType name="informationType">
    <xs:annotation>
      <xs:documentation>Information</xs:documentation>
    </xs:annotation>
    <xs:sequence>
      <xs:element name="language" type="xs:string" maxOccurs="1"/>
      <xs:element name="text" type="xs:string" minOccurs="1"/>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="textualDescriptionType">
    <xs:annotation>
      <xs:documentation>Textual Description</xs:documentation>
    </xs:annotation>
    <xs:sequence>
      <xs:element name="fileReference" type="xs:string"/>
      <xs:element name="language" type="xs:string" minOccurs="0" maxOccurs="1"/>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="featureNameType">
    <xs:annotation>
      <xs:documentation>Feature Name</xs:documentation>
    </xs:annotation>
    <xs:sequence>
      <xs:element name="displayName" type="xs:boolean" minOccurs="0" maxOccurs="1"/>
      <xs:element name="language" type="xs:string" minOccurs="0" maxOccurs="1"/>
    </xs:sequence>
  </xs:complexType>
</xs:schema>
```

```

        <xs:element name="name" type="xs:string"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="fixedDateRangeType">
    <xs:annotation>
        <xs:documentation>Fixed Date Range</xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="dateEnd" type="xs:date" minOccurs="0" maxOccurs="1"/>
        <xs:element name="dateStart" type="xs:date" minOccurs="0" maxOccurs="1"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="periodicDateRangeType">
    <xs:annotation>
        <xs:documentation>Periodic Date Range</xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="dateEnd" type="xs:date" minOccurs="0" maxOccurs="1"/>
        <xs:element name="dateStart" type="xs:date" minOccurs="0" maxOccurs="1"/>
    </xs:sequence>
</xs:complexType>
<!-- Types for enumerated attributes -->
<xs:simpleType name="radiobeaconHealthType">
    <xs:annotation>
        <xs:documentation>The type of radiobeaconHealth</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
        <xs:enumeration value="RadiobeaconOperationNormal">
            <xs:annotation>
                <xs:appinfo>1</xs:appinfo>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="NoIntegrityMonitorOperating">
            <xs:annotation>
                <xs:appinfo>2</xs:appinfo>
            </xs:annotation>
        </xs:enumeration>
    </xs:restriction>
</xs:simpleType>

```

```

    <xs:enumeration value="NoInformationAvailable">
      <xs:annotation>
        <xs:appinfo>3</xs:appinfo>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="Don'tUseThisRadiobeacon">
      <xs:annotation>
        <xs:appinfo>4</xs:appinfo>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="transmittedMessageTypesType">
  <xs:annotation>
    <xs:documentation>The type of transmittedMessage</xs:documentation>
  </xs:annotation>
  <xs:restriction base="xs:string">
    <xs:enumeration value="DifferentialGPSCorrections">
      <xs:annotation>
        <xs:appinfo>1</xs:appinfo>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="DeltaDifferentialGPSCorrections">
      <xs:annotation>
        <xs:appinfo>2</xs:appinfo>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="GPSReferenceStationParameters">
      <xs:annotation>
        <xs:appinfo>3</xs:appinfo>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="ReferenceStationDatum">
      <xs:annotation>
        <xs:appinfo>4</xs:appinfo>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>
</xs:simpleType>

```



```
<xs:enumeration value="GPSConstellationHealth">
  <xs:annotation>
    <xs:appinfo>5</xs:appinfo>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="GPSNullFrame">
  <xs:annotation>
    <xs:appinfo>6</xs:appinfo>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="DGPSRadiobeaconAlmanac">
  <xs:annotation>
    <xs:appinfo>7</xs:appinfo>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="PseudoliteAlmanac">
  <xs:annotation>
    <xs:appinfo>8</xs:appinfo>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="GPSPartialCorrectionSet">
  <xs:annotation>
    <xs:appinfo>9</xs:appinfo>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="P-CodeDifferentialCorrections">
  <xs:annotation>
    <xs:appinfo>10</xs:appinfo>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="C/A-CodeL1L2DeltaCorrections">
  <xs:annotation>
    <xs:appinfo>11</xs:appinfo>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="PseudoliteStationParameters">
  <xs:annotation>
```

```
        <xs:appinfo>12</xs:appinfo>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="GroundTransmitterParameters">
    <xs:annotation>
        <xs:appinfo>13</xs:appinfo>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="GPSTimeofWeek">
    <xs:annotation>
        <xs:appinfo>14</xs:appinfo>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="IonosphericDelayMessage">
    <xs:annotation>
        <xs:appinfo>15</xs:appinfo>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="GPSSpecialMessage">
    <xs:annotation>
        <xs:appinfo>16</xs:appinfo>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="GPSEphemerides">
    <xs:annotation>
        <xs:appinfo>17</xs:appinfo>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="RTKUncorrectedCarrierPhases">
    <xs:annotation>
        <xs:appinfo>18</xs:appinfo>
    </xs:annotation>
</xs:enumeration>
<xs:enumeration value="RTKUncorrectedPseudoranges">
    <xs:annotation>
        <xs:appinfo>19</xs:appinfo>
    </xs:annotation>
</xs:enumeration>
```

```
</xs:enumeration>
<xs:enumeration value="RTKCarrierPhaseCorrections">
  <xs:annotation>
    <xs:appinfo>20</xs:appinfo>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="RTK/Hi-AccuracyPseudorangeCorrections">
  <xs:annotation>
    <xs:appinfo>21</xs:appinfo>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="ExtendedReferenceStationParameters">
  <xs:annotation>
    <xs:appinfo>22</xs:appinfo>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="AntennaTypeDefinitionRecord">
  <xs:annotation>
    <xs:appinfo>23</xs:appinfo>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="AntennaReferencePoint(ARP)">
  <xs:annotation>
    <xs:appinfo>24</xs:appinfo>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="ExtendedRadiobeaconAlmanac">
  <xs:annotation>
    <xs:appinfo>27</xs:appinfo>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="DifferentialGLONASSCorrections">
  <xs:annotation>
    <xs:appinfo>31</xs:appinfo>
  </xs:annotation>
</xs:enumeration>
<xs:enumeration value="DifferentialGLONASSReferenceStationParameters">
```

```
        <xs:annotation>
          <xs:appinfo>32</xs:appinfo>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="GLONASSConstellationHealth">
        <xs:annotation>
          <xs:appinfo>33</xs:appinfo>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="GLONASSPartialDifferentialCorrectionSet">
        <xs:annotation>
          <xs:appinfo>34</xs:appinfo>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="GLONASSRadiobeaconAlmanac">
        <xs:annotation>
          <xs:appinfo>35</xs:appinfo>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="GLONASSSpecialMessage">
        <xs:annotation>
          <xs:appinfo>36</xs:appinfo>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="GNSSSystemTimeOffset">
        <xs:annotation>
          <xs:appinfo>37</xs:appinfo>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="ProprietaryMessage">
        <xs:annotation>
          <xs:appinfo>59</xs:appinfo>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="MultipurposeUsage">
        <xs:annotation>
          <xs:appinfo>60</xs:appinfo>
        </xs:annotation>
      </xs:enumeration>
```

```

        </xs:annotation>
      </xs:enumeration>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="categoryOfRadioStationType">
    <xs:annotation>
      <xs:documentation>The type of Radio Station</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
      <xs:enumeration value="RadioDirection-findingStation">
        <xs:annotation>
          <xs:appinfo>5</xs:appinfo>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="Decca">
        <xs:annotation>
          <xs:appinfo>8</xs:appinfo>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="LoranC">
        <xs:annotation>
          <xs:appinfo>9</xs:appinfo>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="DifferentialGNSS">
        <xs:annotation>
          <xs:appinfo>10</xs:appinfo>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="Toran">
        <xs:annotation>
          <xs:appinfo>11</xs:appinfo>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="Omega">
        <xs:annotation>
          <xs:appinfo>12</xs:appinfo>
        </xs:annotation>
      </xs:enumeration>
    </xs:restriction>
  </xs:simpleType>

```

```

        </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="Syledis">
        <xs:annotation>
            <xs:appinfo>13</xs:appinfo>
        </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="Chaika(Chayka)">
        <xs:annotation>
            <xs:appinfo>14</xs:appinfo>
        </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="radioTelephoneStation">
        <xs:annotation>
            <xs:appinfo>19</xs:appinfo>
        </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="AISBaseStation">
        <xs:annotation>
            <xs:appinfo>20</xs:appinfo>
        </xs:annotation>
    </xs:enumeration>
</xs:restriction>
</xs:simpleType>
<xs:simpleType name="statusType">
    <xs:annotation>
        <xs:documentation>The status type of DGNSS Station</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
        <xs:enumeration value="permanent">
            <xs:annotation>
                <xs:appinfo>1</xs:appinfo>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="occasional">
            <xs:annotation>
                <xs:appinfo>2</xs:appinfo>
            </xs:annotation>
        </xs:enumeration>
    </xs:restriction>
</xs:simpleType>

```

```

        </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="notinuse">
        <xs:annotation>
            <xs:appinfo>4</xs:appinfo>
        </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="periodic/intermittent">
        <xs:annotation>
            <xs:appinfo>5</xs:appinfo>
        </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="temporary">
        <xs:annotation>
            <xs:appinfo>7</xs:appinfo>
        </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="private">
        <xs:annotation>
            <xs:appinfo>8</xs:appinfo>
        </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="planned">
        <xs:annotation>
            <xs:appinfo>9</xs:appinfo>
        </xs:annotation>
    </xs:enumeration>
</xs:restriction>
</xs:simpleType>
<!-- Feature Types -->
<xs:complexType name="RadioStationType">
    <xs:annotation>
        <xs:documentation>Radio Station</xs:documentation>
    </xs:annotation>
    <xs:complexContent>
        <xs:extension base="S100:AbstractFeatureType">
            <xs:sequence>

```

```

        <xs:element ref="S100:pointProperty">
            <xs:annotation>
                <xs:documentation>Point geometry</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="callSign" type="xs:string" minOccurs="0" maxOccurs="1"/>
        <xs:element name="categoryOfRadioStation" type="categoryOfRadioStationType" minOccurs="0" maxOccurs="1"/>
        <xs:element name="communicatonChannel" type="xs:string" minOccurs="0" maxOccurs="unbounded"/>
        <xs:element name="featureName" type="featureNameType" minOccurs="0" maxOccurs="unbounded"/>
        <xs:element name="fixedDateRange" type="fixedDateRangeType" minOccurs="0" maxOccurs="1"/>
        <xs:element name="periodicDateRange" type="periodicDateRangeType" minOccurs="0" maxOccurs="unbounded"/>
        <xs:element name="scaleMinimum" type="xs:integer" minOccurs="0" maxOccurs="1"/>
        <xs:element name="status" type="statusType" minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>
<!-- Information Types -->
<xs:complexType name="DgnssStationRegionType">
    <xs:annotation>
        <xs:documentation>Information about the DGNSS Station Region</xs:documentation>
    </xs:annotation>
    <xs:complexContent>
        <xs:extension base="S100:AbstractInformationType">
            <xs:sequence>
                <xs:element name="country" type="xs:string" minOccurs="1" maxOccurs="unbounded"/>
                <xs:element name="dateOfIssue" type="xs:date"/>
                <xs:element name="dateOfLastUpdate" type="xs:date"/>
            </xs:sequence>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>
<xs:complexType name="DgnssStationAlmanacType">
    <xs:annotation>
        <xs:documentation>Information about the DGNSS Station Almanac</xs:documentation>
    </xs:annotation>
    <xs:complexContent>

```



```

<xs:extension base="S100:AbstractInformationType">
  <xs:sequence>
    <xs:element name="bitRate" type="xs:integer"/>
    <xs:element name="signalFrequency" type="xs:float"/>
    <xs:element name="nominalRangeAt" type="xs:integer"/>
    <xs:element name="nominalRangeKm" type="xs:integer"/>
    <xs:element name="radiobeaconHealth" type="radiobeaconHealthType"/>
    <xs:element name="referenceStationID" type="xs:string" minOccurs="0" maxOccurs="2"/>
    <xs:element name="stationName" type="xs:string"/>
    <xs:element name="transmittedMessageType" type="transmittedMessageTypesType" minOccurs="0"
maxOccurs="unbounded"/>
    <xs:element name="transmittingStationID" type="xs:string"/>
  </xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>
<xs:complexType name="SupplementaryInformationType">
  <xs:annotation>
    <xs:documentation>Supplementary Information</xs:documentation>
  </xs:annotation>
  <xs:complexContent>
    <xs:extension base="S100:AbstractInformationType">
      <xs:sequence>
        <xs:element name="information" type="informationType" minOccurs="1" maxOccurs="unbounded"/>
        <xs:element name="pictorialRepresentation" type="xs:string" minOccurs="0" maxOccurs="1"/>
        <xs:element name="textualDescription" type="textualDescriptionType" minOccurs="1" maxOccurs="unbounded"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
<!-- Feature and Information elements -->
<xs:element name="DgnssStationRegion" type="DgnssStationRegionType"/>
<xs:element name="DgnssStationAlmanac" type="DgnssStationAlmanacType"/>
<xs:element name="RadioStation" type="RadioStationType"/>
<xs:element name="SupplementaryInformation" type="SupplementaryInformationType"/>
<!-- Dataset structure -->
<xs:complexType name="DgnssStationAlmanacBatchType">

```

```
<xs:annotation>
  <xs:documentation>DGNSS Station Almanac</xs:documentation>
</xs:annotation>
<xs:sequence>
  <xs:element ref="DgnssStationRegion" minOccurs="1" maxOccurs="unbounded"/>
  <xs:element ref="DgnssStationAlmanac" minOccurs="1" maxOccurs="unbounded"/>
  <xs:element ref="RadioStation" minOccurs="1" maxOccurs="unbounded"/>
  <xs:element ref="SupplementaryInformation" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
</xs:complexType>
<xs:element name="DgnssStationAlmanacBatch" type="DgnssStationAlmanacBatchType">
  <xs:annotation>
    <xs:documentation>DGNSS Station Almanac</xs:documentation>
  </xs:annotation>
</xs:element>
</xs:schema>
```

A-2. DGNSS Station Almanac – GML Sample Dataset

A-2.1 Source data

Table of DGNSS Stations			Country: KOREA				Date of issue: November 2006 Date of last update: November 2014				
Station name	Identification Numbers		Geographical Position Latitude Longitude (WGS84)	Nominal range		Station in operation	Integrity Monitoring	Transmitted message types	Freq. (kHz)	Bit Rate (bps)	Remarks
	Reference Stations	Transmitting Station		km	at (μV/m)						
Homigot	732 733	666	36° 04' 40.98" N 129° 33' 59.98" E	185	100	Yes	Yes	3,5,7,9,16	310	200	
Jumunjin	726 727	663	37° 53' 52.18" N 128° 50' 01.56" E	185	100	Yes	Yes	3,5,7,9,16	295	200	
Eocheongdo	728 729	664	36° 07' 30.73" N 125° 58' 06.52" E	185	100	Yes	Yes	3,5,7,9,16	295	200	
Geomundo	724 725	662	34° 00' 27.49" N 127° 19' 20.27" E	185	100	Yes	Yes	3,5,7,9,16	287	200	
Marado	730 731	665	33° 07' 00.95" N 126° 16' 08.91" E	185	100	Yes	Yes	3,5,7,9,16	290	200	
Palmido	722 723	661	37° 21' 30.00" N 126° 30' 40.54" E	185	100	Yes	Yes	3,5,7,9,16	313	200	
Ulleungdo	734 735	667	37° 31' 06.28" N 130° 47' 51.73" E	185	100	Yes	Yes	3,5,7,9,16	319	200	
Yeongdo	720 721	660	35° 03' 43.88" N 129° 04' 14.61" E	185	100	Yes	Yes	3,5,7,9,16	300	200	
Socheongdo	736 737	668	37° 45' 37.27" N 124° 43' 43.56" E	185	100	Yes	Yes	3,5,7,9,16	323	200	
Gageodo	738 739	669	34° 05' 41.62" N 125° 05' 56.10" E	185	100	Yes	Yes	3,5,7,9,16	298	200	
Jeojin	740 741	670	38° 33' 07.47" N 128° 23' 55.47" E	185	100	Yes	Yes	3,5,7,9,16	292	200	
Chuncheon	757 758	676	37° 59' 40.18" N 127° 42' 53.87" E	80	100	Yes	Yes	3,5,7,9,16	286	200	
Chungju	753 754	674	36° 58' 55.69" N 127° 45' 16.62" E	80	100	Yes	Yes	3,5,7,9,16	318	200	
Muju	747 748	671	35° 54' 12.46" N 127° 34' 58.97" E	80	100	Yes	Yes	3,5,7,9,16	322	200	

Table of DGNSS Stations			Country: KOREA			Date of issue: November 2006 Date of last update: November 2014					
Station name	Identification Numbers		Geographical Position Latitude Longitude (WGS84)	Nominal range		Station in operation	Integrity Monitoring	Transmitted message types	Freq. (kHz)	Bit Rate (bps)	Remarks
	Reference Stations	Transmitting Station		km	at (μV/m)						
Pyeongchang	751 752	673	37° 20' 58.87" N 128° 29' 15.57" E	80	100	Yes	Yes	3,5,7,9,16	303	200	
Yeongju	749 750	672	36° 51' 56.53" N 128° 32' 41.55" E	80	100	Yes	Yes	3,5,7,9,16	289	200	
Seongju	755 756	675	36° 51' 17.26" N 128° 10' 59.94" E	80	100	Yes	Yes	3,5,7,9,16	296	200	

A-2.2 GML Sample data

```
<?xml version="1.0" encoding="UTF-8"?>
<DgnssStationAlmanacBatch xsi:schemaLocation="http://www.iala-aism.org/DgnssStationAlmanacSchema S-240_GML_Schema.xsd"
  xmlns="http://www.iala-aism.org/DgnssStationAlmanacSchema"
  xmlns:S100="http://www.iho.int/s100gml/1.0"
  xmlns:gml="http://www.opengis.net/gml/3.2"
  xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <DgnssStationRegion gml:id="DGNSSSTATIONREGION-0001">
    <S100:informationAssociation gml:id="ia0001" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0001"/>
    <S100:informationAssociation gml:id="ia0002" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0002"/>
    <S100:informationAssociation gml:id="ia0003" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0003"/>
    <S100:informationAssociation gml:id="ia0004" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0004"/>
    <S100:informationAssociation gml:id="ia0005" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0005"/>
    <S100:informationAssociation gml:id="ia0006" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0006"/>
  </DgnssStationRegion>
</DgnssStationAlmanacBatch>
```

```

        <S100:informationAssociation gml:id="ia0007" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0007"/>
        <S100:informationAssociation gml:id="ia0008" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0008"/>
        <S100:informationAssociation gml:id="ia0009" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0009"/>
        <S100:informationAssociation gml:id="ia0010" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0010"/>
        <S100:informationAssociation gml:id="ia0011" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0011"/>
        <S100:informationAssociation gml:id="ia0012" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0012"/>
        <S100:informationAssociation gml:id="ia0013" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0013"/>
        <S100:informationAssociation gml:id="ia0014" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0014"/>
        <S100:informationAssociation gml:id="ia0015" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0015"/>
        <S100:informationAssociation gml:id="ia0016" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0016"/>
        <S100:informationAssociation gml:id="ia0017" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="DgnssStationRegionToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0017"/>
        <country>KOREA</country>
        <dateOfIssue>2006-11-01</dateOfIssue>
        <dateOfLastUpdate>2014-11-01</dateOfLastUpdate>
    </DgnssStationRegion>
    <DgnssStationAlmanac gml:id="DGNSSSTATIONALMANAC-0001">
        <bitRate>200</bitRate>
        <signalFrequency>310</signalFrequency>
        <nominalRangeAt>100</nominalRangeAt>
        <nominalRangeKm>185</nominalRangeKm>
    <radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
        <referenceStationID>732</referenceStationID>
        <referenceStationID>733</referenceStationID>
        <stationName>Homigot</stationName>
        <transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
        <transmittedMessageType>GPSConstellationHealth</transmittedMessageType>

```

```

    <transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
    <transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
    <transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
    <transmittingStationID>666</transmittingStationID>
</DgnssStationAlmanac>

<DgnssStationAlmanac gml:id="DGNSSTATIONALMANAC-0002">
    <bitRate>200</bitRate>
    <signalFrequency>295</signalFrequency>
    <nominalRangeAt>100</nominalRangeAt>
    <nominalRangeKm>185</nominalRangeKm>
<radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
    <referenceStationID>726</referenceStationID>
    <referenceStationID>727</referenceStationID>
    <stationName>Jumunjin</stationName>
    <transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
    <transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
    <transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
    <transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
    <transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
    <transmittingStationID>663</transmittingStationID>
</DgnssStationAlmanac>

<DgnssStationAlmanac gml:id="DGNSSTATIONALMANAC-0003">
    <bitRate>200</bitRate>
    <signalFrequency>295</signalFrequency>
    <nominalRangeAt>100</nominalRangeAt>
    <nominalRangeKm>185</nominalRangeKm>
<radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
    <referenceStationID>728</referenceStationID>
    <referenceStationID>729</referenceStationID>
    <stationName>Eocheongdo</stationName>
    <transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
    <transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
    <transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
    <transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
    <transmittedMessageType>GPSSpecialMessage</transmittedMessageType>

```

```

    <transmittingStationID>664</transmittingStationID>
  </DgnssStationAlmanac>

  <DgnssStationAlmanac gml:id="DGNSSSTATIONALMANAC-0004">
    <bitRate>200</bitRate>
    <signalFrequency>287</signalFrequency>
    <nominalRangeAt>100</nominalRangeAt>
    <nominalRangeKm>185</nominalRangeKm>
    <radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
    <referenceStationID>726</referenceStationID>
    <referenceStationID>727</referenceStationID>
    <stationName>Geomundo</stationName>
    <transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
    <transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
    <transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
    <transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
    <transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
    <transmittingStationID>662</transmittingStationID>
  </DgnssStationAlmanac>

  <DgnssStationAlmanac gml:id="DGNSSSTATIONALMANAC-0005">
    <bitRate>200</bitRate>
    <signalFrequency>290</signalFrequency>
    <nominalRangeAt>100</nominalRangeAt>
    <nominalRangeKm>185</nominalRangeKm>
    <radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
    <referenceStationID>730</referenceStationID>
    <referenceStationID>731</referenceStationID>
    <stationName>Marado</stationName>
    <transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
    <transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
    <transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
    <transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
    <transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
    <transmittingStationID>665</transmittingStationID>
  </DgnssStationAlmanac>

```



```
<DgnssStationAlmanac gml:id="DGNSSSTATIONALMANAC-0006">
  <bitRate>200</bitRate>
  <signalFrequency>313</signalFrequency>
  <nominalRangeAt>100</nominalRangeAt>
  <nominalRangeKm>185</nominalRangeKm>
  <radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
  <referenceStationID>722</referenceStationID>
  <referenceStationID>723</referenceStationID>
  <stationName>Palmido</stationName>
  <transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
  <transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
  <transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
  <transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
  <transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
  <transmittingStationID>661</transmittingStationID>
</DgnssStationAlmanac>
```

```
<DgnssStationAlmanac gml:id="DGNSSSTATIONALMANAC-0007">
  <bitRate>200</bitRate>
  <signalFrequency>319</signalFrequency>
  <nominalRangeAt>100</nominalRangeAt>
  <nominalRangeKm>185</nominalRangeKm>
  <radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
  <referenceStationID>734</referenceStationID>
  <referenceStationID>735</referenceStationID>
  <stationName>Ulleungdo</stationName>
  <transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
  <transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
  <transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
  <transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
  <transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
  <transmittingStationID>667</transmittingStationID>
</DgnssStationAlmanac>
```

```
<DgnssStationAlmanac gml:id="DGNSSSTATIONALMANAC-0008">
  <bitRate>200</bitRate>
  <signalFrequency>300</signalFrequency>
```



```
<nominalRangeAt>100</nominalRangeAt>
<nominalRangeKm>185</nominalRangeKm>
<radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
<referenceStationID>720</referenceStationID>
<referenceStationID>721</referenceStationID>
<stationName>Yeongdo</stationName>
<transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
<transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
<transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
<transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
<transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
<transmittingStationID>660</transmittingStationID>
</DgnssStationAlmanac>
```

```
<DgnssStationAlmanac gml:id="DGNSSSTATIONALMANAC-0009">
  <bitRate>200</bitRate>
  <signalFrequency>323</signalFrequency>
  <nominalRangeAt>100</nominalRangeAt>
  <nominalRangeKm>185</nominalRangeKm>
  <radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
  <referenceStationID>736</referenceStationID>
  <referenceStationID>737</referenceStationID>
  <stationName>Socheongdo</stationName>
  <transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
  <transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
  <transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
  <transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
  <transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
  <transmittingStationID>668</transmittingStationID>
</DgnssStationAlmanac>
```

```
<DgnssStationAlmanac gml:id="DGNSSSTATIONALMANAC-0010">
  <bitRate>200</bitRate>
  <signalFrequency>298</signalFrequency>
  <nominalRangeAt>100</nominalRangeAt>
  <nominalRangeKm>185</nominalRangeKm>
  <radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
```

```
<referenceStationID>738</referenceStationID>
<referenceStationID>739</referenceStationID>
<stationName>Gageodo</stationName>
<transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
<transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
<transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
<transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
<transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
<transmittingStationID>669</transmittingStationID>
</DgnssStationAlmanac>
```

```
<DgnssStationAlmanac gml:id="DGNSSSTATIONALMANAC-0011">
  <bitRate>200</bitRate>
  <signalFrequency>292</signalFrequency>
  <nominalRangeAt>100</nominalRangeAt>
  <nominalRangeKm>185</nominalRangeKm>
  <radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
  <referenceStationID>740</referenceStationID>
  <referenceStationID>741</referenceStationID>
  <stationName>Jeojin</stationName>
  <transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
  <transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
  <transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
  <transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
  <transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
  <transmittingStationID>670</transmittingStationID>
</DgnssStationAlmanac>
```

```
<DgnssStationAlmanac gml:id="DGNSSSTATIONALMANAC-0012">
  <bitRate>200</bitRate>
  <signalFrequency>286</signalFrequency>
  <nominalRangeAt>100</nominalRangeAt>
  <nominalRangeKm>80</nominalRangeKm>
  <radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
  <referenceStationID>757</referenceStationID>
  <referenceStationID>758</referenceStationID>
  <stationName>Chuncheon</stationName>
```

```
    <transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
    <transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
    <transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
    <transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
    <transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
    <transmittingStationID>676</transmittingStationID>
</DgnssStationAlmanac>
```

```
<DgnssStationAlmanac gml:id="DGNSSSTATIONALMANAC-0013">
  <bitRate>200</bitRate>
  <signalFrequency>318</signalFrequency>
  <nominalRangeAt>100</nominalRangeAt>
  <nominalRangeKm>80</nominalRangeKm>
  <radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
  <referenceStationID>753</referenceStationID>
  <referenceStationID>754</referenceStationID>
  <stationName>Chungju</stationName>
  <transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
  <transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
  <transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
  <transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
  <transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
  <transmittingStationID>674</transmittingStationID>
</DgnssStationAlmanac>
```

```
<DgnssStationAlmanac gml:id="DGNSSSTATIONALMANAC-0014">
  <bitRate>200</bitRate>
  <signalFrequency>322</signalFrequency>
  <nominalRangeAt>100</nominalRangeAt>
  <nominalRangeKm>80</nominalRangeKm>
  <radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
  <referenceStationID>747</referenceStationID>
  <referenceStationID>748</referenceStationID>
  <stationName>Muju</stationName>
  <transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
  <transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
  <transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
```

```

    <transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
    <transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
    <transmittingStationID>671</transmittingStationID>
</DgnssStationAlmanac>

<DgnssStationAlmanac gml:id="DGNSSSTATIONALMANAC-0015">
  <bitRate>200</bitRate>
  <signalFrequency>303</signalFrequency>
  <nominalRangeAt>100</nominalRangeAt>
  <nominalRangeKm>80</nominalRangeKm>
  <radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
  <referenceStationID>751</referenceStationID>
  <referenceStationID>752</referenceStationID>
  <stationName>Pyeongchang</stationName>
  <transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
  <transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
  <transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
  <transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
  <transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
  <transmittingStationID>673</transmittingStationID>
</DgnssStationAlmanac>

<DgnssStationAlmanac gml:id="DGNSSSTATIONALMANAC-0016">
  <bitRate>200</bitRate>
  <signalFrequency>296</signalFrequency>
  <nominalRangeAt>100</nominalRangeAt>
  <nominalRangeKm>80</nominalRangeKm>
  <radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
  <referenceStationID>749</referenceStationID>
  <referenceStationID>750</referenceStationID>
  <stationName>Yeongju</stationName>
  <transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
  <transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
  <transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
  <transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
  <transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
  <transmittingStationID>672</transmittingStationID>

```

```

</DgnssStationAlmanac>

<DgnssStationAlmanac gml:id="DGNSSSTATIONALMANAC-0017">
  <bitRate>200</bitRate>
  <signalFrequency>296</signalFrequency>
  <nominalRangeAt>100</nominalRangeAt>
  <nominalRangeKm>80</nominalRangeKm>
  <radiobeaconHealth>RadiobeaconOperationNormal</radiobeaconHealth>
  <referenceStationID>755</referenceStationID>
  <referenceStationID>756</referenceStationID>
  <stationName>Seongju</stationName>
  <transmittedMessageType>GPSReferenceStationParameters</transmittedMessageType>
  <transmittedMessageType>GPSConstellationHealth</transmittedMessageType>
  <transmittedMessageType>DGPSRadiobeaconAlmanac</transmittedMessageType>
  <transmittedMessageType>GPSPartialCorrectionSet</transmittedMessageType>
  <transmittedMessageType>GPSSpecialMessage</transmittedMessageType>
  <transmittingStationID>675</transmittingStationID>
</DgnssStationAlmanac>
<RadioStation gml:id="RADIOSTATION-0001">
  <S100:informationAssociation gml:id="ib0001" xlink:arcrole="http://www.ihp.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0001"/>
  <S100:pointProperty>
    <S100:Point gml:id="ID_1">
      <gml:pos>129.5666611 36.07804444</gml:pos>
    </S100:Point>
  </S100:pointProperty>
</RadioStation>
<RadioStation gml:id="RADIOSTATION-0002">
  <S100:informationAssociation gml:id="ib0002" xlink:arcrole="http://www.ihp.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0002"/>
  <S100:pointProperty>
    <S100:Point gml:id="ID_2">
      <gml:pos>128.8337667 37.89782778</gml:pos>
    </S100:Point>
  </S100:pointProperty>
</RadioStation>
<RadioStation gml:id="RADIOSTATION-0003">

```

```

        <S100:informationAssociation gml:id="ib0003" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0003"/>
        <S100:pointProperty>
            <S100:Point gml:id="ID_3">
                <gml:pos>125.9684778 36.12520278</gml:pos>
            </S100:Point>
        </S100:pointProperty>
    </RadioStation>
    <RadioStation gml:id="RADIOSTATION-0004">
        <S100:informationAssociation gml:id="ib0004" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0004"/>
        <S100:pointProperty>
            <S100:Point gml:id="ID_4">
                <gml:pos>127.3222972 34.00763611</gml:pos>
            </S100:Point>
        </S100:pointProperty>
    </RadioStation>
    <RadioStation gml:id="RADIOSTATION-0005">
        <S100:informationAssociation gml:id="ib0005" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0005"/>
        <S100:pointProperty>
            <S100:Point gml:id="ID_5">
                <gml:pos>126.2691417 33.11693056</gml:pos>
            </S100:Point>
        </S100:pointProperty>
    </RadioStation>
    <RadioStation gml:id="RADIOSTATION-0006">
        <S100:informationAssociation gml:id="ib0006" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0006"/>
        <S100:pointProperty>
            <S100:Point gml:id="ID_6">
                <gml:pos>126.5112611 37.35833333</gml:pos>
            </S100:Point>
        </S100:pointProperty>
    </RadioStation>
    <RadioStation gml:id="RADIOSTATION-0007">
        <S100:informationAssociation gml:id="ib0007" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"

```

```

xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0007"/>
  <S100:pointProperty>
    <S100:Point gml:id="ID_7">
      <gml:pos>130.7977028 37.51841111</gml:pos>
    </S100:Point>
  </S100:pointProperty>
</RadioStation>
<RadioStation gml:id="RADIOSTATION-0008">
  <S100:informationAssociation gml:id="ib0008" xlink:arcrole="http://www.ihp.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0008"/>
  <S100:pointProperty>
    <S100:Point gml:id="ID_8">
      <gml:pos>129.070725 35.06218889</gml:pos>
    </S100:Point>
  </S100:pointProperty>
</RadioStation>
<RadioStation gml:id="RADIOSTATION-0009">
  <S100:informationAssociation gml:id="ib0009" xlink:arcrole="http://www.ihp.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0009"/>
  <S100:pointProperty>
    <S100:Point gml:id="ID_9">
      <gml:pos>124.7287667 37.76035278</gml:pos>
    </S100:Point>
  </S100:pointProperty>
</RadioStation>
<RadioStation gml:id="RADIOSTATION-0010">
  <S100:informationAssociation gml:id="ib0010" xlink:arcrole="http://www.ihp.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0010"/>
  <S100:pointProperty>
    <S100:Point gml:id="ID_10">
      <gml:pos>125.0989167 34.09489444</gml:pos>
    </S100:Point>
  </S100:pointProperty>
</RadioStation>
<RadioStation gml:id="RADIOSTATION-0011">
  <S100:informationAssociation gml:id="ib0011" xlink:arcrole="http://www.ihp.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0011"/>

```

```

    <S100:pointProperty>
      <S100:Point gml:id="ID_11">
        <gml:pos>128.3987417 38.552075</gml:pos>
      </S100:Point>
    </S100:pointProperty>
  </RadioStation>
  <RadioStation gml:id="RADIOSTATION-0012">
    <S100:informationAssociation gml:id="ib0012" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0012"/>
    <S100:pointProperty>
      <S100:Point gml:id="ID_12">
        <gml:pos>127.7149639 37.99449444</gml:pos>
      </S100:Point>
    </S100:pointProperty>
  </RadioStation>
  <RadioStation gml:id="RADIOSTATION-0013">
    <S100:informationAssociation gml:id="ib0013" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0013"/>
    <S100:pointProperty>
      <S100:Point gml:id="ID_13">
        <gml:pos>127.7546167 36.98213611</gml:pos>
      </S100:Point>
    </S100:pointProperty>
  </RadioStation>
  <RadioStation gml:id="RADIOSTATION-0014">
    <S100:informationAssociation gml:id="ib0014" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0014"/>
    <S100:pointProperty>
      <S100:Point gml:id="ID_14">
        <gml:pos>127.5830472 35.90346111</gml:pos>
      </S100:Point>
    </S100:pointProperty>
  </RadioStation>
  <RadioStation gml:id="RADIOSTATION-0015">
    <S100:informationAssociation gml:id="ib0015" xlink:arcrole="http://www.iho.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0015"/>
    <S100:pointProperty>

```



```
        <S100:Point gml:id="ID_15">
            <gml:pos>128.4876583 37.34963056</gml:pos>
        </S100:Point>
    </S100:pointProperty>
</RadioStation>
<RadioStation gml:id="RADIOSTATION-0016">
    <S100:informationAssociation gml:id="ib0016" xlink:arcrole="http://www.ihp.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0016"/>
    <S100:pointProperty>
        <S100:Point gml:id="ID_16">
            <gml:pos>128.544875 36.86570278</gml:pos>
        </S100:Point>
    </S100:pointProperty>
</RadioStation>
<RadioStation gml:id="RADIOSTATION-0017">
    <S100:informationAssociation gml:id="ib0017" xlink:arcrole="http://www.ihp.int/S-240/roles/theDgnssStationAlmanac"
xlink:title="RadioStationToDgnssStationAlmanac" xlink:href="#DGNSSSTATIONALMANAC-0017"/>
    <S100:pointProperty>
        <S100:Point gml:id="ID_17">
            <gml:pos>128.1833167 36.85479444</gml:pos>
        </S100:Point>
    </S100:pointProperty>
</RadioStation>
</DgnssStationAlmanacBatch>
```

ANNEX B DGNSS STATION ALMANAC – FEATURE CATALOGUE

```
<?xml version="1.0" encoding="iso-8859-1"?>
<S100FC:S100_FC_FeatureCatalogue xmlns:S100FC="http://www.iho.int/S100FC" xmlns:S100Base="http://www.iho.int/S100Base"
xmlns:S100CI="http://www.iho.int/S100CI" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:S100FD="http://www.iho.int/S100FD"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocation="http://www.iho.int/S100FC S100FC.xsd">
  <S100FC:name>DGNSS Station Almanac</S100FC:name>
  <S100FC:scope>Global</S100FC:scope>
  <S100FC:fieldOfApplication>Shore Technical Infrastructure</S100FC:fieldOfApplication>
  <S100FC:versionNumber>0.1</S100FC:versionNumber>
  <S100FC:versionDate>2015-04-09</S100FC:versionDate>
  <S100FC:producer>
    <S100CI:individualName>Sewoong OH</S100CI:individualName>
    <S100CI:organisationName>IALA</S100CI:organisationName>
    <S100CI:positionName>Member</S100CI:positionName>
    <S100CI:role>originator</S100CI:role>
  </S100FC:producer>
  <S100FC:S100_FC_SimpleAttributes>
    <S100FC:S100_FC_SimpleAttribute>
      <S100FC:name>Bit Rate</S100FC:name>
      <S100FC:definition></S100FC:definition>
      <S100FC:code>bitRate</S100FC:code>
      <S100FC:valueType>int</S100FC:valueType>
    </S100FC:S100_FC_SimpleAttribute>
    <S100FC:S100_FC_SimpleAttribute>
      <S100FC:name>Call sign</S100FC:name>
      <S100FC:definition>The designated call-sign of a radio station.</S100FC:definition>
      <S100FC:code>callSign</S100FC:code>
      <S100FC:alias>CALSGN</S100FC:alias>
      <S100FC:valueType>text</S100FC:valueType>
    </S100FC:S100_FC_SimpleAttribute>
    <S100FC:S100_FC_SimpleAttribute>
      <S100FC:name>Category of radio station</S100FC:name>
      <S100FC:definition>Classification of radio services offered by a radio station.</S100FC:definition>
      <S100FC:code>categoryOfRadioStation</S100FC:code>
      <S100FC:remarks>A radiobeacon is a radio transmitter which emits a distinctive or characteristic signal on which a bearing may be
```

taken.</S100FC:remarks>

<S100FC:alias>CATROS</S100FC:alias>

<S100FC:valueType>enumeration</S100FC:valueType>

<S100FC:listedValues>

<S100FC:listedValue>

<S100FC:label>radio direction-finding station</S100FC:label>

<S100FC:definition>a radio station intended to determine only the direction of other stations by means of transmission from the latter.</S100FC:definition>

<S100FC:code>5</S100FC:code>

</S100FC:listedValue>

<S100FC:listedValue>

<S100FC:label>decca</S100FC:label>

<S100FC:definition>the Decca Navigator System is a high accuracy, short to medium range radio navigational aid intended for coastal and landfall navigation.</S100FC:definition>

<S100FC:code>8</S100FC:code>

</S100FC:listedValue>

<S100FC:listedValue>

<S100FC:label>loran C</S100FC:label>

<S100FC:definition>loran-C is a low frequency electronic position fixing system using pulsed transmissions at 100 Khz.</S100FC:definition>

<S100FC:code>9</S100FC:code>

</S100FC:listedValue>

<S100FC:listedValue>

<S100FC:label>differential GPS</S100FC:label>

<S100FC:definition>a radiobeacon transmitting DGPS correction signals.</S100FC:definition>

<S100FC:code>10</S100FC:code>

</S100FC:listedValue>

<S100FC:listedValue>

<S100FC:label>toran</S100FC:label>

<S100FC:definition>toran is an electronic position fixing system used mainly by aircraft.</S100FC:definition>

<S100FC:code>11</S100FC:code>

</S100FC:listedValue>

<S100FC:listedValue>

<S100FC:label>omega</S100FC:label>

<S100FC:definition>omega is a long-range radio navigational aid which operates within the VLF frequency band. The system comprises eight land based stations.</S100FC:definition>

<S100FC:code>12</S100FC:code>

```

    </S100FC:listedValue>
    <S100FC:listedValue>
      <S100FC:label>syledis</S100FC:label>
      <S100FC:definition>syledis is a ranging position fixing system operating at 420–450MHz over a range of up to
400Km.</S100FC:definition>
      <S100FC:code>13</S100FC:code>
    </S100FC:listedValue>
    <S100FC:listedValue>
      <S100FC:label>chiaka (Chayka)</S100FC:label>
      <S100FC:definition>chiaka is a low frequency electronic position fixing system using pulsed transmissions at 100
Khz.</S100FC:definition>
      <S100FC:code>14</S100FC:code>
    </S100FC:listedValue>
    <S100FC:listedValue>
      <S100FC:label>radio telephone station</S100FC:label>
      <S100FC:definition>the equipment needed at one station to carry on two way voice communication by radio waves
only.</S100FC:definition>
      <S100FC:code>19</S100FC:code>
    </S100FC:listedValue>
    <S100FC:listedValue>
      <S100FC:label>AIS base station</S100FC:label>
      <S100FC:definition></S100FC:definition>
      <S100FC:code>20</S100FC:code>
    </S100FC:listedValue>
  </S100FC:listedValues>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
  <S100FC:name>Communication channel</S100FC:name>
  <S100FC:definition>A channel number assigned to a specific radio frequency, frequencies or frequency band.</S100FC:definition>
  <S100FC:code>communicationChannel</S100FC:code>
  <S100FC:remarks>The expected input is the specific VHF–Channel. The attribute 'communication channel' encodes the various
VHF–channels used for communication.</S100FC:remarks>
  <S100FC:alias>COMCHA</S100FC:alias>
  <S100FC:valueType>text</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
  <S100FC:name>Country</S100FC:name>

```

```
<S100FC:definition></S100FC:definition>
<S100FC:code>country</S100FC:code>
<S100FC:valueType>characterstring</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
```

```
<S100FC:name>Date end</S100FC:name>
<S100FC:definition>The latest date on which an object (e.g., a buoy) will be present.</S100FC:definition>
<S100FC:code>dateEnd</S100FC:code>
<S100FC:remarks>This attribute is to be used to indicate the removal or cancellation of an object at a specific date in the future.
```

See also 'periodic date end' (PEREND).</S100FC:remarks>

```
<S100FC:alias>DATEND</S100FC:alias>
<S100FC:valueType>text</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
```

```
<S100FC:name>Date of Issue</S100FC:name>
<S100FC:definition></S100FC:definition>
<S100FC:code>dateOfIssue</S100FC:code>
<S100FC:valueType>date</S100FC:valueType>
```

```
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
<S100FC:name>Date of Last Update</S100FC:name>
<S100FC:definition></S100FC:definition>
<S100FC:code>dateOfLastUpdate</S100FC:code>
<S100FC:valueType>date</S100FC:valueType>
```

```
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
<S100FC:name>Date start</S100FC:name>
<S100FC:definition>The earliest date on which an object (e.g., a buoy) will be present.</S100FC:definition>
<S100FC:code>dateStart</S100FC:code>
```

<S100FC:remarks>This attribute is to be used to indicate the deployment or implementation of an object at a specific date in the future. See also 'periodic date start' (PERSTA).</S100FC:remarks>

```
<S100FC:alias>DATSTA</S100FC:alias>
<S100FC:valueType>text</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
<S100FC:name>Display name</S100FC:name>
<S100FC:definition></S100FC:definition>
```

```

        <S100FC:code>displayName</S100FC:code>
        <S100FC:valueType>boolean</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
    <S100FC:name>Information</S100FC:name>
    <S100FC:definition></S100FC:definition>
    <S100FC:code>information</S100FC:code>
    <S100FC:valueType>text</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
    <S100FC:name>Language</S100FC:name>
    <S100FC:definition></S100FC:definition>
    <S100FC:code>language</S100FC:code>
    <S100FC:valueType>text</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
    <S100FC:name>Name</S100FC:name>
    <S100FC:definition></S100FC:definition>
    <S100FC:code>name</S100FC:code>
    <S100FC:valueType>text</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
    <S100FC:name>Nominal Range At</S100FC:name>
    <S100FC:definition></S100FC:definition>
    <S100FC:code>nominalRangeat</S100FC:code>
    <S100FC:valueType>int</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
    <S100FC:name>Nominal Range Km</S100FC:name>
    <S100FC:definition></S100FC:definition>
    <S100FC:code>nominalRangeKm</S100FC:code>
    <S100FC:valueType>int</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
    <S100FC:name>Pictorial representation</S100FC:name>
    <S100FC:definition>Indicates whether a pictorial representation of the object is available.</S100FC:definition>
    <S100FC:code>pictorialRepresentation</S100FC:code>

```

<S100FC:remarks>The 'pictorial representation' could be a drawing or a photo. The string encodes the file name of an external graphic file (pixel/vector).</S100FC:remarks>

<S100FC:alias>PICREP</S100FC:alias>

<S100FC:valueType>text</S100FC:valueType>

</S100FC:S100_FC_SimpleAttribute>

<S100FC:S100_FC_SimpleAttribute>

<S100FC:name>Radio Beacon Health</S100FC:name>

<S100FC:definition></S100FC:definition>

<S100FC:code>radiobeaconhealth</S100FC:code>

<S100FC:valueType>enumeration</S100FC:valueType>

<S100FC:listedValues>

<S100FC:listedValue>

<S100FC:label>Radio Beacon Operation Normal</S100FC:label>

<S100FC:definition></S100FC:definition>

<S100FC:code>1</S100FC:code>

</S100FC:listedValue>

<S100FC:listedValue>

<S100FC:label>No Integrity Monitor Operating</S100FC:label>

<S100FC:definition></S100FC:definition>

<S100FC:code>2</S100FC:code>

</S100FC:listedValue>

<S100FC:listedValue>

<S100FC:label>No Information Available</S100FC:label>

<S100FC:definition></S100FC:definition>

<S100FC:code>3</S100FC:code>

</S100FC:listedValue>

<S100FC:listedValue>

<S100FC:label>Don't Use This Radio Beacon</S100FC:label>

<S100FC:definition></S100FC:definition>

<S100FC:code>4</S100FC:code>

</S100FC:listedValue>

</S100FC:listedValues>

</S100FC:S100_FC_SimpleAttribute>

<S100FC:S100_FC_SimpleAttribute>

<S100FC:name>Reference Station IDs</S100FC:name>

<S100FC:definition></S100FC:definition>

<S100FC:code>referenceStationIDs</S100FC:code>

```

    <S100FC:valueType>text</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
  <S100FC:name>Scale minimum</S100FC:name>
  <S100FC:definition>The minimum scale at which the object may be used, e.g., for ECDIS presentation.</S100FC:definition>
  <S100FC:code>scaleMinimum</S100FC:code>
  <S100FC:remarks>The modulus of the scale is indicated, that is 1:1 250 000 is encoded as 1250000.</S100FC:remarks>
  <S100FC:alias>SCAMIN</S100FC:alias>
  <S100FC:valueType>integer</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
  <S100FC:name>Signal frequency</S100FC:name>
  <S100FC:definition>The frequency of a signal.</S100FC:definition>
  <S100FC:code>signalFrequency</S100FC:code>
  <S100FC:alias>SIGFRQ</S100FC:alias>
  <S100FC:valueType>integer</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
  <S100FC:name>Station name</S100FC:name>
  <S100FC:definition></S100FC:definition>
  <S100FC:code>stationName</S100FC:code>
  <S100FC:valueType>text</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
  <S100FC:name>Status</S100FC:name>
  <S100FC:definition>The condition of an object at a given instant in time</S100FC:definition>
  <S100FC:code>status</S100FC:code>
  <S100FC:alias>STATUS</S100FC:alias>
  <S100FC:valueType>enumeration</S100FC:valueType>
  <S100FC:listedValues>
    <S100FC:listedValue>
      <S100FC:label>permanent</S100FC:label>
      <S100FC:definition>intended to last or function indefinitely.</S100FC:definition>
      <S100FC:code>1</S100FC:code>
    </S100FC:listedValue>
    <S100FC:listedValue>
      <S100FC:label>occasional</S100FC:label>

```


<S100FC:definition>acting on special occasions happening irregularly.</S100FC:definition>
<S100FC:code>2</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
<S100FC:label>recommended</S100FC:label>
<S100FC:definition>presented as worthy of confidence, acceptance, use, etc.</S100FC:definition>
<S100FC:code>3</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
<S100FC:label>not in use</S100FC:label>
<S100FC:definition>no longer used for the purpose intended disused.</S100FC:definition>
<S100FC:code>4</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
<S100FC:label>periodic/intermittent</S100FC:label>
<S100FC:definition>recurring at intervals.</S100FC:definition>
<S100FC:code>5</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
<S100FC:label>reserved</S100FC:label>
<S100FC:definition>set apart for some specific use.</S100FC:definition>
<S100FC:code>6</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
<S100FC:label>temporary</S100FC:label>
<S100FC:definition>meant to last only for a time.</S100FC:definition>
<S100FC:code>7</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
<S100FC:label>private</S100FC:label>
<S100FC:definition>not in public ownership or operation.</S100FC:definition>
<S100FC:code>8</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
<S100FC:label>mandatory</S100FC:label>
<S100FC:definition>compulsory enforced.</S100FC:definition>
<S100FC:code>9</S100FC:code>

</S100FC:listedValue>
 <S100FC:listedValue>
 <S100FC:label>extinguished</S100FC:label>
 <S100FC:definition>no longer lit</S100FC:definition>
 <S100FC:code>11</S100FC:code>
 </S100FC:listedValue>
 <S100FC:listedValue>
 <S100FC:label>illuminated</S100FC:label>
 <S100FC:definition>lit by floodlights, strip lights, etc.</S100FC:definition>
 <S100FC:code>12</S100FC:code>
 </S100FC:listedValue>
 <S100FC:listedValue>
 <S100FC:label>historic</S100FC:label>
 <S100FC:definition>famous in history of historical interest.</S100FC:definition>
 <S100FC:code>13</S100FC:code>
 </S100FC:listedValue>
 <S100FC:listedValue>
 <S100FC:label>public</S100FC:label>
 <S100FC:definition>belonging to, available to, used or shared by, the community as a whole and not restricted to
 private use.</S100FC:definition>
 <S100FC:code>14</S100FC:code>
 </S100FC:listedValue>
 <S100FC:listedValue>
 <S100FC:label>synchronized</S100FC:label>
 <S100FC:definition>occur at a time, coincide in point of time, be contemporary or
 simultaneous.</S100FC:definition>
 <S100FC:code>15</S100FC:code>
 </S100FC:listedValue>
 <S100FC:listedValue>
 <S100FC:label>watched</S100FC:label>
 <S100FC:definition>looked at or observed over a period of time especially so as to be aware of any movement or
 change.</S100FC:definition>
 <S100FC:code>16</S100FC:code>
 </S100FC:listedValue>
 <S100FC:listedValue>
 <S100FC:label>un-watched</S100FC:label>
 <S100FC:definition>usually automatic in operation, without any permanently-stationed personnel to superintend

it.</S100FC:definition>

```
<S100FC:code>17</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
  <S100FC:label>existence doubtful</S100FC:label>
  <S100FC:definition>an object that has been reported but has not been definitely determined to
```

exist.</S100FC:definition>

```
<S100FC:code>18</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
  <S100FC:label>buoyed</S100FC:label>
  <S100FC:definition></S100FC:definition>
  <S100FC:code>28</S100FC:code>
</S100FC:listedValue>
</S100FC:listedValues>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
  <S100FC:name>Textual description</S100FC:name>
  <S100FC:definition></S100FC:definition>
  <S100FC:code>textualDescription</S100FC:code>
  <S100FC:valueType>text</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
  <S100FC:name>Transmitted Messsage Types</S100FC:name>
  <S100FC:definition></S100FC:definition>
  <S100FC:code>transmittedMessageTypes</S100FC:code>
  <S100FC:valueType>enumeration</S100FC:valueType>
  <S100FC:listedValues>
    <S100FC:listedValue>
      <S100FC:label>Differential GPS Corrections</S100FC:label>
      <S100FC:definition></S100FC:definition>
      <S100FC:code>1</S100FC:code>
    </S100FC:listedValue>
    <S100FC:listedValue>
      <S100FC:label>Delta Differential GPS Corrections</S100FC:label>
      <S100FC:definition></S100FC:definition>
      <S100FC:code>2</S100FC:code>
```

</S100FC:listedValue>
<S100FC:listedValue>
 <S100FC:label>GPS Reference Station Parameters</S100FC:label>
 <S100FC:definition></S100FC:definition>
 <S100FC:code>3</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
 <S100FC:label>Reference Station Datum</S100FC:label>
 <S100FC:definition></S100FC:definition>
 <S100FC:code>4</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
 <S100FC:label>GPS Constellation Health</S100FC:label>
 <S100FC:definition></S100FC:definition>
 <S100FC:code>5</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
 <S100FC:label>GPS Null Frame</S100FC:label>
 <S100FC:definition></S100FC:definition>
 <S100FC:code>6</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
 <S100FC:label>DGPS Radio beacon Almanac</S100FC:label>
 <S100FC:definition></S100FC:definition>
 <S100FC:code>7</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
 <S100FC:label>Pseudo Lite Almanac</S100FC:label>
 <S100FC:definition></S100FC:definition>
 <S100FC:code>8</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
 <S100FC:label>GPS Partial Correction Set</S100FC:label>
 <S100FC:definition></S100FC:definition>
 <S100FC:code>9</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>

<S100FC:label>P-code Differential Corrections</S100FC:label>
<S100FC:definition></S100FC:definition>
<S100FC:code>10</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
<S100FC:label>C/A-Code Differential Corrections</S100FC:label>
<S100FC:definition></S100FC:definition>
<S100FC:code>11</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
<S100FC:label>Pseudolite Station Parameters</S100FC:label>
<S100FC:definition></S100FC:definition>
<S100FC:code>12</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
<S100FC:label>Ground Transmitter Parameters</S100FC:label>
<S100FC:definition></S100FC:definition>
<S100FC:code>13</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
<S100FC:label>GPS Time of Week</S100FC:label>
<S100FC:definition></S100FC:definition>
<S100FC:code>14</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
<S100FC:label>Iono Spheric Delay Message</S100FC:label>
<S100FC:definition></S100FC:definition>
<S100FC:code>15</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
<S100FC:label>GPS Special Message</S100FC:label>
<S100FC:definition></S100FC:definition>
<S100FC:code>16</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
<S100FC:label>GPS Ephemerides</S100FC:label>
<S100FC:definition></S100FC:definition>

```

        <S100FC:code>17</S100FC:code>
    </S100FC:listedValue>
    <S100FC:listedValue>
        <S100FC:label>RTK Uncorrected Carrier Phases </S100FC:label>
        <S100FC:definition></S100FC:definition>
        <S100FC:code>18</S100FC:code>
    </S100FC:listedValue>
    <S100FC:listedValue>
        <S100FC:label>RTK Uncorrected Pseudo ranges</S100FC:label>
        <S100FC:definition></S100FC:definition>
        <S100FC:code>19</S100FC:code>
    </S100FC:listedValue>
    <S100FC:listedValue>
        <S100FC:label>RTK Carrier Phase Corrections</S100FC:label>
        <S100FC:definition></S100FC:definition>
        <S100FC:code>20</S100FC:code>
    </S100FC:listedValue>
    <S100FC:listedValue>
        <S100FC:label>RTK/Hi-Accuracy Pseudo range Corrections</S100FC:label>
        <S100FC:definition></S100FC:definition>
        <S100FC:code>21</S100FC:code>
    </S100FC:listedValue>
    <S100FC:listedValue>
        <S100FC:label>Extended Reference Station Parameters</S100FC:label>
        <S100FC:definition></S100FC:definition>
        <S100FC:code>22</S100FC:code>
    </S100FC:listedValue>
    <S100FC:listedValue>
        <S100FC:label>Antenna Type Definition Record</S100FC:label>
        <S100FC:definition></S100FC:definition>
        <S100FC:code>23</S100FC:code>
    </S100FC:listedValue>
    <S100FC:listedValue>
        <S100FC:label>Antenna Reference Point(ARP)</S100FC:label>
        <S100FC:definition></S100FC:definition>
        <S100FC:code>24</S100FC:code>
    </S100FC:listedValue>

```

<S100FC:listedValue>
 <S100FC:label>Extended Radio beacon Almanac</S100FC:label>
 <S100FC:definition></S100FC:definition>
 <S100FC:code>27</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
 <S100FC:label>Differential GLONASS Corrections</S100FC:label>
 <S100FC:definition></S100FC:definition>
 <S100FC:code>31</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
 <S100FC:label>Differential GLONASS Reference Station Parameters</S100FC:label>
 <S100FC:definition></S100FC:definition>
 <S100FC:code>32</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
 <S100FC:label>GLONASS Constellation Health</S100FC:label>
 <S100FC:definition></S100FC:definition>
 <S100FC:code>33</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
 <S100FC:label>GLONASS Partial Differential Correction Set</S100FC:label>
 <S100FC:definition></S100FC:definition>
 <S100FC:code>34</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
 <S100FC:label>GLONASS Radio beacon Almanac</S100FC:label>
 <S100FC:definition></S100FC:definition>
 <S100FC:code>35</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
 <S100FC:label>GLONASS Special Message</S100FC:label>
 <S100FC:definition></S100FC:definition>
 <S100FC:code>36</S100FC:code>
</S100FC:listedValue>
<S100FC:listedValue>
 <S100FC:label>GNSS System Time Off Set</S100FC:label>

```

        <S100FC:definition></S100FC:definition>
        <S100FC:code>37</S100FC:code>
    </S100FC:listedValue>
    <S100FC:listedValue>
        <S100FC:label>Proprietary Message</S100FC:label>
        <S100FC:definition></S100FC:definition>
        <S100FC:code>59</S100FC:code>
    </S100FC:listedValue>
    <S100FC:listedValue>
        <S100FC:label>Multi purpose Usage</S100FC:label>
        <S100FC:definition></S100FC:definition>
        <S100FC:code>60</S100FC:code>
    </S100FC:listedValue>
</S100FC:listedValues>
</S100FC:S100_FC_SimpleAttribute>
<S100FC:S100_FC_SimpleAttribute>
    <S100FC:name>Transmitting Station ID</S100FC:name>
    <S100FC:definition></S100FC:definition>
    <S100FC:code>transmittingStationID</S100FC:code>
    <S100FC:valueType>text</S100FC:valueType>
</S100FC:S100_FC_SimpleAttribute>
</S100FC:S100_FC_SimpleAttributes>
<S100FC:S100_FC_ComplexAttributes>
    <S100FC:S100_FC_ComplexAttribute>
        <S100FC:name>Feature name</S100FC:name>
        <S100FC:definition>The complex attribute provides the name of an entity, defines the national language of the name, and provides
the option to display the name at various system display settings.</S100FC:definition>
        <S100FC:code>featureName</S100FC:code>
        <S100FC:subAttributeBinding sequential="false">
            <S100FC:multiplicity>
                <S100Base:lower>0</S100Base:lower>
                <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
            </S100FC:multiplicity>
            <S100FC:attribute ref="displayName"/>
        </S100FC:subAttributeBinding>
        <S100FC:subAttributeBinding sequential="false">
            <S100FC:multiplicity>

```



```

        <S100Base:lower>0</S100Base:lower>
        <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
    </S100FC:multiplicity>
    <S100FC:attribute ref="language"/>
</S100FC:subAttributeBinding>
<S100FC:subAttributeBinding sequential="false">
    <S100FC:multiplicity>
        <S100Base:lower>1</S100Base:lower>
        <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
    </S100FC:multiplicity>
    <S100FC:attribute ref="name"/>
</S100FC:subAttributeBinding>
</S100FC:S100_FC_ComplexAttribute>
<S100FC:S100_FC_ComplexAttribute>
    <S100FC:name>Fixed date range</S100FC:name>
    <S100FC:definition>The complex attribute describes single fixed period, as the date range between its sub-
attributes.</S100FC:definition>
    <S100FC:code>fixedDateRange</S100FC:code>
    <S100FC:remarks>the sub-attributes date start and date end must be encoded using 4 digits for the calendar year (YYYY) and,
optionally, 2 digits for the month (MM) (e.g. April = 04) and 2 digits for the day (DD). When no specific month and/or day is required/known, the values
are replaced with dashes (-).</S100FC:remarks>
    <S100FC:subAttributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>0</S100Base:lower>
            <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
        </S100FC:multiplicity>
        <S100FC:attribute ref="dateEnd"/>
    </S100FC:subAttributeBinding>
    <S100FC:subAttributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>0</S100Base:lower>
            <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
        </S100FC:multiplicity>
        <S100FC:attribute ref="dateStart"/>
    </S100FC:subAttributeBinding>
</S100FC:S100_FC_ComplexAttribute>
<S100FC:S100_FC_ComplexAttribute>

```

```

    <S100FC:name>Periodic date range</S100FC:name>
    <S100FC:definition>The complex attribute describes the active period for a seasonal feature (e.g. a buoy), as the dates between its
sub-attributes.</S100FC:definition>
    <S100FC:code>periodicDateRange</S100FC:code>
    <S100FC:remarks>the sub-attributes date start and date end should be encoded using 4 digits for the calendar year (YYYY),2
digits for the month (MM) (e.g. April = 04) and 2 digits for the day (DD). When no specific year is required(i.e. the feature is removed at the same time
each year) the following two cases may be considered: - same day each year: ----MMDD - same month each year: ----MM-- This conforms to ISO
8601:2004.</S100FC:remarks>
    <S100FC:subAttributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>1</S100Base:lower>
            <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
        </S100FC:multiplicity>
        <S100FC:attribute ref="dateEnd"/>
    </S100FC:subAttributeBinding>
    <S100FC:subAttributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>1</S100Base:lower>
            <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
        </S100FC:multiplicity>
        <S100FC:attribute ref="dateStart"/>
    </S100FC:subAttributeBinding>
</S100FC:S100_FC_ComplexAttribute>
</S100FC:S100_FC_ComplexAttributes>
<S100FC:S100_FC_InformationTypes>
    <S100FC:S100_FC_InformationType>
        <S100FC:name>DGNSS Station Region</S100FC:name>
        <S100FC:definition></S100FC:definition>
        <S100FC:code>DgnssStationRegion</S100FC:code>
        <S100FC:attributeBinding sequential="false">
            <S100FC:multiplicity>
                <S100Base:lower>1</S100Base:lower>
                <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
            </S100FC:multiplicity>
            <S100FC:attribute ref="dateOfIssue"/>
        </S100FC:attributeBinding>
    </S100FC:S100_FC_InformationType>
</S100FC:S100_FC_InformationTypes>

```

```

        <S100FC:multiplicity>
            <S100Base:lower>1</S100Base:lower>
            <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
        </S100FC:multiplicity>
        <S100FC:attribute ref="dateOfLastUpdate"/>
    </S100FC:attributeBinding>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>1</S100Base:lower>
            <S100Base:upper xsi:nil="true" infinite="true"/>
        </S100FC:multiplicity>
        <S100FC:attribute ref="country"/>
    </S100FC:attributeBinding>
</S100FC:S100_FC_InformationType>
<S100FC:S100_FC_InformationType>
    <S100FC:name>DGNSS Station Almanac</S100FC:name>
    <S100FC:definition></S100FC:definition>
    <S100FC:code>DgnssStationAlmanac</S100FC:code>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>0</S100Base:lower>
            <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
        </S100FC:multiplicity>
        <S100FC:attribute ref="bitRate"/>
    </S100FC:attributeBinding>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>0</S100Base:lower>
            <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
        </S100FC:multiplicity>
        <S100FC:attribute ref="signalFrequency"/>
    </S100FC:attributeBinding>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>0</S100Base:lower>
            <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
        </S100FC:multiplicity>

```

```

        <S100FC:attribute ref="nominalRangeat"/>
    </S100FC:attributeBinding>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>0</S100Base:lower>
            <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
        </S100FC:multiplicity>
        <S100FC:attribute ref="nominalRangeKm"/>
    </S100FC:attributeBinding>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>1</S100Base:lower>
            <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
        </S100FC:multiplicity>
        <S100FC:permittedValues>
            <S100FC:value>1</S100FC:value>
            <S100FC:value>2</S100FC:value>
            <S100FC:value>3</S100FC:value>
            <S100FC:value>4</S100FC:value>
        </S100FC:permittedValues>
        <S100FC:attribute ref="radiobeaconhealth"/>
    </S100FC:attributeBinding>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>0</S100Base:lower>
            <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
        </S100FC:multiplicity>
        <S100FC:attribute ref="referenceStationIDs"/>
    </S100FC:attributeBinding>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>0</S100Base:lower>
            <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
        </S100FC:multiplicity>
        <S100FC:attribute ref="stationName"/>
    </S100FC:attributeBinding>
    <S100FC:attributeBinding sequential="false">

```

```
<S100FC:multiplicity>
  <S100Base:lower>1</S100Base:lower>
  <S100Base:upper xsi:nil="true" infinite="true"/>
</S100FC:multiplicity>
<S100FC:permittedValues>
  <S100FC:value>1</S100FC:value>
  <S100FC:value>2</S100FC:value>
  <S100FC:value>3</S100FC:value>
  <S100FC:value>4</S100FC:value>
  <S100FC:value>5</S100FC:value>
  <S100FC:value>6</S100FC:value>
  <S100FC:value>7</S100FC:value>
  <S100FC:value>8</S100FC:value>
  <S100FC:value>9</S100FC:value>
  <S100FC:value>10</S100FC:value>
  <S100FC:value>11</S100FC:value>
  <S100FC:value>12</S100FC:value>
  <S100FC:value>13</S100FC:value>
  <S100FC:value>14</S100FC:value>
  <S100FC:value>15</S100FC:value>
  <S100FC:value>16</S100FC:value>
  <S100FC:value>17</S100FC:value>
  <S100FC:value>18</S100FC:value>
  <S100FC:value>19</S100FC:value>
  <S100FC:value>20</S100FC:value>
  <S100FC:value>21</S100FC:value>
  <S100FC:value>22</S100FC:value>
  <S100FC:value>23</S100FC:value>
  <S100FC:value>24</S100FC:value>
  <S100FC:value>27</S100FC:value>
  <S100FC:value>31</S100FC:value>
  <S100FC:value>32</S100FC:value>
  <S100FC:value>33</S100FC:value>
  <S100FC:value>34</S100FC:value>
  <S100FC:value>35</S100FC:value>
  <S100FC:value>36</S100FC:value>
  <S100FC:value>37</S100FC:value>
```

```

        <S100FC:value>59</S100FC:value>
        <S100FC:value>60</S100FC:value>
    </S100FC:permittedValues>
    <S100FC:attribute ref="transmittedMessageTypes"/>
</S100FC:attributeBinding>
<S100FC:attributeBinding sequential="false">
    <S100FC:multiplicity>
        <S100Base:lower>0</S100Base:lower>
        <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
    </S100FC:multiplicity>
    <S100FC:attribute ref="transmittingStationID"/>
</S100FC:attributeBinding>
</S100FC:S100_FC_InformationType>
<S100FC:S100_FC_InformationType>
    <S100FC:name>Supplementary information</S100FC:name>
    <S100FC:definition>Information about a feature or a number of features additional to that able to be encoded using other feature
attributes.</S100FC:definition>
    <S100FC:code>SupplementaryInformation</S100FC:code>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>0</S100Base:lower>
            <S100Base:upper xsi:nil="true" infinite="true"/>
        </S100FC:multiplicity>
        <S100FC:attribute ref="information"/>
    </S100FC:attributeBinding>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>0</S100Base:lower>
            <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
        </S100FC:multiplicity>
        <S100FC:attribute ref="pictorialRepresentation"/>
    </S100FC:attributeBinding>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>1</S100Base:lower>
            <S100Base:upper xsi:nil="true" infinite="true"/>
        </S100FC:multiplicity>

```

```

        <S100FC:attribute ref="textualDescription"/>
    </S100FC:attributeBinding>
</S100FC:S100_FC_InformationType>
</S100FC:S100_FC_InformationTypes>
<S100FC:S100_FC_FeatureTypes>
    <S100FC:S100_FC_FeatureType>
        <S100FC:name>Radio station</S100FC:name>
        <S100FC:definition>A place equipped to transmit radio waves.</S100FC:definition>
        <S100FC:code>RadioStation</S100FC:code>
        <S100FC:remarks>Such a station may be either stationary or mobile, and may also be provided with a radio receiver. In British
terminology, also called 'w/t station'. The transmission of a radio station may serve to provide mariners with a line of position (IHO Chart Specifications,
M-4). The object 'radio station' is used to encode the point of transmission of the signal.</S100FC:remarks>
        <S100FC:alias>RDOSTA</S100FC:alias>
        <S100FC:attributeBinding sequential="false">
            <S100FC:multiplicity>
                <S100Base:lower>0</S100Base:lower>
                <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
            </S100FC:multiplicity>
            <S100FC:attribute ref="callSign"/>
        </S100FC:attributeBinding>
        <S100FC:attributeBinding sequential="false">
            <S100FC:multiplicity>
                <S100Base:lower>0</S100Base:lower>
                <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
            </S100FC:multiplicity>
            <S100FC:permittedValues>
                <S100FC:value>5</S100FC:value>
                <S100FC:value>8</S100FC:value>
                <S100FC:value>9</S100FC:value>
                <S100FC:value>10</S100FC:value>
                <S100FC:value>11</S100FC:value>
                <S100FC:value>12</S100FC:value>
                <S100FC:value>13</S100FC:value>
                <S100FC:value>14</S100FC:value>
                <S100FC:value>19</S100FC:value>
                <S100FC:value>20</S100FC:value>
            </S100FC:permittedValues>
    </S100FC:S100_FC_FeatureType>
</S100FC:S100_FC_FeatureTypes>

```

```

        <S100FC:attribute ref="categoryOfRadioStation"/>
    </S100FC:attributeBinding>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>0</S100Base:lower>
            <S100Base:upper xsi:nil="true" infinite="true"/>
        </S100FC:multiplicity>
        <S100FC:attribute ref="communicationChannel"/>
    </S100FC:attributeBinding>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>0</S100Base:lower>
            <S100Base:upper xsi:nil="true" infinite="true"/>
        </S100FC:multiplicity>
        <S100FC:attribute ref="featureName"/>
    </S100FC:attributeBinding>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>0</S100Base:lower>
            <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
        </S100FC:multiplicity>
        <S100FC:attribute ref="fixedDateRange"/>
    </S100FC:attributeBinding>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>0</S100Base:lower>
            <S100Base:upper xsi:nil="true" infinite="true"/>
        </S100FC:multiplicity>
        <S100FC:attribute ref="periodicDateRange"/>
    </S100FC:attributeBinding>
    <S100FC:attributeBinding sequential="false">
        <S100FC:multiplicity>
            <S100Base:lower>0</S100Base:lower>
            <S100Base:upper xsi:nil="false" infinite="false">1</S100Base:upper>
        </S100FC:multiplicity>
        <S100FC:attribute ref="scaleMinimum"/>
    </S100FC:attributeBinding>

```



```
<S100FC:attributeBinding sequential="false">
  <S100FC:multiplicity>
    <S100Base:lower>0</S100Base:lower>
    <S100Base:upper xsi:nil="true" infinite="true"/>
  </S100FC:multiplicity>
  <S100FC:permittedValues>
    <S100FC:value>1</S100FC:value>
    <S100FC:value>2</S100FC:value>
    <S100FC:value>4</S100FC:value>
    <S100FC:value>5</S100FC:value>
    <S100FC:value>7</S100FC:value>
    <S100FC:value>8</S100FC:value>
  </S100FC:permittedValues>
  <S100FC:attribute ref="status"/>
</S100FC:attributeBinding>
<S100FC:featureUseType>geographic</S100FC:featureUseType>
<S100FC:permittedPrimitives>point</S100FC:permittedPrimitives>
</S100FC:S100_FC_FeatureType>
</S100FC:S100_FC_FeatureTypes>
</S100FC:S100_FC_FeatureCatalogue>
```

ANNEX C DGNSS STATION ALMANAC – EXAMPLE OF DOCUMENT SERVICE

C.1 Style Sheet for S-240 DGNSS Station Almanac Document

C.2 Document example of S-240 DGNSS Station Almanac

GML convert to HTML
Conversion 도움말(러)

Table of DGNSS Stations			Country: KOREA			Date of issue: November 2006 Date of last update: November 2014					
Station name	Identification Numbers		Geographical Position Latitude Longitude(WGS84)	Nominal range		Station in operation	Integrity Monitoring	Transmitted message types	Freq. (kHz)	Bit Rate (bps)	Remarks
	Reference Stations	Transmitting Station		km	at (mV/m)						
Homigot	732 733	666	Lat : 36° 5' 40.96" N Lon : 129° 34' 59.98" E	185	100	Yes	Yes	3,5,7,9,16	310	200	
Jumunjin	726 727	663	Lat : 37° 54' 52.18" N Lon : 128° 50' 1.56" E	185	100	Yes	Yes	3,5,7,9,16	295	200	
Gocheongdo	728 729	664	Lat : 36° 8' 30.73" N Lon : 125° 58' 6.52" E	185	100	Yes	Yes	3,5,7,9,16	295	200	
Geomundo	726 727	662	Lat : 34° 0' 27.49" N Lon : 127° 19' 20.27" E	185	100	Yes	Yes	3,5,7,9,16	287	200	
Marado	730 731	665	Lat : 33° 7' 0.95" N Lon : 126° 16' 8.91" E	185	100	Yes	Yes	3,5,7,9,16	290	200	
Palmido	722 723	661	Lat : 37° 21' 30.00" N Lon : 126° 31' 40.54" E	185	100	Yes	Yes	3,5,7,9,16	313	200	
Ulleungdo	734 735	667	Lat : 37° 31' 6.28" N Lon : 130° 48' 51.73" E	185	100	Yes	Yes	3,5,7,9,16	319	200	
Yeongdo	720 721	660	Lat : 35° 4' 43.88" N Lon : 129° 4' 14.61" E	185	100	Yes	Yes	3,5,7,9,16	300	200	
Socheongdo	736 737	668	Lat : 37° 46' 37.27" N Lon : 124° 44' 43.56" E	185	100	Yes	Yes	3,5,7,9,16	323	200	
Gageodo	738 739	669	Lat : 34° 6' 41.62" N Lon : 125° 6' 56.10" E	185	100	Yes	Yes	3,5,7,9,16	298	200	
Jeojin	740 741	670	Lat : 38° 33' 7.47" N Lon : 128° 24' 55.46" E	185	100	Yes	Yes	3,5,7,9,16	292	200	
Chuncheon	757 758	676	Lat : 37° 60' 40.18" N Lon : 127° 43' 53.87" E	80	100	Yes	Yes	3,5,7,9,16	286	200	
Chungju	753 754	674	Lat : 36° 59' 55.69" N Lon : 127° 45' 16.62" E	80	100	Yes	Yes	3,5,7,9,16	318	200	
Muju	747 748	671	Lat : 35° 54' 12.46" N Lon : 127° 35' 58.97" E	80	100	Yes	Yes	3,5,7,9,16	322	200	
Pyeongchang	751 752	673	Lat : 37° 21' 58.67" N Lon : 128° 29' 15.57" E	80	100	Yes	Yes	3,5,7,9,16	303	200	
Yeongju	749 750	672	Lat : 36° 52' 56.53" N Lon : 128° 33' 41.55" E	80	100	Yes	Yes	3,5,7,9,16	296	200	
Seongju	755 756	675	Lat : 36° 51' 17.26" N Lon : 128° 11' 59.94" E	80	100	Yes	Yes	3,5,7,9,16	296	200	

완료 CAP NUM SCRL