

KPS & KASS Update in 2021

1st October 2021



과학기술정보통신부
Ministry of Science and ICT



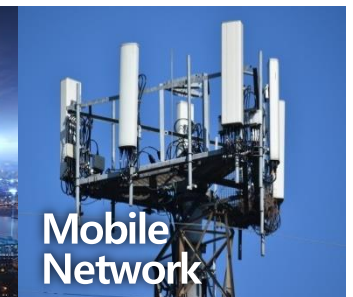
Overview of KPS

Objectives

Providing high-precision PNT information required in the era of the 4th industrial revolution

Goals

Development and construction of KPS system that stably provides 6 PNT services to meet various satellite navigation needs



KPS Services

Open Service



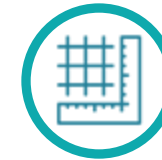
- To provide PNT services free of charge
- Signals : L1/L2/L5/L6/S

Meter Level Service



- To provide correction data for meter-level accuracy
- Signals : L1

Centimeter Level Service



- To provide correction data for centimeter-level accuracy
- Signals : L6

SBAS Service



- To broadcast KASS(SBAS) data
- Signals : L1/L5

Public Safety Service



- To provide PNT services for government-authorized users
- Signals : L6/S

Search and Rescue Service



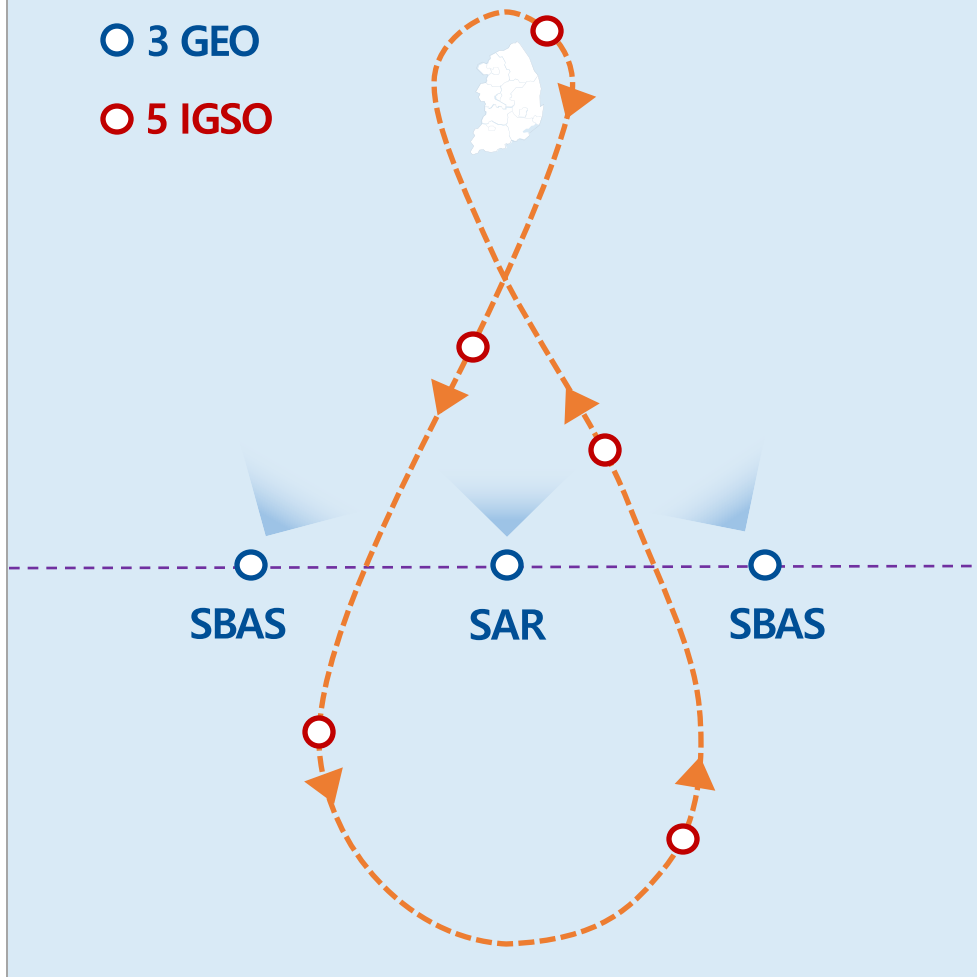
- To relay rescue signal to COSPAS-SARSAT facilities
- Signals : L

KPS System Configuration

KPS Satellite Constellation

○ 3 GEO

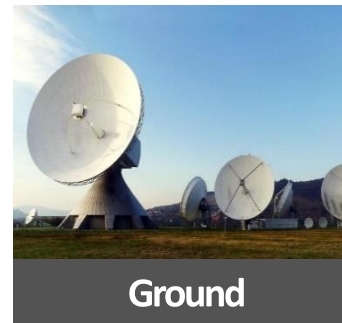
○ 5 IGSO



KPS Segments



- 3 GEO Satellites
- 5 IGSO Satellites
- Payloads : Navigation, Time-sync., SBAS, and SAR



- Operation Centers
- Satellite Control Centers
- Antenna Stations
- Monitoring Stations
- Mission Control Stations for MLS/CMLS



- Research and Development Receiver
- Reference Station Receiver
- Test and Evaluation Receiver
- User Receivers

KPS Development Plan

System Design (‘22~‘24)

- SDR/PDR/CDR of KPS system
- International cooperation for orbits, frequencies, sites acquisition
- Navigation signal and constellation design

System Development (‘25~‘28)

- Development of satellite bus and payloads
- Development of satellite control center and antenna station
- Launch of the 1st IGSO satellite in 2027

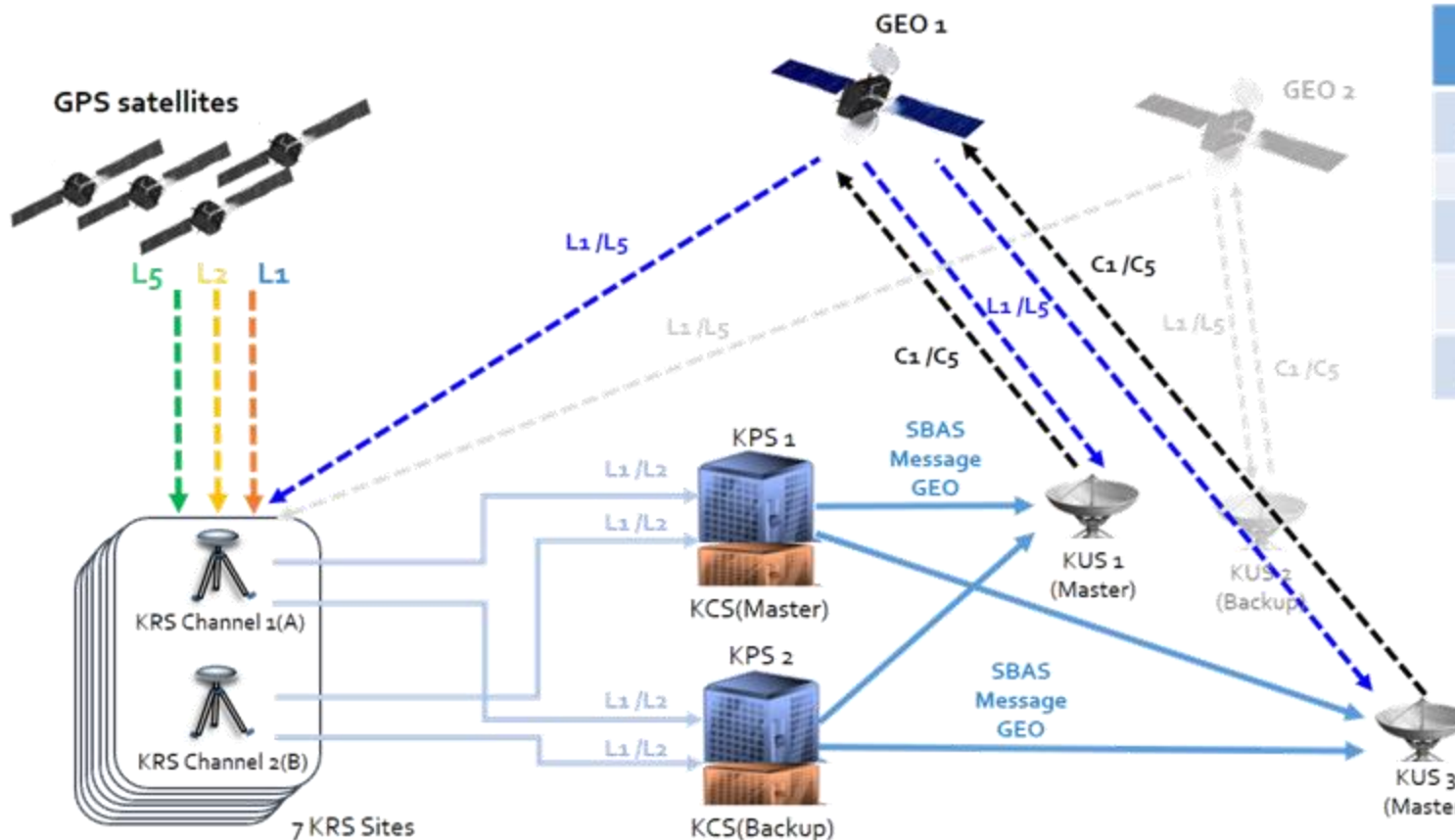
Deployment and Validation (‘29~‘35)

- Development and launch of the 4 IGSO and 3 GEO satellites
- Development of all of the ground segment
- Test during IOC and FOC

KASS Status (1)

Main Goal

- Provide APV-I SoL Service to Airports located in South Korea
- Start APV-I SoL Service after 2023



S/S (Sub System)	Qty. (Baseline)
KRS (KASS Reference Station)	7
GEOs	2(1)
KUS (KASS Uplink Station)	3
KCS (KASS Control Station)	2
KPS (KASS Processing Station)	2

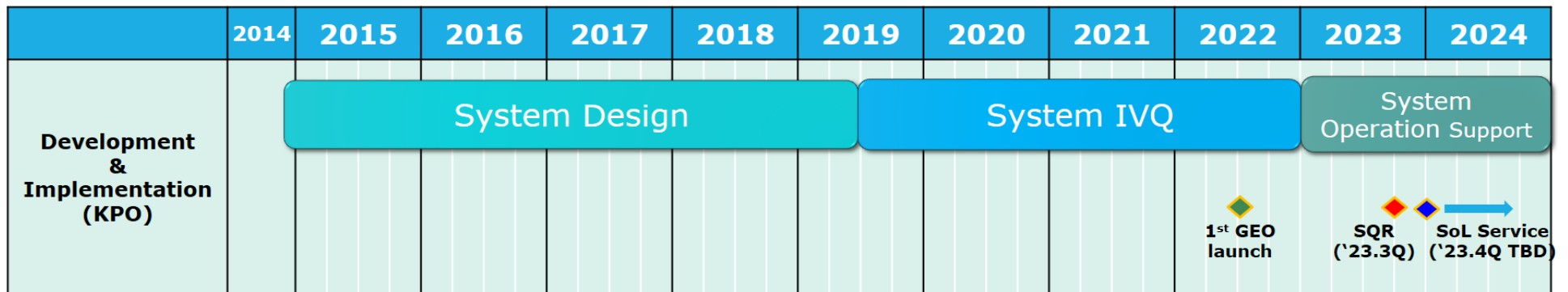
KASS Status (2)

Status

- '20.12., KASS Preliminary Integration (network connectivity test) (MCC ↔ KRS)
* MCC : Mission Control Center
- '21.01., Network Continuity Test (MCC ↔ KRS) (Duration : about 6months)
- '21.06., Completion of KUS site infrastructure facilities

Future Plan

- '21.12., KASS Subsystem (KCS : KASS Control Station) Acceptance Review
- '22.2Q., KASS 1st GEO satellite (Measat-3d with KASS payload) launch
- '23.3Q. (TBD), SQR (System Qualification Review)



* KPO : KASS(Korean SBAS) Program Office

GNSS Application in Korea

Various areas including ICT, Transportation, Commerce, and Safety



Smart Phone & Apps



Self-Driving Car



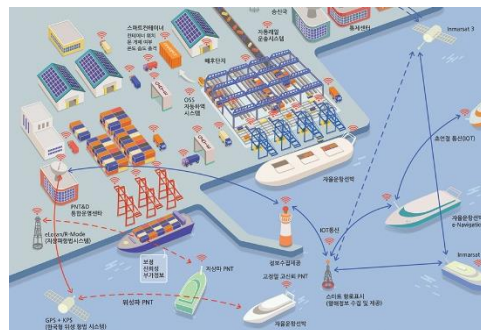
Urban Air Mobility



Aviation Traffic



Autonomous Ship



Smart Ports



Search & Rescue



Smart Farming

Purpose of ICG Membership

Korea hopes to play many roles and contribution with ICG member states in promoting **compatibility**, **interoperability**, and **transparency** on GNSS



Compatibility

- To discuss with the providers in the KPS development process for harmonious operation without interference.



Interoperability

- To discuss for increasing the user's capability such as accuracy and availability by using KPS with other GNSS signals with one receiver.



Transparency

- To share and exchange the documents for the system information, policies, and performance for open service.

Activity and Contribution plan in the ICG

Compatibility

- Participating the compatibility and spectrum subgroup in WG-S and discussing the compatibility of KPS such as signal design, RF specifications, it and coverages
- Participating the IDM TFT and discussing the RF interference potential problems and mitigations in Korea

Interoperability

- Participating the interoperability and service provision subgroup in WG-S and discussing the KPS interoperability for timing in open service and PPP service
- Participating WG-B and discussing KPS services such as SAR/Return-link service and SSV (Space Service Volume) service

Transparency

- Participating Provider's forum and sharing, exchanging information

Contribution

- Hosting the future ICG annual meeting and supporting the Working Group and/or TFT meetings



Thank you



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