

Korea PNT Update

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KPS (Korea Positioning System)

❖ Background

- The applications area of satellite navigation system is rapidly expanding to the life of people such as a smart phone, navigation, geodesy, emergency rescue, etc.
- It is important to support the social infrastructure of the 4th Industrial Revolution as a major infrastructure of Korea that promotes individual benefits
- Neighboring countries around Korea, the United states, Russia, China, Japan and India, are operating or constructing their own satellite navigation system

KPS (Korea Positioning System)

❖ Concept

- Regional Navigation Satellite System with various services
 - ◆ GPS complement, Inter-operability with other GNSS
 - ◆ Providing information on common PNT + high precision PNT

<KPS services (TBD)>

Payload	Band	Service	Detail
Navigation service payload	L band	- Open service	- Provide basic navigation information for general users - Combined with existing GNSS to improve accuracy / availability
		- Meter level service	- SBAS level service (No reliability guaranteed)
		- Centimeter level service	- Service for high-accuracy user
	S band	- Public safety service	- For safety-conscious users, including major national infrastructure
SBAS service payload	L1, L5	- SBAS SoL service	- ICAO standard

- ◆ Search and Rescue(SAR) and additional services are considered
- ◆ Specific navigation signal frequency/bandwidth is not fixed

KPS (Korea Positioning System)

❖ Concept

- Augmentation of existing GNSS systems are also considered
 - ◆ These services have the advantage of ramping up the accuracy of the existing GNSS services less than one meter.
- Configuration
 - ◆ Space Segment : 3 GEO + 4 EIGSO satellites
 - ◆ Ground Segment : Mission Control Stations, Satellite Control Station, Monitoring Stations and etc.



<Satellite constellation>



<Target service area>

KPS (Korea Positioning System)

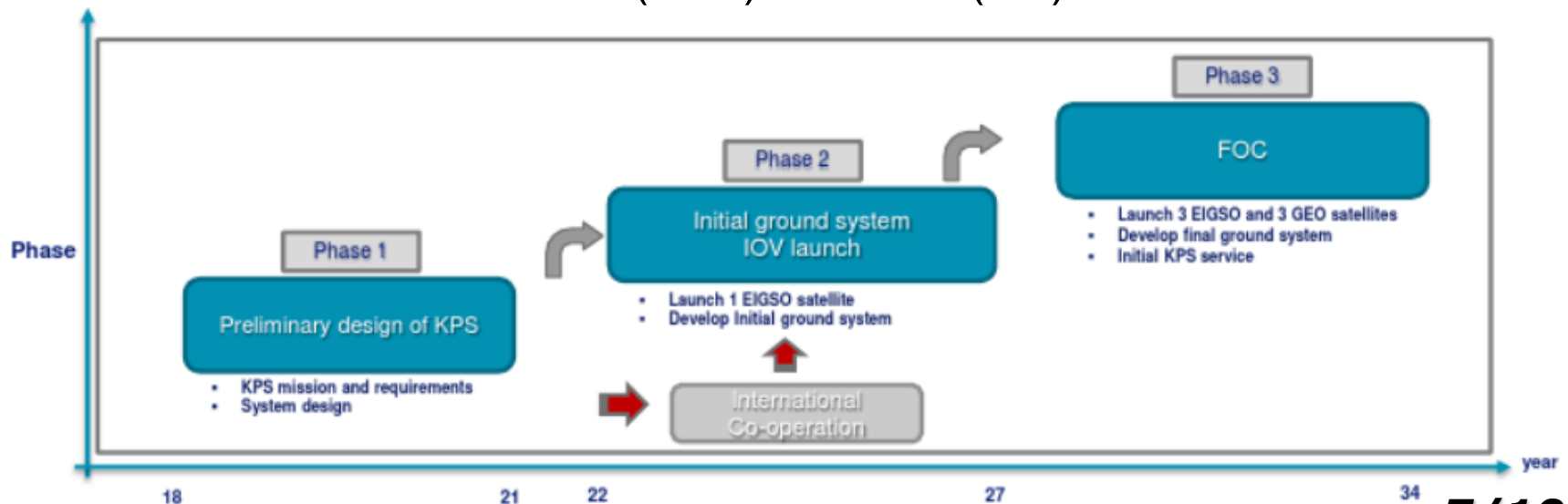
❖ Status

- Mid and Long-term Plan of National Space Development was established in 2013
- Ministry of Science and ICT finalized the third Space Development Promotion Plan at National Space Committee on Feb. 5 2018
 - ◆ The plan includes the construction of the KPS, which provides services from 2035
- A preliminary steering committee for embarking the KPS project had been organized.
- A planning study for a preliminary feasibility study is being done
 - ◆ Defining service and system requirements
 - ◆ Establishing a system development plan

KPS (Korea Positioning System)

❖ Development Plan

- (Phase 1) Establishment of KPS mission & requirements, and preliminary design of KPS system(~'21)
- (Phase 2) Development an IOV satellite(EIGSO) and initial ground system for obtaining operation technologies(~'27)
- (Phase 3) Finally, construction of KPS by launching 3 EIGSO and 3 GEO satellites(~'34) and FOC('35)



KASS (Korean SBAS)

❖ Overview

Goal

Develop a Satellite-Based Augmentation System in Compliance with ICAO Annex 10 Performance Requirements

1

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

2

APV-I SoL Service in 2022

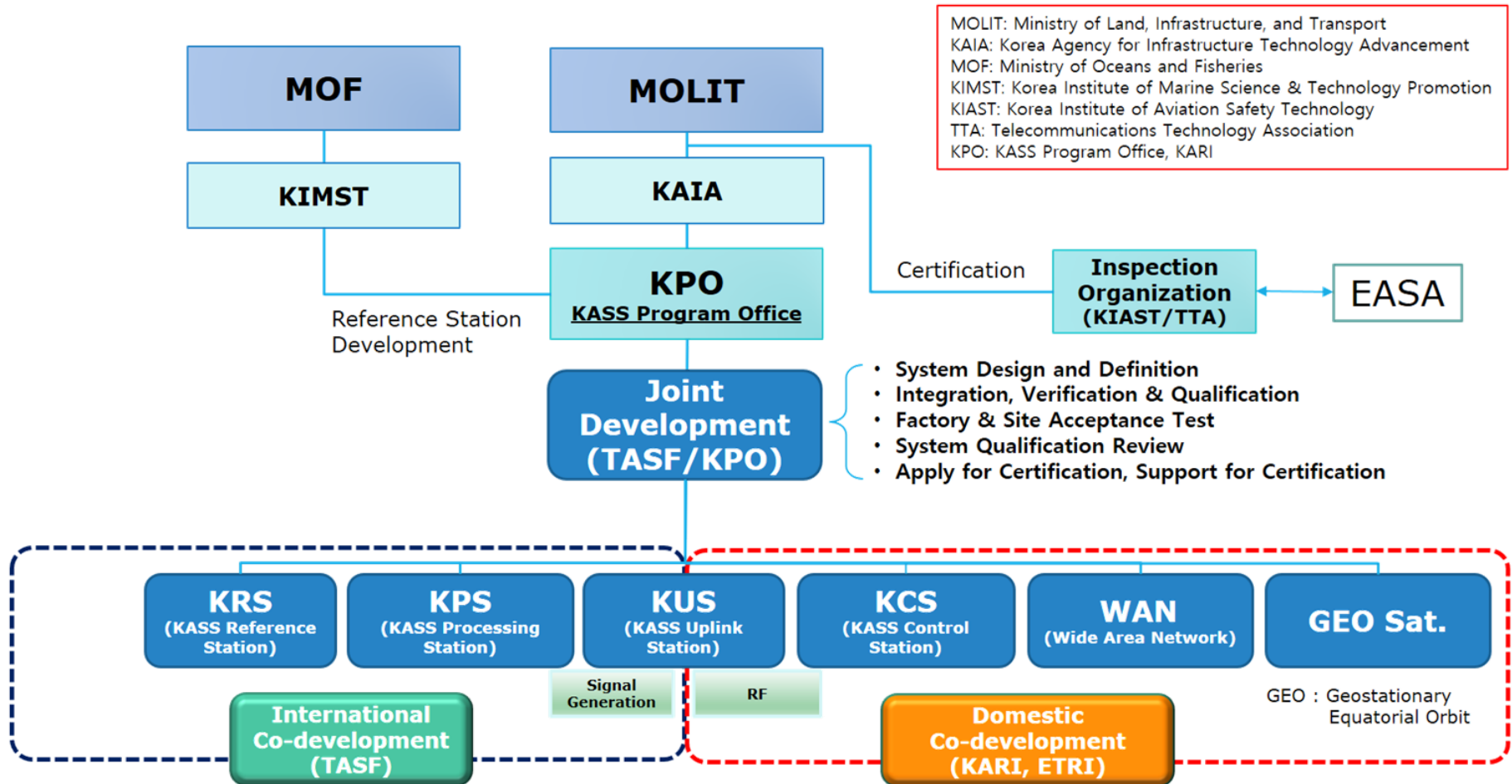
[Period] 5 Phases in 8 Years (2014 - 2022)

- Phase A (Oct. 2014-Jun. 2015): System Definition
- Phase B (Jul. 2015-Mar. 2017): System Design
- Phase C (Apr. 2017-Mar. 2019): Critical Design
- Phase D (Apr. 2019-Jun. 2020): Integration and Verification
- Phase E (Jul. 2020-Oct. 2022): Initial Operation and Approval Process

The milestone related to Phase C~E will be somewhat adjusted due to the 1st GEO available schedule

KASS (Korean SBAS)

❖ Organization for Development



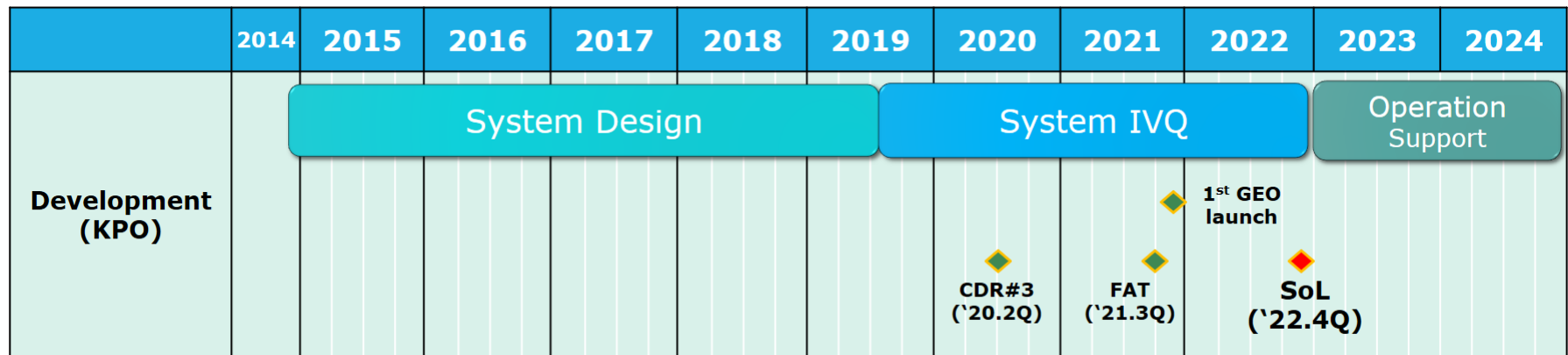
KASS (Korean SBAS)

❖ Status

- '19.6, KPO member join TASF (Joint Test Team's activity)
- '19.9, Software Audit
- '19.10, 2nd Critical Design Review

❖ Future Plan

- '20.6, 3rd Critical Design Review
- '21.9, FAT (Factory Acceptance Test)
- '22.10, SoL service



Thank you for listening !