



Introduction of Network Performance Assessment Center

30 November – 4 December ,2020

NPAC, JCAB

NPAC



Hitachi-ota city

Place of NPAC



Network Performance Assessment Center (NPAC)

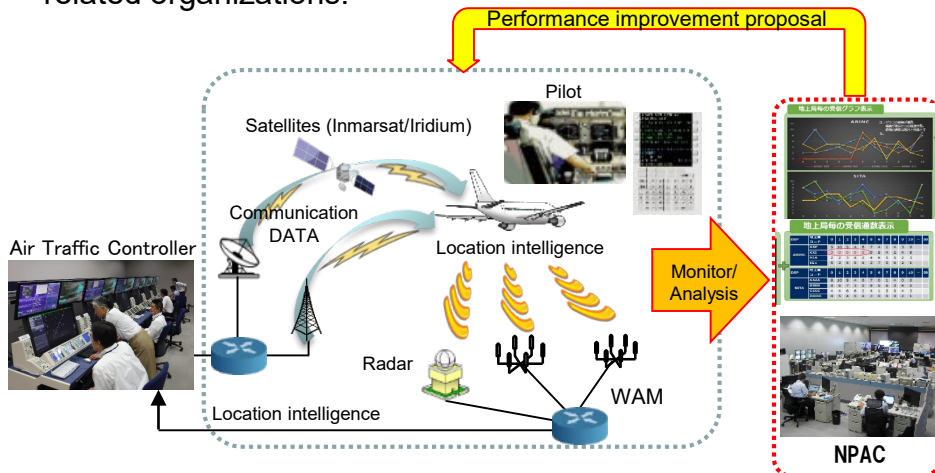
Purpose and Duties



- For the purpose of more efficient flight, improvement of service availability and reducing environment impact, JCAB has been promoting to implement "PBO (Performance Based operation) ".
- PBO requires the highly accurate position information and robust ATC communication. These required high operational services level in each field of C (Communication) , N (Navigation) , S (Surveillance) are supported by the complex combination of various systems.
- The Network Performance Assessment Center (NPAC) was established for the mission to monitor, analyze and assess centrally the service level as the core of CNS performance management, which is the vital key for the PBO realization. NPAC also manages the operation for satellite/datalink facilities are necessary to support the "Performance-Based" air traffic control services.

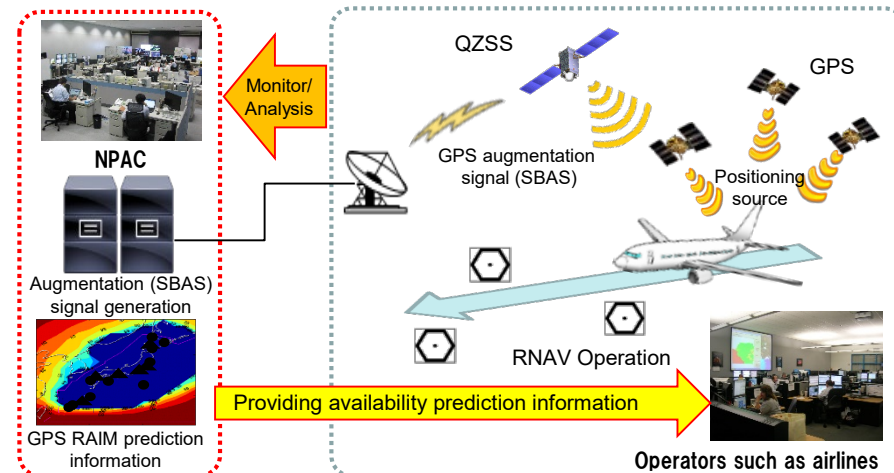
C (Communication) / S (Surveillance)

- NPAC monitors and Assess whether it meets the communication and monitoring performance specified by ICAO (based on PBCS manual).
- The result of monitor and analysis, when it did not comply to the requirement performance, NPAC investigates the cause and recommend/request the performance improvement to the related organizations.



N (Navigation)

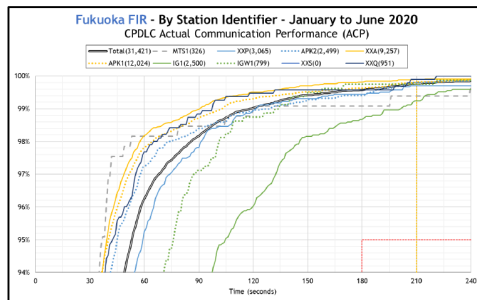
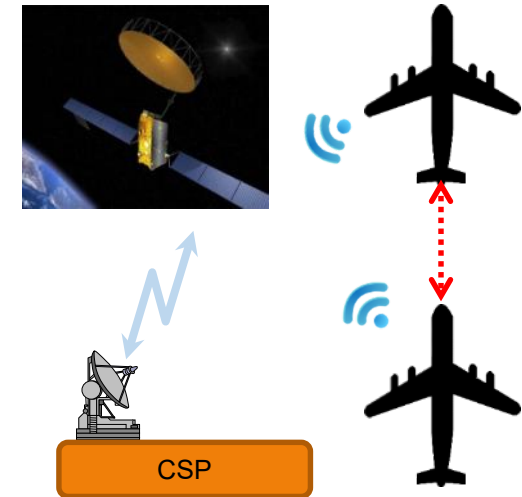
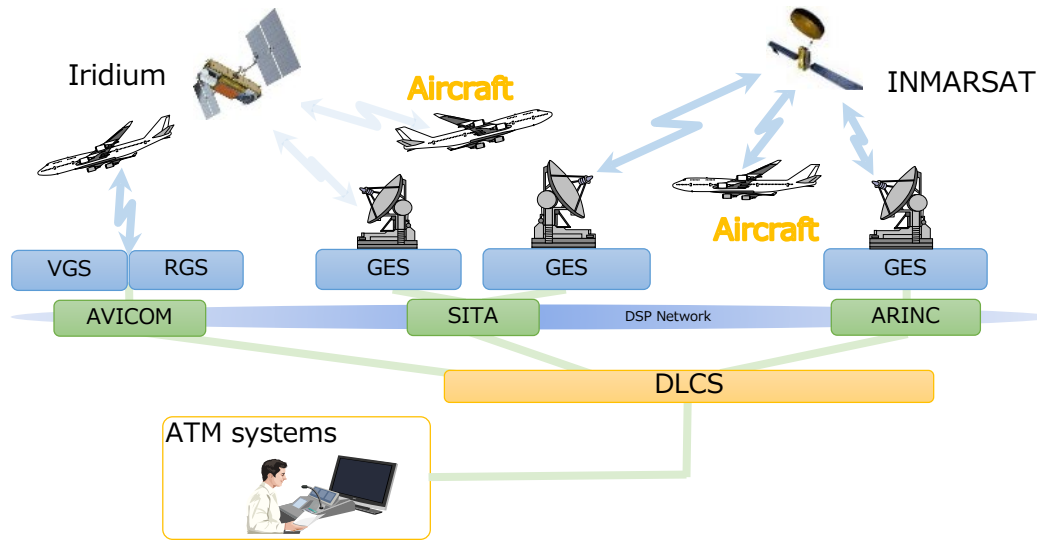
- Providing GPS augmentation signal (SBAS) for aircraft to perform satellite navigation (via QZS-3(GEO)).
- Providing RAIM prediction information (satellite navigation system availability prediction and information) necessary for the aircraft to operate optimally



① Performance Assessment (Communication)



- Monitoring and assessment of datalink performance based on PBCS manual criteria.
 - Monitors and Assessment communication performance under the CRA framework .
 - The assessment results are reported to FIT and PARC.
- Troubleshooting for recovery from communication trouble (data delay, lost, congestion).
- Investigation and report for the Problem Report.



OP Code	RSP180				RCP240						
	Count of ADS-C	% of Total ADS-C	ASP		Count of CPDLC	% of Total CPDLC	ACTP		ACP	PORT	
			95%	99.9%			95%	99.9%	95%	99.9%	
GIA	7,950	0.47%	96.75%	98.45%	134	0.39%	99.25%	99.25%	98.51%	99.25%	98.51%
RKS	1,398	0.08%	96.92%	98.57%	25	0.07%	96.00%	96.00%	96.00%	96.00%	100.00%
TGW	216	0.01%	94.44%	100.00%	3	0.01%	100.00%	100.00%	100.00%	100.00%	100.00%
EDG	186	0.01%	97.31%	98.39%	3	0.01%	100.00%	100.00%	100.00%	100.00%	33.33%

*No-colored where under 100 data points.

Use the assessment results to the performance improvement

② Performance Assessment (Navigation)



- Monitoring and assessment of navigation system performance based on ICAO standard criteria.
- Provide RAIM prediction information to the operator.
 - Confirm the validity of RAIM prediction.
- Investigation and report to the report/inquiry from the operator.

Receivable GNSS signal in Fukuoka FIR

Core constellation			SBAS			
GLONAS (RUS)	GALILEO (EC)	BeiDou (CHN)	GAGAN (IND)	SDCM (RUS)	BD-SBAS (CHN)	KASS (KOR)

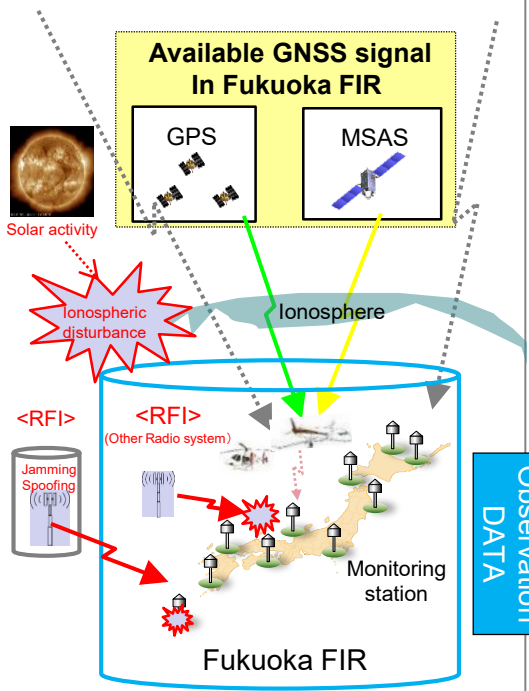
GNSS relating information

- NANU
- Space weather
- RFI

Providing information

【RAIM prediction】
WEB service
On demand prediction

【NOTAM】



Information collection

NPAC

(MSG-16)
SBAS message generation
Interface to QZSS

(GPM-17)
RAIM prediction
GNSS monitoring
SBAS monitoring

Information Provision

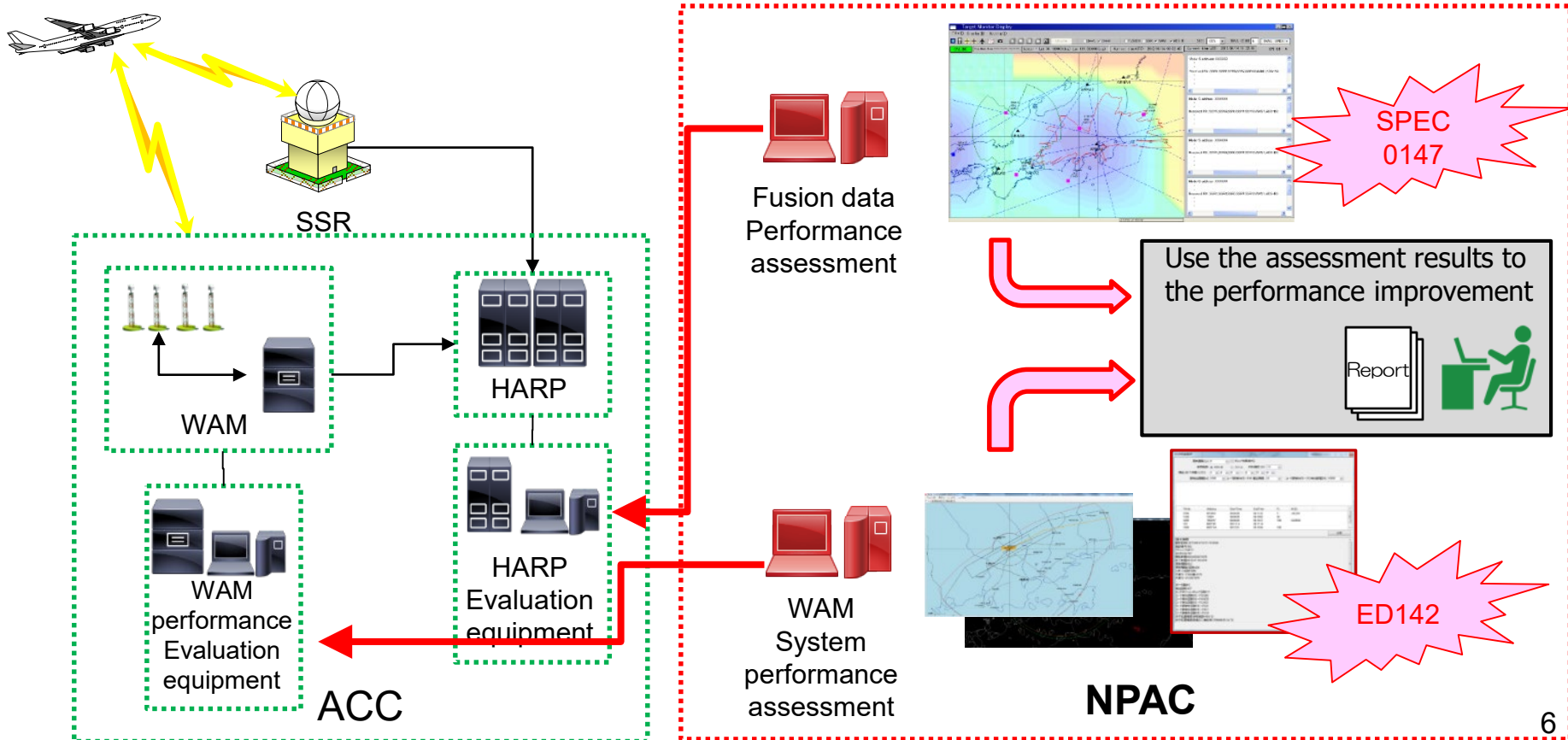
【Assessment Report】

Use the assessment results to the performance improvement

③ Performance Assessment (Surveillance)



- WAM (Wide Area Multilateration) performance assessment based on ED-142 (EUROCAE).
- Fusion data performance assessment based on SPEC0147 (Eurocontrol).
- Analysis of ADS-B data for consideration of future usage to the surveillance source.

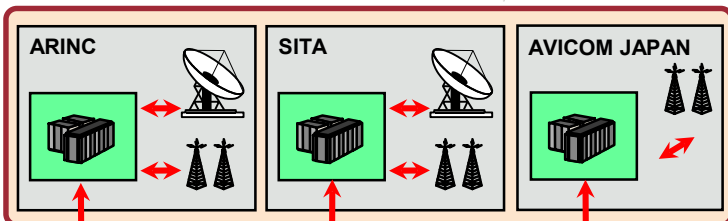
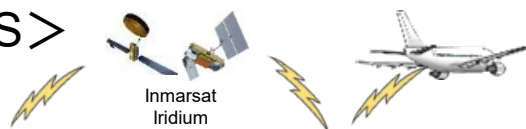


System Operation

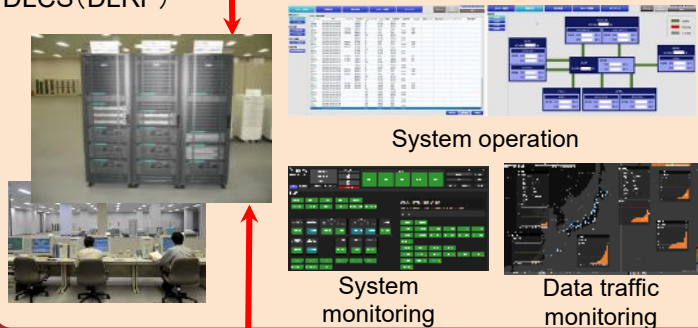


- For providing data link and GNSS navigation stable, continuous operation of DLCS (Data Link Center Sortation equipment) and MSAS (Michibiki Satellite Augmentation Service).
- Engineering staff are on duty 24 hours for System maintenance and troubleshooting.

<DLCS>



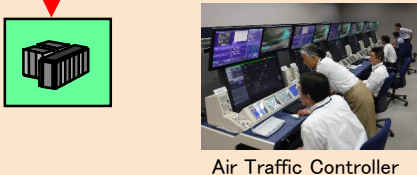
DLCS (DLRP)



DCL, D-ATIS,
Area/En-route data link information

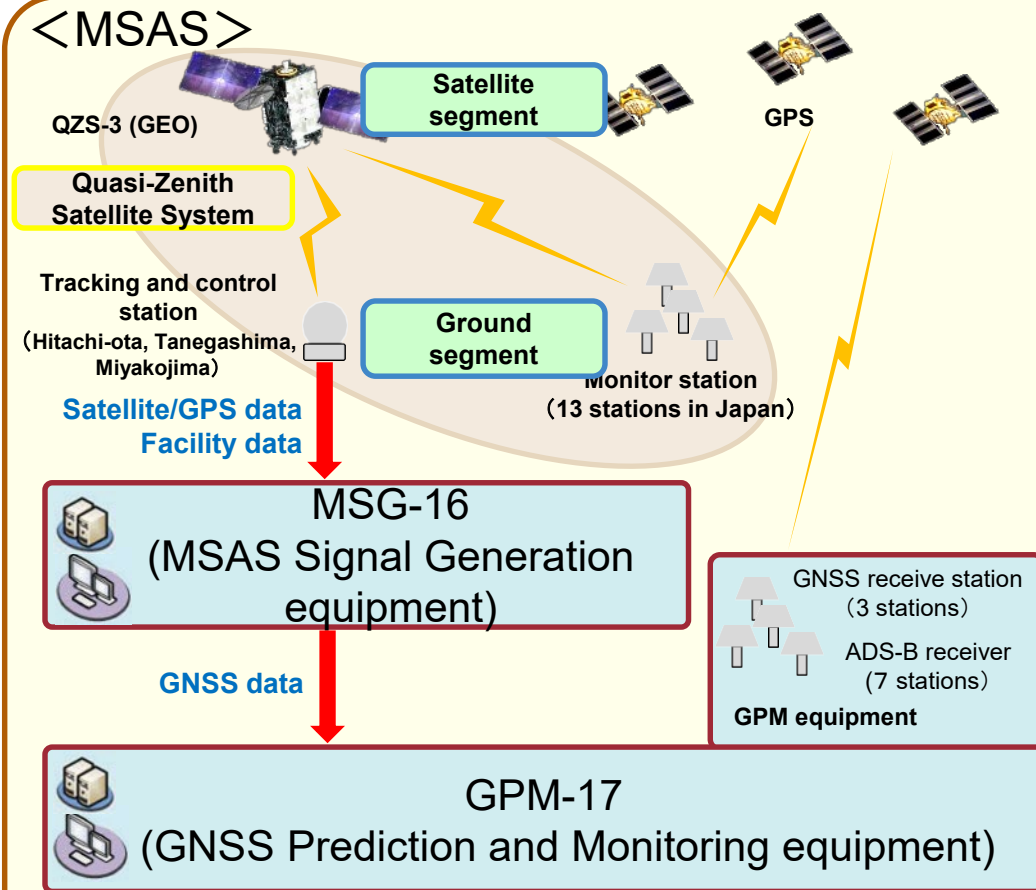
AFN, ADS-C, CPDLC

ATM Systems



Air Traffic Controller

<MSAS>



MSG-16 has MSAS real time performance monitoring function
GPM-17 has RAIM prediction and GNSS performance monitoring function