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ATC phraseology and reporting in APAC

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GNSS RFI in DGCA/59 Conferences



DGCA/59 Conference

Cebu, Philippines, 14 to 18 October 2024

Agenda Item 4: Air Navigation



GNSS Spoofing in Oceanic
Airspace- Japan



GNSS RFI situation
awareness and
cooperation- ROK



GNSS interference and
response of ATC & Pilots-
Pakistan



Thailand's Strategy To
Address Global Navigation
Satellite System Radio
Frequency Interference
(GNSS RFI)



Global Navigation Satellite
System Radio Frequency
Interference (GNSS RFI)-
IATA



Rationalization Of
Navigation Infrastructure-
IATA



GNSS Spoofing in Oceanic
Airspace- Japan

GNSS INTERFERENCE AND RESPONSE OF ATC & PILOTS

(PRESENTED BY ISLAMIC REPUBLIC OF PAKISTAN)

SUMMARY

In recent past, significant escalation has been observed in incidents of GNSS interference, Jamming and spoofing. The incidents are generally being reported by Pilot to air traffic controllers. The scope of communication between ATC & Pilot from Standard RT perspective is limited to reporting only, leading to various response in follow-up communication. This discussion paper is developed to highlight the need for improvement in the standardized RT phraseology, invite the States to share their best practices and to harmonize ATC & Pilot contingency procedures, to the extent possible.



- GNSS is one of the key enablers for Performance-Based Navigation (PBN)
- Application of the PBN procedure significantly reduced the stress & workload for ATC & pilots.
- The increase in the incidents of GNSS Interferences has raised safety concerns.



The harmonization in reporting and follow-up communication between ATC & pilots in the forms of improved Standard RT phraseology, along with the development and implementation of detailed contingency procedures, can contribute towards safety enhancement.

Standard RT phraseology in Chapter-12 of ICAO Doc 4444 (PANS-ATM)

Para No./ Circumstances	Phraseologies	Remarks
12.3.1.14 GNSS SERVICE STATUS	a) GNSS REPORTED UNRELIABLE (<i>or</i> GNSS MAY NOT BE AVAILABLE [DUE TO INTERFERENCE]); 1) IN THE VICINITY OF (<i>location</i>) (<i>radius</i>) [BETWEEN (<i>levels</i>)]; <i>or</i> 2) IN THE AREA OF (<i>description</i>) (<i>or</i> IN (<i>name</i>) FIR) [BETWEEN (<i>levels</i>)]; b) BASIC GNSS (<i>or</i> SBAS, <i>or</i> GBAS) UNAVAILABLE FOR (<i>specify operation</i>) [FROM (<i>time</i>) TO (<i>time</i>) (<i>or</i> UNTIL FURTHER NOTICE)];	The ATC is communicating the Known GNSS service Status / The Pilot acknowledgement with description of its tentative planned action RT Phraseology is missing.
	*c) BASIC GNSS UNAVAILABLE [DUE TO (<i>reason, e.g. LOSS OF RAIM or RAIM ALERT</i>)]; *d) GBAS (<i>or</i> SBAS) UNAVAILABLE. *e) CONFIRM GNSS NAVIGATION; and *f) AFFIRM GNSS NAVIGATION. * Denotes pilot transmission.	The Pilot is communicating Non availability GNSS/GBAS/SBAS services / The ATC response(RT Phraseology) with alternative instructions is missing

Standard RT phraseology in Chapter-12 of ICAO Doc 4444 (PANS-ATM)

Para No./ <i>Circumstances</i>	<i>Phraseologies</i>	Remarks
12.3.1.15 DEGRADATION OF AIRCRAFT NAVIGATION PERFORMANCE	UNABLE RNP (<i>specify type</i>) (<i>or</i> RNAV) [DUE TO (<i>reason, e.g.</i> LOSS OF RAIM <i>or</i> RAIM ALERT)].	The Pilot is communicating degradation of aircraft Navigations performance due certain reasons / The ATC response (RT Phraseology) with alternative instructions is missing

Standard RT phraseology in Chapter-12 of ICAO Doc 4444 (PANS-ATM)

- ✓ Incidents of GNSS interference take place during various flight profiles: en route, Terminal approach, departure, holding and/or Intermediate /Final approach landing phase.
- ✓ Interference, jamming and spoofing,
- ✓ Provision of Standardized RT Phraseology for a few possible scenarios (complete or partial GPS loss, EGPWS warnings, Uncertainty of aircraft position) may prove helpful for both pilots and ATC.

Recommendations:

Contingency procedures (operational and technical) for ATC and flight crew are developed and implemented, and a joint effort is made to harmonize such procedures to the extent possible by sharing experiences and best practices among the regional States.

Proposal for improvement in RT phraseology to relevant ICAO APAC or concerned ICAO forum



Action Items of DGCA/59:

Discussion Paper No.	Action Item	Description
DP/4/3 DP/4/4 DP/4/9 DP/4/10 DP/4/11 DP/4/13	Action Item 59/15	Acknowledging that GNSS RFI events such as jamming and spoofing jeopardize the safety and resiliency of airspace operations, consistent with the recommendations of the Fourteenth Air Navigation Conference, the Conference urged: 1. States/Administrations to: a) take appropriate actions to detect and mitigate GNSS RFI sources; b) monitor, report, and share GNSS RFI events such as jamming and spoofing events and best practices of mitigation measures through APANPIRG; c) maintain adequate conventional Ground Based Navigation Aids (GBNA)/minimal operational networks (MONs) to support aircraft navigation; d) foster enhanced cooperation and collaboration regarding GNSS RFI events with military; e) bring proposals for improvement in RT phraseology regarding reporting of GNSS RFI events to relevant ICAO forum; and 2. ICAO to organize a workshop for sharing best practices and lessons learned for managing and mitigating GNSS RFI events.



Thank You

