**THE FORTY-FIRST MEETING OF THE**

**INFORMAL PACIFIC ATC CO-ORDINATING GROUP**

**(IPACG/41)**

(Kyoto, Japan 16 – 17 September 2015)

Agenda Item 5: Communications/Navigation/Surveillance (CNS) Issues

**Satellite Voice (SATVOICE) Update**

(Presented by Federal Aviation Administration (FAA))

**SUMMARY**

This paper provides an update on activities related to the use of satellite voice (SATVOICE) for air traffic services (ATS). These activities are within the FAA-sponsored Performance-based Aviation Rulemaking Committee Communications Working Group (PARC CWG) and ICAO.

# Introduction

## At IPACG 39, the FAA had provided information on activities concerning the use of satellite voice (SATVOICE) for air traffic services (ATS). These activities are within the FAA-sponsored Performance-based Aviation Rulemaking Committee Communications Working Group (PARC CWG) and ICAO.

## The PARC CWG has been reviewing the use of SATVOICE for ATS in the light of proposed amendments to ICAO Annexes and Procedures for Air Navigation Services (PANS) with a goal to justify recommendations to FAA that would allow one HF communication system to be permanently replaced with a SATVOICE system.

## Meeting this goal has been challenged by the need for reliable “global” SATVOICE services. To overcome this challenge, PARC CWG has been coordinating with FAA / ICAO on amendments to ICAO Annexes, PANS, and supporting guidance material.

## At this time, PARC CWG is NOT considering SATVOICE as a means to completely remove the carriage of HF voice communication equipment on aircraft.

## This paper provides an update on these activities.

# Discussion

SATVOICE Benefits

## SATVOICE complements controller-pilot data link communication (CPDLC) and automatic dependent surveillance – contract (ADS C), both which use satellite data communications in airspace where procedural separations are applied. Therefore, it is only natural for an operator that equips with CPDLC and ADS C to also equip with SATVOICE owing to the negligible additional cost when compared against the benefits. Some operators are already seeking relief of high frequency (HF) radio equipment on the minimum equipment list (MEL) based on SATVOICE to reduce weight, save fuel, reduce greenhouse gas emissions and allow greater payload. Additionally, some States require operators to be equipped with SATVOICE capability for operations, such as extended diversion time operations (EDTO)—also referred to as ETOPS— beyond 180 minutes.

## SATVOICE services complement existing HF voice services. Air traffic service (ATS) units and aeronautical stations are already providing or are planning to provide SATVOICE services to improve voice communication services. These investments were based primarily on operational trials completed in 2007 in the NAT Region. The trials proved SATVOICE for ATS use was useful in situations such as poor HF propagation conditions and emergencies. Currently, controllers are using SATVOICE for direct controller pilot communication at their discretion even in normal situations because it is more convenient and cost effective than the alternatives. In the longer term, SATVOICE could be a viable complement to automatic dependent surveillance – broadcast (ADS‑B) to enable reduced separations between aircraft pairs that are not CPDLC and ADS C capable in airspace that otherwise would not be possible.

## Given the above, SATVOICE can provide an alternative long range communication system (LRCS) as means to comply with relevant National regulations, for example, in the FAA, 14 CFR - §121.351, §125.203, §135.165.

ICAO Activities concerning SATVOICE

## In June 2015, ICAO issued a State Letter for comment on proposed amendments to Annexes and Procedures for Air Navigation Services (PANS) concerning the use of SATVOICE for ATS communications. These proposed amendments were developed by the Operational Data Link Panel (OPLINKP). In summary, these proposed amendments:

1. Define “SATVOICE” for use in phraseology;
2. Require States to publish aeronautical station SATVOICE number(s) in aeronautical information publications (AIPs) and on aeronautical charts;
3. Require operators to file CODE/ in Item 18 of the flight plan (the aeronautical station can convert CODE/ into the aircraft SATVOICE number   
   (e.g. CODE/A1529D = SATVOICE # 50251225);
4. Include 4 different priority levels: emergency, ATS, aeronautical operational control (AOC) and public use; and
5. Include criteria for SATVOICE numbers and calls, as follows:

|  |  |
| --- | --- |
| Ground-to-air calls require | Air-to-ground calls require |
| * Secure calling * Priority calling and * Aircraft SATVOICE number, which is the aircraft address expressed as an 8-digit octal number | * Priority calling * ATS unit SATVOICE number, which is a unique 6-digit number (i.e. short code) or direct dial commercial number |

## The PfAs to the Annexes and PANS, and supporting guidance material, are intended to promote global harmonization of SATVOICE services, aircraft SATVOICE capability and use for air traffic service (ATS) communication. Harmonization of SATVOICE systems and procedures, the associated equipment for the ATS provision, as well as the aircraft equipment, are crucial to ensure cost-effective solutions to advance air traffic management (ATM), which is supported by both ATS and aeronautical operational control (AOC). The proposed amendments provide a common architecture for different commercial satellite companies and network service providers and will allow:

1. ANSPs to contract and implement reliable SATVOICE services from a competitive market;
2. Operators to choose from a variety of aircraft systems available that are interoperable with SATVOICE services; and
3. ANSPs and operators to prepare for decisions on the role of SATVOICE in air traffic management (beyond 2028).

## The OPLINKP has developed a SATVOICE Operations Manual (Doc 10038), which was based on the inter-regional Satellite Voice Guidance Material endorsed by the Asia-Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) and North Atlantic Systems Planning Group (NAT SPG). ICAO is targeting Nov 2015 to publish the SATVOICE Operations Manual (Doc 10038).

## OPLINKP is planning to update the SATVOICE Operations Manual (Doc 10038) for November 2017 publication to include guidance for assigning unique short codes to ATS and AOC ground stations regardless of technology or service provider (e.g. Iridium, Inmarsat, MTSAT, Classic Aero, SwiftBroadband, Certus).

PARC CWG activities concerning SATVOICE

## In March 2008, the PARC CWG initiated a project to investigate the use of SATVOICE for ATS communication taking into consideration work underway at ICAO and in the regions. The goal of the project is to conclude on recommendations to the FAA that would allow one HF communication system to be permanently replaced with a SATVOICE system in cases where two long range communication systems (LRCSs) are required.

## The PARC CWG recommendations will concern FAA policies and practices that are applied to the master minimum equipment list (MMEL) for a specific aircraft model and the minimum equipment list (MEL) for a specific operator, the use of SATVOICE as a means of compliance with the criteria for voice communication dispatch reliability and in other cases where LRCSs are required by regulation. The PARC CWG is not considering SATVOICE as a means to completely remove the carriage of HF voice communication equipment at this time; however, it recognizes that this is identified in the ICAO Global Air Navigation Plan for beyond 2028.

## The PARC CWG SATVOICE project is supported by a tiger team comprising six airlines (Hawaiian (HAL), UPS, Delta, United, Sun Country and Southwest), two satellite service providers (Iridium and Inmarsat), two communication service providers (Rockwell Collins (formerly ARINC) and SITA), Boeing, two avionics manufacturers (Avionica and ICG) and the FAA.

## While much of the tiger team’s work has been focused on Iridium, the project includes Inmarsat and MTSAT. The evaluations are intended to determine the viability of SATVOICE as an LRCS that can be used in tandem with HF voice communication via a radio operator and/or directly with a controller.

## Currently, 103 aircraft participate in the SATVOICE evaluation. 92 aircraft are equipped with Iridium ATS SIM cards. In January 2015, UPS reported that it had completed modifications to 83 of 85 aircraft installations to use the Iridium ATS Safety Voice Service. HAL had reported that it had completed the modifications to nine B767 Iridium equipped aircraft, and also provided 11 Inmarsat equipped aircraft. In June 2015, HAL had provided 1 Inmarsat (SwiftBroadband) aircraft to participate.

## The tiger team had analyzed data collected from September 2014 to May 2015 with HAL aircraft in the Oakland Oceanic flight information region (FIR) to measure against the required communication performance (RCP) 400 specification and is currently in the process of compiling the results.

## Prior to the data collection, which began in 2014, the tiger team resolved issues with using Iridium ATS Safety Voice Service. On 6 June 2014, the FAA issued Policy Letter PL‑106, Rev 5, concerning High Frequency (HF) Communications. The purpose of PL‑106 is to provide standardized MMEL requirements for HF communication systems. PL‑106, Rev 5:

1. Recognizes SVGM as basis for evaluating SATVOICE systems as a long range communication system (LRCS);
2. Requires Iridium ground-to-air calls to aircraft to use aircraft address represented by 8-digit octal number (i.e. a direct dial commercial number is not acceptable);
3. Requires the flight plan to identify the SATVOICE equipment and capability in Item 10—M1 (Inmarsat), M2 (MTSAT) or M3 (Iridium)—and aircraft address in Item 18—CODE/[aircraft address] (e.g. CODE/A1529D); and
4. Indicates CPDLC is not acceptable for MMEL relief of one HF radio due to limited CPDLC capability in emergency and non-routine situations.

## On 23 October 2014, the FAA issued Notice N8900.277, OpSpec/MSpec B045, Extended Overwater Operations Using a Single Long-Range Communication System. This notice, which is an internal document for Principal Operations Inspectors (POIs), revises FAA policy to allow SATVOICE as a backup for HF communications in the West Atlantic Route System (WATRS) airspace as a means to maintain an acceptable level of voice communication reliability.

## While N8900.277 currently allows the use of Iridium SATVOICE installations that receive ground-to-air calls using direct dial commercial numbers (not ATS Safety Voice Services), the policy is expected to be revised again to require Iridium SATVOICE installations to use the aircraft address represented by an 8-digit octal number instead. On 4 August 2015, the FAA issued Information for Operators (InFO) 15008, Iridium Satellite Voice (SATVOICE) with Safety Services, which is provided at Attachment A. The InFO notifies operators that:

1. Some Iridium SATVOICE aircraft installations, operations centers and service accounts will need to be modified if intended for use as an LRCS;
2. Use of direct dial commercial numbers for ground-to-air calls are NOT acceptable for MMEL for HF Communications (PL-106); and
3. The FAA intends to align its LRCS policies with ICAO proposed amendments planned for November 2016 applicability. SATVOICE intended to be used as an LRCS will be required to use aircraft address represented as an 8-digit octal code for ground-to-air calls.

## In January, Rockwell Collins (aka ARINC) informed PARC CWG that it began checking FAA flight plans to see if operators who file SATVOICE capability in Item 10 (e.g. M1 (Inmarsat), M2 (MTSAT) and M3 (Iridium) also file CODE/[aircraft address in hex code] in Item 18. Table 1 shows an example of the flight plans with the CODE/ compliance report summary for December 2014 for all operators. The data indicate that out of 74, 570 flight plans, 25,298 filed SATVOICE capability in Item 10 and only 46% of these flight plans filed CODE/[aircraft address in hex code] in Item 18.

Table 1. FPL 2012 hex code compliance report (December 2014 HAL)

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| --- | --- | --- | --- | --- | --- |
| SATCOM FPL 2012 COMPLIANCE REPORT | | | | | |
| **ALL OPERATORS** | | | | | |
| DECEMBER 2014 | | | | | |
| Agency | Provider | FPL Filed | % of total FPL by provider | **FPL in compliance** | |
| FPL with CODE/ | % |
| ALL | M1 Inmarsat | 19,816 | 27% | 8,876 | 45% |
| ALL | M2 MTSAT | 2,549 | 3% | 1,586 | 62% |
| ALL | M3 Iridium | 2,933 | 4% | 1,293 | 44% |
| Subtotal |  | **25,298** | **34%** | 11,755 | **46%** |
|  |  |  |  |  |  |
| ALL | No Provider Listed | 49,272 | 66% | 3,161 |  |
|  |  |  |  |  |  |
| TOTAL |  | **74,570** | 100% |  |  |

## The FAA has drafted an InFO (See Attachment B for draft), which is currently in coordination, to raise the awareness of flight plan requirements for filing REG/ and CODE/ in Item 18 of the flight plan. It is noted that the InFO is not specific to SATVOICE because ATS systems use REG/ and CODE/ for multiple purposes. The FAA expects to issue this InFO in the near future.

## PARC CWG has taken an action to begin collecting information from AIPs to develop a world map of SATVOICE services and identify intended uses and any restrictions (e.g., for non-routine and emergency use only).

## The SATVOICE project has been challenged by the need for “global” reliable SATVOICE services. PARC CWG continues to coordinate with FAA / ICAO on ICAO provisions, and the regions on planning and implementation initiatives.

# Action by the meeting

## The meeting is requested to note the content of this paper.

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| LOGO BLK OUTLINE new 2005 | **InFO**  Information for Operators |
| U.S. Department of Transportation **Federal Aviation Administration** | InFO 15008 DATE: 8/4/15  Flight Standards Service  Washington, DC |
|  |  |
| <http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/info> | |
| An InFO contains valuable information for operators that should help them meet certain administrative, regulatory, or operational requirements with relatively low urgency or impact on safety. | |

Subject: Iridium Satellite Voice (SATVOICE) with Safety Services

Purpose: This InFO notifies operators that some Iridium SATVOICE aircraft installations, operations centers and service accounts will need to be modified if intended for use as a Long Range Communication System (LRCS). This InFO is not applicable to Inmarsat SATVOICE systems.

Background: In June 2014, the Federal Aviation Administration (FAA) approved a global change to its Master Minimum Equipment List (MMEL) by revising policy letter (PL-106) regarding high frequency (HF) communication. This change allows for a compliant SATVOICE system as an alternative to one of the two required HF radios. A compliant SATVOICE system must use safety voice services. Additionally, in October 2014, the FAA revised its policy for issuing operations specifications/management specifications (OpSpec/MSpec) B045 to allow SATVOICE as a backup for HF communications in the West Atlantic Route System (WATRS) airspace as a means to maintain a high level of voice communication reliability. Currently, the policy for issuing OpSpec/MSpec B045 does not require the SATVOICE system to use safety voice services. The International Civil Aviation Organization (ICAO) is proposing a SATVOICE provision in Annex 10 that will require safety voice services. This provision is anticipated to be applicable in November 2016. The FAA is working with ICAO to establish harmonized global standards, procedures, and guidance on SATVOICE use.

Discussion: An Iridium SATVOICE installation that receives calls using a direct dial commercial number, which does not use safety voice services, is the subject of this InFO. To utilize the Iridium safety voice services for calls to the flight deck and comply with the provisions of PL-106, modifications are needed to aircraft equipment, automation/procedures at operations centers and service accounts. Operators should contact their Iridium equipment manufacturer and communication service provider (e.g. Rockwell Collins (formerly ARINC) or SITA) for information on modifying their aircraft installations, operations centers and service accounts. Operators seeking MMEL relief in accordance with PL-106 using Iridium SATVOICE installations are required to operate and complete the required modifications as necessary.

Recommended Action: The FAA is actively pursuing policy changes to OpSpec/MSpec B045 or any regulation concerning requirements for communication systems (e.g. Title 14 of the Code of Federal Regulations (14 CFR) part 121, §121.351; part 125, §125.203; and part 135, §135.165) to allow for ICAO-compliant SATVOICE systems to be used as an LRCS. With this policy change, operators will need to modify Iridium SATVOICE aircraft installations, operations centers, and service accounts, as necessary. This policy change and timeframe would be aligned with the November 2016 applicability date for the ICAO SATVOICE provision. Directors of safety and directors of operations (part 121); directors of operations (part 125 and 135); training managers; and pilots must ensure these safety services are being used in lieu of commercial services, and that flightcrews and operations personnel (dispatchers) are knowledgeable in the new communication procedures.

Contact: Questions or comments regarding this InFO should be directed to the New Program Implementation, and International Support Branch, AFS-240 at (202) 267-8166.

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| Approved by: AFS-200 | OPR:AFS-240 |

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| LOGO BLK OUTLINE new 2005 | **DRAFT** | **InFO**  Information for Operators |
| U.S. Department of Transportation **Federal Aviation Administration** |  | InFO xxxxx DATE: [TBD]  Flight Standards Service  Washington, DC |
|  |  |  |
| <http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/info> | | |
| An InFO contains valuable information for operators that should help them meet certain administrative, regulatory, or operational requirements with relatively low urgency or impact on safety. | | |

**SUBJECT**: Filing REG/ and CODE/ in Item 18 of the flight plan

**Purpose**: This InFO provides operators with notice to file CODE/ and REG/ in Item 18 of the flight plan.

**Background**: In accordance with ICAO *Procedures for Air Navigation Services/ Air Traffic Management* (PANS-ATM, Doc 4444), REG/ is the registration mark of the aircraft and, if different from the aircraft identification in Item 7, REG/ should be filed in Item 18 (e.g. REG/N2567GA). CODE/ is the aircraft address, often referred to as the ICAO 24-bit code, and should be filed in Item 18 as a 6-alphanumeric hexadecimal code (e.g. CODE/A1529D). Air traffic systems use REG/ and CODE/ to uniquely identify an aircraft and associate it with related capabilities that are filed in Item 10. For example, air traffic systems use REG/ to correlate logon information for CPDLC, denoted by J2 through J7 (CPDLC FANS 1/A …). Air traffic systems use CODE/ to:

1. Correctly identify the aircraft position and other information obtained from ADS B;
2. Derive the satellite voice (SATVOICE) number, which is the aircraft address expressed as an 8-numeric octal code, for an aircraft that has filed SATVOICE, denoted by M1 (Inmarsat), M2 (MTSAT) and/or M3 (Iridium) in Item 10a  (e.g. CODE/A1529D = SATVOICE number 50251225); and
3. In Europe, to correlate logon information for CPDLC, denoted by J1 (CPDLC ATN VDL Mode 2) in Item 10a.

In June 2015, the North Atlantic (NAT) Region Systems Planning Group concluded to amend the ICAO NAT Regional Supplementary Procedures (Doc 7030) to require all operators intending to operate in the NAT Region to file aircraft registration (i.e. REG/) and the ICAO aircraft address (i.e. CODE/) in Item 18 of the flight plan.

**Discussion**: The FAA reviewed 394,215 flight plans filed from July 6-12, 2015 (7 days). Of those flight plans, only 7% included CODE/ and 62% included REG/ in Item 18. Furthermore, only 64% of the flight plans that filed ADS-B capability in Item 10 and 46% of the flight plans that filed SATVOICE capability in Item 10 included CODE/ in Item 18. With the increase use of REG/ and CODE/ by air traffic systems, all flight plans should include REG/ and CODE/ in Item 18.

**Recommended action**: Directors of safety and directors of operations (part 121); directors of operations (part 125 and 135); and training managers must ensure flight crews and operations personnel (Dispatchers) are knowledgeable and comply with ICAO filing protocols, and always file REG/ and CODE/ in Item 18. Operators should file REG/ in Item 18 even if it is the same as the aircraft identification filed in Item 7. This notice supplements FAA flight planning information, which can be found at the following website: <http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/air_traffic_services/flight_plan_filing/#icao>.

**Point of Contact**: Questions or comments regarding this InFO should be directed to the New Program Implementation, and International Support Branch, AFS-240 at (202) 267-8166.

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| --- | --- |
| **DRAFT** by: AFS-200 | OPR:AFS-240 |

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