SAM/IG/22

INTERNATIONAL CIVIL AVIATION ORGANIZATION
South American Office

Regional Project RLA/06/901

TWENTY SECOND WORKSHOP/MEETING OF THE SAM IMPLEMENTATION GROUP

(SAM/IG/22)

FINAL REPORT

Lima, Peru, 19 to 23 November 2018

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INDEX

ii-1 PLACE AND DURATION OF THE MEETING

The Twenty Second Workshop/Meeting of the SAM Implementation Group (SAM/IG/22) was held in the premises of the ICAO South American Regional Office in Lima, Peru, from 19 to 23 November 2018, under the auspices of Regional Project RLA/06/901.

ii-2 OPENING CEREMONY AND OTHER MATTERS

Mr. Marcelo Ureña, on behalf of the ICAO South American Office Regional Director, greeted attending civil aviation authorities and representatives of State and private organizations of the SAM Region. Furthermore, he reiterated his thanks for the continuous support given to the activities of the SAM Regional Office, especially those related to the SAM Implementation Group (SAM/IG), highlighting its achievements in the implementation of systems, services and procedures in the SAM Region during the ten years of its existence.

ii-3 SCHEDULE, ORGANIZATION, WORKING METHODS, OFFICERS AND SECRETARIAT

The Workshop/Meeting agreed to hold its sessions from 09:00 to 15:00 hours, with appropriate breaks. Working methods of the Meeting included a Single Committee, Working Groups and *ad-hoc* Groups.

Mr. Roque Diaz Estigarribia, delegate from Paraguay and Mr. Ivan de Leon, delegate from Panama, were elected as Chairman and Vice-Chairman of the Meeting, respectively.

Mr. Fernando Hermoza, ICAO ATM/SAR Regional Officer acted as Secretary, and was assisted by Mr. Francisco Almeida, ICAO CNS Regional Officer and Mr. Onofrio Smarrelli, ICAO CNS Consultant.

In addition, the Secretariat counted with the support of Mr. Julio Pereira for the PBN Group, Nicolas Borovich for the ATFM Group, Mr. Murilo Albuquerque Loureiro for the Group on Improvements in CNS Capabilities, and Mr. Jorge Merino for the Automation and Situational Awareness Group.

ii-4 WORKING LANGUAGES

The working languages of the Meeting were English and Spanish.

ii-5 AGENDA

The following agenda was adopted:

Agenda Item 1: Follow-up to conclusions and decisions adopted by SAM/IG meetings and presentation of air navigation results at a global, interregional and intraregional level

Agenda Item 2: Optimization of the SAM airspace

a) PBN regional implementation progress
b) Actions to standardize the longitudinal separations of *en-route* aircraft
c) Post-implementation analysis of the SAM route network – Version 4

Agenda Item 3: Implementation of Air Traffic Flow Management (ATFM) and improvement of procedures for coordination between agencies.

Agenda Item 4: Assessment of operational requirements to determine the implementation of improvements in communications, navigation and surveillance (CNS) capabilities for operations in route and terminal area

Agenda Item 5: Operational implementation of new ATM automated systems and integration of the existing systems

Agenda Item 6: Other business

ii-6 ATTENDANCE

The Meeting was attended by 80 participants of 13 States of the SAM Region (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Panama, Paraguay, Peru, Suriname, Uruguay and Venezuela); and as Observer, one State from the North American and Caribbean Region (United States), one International Organization (IATA) and six Observers from the aviation industry (AEROMACS WIMAX FORUM, AIREON, ATECH, FREQUENTIS, IATA, SIEMENS Brazil and THALES). The list of participants is shown in page iii-1.

ii-7 LIST OF CONCLUSIONS [1]

[1] The Conclusions are presented in the format requested by the Air Navigation Commission (ANC) through Study Note 8993 (6/11/2015) Progress report of the ad hoc working group in the PIRG and RASG reports (item No. 20036).

LISTA DE PARTICIPANTES / LIST OF PARTICIPANTS

ARGENTINA

1. Esteban Mendoza
2. Silvana Enríquez
3. Diego Alberto Gamboa
4. Nicolás Borovich
5. Mario Correa

BOLIVIA

6. Walter Jorge Olivera Ballesteros
7. Pablo César Zárate Arancibia

BRASIL / BRAZIL

8. Murilo Albuquerque Loureiro
9. Luiz Antonio dos Santos
10. Andres Luis Santos de Rocha
11. James Souza Short
12. Alessander de Andrade Santoro
13. Claudio Luiz Rocha Carneiro
14. Igor José Ribeiro de Sampaio
15. Mariel Santos de Aguiar
16. João Marcelo Monteiro

CHILE

17. Alfonso de la Vega
18. Lucio López
19. Patricio Zelada

COLOMBIA

20. David Camilo Sánchez Espinosa
21. Rolando Aros Riaño

ECUADOR

22. Clemente Pinargote
23. Christian Ramos
24. Jimmy Sandoval

ESTADOS UNIDOS

25. Al O'Neill
26. Dulce M.Roses
27. Raul G. Chong

GUYANA

28. Trevor Daly
29. Sewchan Hemchan

PANAMÁ

30. Iván De León
31. Carlos M. Aparicio
32. Gilda Espinosa
33. Mario Facey Howard

PARAGUAY

34. Roque Díaz Estigarribia
35. Liz RocíoPortillo Castellanos
36. Víctor Morán Maldonado
37. Delia Giménez

PERÚ

38. Sara Siles La Rosa
39. Sady Beaumont Valdez
40. Joel Cordero Sánchez
41. Libio Benites Condori
42. Diana Priscilla Montoya Castro
43. Brenda Solange Céspedes Rojas
44. Giuliano Guzmán Vera
45. Tomás Macedo Cisneros
46. Jorge Eduardo Merino Rodríguez
47. Juan Pablo Portilla Venero
48. César Rebaza Benites
49. Federico Vasquez
50. Raúl Anastacio Granda
51. Mario Matos
52. Jorge García Villalobos
53. Gisella Garay
54. Sara Borda García
55. John Camacho
56. Eloy Tafur
57. Freddy Pimentel

SURINAM / SURINAME

58. Quincy Stewart Cyrus

URUGUAY

59. Gabriel E. Falco
60. Gustavo Turcatti
61. Isidoro Daniel Espalater da Silva
62. Rosanna Barú
63. Pedro Cardeillac

VENEZUELA

64. Omar Enrique Linares
65. Maribel Mayora
66. Alberto Marín

AEROMACS WIMAX FORUM

67. Alessandra Rocha

AIREON

68. Demetrius Zuidema
69. Athayde Frauche

ATECH

70. José Airton Patricio
71. Marcos Kiyoshi Shibata

FREQUENTIS

72. Adriana Candez

IATA

73. Julio de Souza Pereira
74. Gabriel Rossi
75. Raymundo Hurtado

SIEMENS Brasil

76. Ricardo Serra Simoes

THALES

77. Frédéric Cuq

OACI / ICAO

78. Fernando Hermoza Hübner

79. Francisco Almeida
80. Onofrio Smarrelli

Agenda Item1: Follow-up to conclusions and decisions adopted by SAM/IG meetings and presentation of air navigation results at a global, interregional and intraregional level

1.1 Under this agenda item, the following papers were analysed:

a) WP/02 – *Follow-up to valid conclusions formulated by SAM/IG meetings and pending activities* (presented by the Secretariat); and
b) IP/03 – *Results of the Thirteenth Air Navigation Conference* (presented by the Secretariat).

Conclusions and decisions formulated by SAM/IG meetings

1.2 The Meeting reviewed the conclusions and decisions still valid, as well as the activities pending from the workshops/meetings of the SAM Implementation Group (SAM/IG), as shown in **Appendix A** to this agenda item. The list of conclusions and activities include:

a) tasks to be performed and/or the corresponding conclusion in the area concerned;
b) specific tasks leading to accomplishment of the main task;
c) results expected from each task;
d) completion dates;
e) parties responsible for implementation;
f) members supporting the task; and
g) status of implementation of the task, and, if needed for better understanding, an explanatory comment on the status of implementation.

1.2 Likewise, the Meeting completed the table shown in **Appendix B** to this agenda item, containing the tasks to be performed by the States for the purpose of their follow-up.

Results of the Thirteenth Air Navigation Conference

1.3 The meeting was informed on the Thirteenth Air Navigation Conference (AN-Conf/13) held in Montreal (Canada) from 9 to 19 October 2018. The theme of the Conference was "*From development to implementation"*.

1.4 The agenda of the Conference included a broad range of issues related to flight safety and air navigation capacity and efficiency of interest to the Directors General of Civil Aviation, as well as to air navigation service providers and all airspace users. The Air navigation committee (Committee A) reviewed items 1, 2, 3, 4 and 5 of the agenda, as follows:

- Agenda item 1: Air navigation global strategy
- Agenda item 2: Enabling the global air navigation system
- Agenda item 3: Enhancing the global air navigation system
- Agenda item 4: Implementing the global air navigation system and the role of planning and implementation regional groups (PIRGs)
- Agenda item 5: Emerging issues

1.5 The meeting examined air navigation matters of the Conference being developed globally and that will require in the short term the beginning of planning tasks in our Region, related to ATM and CNS, including the evolution of the global navegacion satellite system (GNSS) towards the introduction of services with dual-frequency multiple constellations (DFMC). The use of digital and remote technologies in the operations of air traffic control towers, operations above FL600, unmanned aircraft systems (UA) operations called "drones", as well as the new "flying taxi", in operations below 1,000 ft, were also discussed.

1.6 Opportunities and difficulties related to the operation of remotely piloted aircraft systems (RPAS) and ICAO activities in the development of the regulatory framework to support the integration of remotely piloted aircraft (RPA) into non-segretated airpace and aerodromes, were analyzed.

1.7 The meeting highlighted the need for States to support the multidisciplinary development of SARPS and guidelines on RPAS across all relevant ICAO technical panels. It was also recalled the preparation of training activities by ICAO as well as additional guidelines to support the States in the implemention of SARPS related to RPAS.

1.8 The meeting was invited to review the complete report of the Conference shown in:

https://www.icao.int/Meetings/anconf13/Pages/default.aspx

APPENDIX A

STATUS OF IMPLEMENTATION OF CONCLUSIONS AND/OR TASKS EMANATING FROM SAM/IG MEETINGS

Note: During SAM/IG/22 Conclusions 14-10, 15-4, 19-1, 18-02 and 15-07 were deleted.

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
3. Implementation of performance-based navigation (PBN) in the SAM Region							
3-1	**Conclusion SAM/IG/14-6: Projects and/or action plans for PBN redesign of the main South American TMAs** That SAM States: a) send the Project and/or Action Plans for PBN redesign of the main TMA(s) selected by their Administration, in order to complete the SAM PBN Project that is contained in Appendix J to this part of the Report, to the SAM Regional Office by 31 December 2014; b) send the corresponding updates to the aforementioned Project and/or Plans to the SAM Regional Office as soon as possible, so as to ensure harmonisation of activities under the SAM PBN Project.	Determination of the selected air spaces to be optimized with the implementation of PBN	Indicate the selected airspace for redesign or optimisation Report updates	SAMI/IG/25	STATES	RO/ATM	**VALID**

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
3-2	**Conclusion SAM/IG/21-01: Regional and interregional harmonised PBN implementation goals** That SAM States, organisations, users, and stakeholders double efforts to meet regional and interregional performance-based air navigation implementation goals, based on GREPECAS projects, and contemplating the strengthening of national PBN implementation plans so that they include performance indicators and the use of recognised project management tools and methods.	Updating of regional PBN action plans and State action plans. Follow-up to PBN implementation and specific assistance to States.	PBN implementation plans implemented	SAMI/IG/26	STATES	RO/ATM	**VALID**

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
	Conclusion SAM/IG/22-01: Study Group and Implementation of the SAM Air Space (GEPEA) The Study Group and Implementation of the SAM Air Space (GESEA) be constituted, in accordance with the Terms of Reference approved by the SAM/IG Meeting.	cover the topics related to the Design of Procedures that are mostly treated in the PANSOPS workshops; facilitate more in-depth work on specific and complex issues; provide the best conditions for work outside the meetings, via teleconference; and stimulate the participation of new professionals in the work carried out in the Planning of the SAM Air Space, as well as in the activities related to the PANS OPS.	GESEA constitution	SAM/IG/23	STATES	RO/ATM	**VALID**
	4. **Standards and procedures for performance-based navigation operations approval**						
4-1	**Conclusion SAM/IG/14-9: Aircraft and operator PBN capacity database** That the ICAO SAM Office send to SAM States information on the use of the aircraft and operator PBN capacity database, requesting that the aforementioned database be completed by 15 March 2015.	Complete the implementation of the Database on aircraft and operator PBN capacity; and circulate a letter to States requesting to complete the data.	a) Web-based application b) Updated database	SAM/IG/24	RO/TC	RO/ FLS	**VALID** Application development started. Currently under review by ICAO Montreal HQ in order to include it in iSTARS.

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
5. ATFM implementation							
5-1	**Conclusion SAM/IG/5-7: ATFM teleconferences in the SAM Region** That SAM States continue to hold weekly ATFM teleconferences between flow management units or flow management positions (FMU / FMP) to improve the exchange of information among participating States.	Implement ATFM teleconferences	FMU/FMP coordination carried out.	Permanent	States	RO/ATM	**VALID** Chile, Panama, Paraguay, Peru, and Venezuela will conduct tests starting in November 2017 during CADENA – CANSO ATFM teleconference. Argentina and Brazil are already participating. Results will be reported at the 2018 ATFM workshop.
5-2	**Conclusion SAM/IG/21-02: Consolidation of the implementation of 40NM longitudinal separation minima between adjacent FIRs in the SAM Region and promotion of the Action Plan for the implementation of a 20NM separation** That SAM States take action and apply procedures in the ACCs to consolidate the implementation of 40NM longitudinal separation minima and give priority to the execution of the action plan for the	Follow-up to the implementation of the 40NM separation, follow-up to the Action Plan for the implementation of 40 NM separation, follow-up to the Action Plan for the implementation of 20NM minima, and specific assistance to	Implementation of 20NM longitudinal separation minima in continental airspace.	SAM/IG/25	STATES	RO/ATM	**VALID**

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
	implementation of standard 20NM separation minima between adjacent FIRs in SAM continental airspace.	States.					
	Conclusion SAM/IG/22-02: Support in the implementation of the intraregional and interregional ATFM **That:** The States enhance their efforts to: a) promote or optimize the implementation of the ATFM units in the assigned ACCs and that a study of procedures and tests be initiated to join the functions of their units with those of other adjacent States of the SAM Region, and, if such were the case, of the CAR Region; and **b)** render administrative resources that will facilitate the ATFM functions, including basic and recurrent instruction for operational and supervision personnel	With the purpose of strengthening the provision of ATFM services and establishing the basis for a multinodal model and/or combined with a centralized function, the benefits of ATFM services should be extended to intrarregional and interregional levels.	Support to ATFM	SAM/IG/25	STATES	RO/ATM	**VALID**
6. Operational implementation of new ATM automated systems and integration of the existing systems							
6-2	**Conclusion SAM/IG/15-08: Provision of facilities for the staff in charge of the operational implementation of the AIDC by the aeronautical authorities of the States**	Provision of facilities for the staff in charge of the operational implementation of	Facilities for the staff in charge of the operational implementation	December 2016	States	ICAO Secretariat	**VALID** The lack of support by aeronautical authorities

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
	That the aeronautical authorities of SAM States involved in the implementation of the AIDC system interconnection, in order to meet the requirements of the Bogota Declaration in this regard, provide the necessary facilities so that the staff designated for the implementation of this activity, especially focal points, may carry out the work within the time specified in the schedules of activities listed in Appendix C of this agenda item.	AIDC by the aeronautical authorities of the States	of the AIDC implemented				to AIDC focal points in the implementation process is still evident.
6-3	**Conclusion SAM/IG/18/03: Designation of ADS B focal points** That, in order to coordinate regional ADS B planning and implementation activities in the SAM Region, States designate focal points and send the information to the ICAO South American Office no later than 30 December 2016.	Designation of ADS B focal points	ADS B focal points designated	30 Dec 2016	States	RO/CNS	**VALID** To date, the following States have designated focal points: Argentina, Bolivia, Brazil, Chile, Colombia, Uruguay Venezuela; Ecuador and Perú
6-4	**Conclusion SAM/IG/19-2: Implementation of procedures to mitigate the duplication/ multiplicity of scheduled commercial flight plans** In order to implement procedures to mitigate the duplication/multiplicity of scheduled commercial flight plans, States: a) should establish AFTN address XXXXZPZX, corresponding to the ARO/AIS Offices, as the only address for receiving flight plans. b) could use as a reference the AIC model developed by Peru, shown in Appendix G	a) establish AFTN address XXXXZPZX as the only address for receiving flight plans b) develop AIC	Singe address Implemented AIC developed	December 2018	States	RO/CNS y RO/ATM	**VALID** To date, only Peru has implemented the procedure. Brazil, Ecuador and Venezuela have begun the procedure

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
	to this agenda item, when filing the flight plan directly to the ACC FDP.						
6-5	**Conclusion SAM/IG/21-03: Activities required in the AIDC pre-operational phase to reduce migration times to the operational phase** That SAM States currently in the AIDC pre operational phase, in order to reduce time in this phase and migrate to the operational phase: a) operate AIDC for a period of time to obtain the skills required for use thereof; b) monitor AIDC operation, recording errors made during the reporting, coordination and transfer stages; c) conduct statistical measurements based on the results of b), in order to identify the most frequent errors; d) based on the results of c), take the necessary action to mitigate errors; and report the results obtained in c) and d) and disseminate the lessons learned at events, teleconferences and AIDC implementation meetings of the SAM Region, so that they may serve as a reference for other AIDC implementations.	Follow-up and coordination via teleconferences and meetings	AIDC operational connection completed	December 2019	States	RO/CNS and RO/ATM	**VALID** On 18 August 2018, operational AIDC was established between Lima ACC - Guayaquil ACC and also between Iquique ACC–Lima ACC
	Conclusion SAM/IG/22-03: Interoperability Task Force (GT Interop) **That:** To create an Interoperability Task Force (GT Interop) to address the issue in the SAM Region, providing States with guidance on the	With the main objective of guarantee the interoperability among the automated systems used by the areas of	Creation of GT interop	SAM/IG/23	SAM Region States	ICAO SAM Office	**VALID**

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
	processes for interconnecting systems already implemented or to be acquired.	AIM, MET, ATM, ATFM, and CNS.					
7.	**Follow up to conclusions and decisions adopted by SAM/IG meetings, results of the thirty-eighth session of the ICAO Assembly (A38) and thirteenth meeting of Civil Aviation Authorities of the SAM Region (RAAC/13) and progress made in the development of the new electronic Air Navigation Plan (e-ANP)**						
7-1	**Conclusion SAM/IG/13–1: Alignment of the national air navigation plans with the ICAO Global Air Navigation Plan (GANP) and SAM Performance-Based Air Navigation Implementation Plan (PBIP)** That SAM States amend their national air navigation plans, with the aim of aligning them with the new ICAO Global Air Navigation Plan (GANP, 4th Edition) and SAM Performance-Based Air Navigation Implementation Plan (PBIP) approved at the thirteenth meeting of Civil Aviation Authorities of the SAM Region (RAAC/13), and present any progress made in October 2014, at the SAM/IG/14 meeting.	Amend the air navigation national plans to have them aligned with the new ICAO Global Air Navigation Plan.	National air navigation plans aligned with ASBU	SAM/IG/24	SAM States	ICAO SAM Office	**VALID** Brazil, Chile, Colombia, France and Venezuela have reported the completion of its national plans aligned with the ASBU. The PNAI of Chile is presented as reference document of the SAM/IG/21 meeting
7-2	**Conclusion SAM/IG/13-3: Designation of a national focal point for the drafting of the new regional e-ANP** That, with the aim that SAM States can coordinate with the ICAO SAM Regional Office the provision of the data necessary for the drafting of the new regional electronic air navigation plan (e-ANP): a) The ICAQ SAM Regional Office will send a State letter in early June 2014, requesting the nomination of a national focal point; and b) SAM States will officially inform by 1	Designate focal points	Focal point	01/08/2014	States	RO/ATM	**VALID** The Secretariat sent letter SA280 on 12 June 2014.

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
	August 2014 the name of the designated focal point, and provide a brief resumé, telephone number and electronic mail of the incumbent.						

Updated on SAM/IG/22 November 2018.

APPENDIX B

FOLLOW-UP TO THE CONCLUSIONS AND PENDING TASKS OF SAM/IG MEETINGS

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES/ REMARKS
Conclusion SAM/IG/13-1 – Alignment of the national air navigation plans with the ICAO Global Air Navigation Plan (GANP) and SAM Performance-Based Air Navigation Implementation Plan (PBIP) That SAM States amend their national air navigation plans, with the aim of aligning them with the new ICAO Global Air Navigation Plan (GANP, 4th Edition) and SAM Performance-Based Air Navigation Implementation Plan (PBIP) approved at the thirteenth meeting of Civil Aviation Authorities of the SAM Region (RAAC/13), and present any progress made in October 2014, at SAM/IG/14 meeting.	O/G	O/G	YES	YES	YES	O/G	YES	O/G	O/G	O/G	O/G	O/G	O/G	YES	Bolivia foresees completion in December 2018. Peru foresees completion in 2019. PNNA will be presented SAM/IG/24 Paraguay foresees completion in December 2018 Suriname is drafting his first N-ANP Note: States should use as a reference the Global Air Navigation Plan (GANP, 5th edition) and the SAM Performance-based navigation implementation plan (PBIP) version 1.5 approved at the Thirteenth meeting of Civil Aviation Authorities (RAAC/15)
Conclusion SAM/IG/13-3 - Designation of a national focal point for the drafting of the new regional e-ANP That, with the aim that SAM States can coordinate with the ICAO SAM Regional Office the provision of the data necessary for the drafting of the new regional electronic air navigation plan (e-ANP): a) The ICAO SAM Regional Office will send a State letter in early June 2014, requesting the nomination of a national	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	Information from Guyana and Panama still pending.

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES/ REMARKS
focal point; and b) SAM States will officially inform by 1 August 2014 the name of the designated focal point, and provide a brief resumé, telephone number and electronic mail of the incumbent.															
Conclusion SAM/IG/13-9 - IATA safety event indicators for SAM States Encourage States to develop, jointly with operators, Secretariat and other ATM community stakeholders deemed relevant, the methodology allowing the use of the data on safety events and indicators registered by airlines through IATA, in order to identify and mitigate any potential risk to operations, setting goals, priority areas and action plan.	YES	O/G	YES	YES		YES	YES		NO	NO	NO	NO	NO	YES	Bolivia: First contact made with IATA
Conclusion SAM/IG/14-9 - Aircraft and operator PBN capacity database That the ICAO SAM Office send to SAM States information on the use of the aircraft and operator PBN capacity database, requesting that the aforementioned database be completed by 15 March 2015.															The Secretariat coordinated (August 2017) with ICAO HQ in Montreal so that personnel of iSTAR develop a PBN capacity database. In this respect, iSTAR personnel paid a one-month mission to ICAO SAM Office to begin the activity, which is still in progress. The application will allow States to fill remotely and keep the database updated.
Conclusion SAM/IG/14-13 - AMHS interconnection trial procedures That SAM States, when conducting AMHS interconnection trials, use as a reference the list of procedures aligned with the SAM AMHS interconnection guide shown in Appendix B to this agenda item.	YES	YES	YES	YES	YES	YES	YES	YES	O/G	YES	YES	YES	YES	YES	Procedure implemented

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES/ REMARKS
Conclusion SAM/IG/14-17 - Updating of FASID Table CNS4 That SAM States send to the Secretariat at the ICAO SAM Office the updated FASID Table CNS4 by 15 December 2014.	YES	NO	O/G	YES	YES	YES	NO	NO	YES	YES	YES	NO	YES	YES	FASID Table CNS 4 is now CAR/SAM 5 Table CNS II of the eANP Volume II
Conclusion SAM IG/14-18 - Exception in the insertion of alternate aerodromes That: a) Airlines operating to the United States that will apply exceptions to the insertion of the alternate aerodrome, insert "ZZZZ" in box 16 of the FPL and specify ALTN//NIL in box18. **b)** States include such procedures in the respective AIPs.	b) YES	b) NO	YES	b)NO	b)O/G	b)O/G	b)O/G	b)O/G	b)O/G	b)O/G	b) YES	b)O/G	b)O/G	b)NO	The recommendation of the NAM/CAR/SAM AIDC/4 meeting of April 2018 also promotes the implementation of the exception. SRVSOP LAR 121.2585 and ICAO Annex 6 provide for the exception when filling the ALTN DEST Bolivia will not apply exception set in LAR 121.2585. Argentina is publishing the application in its AIP, as reported at the SAMIG/21.
Conclusion SAM/IG/15-08: Provision of facilities for the staff in charge of the operational implementation of the AIDC by the aeronautical authorities of the States That the Aeronautical Authorities of the SAM Region States involved in the implementation of the AIDC systems interconnection, in order to comply with the requirements of the Bogota Declaration in this regard, provide the necessary facilities for the staff designated for the implementation of this activity, especially the focal points, could carry out the work within the time specified in the schedules of activities listed in Appendix C of this agenda item.	O/G	N/A	YES	O/G	YES	YES	N/A	N/A	YES	O/G	YES	N/A	O/G	YES	**VALID**

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES/ REMARKS
Conclusion SAM/IG/16-01: **Model amendment to the letter of operational agreement on AIDC between two centres** That SAM States, when implementing AIDC between adjacent ATS units, make the corresponding amendments to the letters of operational agreement using as a model the amendment to the letter of operational agreement between the Lima ACC and the Guayaquil ACC for the operation of AIDC, shown in Appendix A to this agenda item.	O/G	NA	O/G	O/G	YES	YES	O/G	NA	YES	O/G	YES	NA	O/G	NA	At present, the model amendment to the letter of operational agreement on AIDC is being used by Colombia, Ecuador, Panama and Peru. The remaining States will use it when their operational letters of agreement are amended to include AIDC.
Conclusion SAM/IG/18-01: **PANS-OPS recommendations for harmonising instrument procedures in the SAM Region** That SAM States implement and apply, as soon as possible, the recommendations of the PANS-OPS group, shown in Appendix B* to this part of the report, with a view to harmonising instrument procedures and the associated processes, and enhance safety.	O/G	O/G	O/G	O/G		O/G			O/G	O/G	YES		O/G	YES	*See information in PANS-OPS workshop States to report on implementation of conclusions at SAM/IG/19 The objectives of the conclusion are being met. Follow-up being conducted in SAM/IG/19 table. Table was updated at SAMIG/21.
Conclusion SAM/IG/18/03: **Designation of ADS B focal points** That, in order to coordinate regional ADS B planning and implementation activities in the SAM Region, the States designate focal points and send the information to the ICAO South American Office no later than 30 December 2016.	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES	NO	YES	YES	

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES/ REMARKS
Conclusion SAMIG/19-02 Implementation of procedures to mitigate duplication/multiplicity of scheduled commercial flight plans In order to implement procedures to mitigate the duplication/multiplicity of scheduled commercial flight plans, States: a) should establish AFTN address XXXXZPZX, corresponding to ARO/AIS Offices, as the only address for receiving flight plans. b) could use as a reference the AIC model developed by Peru, shown in Appendix G to this agenda item, when filing the flight plan directly to the ACC FDP.	a) O/G b) O/G	NO	a) O/G b) O/G	a) O/G b) O/G	a) O/G b) O/G	a) O/G b) O/G	NO	NO	a) O/G b) O/G	a) O/G b) O/G	a) YES b) YES	NO	a) O/G b) O/G	a) O/G b) O/G	
Conclusion SAM/IG/21-01: Regional and interregional harmonised PBN implementation goals That SAM States, organisations, users, and stakeholders double efforts to meet regional and interregional performance-based air navigation implementation goals, based on GREPECAS projects, and contemplating the strengthening of national PBN implementation plans so that they include performance indicators and the use of recognised project management tools and methods.		O/G	O/G	YES		O/G					O/G		O/G	O/G	Bolivia: implementation foreseen by 11/11/19 Peru: In 2018 eight (8) key performance indicators (KPI)has been implemented and applied to ATFM and A-CDM. It is foreseen to extend those indicators to PBN in 2019.
Conclusion SAM/IG/21-02: Consolidation of the implementation of 40nm longitudinal separation minima between adjacent FIRs in the SAM Region and promotion of the action plan for the implementation of a 20NM separation That SAM States take action and apply procedures in the ACCs to consolidate the implementation of 40NM longitudinal separation minima and give priority to the execution of the action plan for the implementation of standard 20NM separation minima between adjacent FIRs in SAM continental airspace.		O/G	YES	YES		O/G					O/G		YES	YES	Bolivia cannot implemented 40nm separation minima with its current communications system. Improvement to the VHF network foreseen for 2019.

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES/ REMARKS
Conclusion SAM/IG/21-03: **Activities required in the AIDC pre-operational phase to reduce migration times to the operational phase** That SAM States currently in the pre-operational phase of AIDC, in order to reduce time in this phase and migrate to the operational phase:	NA	NA					NA	NA		NA		NA	NA	NA	Brazil, Chile, Colombia, Ecuador, Panama and Peru have activities to sign operational letters of agreement
a) operate AIDC for a period of time to obtain the skills required for the use thereof;			O/G	YES	O/G	YES			YES		YES				
b) monitor AIDC operation, recording errors made during the reporting, coordination and transfer stages;			O/G	YES	O/G	YES			YES		YES				
c) conduct statistical measurements based on the results of b), in order to identify the most frequent errors;			O/G	YES	O/G	YES			YES		YES				
d) based on the results of c), take the necessary action to mitigate errors; and			O/G	O/G	O/G	O/G			O/G		O/G				
e) report the results obtained in c) and d) and disseminate the lessons learned at events, teleconferences and AIDC implementation meetings of the SAM Region, so that they may serve as a reference for other AIDC implementations.															

Agenda Item 2: Optimisation of the SAM airspace

a) PBN regional implementation progress
b) Actions to standardise longitudinal separation of en-route aircraft
c) Post-implementation analysis of the SAM route network – Version 4

2.1 Under this agenda item, the following papers were analysed:

a) WP/03 - *Follow-up to PBN Implementation* (presented by the Secretariat);
b) WP/04 - *New Structure of the Global Air Navigation Plan* (presented by the Secretariat);
c) WP/05 - *Plan de medición de performance del Proyecto TMA-SP NEO* (presented by Brasil) (**Spanish only**);
d) WP/06 - *Airspace Planning Study Group (GEPEA)* (presented by Brazil and IATA);
e) WP/07 - *Progress in the PBN Implementation at the TMA Panama* (presented by Panama);
f) WP/17 - *Study of the Feasibility and Convenience of Using the Satellite-Based ADS-B Service in the SAM Region* (presented by the Secretariat);
g) WP/19 - *Acciones realizadas por EANA para optimizar la gestión del tránsito aéreo a través de la medición por indicadores* (Presentada por Argentina) (**Spanish only**)
h) WP/20 - *Improvements on Planning and Implementation Aimed to Achieve Performance Objectives through the Harmonization of the Queue Managements and Regional Data Analysis Process* (presented by Brazil);
i) WP/21 - *AGILE GRU Project* (presented by Brazil and IATA);
j) IP/04 - *Update on the Implementation of PBN in Paramaribo FIR* (presented by Suriname);
k) IP/05 - *Optimización del espacio aéreo colombiano* (presented by Colombia) (**Spanish only**); and
l) IP/21 - *Post-Implementation Analysis of the SAM Route Network with the Georgetown – UP549* (presented by Guyana).

2.2 The list of PBN focal points of the Regulator and the Air Navigation Service Provider (ANSP) was updated for the maintenance of coordination and teleconferences, as attached as **Appendix A** to this Agenda Item.

2.3 At the SAM/IG/21 meeting (Lima, 2 to 18 May, 2018) a proposal was presented to update the SAM PBN project, which aims to apply project management techniques and incorporate performance indicators.

2.4 It was agreed that National PBN Plans should be aimed at identifying and addressing the real needs of States based on collaborative decisions with users, as well as indicating implementation priorities. At the same time, the value of these Plans was highlighted in the context that several SAM States have not finished elaborating or updating their National Air Navigation Plans (PNNA). **Appendix B** to this part of the Report presents the Draft Regional PBN Plan, and **Appendix C** presents a model for National PBN Implementation Plans.

2.5 It was reported that there have been difficulties in executing the five teleconference cycle agreed in SAMIG/21 to promote the updating of the PBN plans of the States. In that sense, paragraph

2.37 of this part of the Report addresses the approval of an improvement in the work model of the PBN group.

Progress in the Regional PBN implementation

PBN en-route

2.6 Implementation of PBN en route is addressed at ATS route network optimisation (ATSRO) meetings, based on route network versions, to ensure the best possible airspace structure at all times within an integrated development concept.

2.7 Version 04 initiatives were consolidated at the ATSRO/9 meeting and became effective on 11 October 2018 with the implementation of 25 improvements involving realignment, flight distance reductions, and extension of RNAV-5 route segments. Furthermore, the optimisation includes 6 new RNAV-5 routes for the SAM Region and the elimination of 8 conventional routes, as a result of flow improvements derived from more efficient RNAV-5 routes.

2.8 Likewise, 5 interregional initiatives of ATSRO Version 04 were coordinated with CAR States at the Third PBN meeting held at the Mexico Office early this month. Accordingly, 29 ATSRO initiatives will have been implemented by 31 January 2019.

PBN in TMAs

2.9 SAM States continue to work to meet the implementation dates for PBN-based TMA redesign. Current planning is shown in the following table:

Redesign of selected TMA airspaces based on PBN plans		
State		**Implementation**
Argentina	BAIRES	Phase 1.- October 2017. Optimization of available resources. Completed. Phase 2.- 2017-2020. Introduction of the PBN concept. (See SAM/IG/20-IP/04) Phase 3. Total PBN redesign. Implementation expected by 2022
	Cordoba	Start redesign 1Q2019, Implementation 2Q2020
	Comodoro Rivadavia	Implementation 6Dec2018
	Bahia Blanca	Implementation 31Jan2019
	Salta/Jujuy	Implementation 28Mar19
	Ushuaia/Rio Grande	Implementation 2Q2019
	Mendoza	Implementation 19Jul2018
	Tucuman	Implementation 12Oct2017
	Rosario	Implementation 11Oct2018
	Bariloche	Implementation 8Nov2018
	Posadas	Inicio Rediseño 3Q2019 Implantación 2Q2020
Bolivia	Cochabamba	Phase 1.- November 2018. LA PAZ TMA PBN. Phase 2.- TBD Final PBN designs at the LA PAZ FIR with ATS surveillance.
	La Paz	
	Santa Cruz	

Brazil	**Brasilia**		**12 Nov2015 (implemented)**
	Belo Horizonte		12 Nov2015 (implemented)
	Sao Paulo (partial modifications)		12 Nov2015 (implemented)
	Salvador		27 Apr2017 (implemented)
	Manaus		17 Aug2017 (implemented)
	(PBN SUR)	Curitiba	12 Oct 2017 (implemented)
		Florianopolis	
		Joinville	
		Navegantes	
		Porto Alegre	
		São Paulo (modifications)	
		CW FIR route network	
	Sao Paulo (restructuring)		September 2020
	Fortaleza, Natal, João Pessoa, Recife		November 2021
	Belem, Campo Grande and Sao Luis		October 2022
	Cuiaba, Boa Vista, Porto Velho and Rio Branco		October 2023
Chile	Santiago (South)		8 Dec 2016 (implemented)
	Santiago FIR route network		
Colombia	Bogota		12 Oct 2017 (implemented)
	Medellín		June 2019
	Pereira		September2019
	Cúcuta		December 2019
	Bucaramanga		June2020
	San Andres		December 2020
Ecuador	Guayaquil		21 Jul 2016 (implemented)
	Manta		October 2019
Panama	Panama		Project starting in 2019
Paraguay	Asunción		17 Aug2017 (implemented)
Peru	Arequipa		First semester 2019
	Cusco		5 Feb 2015(implemented)
	Juliaca		Second semester 2019
	Puerto Maldonado		Second semester 2019
Suriname	Paramaribo		January 2019
Uruguay	Carrasco and Laguna del Sauce		First semester 2018 * The Carrasco TMA will be optimised, in accordance with Phase 2 of the Baires TMA. The plan will be reviewed as a result of the agreement with DECEA
Venezuela	Maiquetia		December 2017
	Isla Margarita		Foreseen 25 April 2019

Implementation of SIDs, STARs, and PBN approach procedures

2.10 The Declaration of Bogota binds States to implement SID routes and STAR PBN at international aerodromes, using CDO and CCO methods, in order to meet the established goals. The Declaration also urges States to implement APV approach procedures, with a view to complying with ICAO Assembly Resolution A37-11.

2.11 In the Region, PBN SID/STAR implementation amounts to 72.9%. The 60% goal set in the Declaration of Bogota has already been met. Associated to the design of arrival and departure procedures is the application of CDO and CCO methods, which have reached the following levels of implementation: CDO 34% and CCO 26%.

2.12 Regarding the implementation of PBN approaches pursuant to Resolution A37-11, the ICAO iSTARS 3.0 website tool shows the status of implementation in 13 SAM States. To date, out of a total of 209 runway thresholds (international airports), 175 already have approach procedures with APV vertical guidance and/or LNAV-only minimum, *i.e.* 83.7% implementation. See details in the following ICAO website link:

https://portal.icao.int/space/Pages/PBN-Status.aspx

2.13 Regarding other information from the iSTARS tool, Peru indicated that the data on the air navigation implementation of the SAM Region should be updated. The Secretariat was in charge of coordinating with those responsible for iSTARS, at the Montreal headquarters.

PANS-OPS workshops

2.14 On the week of 24 September 2018, the SAM PANS-OPS/3 workshop addressed the initial planning of these activities, highlighting the publication of Circular 353, 'Transition Planning for Change to Instrument Flight Procedure Approach Chart Identification from RNAV to RNP', containing revised guidelines to support the implementation of the new PBN approach chart identification.

2.15 It was noted that Brazil had a significant number of charts that need to be updated (approximately 300), recognising the need to refine an action plan consistent with the Regional Plan. For all States, the transition will require resources and great effort, especially since most are addressing the task of implementing PNB in TMAs and airports, a tasks that cannot be interrupted. The Meeting noted that before July 2019 a Transition Plan agreed with the NACC Office should be delivered.

Actions for the optimisation of longitudinal separation of aircraft en route

2.16 A 4-day workshop was held in November 2017 at the SAM Regional Office, where an action plan was proposed to promote a reduction from 40NM to 20NM. In this regard, Brazil has started standard implementation of the 20NM separation for aircraft entering its FIRs. The summary of the results of this workshop appears in the following link:

https://www.icao.int/SAM/Pages/ES/MeetingsDocumentation_ES.aspx?m=2017-OPTSEPLONG

2.17 The States updated the status of the application of the longitudinal separation minimum in the Table shown in **Appendix D** to this part of the report.

Project A2 – Air navigation systems in support of PBN

2.18 The activities corresponding to this project are addressed in Agenda Item 4.

Activities and resources required for the implementation of the South American Airspace Optimisation Action Plan, with the support of Project RLA/06/901

2.19 It was noted that the Twelfth Meeting of the Coordination Committee of Project RLA/06/901 (RCC/12) approved activities to be carried out in 2019 in support of SAM airspace optimisation, which have been scheduled/executed as follows:

- Development of draft Version 05 of the SAM Route Network – Deliverable: SAM Route Network Version 05 document. (February 2019)

- Seminar on the organisation of flight procedure design services (IFPD). – to address the implementation of the IFPD service in accordance with ICAO Annex 11 and LAR 211. Aimed at strengthening the capacity of the region to sustain PBN implementation over time. (April 2019)

- Development of a catalogue for planning and monitoring the implementation of regional ATS routes and flight procedures. - Catalogue of ATS routes and RNAV/RNP flight procedures at international airports of the SAM Region. Support for the first updating phase of the ICARD route designator database. (April-May 2019)

- ATSRO/10 – Follow-up to the implementation of Version 05 of the SAM Route Network. (June 2019)

- Fourth workshop on PANS-OPS implementation. - Continue harmonising and coordinating PBN instrument procedures in the SAM Region, improving the PANS OPS design capacity of States (October 2019)

- SAM/IG/23 and SAM/IG/24 – All air navigation implementation priorities in order to continue with implementation activities and the execution of action plans. (May and November 2019, respectively).

- Workshop on the identification and implementation of performance indicators of air navigation systems in the SAM Region (date to be defined)

Strategy for PBN implementation in the SAM Region

2.20 SAM/IG meetings promote a strategy for PBN implementation in TMA and *en-route* airspace, with the approval of various activities. These activities, such as aircraft separation and PANS-OPS workshops, were included in the airspace optimisation work plan.

2.21 Taking into account that the two SAM/IG annual meetings would not be enough for such follow-up, it is advisable to participate in the monthly teleconferences. In summary, PBN implementation would be based on the following activities/events.

a) Development of daft Version 5 of the ATS route network.

b) ATSRO/10 meeting, with activities for the follow-up and adjustment of the implementation of the ATS route network – Version 5.

c) PBN implementation in TMAs - SAM/IG meetings and teleconferences.

d) Seminar on the organisation of flight procedure design services (IFPD)

e) Transition from RNAV to RNP charting and harmonisation and coordination of PBN instrument procedures in the SAM Region - PANS-OPS workshops.

f) Optimisation of longitudinal separation – multilateral and bilateral meetings.

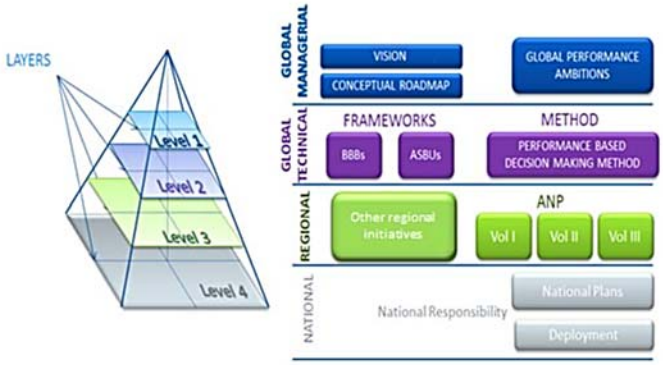
g) Meetings to update ATS contingency plans and letters of agreement in such a way as to ensure safety and consolidate PBN implementations and improvements, and to guarantee their benefits.

h) Coordination and harmonisation of the route network and longitudinal separation between the CAR/SAM Regions - NAM/CAR/SAM interregional implementation meetings and teleconferences.

New structure of the Global Air Navigation Plan - GANP

2.22 The meeting was informed that the 39th Session of the Assembly instructed the Secretary General to promote, make available and effectively communicate the GANP. Therefore, to better communicate with high-level and technical managers and to not leave any State or stakeholder behind, a multilayer structure, tailored for the various audiences, is proposed for the sixth edition of the GANP.

2.23 This four-layer structure, as illustrated below, is made up of global (strategic and technical), regional and national levels, and will provide a framework for alignment of regional, sub-regional and national plans.



2.24 The Meeting took note that the GANP reference information sixth edition is available through the GANP Portal on the web (still under construction). It is a web portal where different users can find the most important information that fits their specific needs.

https://www4.icao.int/ganpportal/

Development of performance indicators in Brazil

2.25 It was reported that Brazil is developing a proposal for a Performance Measurement Plan for the TMA-SP Neo Project for the TMA SAO PAULO. The objective is to implement indicators of operational safety, capacity and efficiency that can verify the effectiveness of the new concept of airspace.

2.26 Through a working paper and a presentation, Brazil presented the performance-based approach of the Manual on Global Performance of the Air Navigation System (Doc 9883), which proposes a globally harmonized performance management process that It is based on six well-defined steps. These steps determine a sequence that allows to achieve a repetitive and continuous process.

2.27 It was highlighted that afore the Brazilian challenges of measuring the performance of the air navigation system at the national level, it is necessary to adopt a standard process for the data collection, management, and analysis at the regional level, in order to harmonize the performance measure objectives and use them in the modernization of PIRG. In addition, it allows the supervision of the benefits derived from this implementation and to inform about it. The working paper WP/20 and the presentation of Brazil with details on the subject are available on the website of the meeting, in the link;

http://www.icao.int/SAM/Pages/ES/MeetingsDocumentation_ES.aspx?m=2018-SAMIG22

2.28 Brazil, together with IATA, presented the initiative to optimize the use of runway capacity in Guarulhos - Sao Paulo, with the application of simultaneous segregated operations under VMC, called the AGILE GRU Project. The implementation will be made on December 6, 2018 and has industry participation. Working paper WP/21 presents details on a Performance Measurement Plan.

Improvements in PBN implementation in SAM States

2.29 Suriname reported that in August 2018 it implemented four improvement initiatives in Regional RNAV routes, as part of the version 4 of the route network developed in the ATS/RO group. On November 8, 2018, the RNP APCH procedures for runways 11 and 29 of the Johan Pengel International Airport in Paramaribo, Suriname, which will be in force from January 3, 2019, have been published. It was indicated that the longitudinal separation of 40 NM in FIR Paramaribo, and activities are developed for the preparation of the National Air Navigation Plan.

2.30 Guyana reported on the results of the implementation of the UP549 regional route between Panama City and Georgetown. The following estimated fuel savings are available for 4 weekly flights:

- Previous route UG443 equals 1317 NM. Route UP 549 is equivalent to 1280 NM, saving is estimated at 37 NM or 5 minutes of flight.
- 208 flights annually save 1040 flight minutes, which represent an estimated 43,845 kg of fuel and represent a reduction of 138,112 kg of CO2.

2.31 Colombia reported the following advances in the PBN implementation:

a. Instrumented Normalized Departures (SID): established under the concept of performance-based navigation (PBN) and designed for the International Airports of Colombia. To date there is an advance of 75%.

b. Standardized Arrivals by Instruments (STAR): made under the concept of performance-based navigation (PBN) and designed for the International Airports of Colombia. To date there is an 86% advance.

c. Operations with Continuous Ascent (CCO): in departures designed for International airports. To date there is an advance of 43%. Operations with Continuous Descent (CDO): in arrivals and departures. To date there is an advance of 43%.

d. PBN routes in the Upper Air Space: Designed in the controlled airspaces of the Barranquilla FIR (SKEC) and FIR Bogotá (SKED). To date there is an advance of 62% and. Approach procedures RNP AR APCH: designed for International airports. To date there is an advance of 78%.

e. Approach Procedures with Vertical Guide (APV) and with lateral guidance (LNAV): designed for International airports. To date there is an advance of 61%.

f. PBN approach procedures with Lateral Guide Only (LNAV): designed for International airports. To date there is an advance of 90%.

2.32 The Meeting noted that a "free routing" model is being implemented to allow the use of airspace together with flexible routing adjusted to specific traffic patterns. This will allow greater routing possibilities, reducing possible congestion on trunk routes and saturated crossing points, resulting in a reduction in the emission of CO2 pollutant gases and fuel consumption. There are three trajectories implemented, which are generating annual savings of 288,000 kg of fuel, representing 876,000 kg of CO2 reduction.

2.33 Panama informed that the re-design project with PBN application in the TMA Panama is of utmost importance due to the significant increase in air traffic in the region, for which actions are taken to tender again in public act the integral study of the FIR Panama, re design of the TMA and the elaboration of PBN procedures that are needed according to the Regional Air Navigation Plan. At the end of November 2018 the documentation will be delivered by the proponents. The start-up of this project will be in 2019, with completion estimated for 2020.

2.34 Argentina reported on the fuel savings generated in 2018 in its PBN implementation. For approach procedures generated saved 832,545 NM representing 8,325,450 Kg of fuel and 26,283,447 Kg of CO2 reduction. In routes, it was reduced 205.65 NM and generated 1,033,500 Kg of fuel in savings, representing 3,263,707 Kg of CO2.

Study Group on planning; GEPEA–Brazil

2.35 The Meeting was informed that, in accordance with the guidelines provided by ICAO, the Brazilian industry has taken the initiative to create the Studies Group on Airspace Planning (GEPEA), with the participation of the National Agency of Civil Aviation. (ANAC), Brazilian Association of Airlines (ABEAR), Department of Airspace Control (DECEA), and International Air Transport Association (IATA).

2.36 The main products already delivered by the GEPEA:

a) New airport operational minimums, aligned with Doc. 9365 and with international best practices, which will improve efficiency in landing and takeoff operations.
b) Suspension of the application of noise abatement procedures, which will result in savings of approximately 2,300 tons of fuel per year (7,300 tons of CO2).
c) Reduction of preferential routes in Brazilian airspace, with the application only in the essential sections for airspace management.

2.37 Working Paper WP/06 contains more details of the GEPEA and its organization, including the terms of reference of the Group.

Improvements in the work model of the PBN Group

2.38 Through Note of Discussion NE/01 of the Secretariat, the Meeting analyzed a proposal for improvement of the SAM PBN Implementation Group through the Study Group and implementation of the SAM Air Space, based on the experience of the industry in Brazil, presented in the WP/06 of Brazil and IATA.

2.39 It was agreed that in the last 10 years, the Group has developed the necessary guides for the harmonized implementation of PBN in route, TMA and approach. However, air space planning has evolved in recent years, with the publication of several ICAO documents related to the development of Airspace Concepts (Doc. 9931, Doc. 9992, Doc. 9993), in which it has been shown that PBN is a tool to achieve safe and efficient airspace concepts.

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2.40 It was analyzed that the current PBN group (PBN/SAM/IG) needs to improve its working models to:

a) cover the topics related to the Design of Procedures that are mostly treated in the PANS-OPS workshops;
b) facilitate more in-depth work on specific and complex issues;
c) provide the best conditions for work outside the meetings, via teleconference;
d) encourage the participation of new professionals in the work carried out in the SAM Air Space Planning, as well as in the activities related to the PANS-OPS

The main objectives of the GESEA would be the following:

a) Coordinate the implementation of SAM route versions.
b) Harmonize the PBN implementation in the main SAM TMA, applying the best international practices
c) Support SAM States in the implementation of STAR, SID and PBN-based approaches.
d) Coordinate the migration process of RNAV nomenclature to ICAO RNP.
e) Develop a harmonized methodology for post-implementation evaluation, with the application of key performance indicators
f) Support the implementation of a regulatory framework for the instrument flight procedure design service.
g) Share best practices in the design and publication of instrument flight procedures, with a view to increasing operational safety and flight efficiency.

2.42 The Meeting examined a proposal of terms of reference that are included in **Appendix E** to this part of the Report. It was highlighted that the aim is to increase the efficiency of the work promoted by the SAM/IG, without generating bureaucratic burdens or additional costs. GESEA will therefore work based on teleconference and electronic communication and, as appropriate, on face-to-face activities within the RLA / 06/901 program.

2.43 The constitution of the GESEA group was agreed, according to the proposal, however, the Secretariat was entrusted with the task of issuing a letter to the States to express their interest and capacity to nominate technicians and experts to form the Group.

2.44 In view of the above, the Meeting formulated the following conclusion:

<table>
<tr><td colspan="2">CONCLUSION
SAM/IG/22-01 Study Group and Implementation of the SAM Air Space (GEPEA)</td></tr>
<tr><td>that:

The Study Group and Implementation of the SAM Air Space (GESEA) be constituted, in accordance with the Terms of Reference approved by the SAM/IG Meeting.</td><td>Expected impact:

☐ Politician / Global

☐ Inter-regional

☒ Economic

☐ Environmental

☒ Technical/Operational</td></tr>
<tr><td colspan="2">Why: Whereas the PBN/SAM/IG needs to improve its working models to:

a) cover the topics related to the Design of Procedures that are mostly treated in the PANSOPS workshops;
b) facilitate more in-depth work on specific and complex issues;
c) provide the best conditions for work outside the meetings, via teleconference; and
d) stimulate the participation of new professionals in the work carried out in the Planning of the SAM Air Space, as well as in the activities related to the PANS OPS.</td></tr>
<tr><td>When: In SAM/IG/23</td><td>Status: Adopted by SAM/IG/22</td></tr>
<tr><td colspan="2">Who: ☐Coordinators ☒States ☒ICAO Secretariat ☐ICAO HQ ☐Others: Users/Industry</td></tr>
</table>

APPENDIX A / APÉNDICE A

LIST OF CONTACTS FOR OPERATIONAL PBN FOCAL POINTS / LISTA DE CONTACTOS PARA PUNTOS FOCALES PBN

Updated during SAM/IG/22 / Actualizados en la SAM/IG/22

State / Estado	PBN FOCAL POINTS / PUNTOS FOCALES PBN
ARGENTINA	Mariana Fernandez Administración Nacional de Aeronáutica Civil (ANAC) A/C Departamento Programación Técnica Tel: +54 11 5941 3000 Ext. 69193 E-mail: mafernandez@anac.gov.ar Rodrigo Devesa Diseño de Espacio Aereo Empresa Argentina de Navegación Aérea (EANA) Tel: +54 11 4320 2010 Cel: +54911 4088 6542 E-mail: rdevesa@eana.com.ar Diego Alberto Gamboa Jefe Departamento Diseño de Espacio Aéreo Empresa Argentina de Navegación Aérea (EANA) Tel: +5411 3092 7597 E-mail: dgamboa@eana.com.ar Maria Estela Leban Directora de Regulaciones Normas y Procedimientos Tel: 541159413000 int 69728 E-mail: meleban@anac.gob.ar
BOLIVIA (Plurinational State of) / **BOLIVIA (Estado Plurinacional de)**	Luis Benjamín Rojas Santa Cruz Dirección General de Aeronáutica Civil (DGAC) Especialista Planificación de Espacios Aéreos y Procedimientos de Vuelo Tel.: +591 4 422 1696 Cel.: +591 7203 5429 E-mail: lrojas@dgac.gob.bo lbrsc@hotmail.com

State / Estado	PBN FOCAL POINTS / PUNTOS FOCALES PBN
BRAZIL / BRASIL	Hugo Dominato Rossi Jefe ATM Departamento de Control del Espacio Aéreo (DECEA) Av. General Justo, 160 – Centro Rio de Janeiro 20.021-130, Brasil Tel: +55 21 2101 6278 E-mail: rossihdr@decea.gov.br Rochelly de Miranda Corrêa Auxiliar ATM Departamento de Control del Espacio Aéreo (DECEA) Av. General Justo, 160 – Centro Rio de Janeiro 20.021-130, Brasil Tel: +55 21 2101 6197 E-mail: rochellyrmc@decea.gov.br
CHILE	Alfonso de la Vega Encargado Sección Navegación Aérea Dirección General Aeronáutica Civil (DGAC) Miguel Claro 1314 Providencia, Santiago, Chile Tel: +56 2 2439 2952 E-mail: adelavega@dgac.gob.cl; aldelavega@vtr.net Hector Ibarra Martínez ATC Planificador ATM Dirección General Aeronáutica Civil (DGAC) Miguel Claro 1314 Providencia, Santiago, Chile Tel: +56 2 2836 4020 E-mail: hibarra@dgac.gob.cl Marco Abarca Daza ATC Diseñador de Procedimientos Dirección General Aeronáutica Civil (DGAC) Miguel Claro 1314 Providencia, Santiago, Chile Tel: +56 2 2290 4718 E-mail: mabarca@dgac.gob.cl

State / Estado	PBN FOCAL POINTS / PUNTOS FOCALES PBN
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ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Text1
1		**National PBN implementation plans**	134 days	Tue 5/22/18	Fri 11/23/18			
2			134 days	Tue 5/22/18	Fri 11/23/18			
3		Develop new SAM PBN implementation plan model	1 day	Tue 5/22/18	Tue 5/22/18		SAM/PBN/ G	SAM G21
4		Discuss and approve new PBN implementation plan model	1 day	Wed 5/23/18	Wed 5/23/18	3	SAM/PBN/ G	SAM G21
5		Development and delivery of the new PBN implementation plans	132 days	Thu 5/24/18	Fri 11/23/18	4	States	SAM G22
6		**SAM route network optimisation**	52 days?	Thu 5/10/18	Fri 7/20/18			
7		**Version 4**	44 days	Tue 5/22/18	Fri 7/20/18			
8		**Package 1 (30 routes agreed at ATSRO/8)**	2 days	Tue 5/22/18	Wed 5/23/18			
9		Verify status of implementation	1 day	Tue 5/22/18	Tue 5/22/18		SAM/PBN/ G	SAM G21
10		Define implementation dates for routes not yet implemented	1 day	Wed 5/23/18	Wed 5/23/18		SAM/PBN/ G	SAM G21
11		**Package 2 (52 routes pending from ATSRO/8)**	43 days	Wed 5/23/18	Fri 7/20/18			
12		Preliminary assessment in SAMIG21	1 day	Wed 5/23/18	Wed 5/23/18		SAM/PBN/ G	SAM G21
13		Teleconference1	0.5 days	Tue 6/5/18	Tue 6/5/18		States; coordinator	

Project: Project PBN_2018_pri
Date: Thu 5/10/18

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Text1
14		Teleconference 2	0.5 days	Tue 7/10/18	Tue 7/10/18			
15		Final assessment and definition of implementation date	43 days	Wed 5/23/18	Fri 7/20/18		States; coordinator	
16		**Version 5**	1 day?	Thu 5/10/18	Thu 5/10/18			
17		**Airspace concept**	1 day?	Thu 5/10/18	Thu 5/10/18			
18		**Air traffic data**	1 day	Thu 5/10/18	Thu 5/10/18			
19		Obtain CARSAMMA data 1						
20		Determine main flows 1						
21		Obtain CARSAMMA data 2						
22		Determine main flows 2						
23		**Fleet capacity**	1 day	Thu 5/10/18	Thu 5/10/18			
24		Investigate navigation capacity database						
25		Final report						
26		CNS means	1 day	Thu 5/10/18	Thu 5/10/18			

Project: Project PBN_2018_pri
Date: Thu 5/10/18

Task	Inactive Summary	External Tasks	
Split	Manual Task	External Milestone	
Milestone	Duration-only	Deadline	
Summary	Manual Summary Rollup	Progress	
Project Summary	Manual Summary	Manual Progress	
Inactive Task	Start-only		
Inactive Milestone	Finish-only		

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Text1
27		Identify material required for CNS analysis						
28		Final report						
29		**Design Version 5**	1 day?	Thu 5/10/18	Thu 5/10/18			
30		Determine tools required						
31		Determine additional tools required						
32		Identify TMA gateways 1						
33		Identify final TMA gateways						
34		CAR/SAM interface 1						
35		CAR/SAM interface 2						
36		Final CAR/SAM interface						
37		Assessment of RNP 2 implementation						
38		Preliminary RNAV-5 exclusionary airspace volume						
39		Final RNAV-5 exclusionary airspace volume						

Project: Project PBN_2018_pri
Date: Thu 5/10/18

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Text1
40		Preliminary design 1						
41		Preliminary design 2						
42		Final design						
43		**Validation**	1 day	Thu 5/10/18	Thu 5/10/18			
44		FTS need / feasibility						
45		Strategy for using the FSET tool						
46		**Safety assessment**	1 day	Thu 5/10/18	Thu 5/10/18			
47		Workshop on risk analysis						
48		Drafting of final document						
49		**Aircraft and operator approval**	1 day	Thu 5/10/18	Thu 5/10/18			
50		Verify status of implementation of RNP 2						
51		**Standards and procedures**	1 day	Thu 5/10/18	Thu 5/10/18			
52		Initial dissemination of AIC						

Project: Project PBN_2018_pri
Date: Thu 5/10/18

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Text1
53		Database provider coordination system						
54		Amendment to the AIP						
55		Model letter of operational agreement						
56		Amendment to the ANP						
57		**Implementation decision**	1 day	Thu 5/10/18	Thu 5/10/18			
58		Verify ATS documentation						
59		Verify validation						
60		Verify status of operational approval						
61		Verify safety validation						
62		**Post-implementation monitoring**	1 day	Thu 5/10/18	Thu 5/10/18			
63		Define tools						
64		Establish methodology						
65		**Hiring of consultants**	1 day?	Thu 5/10/18	Thu 5/10/18			

Project: Project PBN_2018_pri
Date: Thu 5/10/18

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Text1
66		Start hiring process 1						
67		Hiring of consultants 1						
68		Start hiring process 2						
69		Hiring of consultants 2						
70		**Documentation**	1 day	Thu 5/10/18	Thu 5/10/18			
71		Preliminary Version 5 document 1						
72		Preliminary Version 5 document 2						
73		Final Version 5 document						
74		**Publication**	1 day	Thu 5/10/18	Thu 5/10/18			
75		Publication of amendment to AIP						
76		Publication of trigger NOTAM						
77		Entry into force						
78		**TMA**	1 day	Thu 5/10/18	Thu 5/10/18			

Project: Project PBN_2018_pri
Date: Thu 5/10/18

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Text1
79		Argentina	1 day	Thu 5/10/18	Thu 5/10/18			
80		**Bolivia**						
81		**Brazil**						
82		**Chile**						
83		**Colombia**						
84		Ecuador	1 day	Thu 5/10/18	Thu 5/10/18			
85		**Guyana**						
86		**French Guiana**						
87		Panama	1 day	Thu 5/10/18	Thu 5/10/18			
88		**Paraguay**						
89		**Peru**						
90		**Suriname**						
91		**Uruguay**						
92		**Venezuela**						
93		**Performance indicators**	391 days	Mon 5/14/18	Mon 11/11/19			
94		Preliminary analysis of performance indicators	1 day	Tue 5/22/18	Tue 5/22/18		SAM/PBN/ G	
95		Drafting of proposal on PBN performance indicators	120 days	Mon 5/28/18	Fri 11/9/18		Regional Office	

Project: Project PBN_2018_pri
Date: Thu 5/10/18

Task	Inactive Summary	External Tasks
Split	Manual Task	External Milestone
Milestone	Duration-only	Deadline
Summary	Manual Summary Rollup	Progress
Project Summary	Manual Summary	Manual Progress
Inactive Task	Start-only	
Inactive Milestone	Finish-only	

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Text1
96		Incorporation of performance indicators in national PBN implementation plans	121 days	Mon 11/26/18	Mon 5/13/19		SAM G23	
97		Presentation of preliminary results of performance indicators	126 days	Mon 5/20/19	Mon 11/11/19		SAM G24	
98		**CAR/SAM coordination**	**144.5 days**	**Mon 5/14/18**	**Tue 12/4/18**			
99		Third ICAO/IATA/CANSO meeting on harmonisation, modernisation and implementation of performance-based navigation (PBN) for the North American, Caribbean and South American (NAM/CAR/SAM) Regions	5 days	Mon 7/2/18	Fri 7/6/18			
100		1st coordination teleconference	0.5 days	Mon 5/14/18	Mon 5/14/18			
101		2nd coordination teleconference	0.5 days	Tue 6/5/18	Tue 6/5/18			
102		3rd coordination teleconference	0.5 days	Tue 8/7/18	Tue 8/7/18			
103		4th coordination teleconference	0.5 days	Tue 9/4/18	Tue 9/4/18			
104		5th coordination teleconference	0.5 days	Tue 10/2/18	Tue 10/2/18			
105		6th coordination teleconference	0.5 days	Tue 11/6/18	Tue 11/6/18			

Project: Project PBN_2018_pri
Date: Thu 5/10/18

Task	Inactive Summary	External Tasks	
Split	Manual Task	External Milestone	
Milestone	Duration-only	Deadline	
Summary	Manual Summary Rollup	Progress	
Project Summary	Manual Summary	Manual Progress	
Inactive Task	Start-only		
Inactive Milestone	Finish-only		

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Text1
106		7th coordination teleconference	0.5 days	Tue 12/4/18	Tue 12/4/18			
107		**Longitudinal separation optimisation**	**252 days**	**Fri 5/25/18**	**Mon 5/13/19**			
108		Updating of status of implementation	1 day	Fri 5/25/18	Fri 5/25/18		SAM/PBN/ G	SAM G21
109		1st coordination teleconference	0.5 days	Wed 6/6/18	Wed 6/6/18			
110		2nd coordination teleconference	0.5 days	Wed 8/8/18	Wed 8/8/18			
111		3rd coordination teleconference	0.5 days	Wed 10/3/18	Wed 10/3/18			
112		Updating of status of implementation	1 day	Fri 11/23/18	Fri 11/23/18		SAM/PBN/ G	SAM G22
113		4th coordination teleconference	0.5 days	Wed 12/5/18	Wed 12/5/18			
114		5th coordination teleconference	0.5 days	Wed 2/6/19	Wed 2/6/19			
115		6th coordination teleconference	0.5 days	Wed 4/3/19	Wed 4/3/19			
116		Updating of status of implementation	1 day	Mon 5/13/19	Mon 5/13/19		SAM/PBN/ G	SAM G23

Project: Project PBN_2018_pri
Date: Thu 5/10/18

Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	
Milestone		Duration-only		Deadline	
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only			
Inactive Milestone		Finish-only			

PBN Implementation Plan

State XX

Table of Contents

1. Objective

This PBN implementation plan has the following objectives:

a) Provide a high-level strategy for PBN implementation in (indicate STATE and/or ANSP). This strategy is based on PBN concepts, area navigation (RNAV) and required navigation performance (RNP), which will be applied to aircraft operations in all flight phases: en-route (oceanic and continental), TMA (SIDs and STARs) and IFR approach, in accordance with the implementation objectives set forth in resolution A37-11 of the 37th ICAO Assembly and based on the Declaration of Bogota, established at the Thirteenth Meeting of Civil Aviation Authorities of the SAM Region.

b) Avoid unnecessarily imposing the mandate for multiple equipment on board or multiple systems on the ground.

c) Avoid the need for multiple aircraft and operator approvals for intra- and inter-regional navigation.

2. Background

Resolution A37-11: Global performance-based navigation goals, requires States to complete a PBN implementation plan as a matter of urgency, for purposes of:

a) implementation of RNAV and RNP operations (where required) for en-route and terminal areas in accordance with the established target dates and intermediate milestones;

b) implementation by 2016 of approach procedures with vertical guidance (APV) (Baro-VNAV and/or augmented GNSS), including minima for LNAV alone, for all instrument flight runway ends, whether main approach or as support to precision approaches, with the following intermediate milestones: 30% by 2010 and 70% by 2014; and

c) implementation of LNAV-alone direct procedures, as an exception to b) above, for instrument flight runways at aerodromes that lack available local altimeter facilities and where aircraft are not duly equipped for APV operations with a maximum certified take-off mass of 5 700 kg or more.

Pursuant to Resolution A37-11, SAM States have signed the Declaration of Bogota. Out of the 15 goals established in the aforementioned declaration, 5 are directly related and 3 are indirectly related to PBN implementation. These goals are as follows:

Indirect relation

- Accidents – Reduce the gap between the accident rate in the SAM Region and the global accident rate by 50%.
- Runway excursions – Reduce by 20% the rate of runway excursions with respect to the average rate for the Region (2007 – 2012).
- ATFM - 100% of area control centres (ACCs) providing the air traffic flow management (ATFM) service.

Direct relation

- Performance-based navigation (PBN) in terminal area – Achievement of the goals set forth in Resolution A37-11 of the ICAO Assembly concerning approach procedures with vertical guidance (APV).
- PBN en route
  - 60% of international aerodromes with standard instrument departure (SID) / standard instrument arrival (STAR) PBN.
  - 60% of routes/airspaces with PBN.
- CDO - 40% of international aerodromes/terminal control areas (TMAs) with continuous descent operations (CDO).
- CCO - 40% of international aerodromes/TMAs with continuous climb operations (CCO).
- Fuel saving / $C0_2$ emission reduction estimates, based on the ICAO fuel savings estimation tool (IFSET) – Attain a regional level of 40,000 tonnes of annual reduction of CO_2 emissions in en-route PBN implementation.

Thus, PBN implementation is assigned high priority in the ATM Work Programme of the South American Regional Office and of (indicate State and/or ANSP).

3. Introduction

(AT THE DISCRETION OF THE STATE)

PBN implementation success will depend on effective participation by the ATM community, to make sure that the operational requirements of the various airspace users and of service providers are met.

4. Strategic objectives

4.1 En-route operations

PBN implementation for en-route operations in continental airspace under the jurisdiction of (indicate STATE) will take place in accordance with the SAM regional strategy and in compliance with the following strategic objectives:

a) Safety – The implementation of RNAV-5 has permitted the formalisation and harmonisation of the use of RNAV in the new and existing RNAV routes, and of the conditions required for full restructuring of the route network. Thus, it will be possible to develop a less complex route network, reducing controller workload and, consequently, increasing safety.

b) Capacity – Taking into account reduced airspace complexity and the subsequent reduction in controller workload, there will be an increase in ATC sector capacity, allowing for more aircraft in flight.

c) Efficiency – The implementation of RNAV-5 will improve operational efficiency, since it will allow for:

- Improved airspace management, through relocation of intersections.
- Better use of available airspace, through a route network that allow for the establishment of:
  - More direct routes (double and parallel, if necessary) to accommodate more air traffic flow.
  - "Bypass" routes for aircraft overflying high-traffic-density TMAs.
  - Alternate or contingency routes.
  - Optimum in-flight holding positions.
  - Optimised feeder routes.
- Reduction of distance flown, resulting in fuel savings.
- Reduction in the number of Navaids.

d) Environmental protection – As a result of increased efficiency and fuel savings, there will be a reduction in the emissions of harmful gases into the atmosphere.

4.2 Terminal and approach control areas (SIDs ands STAR)

The implementation of RNP1 and/or RNAV1 at the main TMAs and of RNP APCH with Baro-VNAV in all the thresholds used for IFR and/or RNP AR APCH operations where operational benefits can be obtained (safety, efficiency and access) will address the following strategic objectives:

a) Safety – The implementation of RNP1 and/or RNAV-1 at TMAs will permit separation between arrival and departure paths, thus avoiding conflicts between aircraft. The use of RNP APCH with APV/Baro-VNAV and/or RNP AR ACPH will reduce the risk of *"Controlled Flight into Terrain"* (CFIT).

b) Capacity – The use of SID/STAR RNAV-1 and/or RNP1 will reduce the use of radar vectors and, thus, reduce airspace complexity and allow for the distribution of controller workload, increasing ATC sector capacity and allowing for more aircraft in flight.

c) Efficiency – The implementation of RNP1 and/or RNAV-1 will result in enhanced operational efficiency, taking into account that the establishment of well-defined gateways will permit the restructuring of the TMA incoming and outgoing route network, thus reducing flight time. The interaction between STAR-approach interaction will permit the establishment of optimum arrival paths from the en-route phase to the final approach. Furthermore, RNP1 and RNAV-1 navigation precision will make aircraft paths more foreseeable, reducing the need for air traffic controller intervention in case of aircraft deviations from the expected paths. Likewise, predictability will increase as a result of STAR-approach integration.

d) Environmental protection – Because of increased efficiency and fuel savings, harmful gas emissions into the atmosphere will be reduced. Likewise, the implementation of CDO/CCO will help reduce aeronautical noise.

e) Access – The implementation of RNAV (GNSS) approach procedure with Baro-VNAV and/or RNP AR APCH at airports lacking ILS or where the terrain/obstacles lead to high operational meteorological minima, will help improve aerodrome access under adverse meteorological conditions.

5. Implementation

5.1 En-route operations

The implementation of PBN en-route is addressed at regional level, taking into account that the main air traffic flows encompass two or more States.

The regional PBN implementation strategy for en-route operations is based on the route network version concept, taking into account that the airspace structure changes based on the growth of air traffic movement, the shifting of air traffic demand from one Region or airport to another, and available technology, amongst other aspects. The use of route network versions reflects the need for periodic integrated reviews to make sure that the best possible airspace structure is always available, within an integrated development concept. Route network versions are the result of a broader analysis of the route network, based on statistical data on air traffic movement and fleet navigation capabilities, seeking to eliminate unused routes, and the exclusion or reduced use of "conventional" routes from a given airspace volume, where most users are RNAV-5 capable.

Furthermore, SAM route network versions must seek a full restructuring of the route network through a complete integration of ATS routes, control sectors, TMAs, etc., applying the flexible use of airspace concept. Use of specific *"airspace modelling"* and fast-time ATC simulation tools should be further analysed.

5.2 Complete redesign of terminal areas

5.2.1 TMA XX

5.2.1.1 Preliminary operational requirements

5.2.1.1 Tentative date of implementation

5.2.2 TMA YY

5.2.2.1. Preliminary operational requirements

5.2.2.1 Tentative date of implementation

5.2.3 TMA ZZ

5.2.3.1 Preliminary operational requirements

5.2.3.2 Tentative date of implementation

5.3 Implementation of arrivals and departures applying CDO and CCO

The objective of the PBN SID and STAR implementation programme is to publish these instrument procedures for all IFR thresholds, applying CDO and CCO techniques.

The status of planning and implementation of PBN arrivals and departures, with and without the application of CDO and CCO techniques, is shown in Appendix A (example: BOLIVIA) to this plan, and will be updated and delivered to the SAM Regional Office on a semi-annual basis, on 30 June and 31 December of each year.

5.4 PBN approach

The objective of the Aerodrome Approach Implementation Programme is to publish RNAV (GNSS) approach procedures for all IFR thresholds, with the possibility of applying vertical navigation (LNAV/VNAV) using Baro-VNAV. Likewise, RNAV/ILS approach procedures will be published for airport equipped with ILS, in order to facilitate the arrival-approach interface.

The status of planning and implementation of PBN approach procedures is shown in **Appendix A** (example: BOLIVIA) to this plan, and will be updated and delivered to the SAM Regional Office on a semi-annual basis, on 30 June and 31 December each year.

5.5 Fuel savings and reduction of CO_2 emissions

Fuel savings and CO_2 emission reduction derived from PBN implementation will be calculated using the IFSET tool, in order to determine the efficiency of such implementation. The aforementioned calculation will be applied to the full redesign of the main TMAs, and to the implementation of SIDs, STARs, and APV approach procedures. These estimates of fuel savings and CO_2 emission reductions will be sent to the SAM Regional Office, on a semi-annual basis, on 30 June and 31 December each year.

During the post-implementation phase, estimates of actual fuel savings and of CO_2 emission reduction will be prepared based on tools that retrieve data from the "*Flight Operations Quality Assurance*" and/or other means that might provide real information on fuel consumption. This data, when available will be sent to the SAM Regional Office.

Appendix A

Status of implementation of PBN SIDs, STARs, and approach procedures

DATA COLLECTION DATE: 10 OCTOBER 2014											
STATE	**CAR/SAM ANP INTERNATIONAL AIRPORTS**	**IFR thresholds**	**VFR thresholds**	**APV IAP**	**LNAV IAP**	**RNPAR IAP**	**PBN SID**	**PBN STAR**	**CCO SID**	**CDO STAR**	**OBS**
BOLIVIA	**BOLIVIA (5 AEROPUERTOS)**										
	SLCB COCHABAMBA	(1)	(2)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(4)
	SLLP LA PAZ										
	SLVR SANTA CRUZ										
	SLTJ TARIJA										
	SLTR TRINIDAD										

Note: The aforementioned AIRAC dates are tentative, based on instrument procedure publication capacity.

(1) Insert the orientation of thresholds capable of supporting IFR operations
(2) Insert the orientation of thresholds with **only** VFR operations or are **not** in a position to support IFR operations.
(3) Insert "yes" if the threshold of that airport already has the instrument procedure listed in the column title (APV IAP, LNAV IAP, RNAV AR IAP, PBN SID or PBN STAR). Insert the tentative AIRAC date of implementation of the procedure type, if not yet implemented.
(4) Insert the relevant remarks. If appropriate, insert summarised information on the reason why the threshold does not support IFR operations.

APPENDIX D

STATUS OF IMPLEMENTATION OF OPTIMISED LONGITUDINAL SEPARATION

ARGENTINA *Updated by SAM/IG/22 Nov.2018						
ACC	ACC ADJ	Longitudinal Separation				Comments
		40 NM GNSS/ DME	Date of implementation	20 NM GNSS/ DME	Date of implementation	
CORDOBA	IQUIQUE	YES	03/12/18			
	LA PAZ	YES	01/01/17			
	EZEIZA			YES	13/10/2016	
	MENDOZA			YES	13/10/2016	
	RESISTENCIA			YES	13/10/2016	There are some problems with VHF Com.
RESISTENCIA	ASUNCION		01/01/17			
	LA PAZ	YES	01/01/17			
	CORDOBA			YES	13/10/2016	
	CURITIBA	YES	01/01/17			
	EZEIZA			YES	13/10/2016	
	MONTEVIDEO	YES	01/01/17			
EZEIZA	COMODORO RIVADAVIA			YES	13/10/2016	
	MENDOZA			YES	13/10/2016	
	PUERTO MONTT	YES	03/12/18			
	CORDOBA			YES	13/10/2016	
	RESISTENCIA			YES	13/10/2016	
	MONTEVIDEO	YES	01/01/17	YES	2010	PAPIX, KUKEN and DORBO 20 NM
MENDOZA	EZEIZA			YES	13/10/2016	
	SANTIAGO			YES	03/12/2018	
	CORDOBA			YES	13/10/2016	
COMODORO RIVADAVIA	EZEIZA			YES	13/10/2016	
	PUNTA ARENAS	YES	03/12/18			
	PUERTO MONTT	YES	03/12/18			

BOLIVIA *Updated by SAM/IG/22 Nov.2018						
ACC	ACC ADJ	Longitudinal Separation				Comments
		40 NM GNSS/ DME	Date of implementation	20 NM GNSS/ DME	Date of implementation	
LA PAZ	AMAZONICO	YES	01/01/17			Not being applied.
	ASUNCION	YES	01/01/17			Not being applied.
	CURITIBA	YES	01/01/17			Not being applied.
	CORDOBA	YES	01/01/17			Not being applied.
	LIMA	OG				Without agreement.
	IQUIQUE	OG				Agreements being handled.
	RESISTENCIA	YES	01/01/17			Not being applied.

BRAZIL *Updated by SAM/IG/22 Nov. 2018						
ACC	ACC ADJ	Longitudinal Separation				Comments
		40 NM GNSS/ DME	Date of implementation	20 NM GNSS/ DME	Date of implementation	
AMAZÓNICO	BRASILIA	---	---	---	---	10 NM
	BOGOTÁ	YES	13/10/16	YES	01/12/17	20 NM for Amazonico and 40 NM for Bogota
	CAYENNE	---	---	---	---	10 minutes
	CURITIBA	---	---	---	---	10 NM
	GEORGETOWN	YES	07/01/16			
	LA PAZ	YES	01/01/17			
	LIMA	YES	31/03/16	YES	01/12/2017	
	MAIQUETIA	YES	23/10/16			
	PARAMARIBO	YES	13/10/16			
	RECIFE	---	---	---	---	10 NM
	ATLANTICO	---	---	---	---	10 minutes
BRASILIA	AMAZÔNICO	---	---	---	---	10 NM
	CURITIBA	---	---	---	---	5 NM
	RECIFE	---	---	---	---	5 NM
CURITIBA	ASUNCION	YES	Mar/2016	YES	29/03/2018	20 NM for Curitiba and 40 NM for Asuncion
	AMAZONICO	---	---	---	---	10 NM
	BRASILIA	---	---	---	---	5 NM
	LA PAZ	YES	01/01/17			
	MONTEVIDEO	YES	01/01/17	YES	15/11/2018	10 NM under coordination
	RECIFE	---	---	---	---	5 NM
	RESISTENCIA	YES	01/01/17			
	ATLANTICO	---	---	---	---	10 minutes
RECIFE	AMAZONICO	---	---	---	---	10 NM
	BRASÍLIA	---	---	---	---	5 NM
	CURITIBA	---	---	---	---	5 NM
	ATLANTICO	---	---	---	---	10 minutes
ATLANTICO	AMAZÔNICO	---	---	---	---	10 minutes Problems Com. VHF
	CURITIBA	---	---	---	---	
	RECIFE	---	---	---	---	
	CAYENNE	---	---	---	---	
NOTE.- Before SAM/IG/21, 20 NM will be applied to receive traffic, entering the FIR of Brazil..						

CHILE *Updated by SAM/IG/22 Nov. 2018						
ACC	ACC ADJ	Longitudinal Separation				Comments
		40 NM GNSS/ DME	Date of implementation	20 NM GNSS/ DME	Date of implementation	
SANTIAGO	IQUIQUE	NA	---	----	-----	5 NM
	MENDOZA	YES	3/12/2018			
	PUERTO MONTT	NA	----	----	----	5 NM
IQUIQUE	CORDOBA	YES	3/12/2018			
	LA PAZ	OG				Managing agreements
	LIMA	OG				Managing agreements
PUERTO MONTT	SANTIAGO	NA	---	----	----	5 NM
	PUNTA ARENAS	NA	----	----	---	5 NM
	EZEIZA	YES	3/12/2018			
	COMODORO RIVADAVIA	YES	3/12/2018			
PUNTA ARENAS	PUERTO MONTT	NA	----	----	----	5 NM
	COMODORO RIVADAVIA	YES	3/12/2018			

COLOMBIA *Updated by SAM/IG/22 Nov. 2018						
ACC	ACC ADJ	Longitudinal Separation				Comments
		40 NM GNSS / DME	Date of implementation	20 NM GNSS/ DME	Date of implementation	
BOGOTA	AMAZONICO	YES	30/09/16			
	CENAMER	NO				MoU was not elaborated, for not guaranteeing efficient communications in the border área.
	GUAYAQUIL	YES	13/10/16			
	LIMA	YES	10/11/16			
	MAIQUETIA	YES	21/03/17			
	PANAMÁ	YES	13/10/16			
	BARRANQUILLA	YES	05/10/16			
BARRANQUILLA	MAIQUETIA	YES	21/03/17			
	PANAMÁ	YES	13/10/16			
	BOGOTÁ	YES	05/10/16			
	KINGSTON	YES	15/06/13			
	CURAZAO	NO				MoU was not elaborated, for not guaranteeing efficient communications in the border área.

ECUADOR *Updated by SAM/IG/22 Nov. 2018						
ACC	ACC ADJ	Longitudinal Separation				Comments
		40 NM GNSS/ DME	Date of implementation	20 NM GNSS/ DME	Date of implementation	
GUAYAQUIL	BOGOTÁ	YES	13/10/16	O/G		The reduced separation of 40 NM is applied. Memorandum of Understanding between ATC service providers, signed.
	LIMA	YES	10/11/16	O/G		Implemented..
	CENAMER	NA	---	---	---	Oceanic separation.

FRENCH GUYANA *Updated by SAM/IG/20 Oct.2017						
ACC	ACC ADJ	Longitudinal Separation				Comments
		40 NM GNSS/ DME	Date of implementation	20 NM GNSS/ DME	Date of implementation	
CAYENNE	AMAZONICO	---	---	---	---	10 minutes
	PARAMARIBO	---	---	---	---	10 minutes
	PIARCO					No information available.

GUYANA *Updated by SAM/IG/22 Nov. 2018						
ACC	ACC ADJ	Longitudinal Separation				Comments
		40 NM GNSS/ DME	Date of implementation	20 NM GNSS / DME	Date of implementation	
GEORGETOWN	AMAZONICO	YES				Georgetown will propose 20nm tests.
	PIARCO	YES	17/08/2017			Georgetown will propose 20nm tests.
	MAIQUETIA	YES	19/03/2018			Georgetown will propose 20nm tests.

PANAMÁ *Updated by SAM/IG/22 Nov. 2018						
ACC	ACC ADJ	Longitudinal Separation				Comments
		40 NM GNSS/ DME	Date of implementation	20 NM GNSS/ DME	Date of implementation	
PANAMÁ	BOGOTÁ	YES	Oct/16	NO	TBD	Start conversations January 2019
	BARRANQUILLA	YES	Oct/16	NO	TBD	Start conversations January 2019
	CENAMER	YES	15/11/16	OG	April 2019	Likely date of implementation.
	KINGSTON	YES	10/12/16	NO	TBD	Start conversations January 2019
	PARAMARIBO	YES				Georgetown will propose 20nm tests.

PARAGUAY *Updated by SAM/IG/22 Nov. 2018						
ACC	ACC ADJ	Longitudinal Separation				Comments
		40 NM GNSS/ DME	Date of implementation	20 NM GNSS / DME	Date of implementation	
ASUNCION	CURITIBA	YES	Mar/16 date of SAMIG 16		28/03/ 2018	Traffic from Asuncion to Curitiba.
	LA PAZ	YES	01/01/17			
	RESISTÊNCIA	YES	01/01/17			Not being applied. Coordination with Argentina is required.

PERU *Updated by SAM/IG/22 Nov. 2018						
ACC	ACC ADJ	Longitudinal Separation				Comments
		40 NM GNSS/ DME	Date of implementation	20 NM GNSS/ DME	Date of implementation	
LIMA	AMAZONICO	YES	31/03/16			Pending revisión in LoA ACC Lima – ACC Amazonico. It is expected to apply from June 2019. In OSL Workshop full implementation was agreed
	BOGOTÁ	YES	31/03/16			Implemented
	OCEANICO	NA	---	---	---	Oceanic Separation
	IQUIQUE	OG				Managing agreements
	GUAYAQUIL	YES	10/11/16			Implemented
	LA PAZ	OG				There are limitations in the scope of air-ground communications. Without agreement.

SURINAME *Updated by SAM/IG/22 Nov. 2018						
E	ACC ADJ	Longitudinal Separation				Comments
		40 NM GNSS/ DME	Date of implementation	20 NM GNSS/ DME	Date of implementation	
PARAMARIBO	AMAZONICO	YES	13/10/16			Signed.
	GEORGETOWN	YES	29/03/16			Signed.
	PIARCO	N/A	---	---	---	Oceanic Separation.
	CAYENNE	N/A	---	---	---	10 minutes.

URUGUAY *Updated by SAM/IG/22 Nov. 2018						
ACC	ACC ADJ	Longitudinal Separation				Comments
		40 NM GNSS/ DME	Date of implementation	20 NM GNSS/ DME	Date of implementation	
MONTEVIDEO	CURITIBA	YES	01/01/17	YES	15/11/18	Coordinated with CAM and effective surveillance, can be 10 nm.
	EZEIZA	YES	01/01/17	YES	01/08/2017	
	RESISTENCIA	YES	01/01/17	YES	15/03/2018	

VENEZUELA *Updated by SAM/IG/22 Nov. 2018						
ACC	ACC ADJ	Longitudinal Separation				Comments
		40 NM GNSS/ DME	Date of implementation	20 NM GNSS/ DME	Date of implementation	
MAIQUETIA	AMAZONICO	YES	12/12/15			
	BOGOTA	YES	21/03/17			
	BARRANQUILLA	YES	21/03/17			
	PIARCO	OG				Negotiating
	CURAZAO	YES	31/01/19			Close to the signing of the LOA
	SAN JUAN	NO				San Juan does not have conditions to implement.
	GEORGETOWN	YES	19/03/18			

Action Plan 2018 – 2019

"Improvement and normalization of minimum longitudinal separations en route"

Phase 1; Consolidation of SLM 40 NM and initial actions to apply SLM 20 NM

- Define agreements to apply SLM 40 NM with CAR States (April 2018)
- Define application of SLM 40 NM in FIR La Paz (SAMIG/21)
- Feedback from Brazil on SLM 20 NM application (SAMIG / 21)
- Feedback from COL, PER, ECU, VEN, PAN on SLM 20 NM application (SAMIG / 21)
- Complete implementation of SLM 40 NM in the SAM continental space (SAMIG / 21)

Phase 2; Implementation of SLM 20 NM

- Post-implantation analysis SLM 40NM (SAMIG/22)
- Analysis of 20 NM unilateral application results in Brazil (SAMIG/22)
- Analysis of the results of SLM 20 NM States tests (SAMIG/22)
- Analysis of limitations and shortages (SAMIG/22)
    a. ATS sectorization, ATS capacity measurement
    b. Flow Management, appropriate application of initiatives.
    c. Direct communications in VHF
    d. ATS route network
    e. Application of the AIDC, management of the FPL.

- Risk evaluation

- Define agreements to apply SLM 20 NM with CAR States (SAMIG/22)
    a. Stage 1, aircrafts that land in the FIR
    b. Stage 2, all aircrafts that enter the FIR

- Define agreements and application date of SLM 20 NM among SAM States (SAMIG/22)
    a. Stage 1, aircrafts that land in the FIR
    b. Stage 2, all aircraft that enter the FIR

- Complete implementation of SLM 20 NM in the SAM continental space (SAMIG/23 - 2019)

- SLM 20 NM post-implantation analysis (SAMIG/23 - 2019)

Phase 3; Implementation to apply SLM 10 NM, with ATS surveillance

(TBD)

APPENDIX E

GESEA

Grupo de Estudio e implantación del Espacio Aéreo SAM

GESEA

Grupo de Estudio e implantación del Espacio Aéreo SAM

Términos de Referencia (ToR)

REGISTRO DE ENMIENDAS

N.º da Enmienda	Fecha	Descripción	Aprobación
DRAFT	23 NOV 2018	No aplicable	SAM/IG/22

1. HISTÓRICO

El Grupo de Estudio e implantación del Espacio Aéreo SAM (GESEA) fue creado en la Reunión SAM/IG/22 para optimizar las actividades del Grupo de Implementación PBN SAM (PBN/SAM/IG), con miras a:

a) abarcar los temas relacionados al Diseño de Procedimientos que mayormente son tratado en los talleres PANSOPS;
b) facilitar el trabajo más profundizado de temas específicos y complejos;
c) proporcionar las mejores condiciones para el trabajo fuera de las reuniones, vía teleconferencia.
d) estimular la participación de nuevos profesionales en los trabajos realizados en la Planificación del Espacio Aéreo SAM, así como en las actividades relacionadas al PANSOPS.

2. OBJETIVO(S)

a) Coordinar la implementación de las versiones de rutas SAM
b) Introducir e implementar de forma armonizada nuevos conceptos de espacio aéreo aplicando las mejores prácticas, incluyendo aspectos de la seguridad operacional, en el marco del interés de la comunidad aeronáutica.
c) Apoyar los Estados SAM en la implementación de STAR, SID y aproximaciones basadas en PBN
d) Coordinar el proceso de migración de nomenclatura RNAV a RNP de OACI
e) Desarrollar una metodología armonizada de evaluación en etapas pre-implementación y post-implementación, con la aplicación de indicadores claves de desempeño.
f) Apoyar la implementación del servicio de diseño de procedimientos de vuelo por instrumentos.
g) Compartir las mejores prácticas en el diseño y publicación de procedimientos de vuelo por instrumentos
h) Apoyar el desarrollo de planes, hojas de ruta, guías, circulares y otros documentos, en el marco colaborativo CDM
i) Considerar especialmente aspectos de factores humanos y la armonización de la implementación Regional

3. PERFIL DE LOS PARTICIPANTES

El GESEA debe, preferencialmente, tener la participación de los siguientes profesionales, a criterio de cada Estado y Organización Internacional:

a) Planificadores de Espacio Aéreo;
b) Diseñadores de procedimientos de vuelo por instrumentos;
c) Inspectores de aviación civil y de navegación aérea;
d) Controladores de Tránsito Aéreo;
e) Pilotos técnicos
f) Analistas e Ingenieros de Operaciones;
g) Expertos en seguridad operacional.

4. RESPONSABILIDADES Y FUNCIONAMIENTO

Conforme Apéndice A.

5. LISTA DE PARTICIPANTES

A participación en el grupo debe estar limitada a los Coordinadores, relatores y asesores definidos por cada Estado y Organización Internacional.

A lista de participantes con los coordinadores, relatores y asesores se adjunta como apéndice B.

6. PROGRAMA DE TRABAJO

Conforme Apéndice C.

APENDICE A – RESPONSABILIDADES Y FUNCIONAMIENTO

1. RESPONSABILIDADES

a. MIEMBROS DEL GESEA:

i. Elegir el Coordinador del GESEA y los coordinadores de los Subgrupos;

ii. Decidir pela creación de Subgrupos y Grupos de Tarea;

iii. Designar asesores que puedan contribuir efectivamente en los trabajos del GEPEA, evitando reemplazos innecesarios, que puedan resultar en pérdidas en la eficiencia de los trabajos en ejecución.

iv. Garantizar la actualización periódica del programa de trabajo, con base a las propuestas de los Estados y Organizaciones Internacionales, así como en las propuestas de los Subgrupos;

v. Definir los paquetes de trabajo y los plazos para entrega de los productos previstos en el programa de trabajo, con base en las propuestas de los Subgrupos;

vi. Supervisar la ejecución del programa de trabajo; y

vii. Aprobar los productos entregables por los Subgrupos.

b. MIEMBROS DE LOS SUBGRUPOS:

i. Designar asesores que puedan contribuir efectivamente en los trabajos del Subgrupo, evitando reemplazos innecesarios, que puedan resultar en pérdidas en la eficiencia de los trabajos en ejecución

ii. Designar los Relatores de los Grupos de Tarea, considerando la experiencia profesional y perfil para coordinación de sus actividades;

iii. Mantener los miembros del GESEA informados sobre el progreso de los trabajos del Subgrupo;

iv. Decidir por la creación de Grupos de Tarea;

v. Solicitar la aprobación del GESEA para las propuestas de actualización del Programa de Trabajo del Subgrupo.

vi. Supervisar la ejecución del Programa de Trabajo de los Grupos de Tarea;

vii. Aprobar los productos entregues por los Grupos de Tarea; y

viii. Solicitar al GESEA la aprobación de los productos entregues por los Subgrupos.

RELATORES DE GRUPOS DE TAREA:

i. Designar asesores que puedan contribuir efectivamente en los trabajos del Grupo de Tarea, evitando reemplazos innecesarios, que puedan resultar en pérdida en la eficiencia de los trabajos en ejecución

ii. Mantener los miembros del Subgrupo informados sobre el progreso de los trabajos del Grupo de Tarea;

iii. Solicitar la aprobación del Subgrupo para las propuestas de actualización del Programa de Trabajo del Grupo de Tarea.

iv. Solicitar al Subgrupo la aprobación de los productos entregues por el Grupo de Tarea.

2. FUNCIONAMENTO DEL GRUPO, GRUPO DE TRABAJO, SUBGRUPOS y GRUPOS ADHOC

a. Las reuniones del GESEA y de sus Subgrupos serán realizadas durante las reuniones SAM/IG y por teleconferencias.

b. Las reuniones de los Grupos de Tarea serán realizadas por teleconferencias y, excepcionalmente, podrán también ser realizadas durante la SAM/IG.

c. Las reuniones presenciales o por videoconferencias serán nombradas de la siguiente forma:

i. Reuniones del GESEA/ [número secuencial];

ii. Reuniones de los Subgrupos: GESEA/SG [número del subgrupo]/ [número secuencial]; y

iii. Reuniones de los Grupos de Tarea: GEPEA/SG [número del subgrupo]/GT [nombre del Grupo de Tarea]/ [número secuencial].

d. Toda la documentación producida en los Grupos, Subgrupos y Grupos de Tarea estarán disponibles en la página WEB específica de la Oficina Regional SAM.

3. AGENDA

a. La agenda de las reuniones del GESEA, Subgrupos o Grupos de Tarea deberá ser enviada por el coordinador del GEPEA, por el coordinador del Subgrupo o por el Relator del Grupo de Tarea; y

b. La agenda tentativa deberá ser enviada a los participantes con antelación mínima de 10 dias para reuniones presenciales y de 5 dias para teleconferencias.

4. INFORME

a. El coordinador del GESEA, los coordinadores de Subgrupos y relatores de grupos de tarea deberán elaborar el informe de las reuniones presenciales o vía teleconferencia, abarcando al menos: agenda, lista de participantes, sumario de las discusiones y conclusiones, se fuera el caso, para cada asunto de la agenda;

ANEXO B – LISTA DE PARTICIPANTES

La Lista de Participantes del GESEA está disponible en www.icao.int/sam

ANEXO C – PROGRAMA DE TRABAJO

El Programa de Trabajo del GESEA está disponible en www.icao.int/sam.

Agenda Item 3: Implementation of Air Traffic Flow Management (ATFM) and improvement of procedures for flow coordination between agencies

3.1 this agenda item, the following papers were analysed:

a) WP/08 - *Follow-up to ATFM Implementation* (presented by the Secretariat);
b) WP/09 - *Action Taken by EANA for the Implementation of the ATFM Service* (presented by EANA);
c) WP/10 - *Acciones para optimizar la implementación ATFM en Argentina* (presented by LATAM –IATA) (**Spanish only**);
d) WP/22 - *Air Traffic Flow Management (ATFM) concept for the South American (SAM) Region* (presented by Colombia);
e) WP/23 - *ATFM Information Management in SAM* (Presented by Brazil and IATA);
f) WP/25 - *Technical Cooperation Agreements between Countries of the SAM Region* (presented by Brazil);
g) IP/06 - *Acciones realizadas por EANA para mejorar los procedimientos de coordinación ATFM entre dependencias* (presented by Argentina) (**Spanish only**);
h) IP/07 - *Estado de implantación del ATFM en Ecuador – Cálculos de capacidad ATC y de pista de los aeropuertos de Quito, Guayaquil, Manta y Latacunga* (presented by Ecuador) (**Spanish only**);
i) IP/17 - *International Collaborative Decision-Making Routes (CDM-Routes)* (presented by Brazil); and
j) IP/26 - *Implementación de indicadores clave de rendimiento de la gestión de afluencia del tránsito aéreo (ATFM) en la FIR Lima y de las operaciones aeroportuarias por medio de la A-CDM* (presented by Perú) (**Spanish only**).

3.2 The list of ATFM operational focal points and ATFM units established for the maintenance of coordination and teleconferences, as detailed in **Appendix A** of this Agenda Item.

Follow-up on the implementation of Regional ATFM

3.3 The Meeting acknowledged the increasing tendency of air traffic has been maintained and is reflected in the visible imbalances of demand/capacity in most of the States in the Region.

3.4 The Meeting was informed on the achievements in the implementation of ATFM. Taking as reference the Declaration of Bogota, the percentage of implementation of flow units/positions in the SAM Region increased in 70 percent due to the initiation of functions of the FMU Ezeiza, Buenos Aires, on 21 May 2018.

3.5 It was informed that as of October 2018, flow control NOTAMs affecting flight efficiency (domino effect), especially in routes in the area of the Pacific Ocean, were decreasing.

3.6 Combined tasks between the NACC and SAM Offices are being coordinated for the update of the CONOPS ATFM CAR/SAM, as per ICAO Doc 9971; the completion of its first draft is planned for the first semester 2019. It should be considered that both Regions have different air flow distribution and present different origins for their capacity/demand imbalances. For example, the States and Territories of the CAR Region are characterized by aircraft overflight flows and by take-off/landing operations to/from airports in the United States.

3.7 With respect to the SAM Region, the ATFM service has been established, based on the units implemented in the international airports with high flight density, and in the case of Brazil, based on

an advanced centralized system, with its output focused at the national level. These ATFM units should multiply and consolidate as "nodes" of a future regional network, for which the evolution from a national ATFM to a regional and then interregional service is needed.

3.8 Likewise, Colombia presented in its working paper NE/22 the implementation of a cross-border ATFM concept of a multinodal centralized network for the SAM Regional, that would help solve the imbalance between demand and the capacity which exists at present, contributing significant progress with reference to safety, reduction of fuel consumption and polluting gas emissions in the environment. Finally, this cross-border concept would contribute in the optimization of airport capacity and the regional ATM system, considering that demand in the SAM Region continues growing.

3.9 Taking into consideration the equipment available in Colombia as well as a Web access, the viability of trials with Ecuador, Peru and Panama (observer) was highlighted, in order to gain experience in the cross-border initiatives, as basis for the future Regional ATFM and reinforcement of node capacity. The four delegates stated that they will initiate the respective coordination with their technical and operational personnel.

3.10 It was informed that the RCC/12 Meeting of RMA/06/901 approved an activity to be held in March 2019 to optimized regional guidance documentation, which includes the elaboration of a Guidance Manual for ATFM Service, a guide for capacity calculations, guidance for the implementation of technology, and also tasks for the coordination of CONOPS ATFM CAR and SAM texts. This activity will be developed by a specialist of the SAM Region.

3.11 LATAM-IATA highlighted the importance of including in the above-mentioned manuals procedures that will allow the application of uniform operation criterion in the States of the Region regarding flow measures and the reinforcement of communications and CDM in order that aircraft operators may offer input regarding such measures.

3.12 The Meeting agreed that States and Territories should promote the implementation of at least one ATFM management position (FMP) for each FIR, in order to balance the demand of air operations and service capacity in the airspace and international aerodromes, taking into consideration as well the impact of other meteorological events or temporary interruptions of the air navigation services.

3.13 In view of the above, the Meeting formulated the following conclusion:

<table>
<tr><td colspan="2">CONCLUSION
SAM/IG/22-02 Support in the implementation of the intraregional and interregional ATFM</td></tr>
<tr><td>That:

The States enhance their efforts to:

a) promote or optimize the implementation of the ATFM units in the assigned ACCs and that a study of procedures and tests be initiated to join the functions of their units with those of other adjacent States of the SAM Region, and, if such were the case, of the CAR Region; and
b) render administrative resources that will facilitate the ATFM functions, including basic and recurrent instruction for operational and supervision personnel.</td><td>Expected impact:

☐ Political / Global

☒ Inter-regional

☒ Financial

☒ Environmental

☒ Technical/Operational</td></tr>
<tr><td colspan="2">Why: With the purpose of strengthening the provision of ATFM services and establishing the basis for a multinodal model and/or combined with a centralized function, the benefits of ATFM services should be extended to intrarregional and interregional levels.</td></tr>
<tr><td>When: Immediately</td><td>Status: Adopted at the SAM/IG/22</td></tr>
<tr><td colspan="2">Who: ☐ Coordinators ☒ States ☐ ICAO Secretariat ☐ ICAO HQ ☐ Others: Users/Industry</td></tr>
</table>

ATFM implantación in Argentina

3.14 Argentina stated that capacity of runways and ATC sectors has been measured with a view towards the development of ATFM services. In 2017, the "ATFM Operational Concept" document was created. Together with the support of CGNA/DECEA, ATFM personnel assigned to the operation was trained during the first four months of 2018. Training was also imparted to all ACC supervisors in the State. ATFM services started on 21 May 2018 in the Ezeiza FIR.

3.15 EANA, the air navigation services provider, is in charge of measuring runway and airspace capacity. Furthermore, EANA forecasts the demand by means of a combination of authorized feasibilities by the aeronautical authority together with an incumbent in the general aviation sector. Likewise, delays indicators are being developed together with aircraft operators. Information regarding an ATFM operators course, held in Buenos Aires, in September 2018, was also presented to the Meeting. The availability of an ATFM course developed on Moodle for virtual sessions of 30 hours was also highlighted. Argentina stated that ATFM focal points can be contacted to gain access to said virtual sessions. The link to check on this is https://pcc.eana.com.ar.

3.16 The LATAM-IATA representative stated his support to the implementation in Argentina and pointed out certain opportunities that would result in service optimizations, based on a collaborative decision-making (CDM) process as the working methodology that allows the enhancement of decisions, through the awareness of preferences, limitations and real-time situations, amongst others, of all participants. As such, each participant should be involved in a collaborative effort, sharing responsibilities, information, resources and common objectives.

Regional implementation activities

3.17 IATA presented a proposal to optimize ATFM information management in the SAM Region, through the use of ITOP (IATA Tactical Operation Portal) of the Liaison Desk in CGNA,in order to swiftly disseminate immediate operational subject maters, as well as ACC and airport contingencies. The representative from IATA made available this tool and all those interested may request a user access.

3.18 The Meeting was informed that a technical cooperation agreement was signed, in April 2017, in Porto Iguazú, Argentina, among EANA (Argentina), DECEA (Brazil), DINAC (Paraguay) and DINACIA (Uruguay). This agreement is known as the *Declaración de Interés Fundacional*. In this respect, the collaboration of Brazil that allowed the ATFM implementation in Argentina in May 2018 was also highlighted.

3.19 Brazil emphasized that their collaborative efforts in ATFM, PBN and others of air navigation areas are accessible and can be extended to all SAM States that require it, through the respective mechanisms.

3.20 Furthermore, the Meeting was informed on the cooperation rendered by Brazil to Paraguay that is being developed in the following five areas: Capacity building, ATFM services development, implementation of the Guarani APP, SARPS and an AGA portal. Training of human resources is being implemented through a series of courses that are being held in Brazil and Paraguay. Development of the ATFM services will be achieved through the creation of a Flow Management Position (FMP) in the Asuncion ACC.

3.21 Cooperation between Brazil and Uruguay is being developed in four areas: Aeronautical information services, training, airspace restructuring (PBN) and implementation of ATFM services. Venezuela stated its interest to reach agreements, in the near future, with Brazil towards the development of ATFM cooperation and other ATM matters.

3.22 The meeting proposed that the SAM Regional Office promotes and coordinates the development of technical cooperation agreements between the States in the Region in order to increment the efficiency of ATFM services in South America and, in general, of the ATM. The Secretariat took note of the respective coordination.

3.23 The Meeting was offered relevant ATFM material through the following Information Papers: IP/06 - *Acciones realizadas por EANA para mejorar los procedimientos de coordinación ATFM entre dependencias* (Argentina); IP/07 - *Estado de implantación del ATFM en Ecuador – Cálculos de capacidad ATC y de pista de los aeropuertos de Quito, Guayaquil, Manta y Latacunga* (Ecuador); IP/17 - International Collaborative Decision-Making Routes (CDM-Routes) (Brazil); and IP/26 - *Implementación de indicadores clave de rendimiento de la gestión de afluencia del tránsito aéreo (ATFM) en la FIR Lima y de las operaciones aeroportuarias por medio de la A-CDM* (Peru).

APPENDIX A / APÉNDICE A

LIST OF CONTACTS FOR OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS

LISTA DE CONTACTOS PARA PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS

State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
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State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
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State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
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State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
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State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
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State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
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State/ Estado	STATE ATFM FOCAL POINTS PUNTOS FOCALES ATFM DEL ESTADO	OPERATIONAL ATFM FOCAL POINTS AND ESTABLISHED ATFM UNITS PUNTOS FOCALES ATFM OPERACIONALES Y UNIDADES ATFM ESTABLECIDAS
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	INDUSTRY / INDUSTRIA	
	Walter Nogueira Pizzo Gerente de Programas ATECH Tel: +55 11 3103 4600 ext 1054 E-mail: wpizzo@atech.com.br	

**** Updated during SAM/IG/22 Meeting / Tabla actualizada durante la SAM/IG/22***

Agenda Item 4: Assessment of operational requirements to determine the implementation of improvements in communications, navigation and surveillance (CNS) capabilities for operations in *en route* and terminal areas

4.1 Under this agenda item, the following working and information papers were analysed:

a) WP/11 - *Follow-up to Performance and Activities of REDDIG II* (presented by the Secretariat);
b) WP /12 - *Proposal to Add a REDDIG II Node of the Backup Network (MPLS) at the ICAO Lima Regional Office* (presented by the Secretariat);
c) WP /13 - *Follow-up to the Implementation of the AMHS Interconnection* (presented by the Secretariat);
d) WP/14 - *Interoperability of Aeronautical Systems* (presented by the Secretariat);
e) WP/15 - *Survey on CNS Capacity of Airport Operating in the Americas and North Atlantic* (presented by IATA);
f) IP/08 - *Estado de implantación para la interconexión AMHS – Ecuador* (presented by Ecuador) (**Spanish only**);
g) IP/09 - *Estado de las interconexiones AMHS de Brasil* (presented by Brazil) (**Spanish only**);
h) IP/10 - *Status of GBAS Implementation in Brazil* (presented by Brazil);
i) IP/11 - *Estado implementación REDDIG II / MEVA III / AMHS / ADS-B* (presented by Colombia) (**Spanish only**);
j) IP/12 - *Evolution of Aeronautical Mobile Communication Infrastructure* (presented by the Secretariat);
k) IP/16 - *Status of ADS-B Implementation in Brazil* (presented by Brazil);
l) IP/27 - *Proyecto de implantación ATN en Brasil* (presented by Brazil) (**Spanish only**).

ACTIVITIES CARRIED OUT UNDER THE ATN ARCHITECTURE PROJECT – D1

4.2 The Meeting took note of the main activities carried out in REDDIG II since the SAM/IG/20 Meeting concerning the following aspects:

a) REDDIG II training programme;
b) REDDIG II operation and analysis of the implementation of new services.

REDDIG II training programme

4.3 In reference to the training activities since SAM/IG/21, the Meeting took note of the following trainings:

Training of Manaus NCC personnel in the Fluke model DTX-1800 network certifier utilization and applications

4.4 In the NCC Manaus, in May 2018, the REDDIG Administrator carried out a training of network certification to the NCC Manaus staff, on utilization of the Fluke model DTX-1800 network certifier equipment. This training allowed checking all cables in use that interconnect the different devices in the station.

Operation and Maintenance Training in the Maiquetia REDDIG Node

4.5 From 6 to 10 August 2018, was applied a training by the REDDIG Administrator (Mr. Cristian Javier Vittor), with participation of 17 technicians of Venezuela. In this opportunity, the Administrator carried out the inventory and revised the node´s equipment, cabling and configuration.

MODEM Skywan models 7000/1070 maintenance, operation and configuration Course

4.6 A course on MODEM Skywan models 7000/1070 maintenance, operation and configuration was carried out in Germany, from 8 to 12 October 2018, with participation of the REDDIG Administrator, a technician from the NCC Manaus and a technician from NCC Ezeiza.

Modem Skywan model 1070 maintenance, operation and configuration training

4.7 From 6 to 9 November 2018, in Curitiba-Brazil, was carried out a training about maintenance, operation and configuration of MODEM Skywan 1070 with the REDDIG Administrator. This event was intended to train two technicians of each REDDIG node.

REDDIG II operation and analysis of the implementation of new services

Implementation of new AMHS interconnections

4.8 The Meeting took note that since SAM/IG/21 to the date, the following (P1) AMHS interconnections were implemented and came into operational:

Brasilia – Paramaribo
Brasilia – Atlanta (SITA)
Brasilia – Madrid
Caracas – Quito
Georgetown – Paramaribo

4.9 Also, the following network connections were established for radar data interchange:

Corrientes RADAR – Asunción ACC (Operational)
Asuncion RADAR – Resistencia ACC (Operational)
Foz de Iguaçu RADAR – Guaraní APP (Testing)

Analysis of REDDIG II security

4.10 The Sixth meeting on the technical-operational implementation of REDDIG II (RTO/6) presented an initial action plan for the adoption of measures to mitigate identified threats which might affect REDDIG II security.

4.11 On 25 June 2018, a teleconference was carried out to discuss the quotation for a network security solution (firewalls) for REDDIG with the participation of the REDDIG Administrator and ENGIE-INEO representatives. The quotation should include:

- Provision of 17 redundant equipment for the 17 REDDIG nodes;
- Provision of 19 switches (1 per node + 2 spares);
- Provision of a centralized monitoring system, by means of a separate system, or integrated to the NMS WhatsUp Gold system;
- Update of each node diagrams;
- Basic training in general security policies, to be applied in Lima for 20 persons;
- Configuration training, to be applied in Lima for 20 persons, so each participant can configure its own node equipment;
- Administration training in Lima for three persons (REDDIG Administrator, one Manaus NCC technician and one Ezeiza NCC technician.

4.12 For the firewalls, two quotations were presented:

- CISCO ASA5506, 38 units: USD 402,417.00;
- FORTINET Fortigate, 38 units: USD 293, 458.00.

4.13 The provision costs of 19 switches CISCO WS-C2960X-24TS-LL of 24 ports would be USD 40,060.00.

4.14 The Meeting was informed that during the RTO/7 (Curitiba, 5 to 9 November 2018), the participants evaluated the quotations and will make a recommendation for approval to the next REDDIG Coordination Committee (RCC) meeting, in March 2019.

Acquisition of Antivirus Kaspersky Endpoint Security for Business (Advanced) license

4.15 The Meeting took note that the antivirus license for all nodes was updated with a cost of 1.465,33 Euros, according to ORSENNAs quotation attached as **Appendix A** to this Agenda Item.

Transfer of Bogotá REDDIG station and installation of a new REDDIG station in Ezeiza

4.16 Argentina and Colombia has already made the payments and TCB (Technical Cooperation Bureau) will proceed with the necessary arrangements to contract ENGIE - INEO. After signing the contract, a schedule will be presented for States review and approval. The equipment installation activities will be carried out in 2019.

Acquisition of spare parts for REDDIG

4.17 TCB continues in the process to buy spare parts for the REDDIG project. The quotation from ENGIE - INEO was approved as indicated in the **Appendix B** to this part of the report.

Connection to SITA Data Link Services via REDDIG

4.18 The Meeting took note that in order to renew the contract of CPDLC and ADS-C services with SITA, Chile has stated their intention of using the REDDIG to connect to the SITA infrastructure in Brazil, lowering costs of last mile link leasing.

4.19 On 26 September 2018, an initial teleconference was carried out with representatives of Brazil, Chile, SITA and the SAM Regional CNS Officer, where a brief revision of previous SAM/IG conclusions and recommendations was made and focal points for this subject were nominated.

4.20 The current contract between Chile and SITA will end on 30 April 2019, thus the intention is to establish the connection via REDDIG by the end of February 2019, with all the necessary activities and testing done.

Proposal to add a REDDIG II node of the backup network (MPLS) at the ICAO Lima Regional Office

4.21 The Meeting took note of the content of working paper WP/12 that presents a proposal to add a REDDIG II node of the backup network (MPLS) at the ICAO Lima Regional Office to restore the communication between the nodes of the States and the Regional Office which was interrupted after the moving of the airport premises, for the actual Regional Office premises in San Isidro.

4.22 It is important to note that there is a constant coordination between the Regional Office and the network management centre (NCC) in Manaus, more specifically with the REDDIG administrator, because the Regional Office manages the spare parts of the network and coordinates all the activities referring to the network (contracts, new services, etc.), as well as administrative support to Mr. Cristian Javier Vittor (Administrator of REDDIG II) with missions, licenses, health insurance, etc.

4.23 After deliberating on this agenda item, the Meeting requested that the Secretariat circulate to all participating States of the REDDIG (Regional Project RLA/03/901) the proposal to add a node (MPLS) in the Regional Office, so that the States can evaluate and take a decision at the next Meeting of the Coordination Committee of the Regional Project RLA/03/901.

FOLLOW-UP TO PROJECT ACTIVITIES D2 APPLICATIONS GROUND-GROUND AND AIR-GROUND OF THE ATN

Ground-ground applications

Follow-up to the implementation of the AMHS interconnection

4.24 The implementation situation of all the AMHS interconnections in the SAM Region at their estimated operational date is presented as **Appendix C** to this Agenda Item of the Report. It is noted that by June 2019 it is estimated that all the AMHS interconnections listed in Table CNS II-1 of Volume II of the CAR/SAM Regional Air Navigation Plan (Doc 8733 eANP) will be completed. The updated list of focal points for the implementation of the AMHS interconnection is presented as **Appendix D** to this agenda item.

4.25 Argentina reported the update of its AMHS system, the status of the interconnections and the plans for activation of the interconnections with Asunción, La Paz, Lima, Montevideo, SITA and Santiago, described in the following items:

- SITA:
  The Ezeiza MTA was configured so that it could dialogue by P1 with the SITA MTA, establishing the parameters provided by SITA and the link was established and functioning. It is in the testing stage

- BRAZIL:

The Ezeiza MTA was configured so that it could dialogue by P1 with the MTA of Brasilia, establishing the parameters provided by the Brazilian administration and the link was established. The link with Brazil has been in operation for P1 for more than 4 months.

- PERU:

The Ezeiza MTA was configured so that it could dialogue using the P1 protocol with the MTA of Lima, establishing the parameters provided by the Peruvian administration and the link was established.
It is recommended that after the updates made in the Ezeiza System and the tests that the Argentine administration is carrying out to connect with SITA, the tests with Lima be resumed.

- CHILE:

The MTA of Ezeiza was configured so that it could dialogue by P1 with the MTA of Santiago, establishing the parameters provided by the Chilean administration and the link was established.
Message exchange tests were done and it worked correctly.
It was interconnected this year in an operational manner on two occasions and it was necessary to revert the interconnection.
It is recommended that after the updates made in the Ezeiza System and the tests that the Argentine administration is carrying out to connect with SITA, the tests with Santiago be resumed.

- URUGUAY:

The Ezeiza MTA was configured so that it could dialogue by P1 with the MTA of Montevideo, establishing the parameters provided by the Uruguayan administration, and the link was established.
Very short messages were exchanged and worked correctly in the AMHS-AMHS sense, but a problem with outgoing AFTN messages from Argentina to Uruguay is still pending.
As Argentina is a nexus of interconnection between Chile, Bolivia, Paraguay and Uruguay, both the messages that come from these three countries to Uruguay, as well as the messages of Argentina's AFTN residual systems destined for Uruguay, are not being sent and accumulate in Ezeiza.
It is necessary to start testing again and check if the various configurations in the Ezeiza system have solved the connection problems.

- PARAGUAY:

The interconnection between the Paraguayan system and the Argentinean was one of the first interconnections at the regional level and remained operative for several years.
As a result of not having contracted maintenance, the Paraguayan system degraded, causing among other things that the P1 connection with Argentina has to be passed to AFTN, and also via Brazil.
As of today, the Paraguayan administration is waiting to finish updating its AMHS terminals to return its link with Argentina to P1.
Tests were done again during the last two weeks to re-establish the P1 connection that was available, and the results were positive.

- BOLIVIA:

Received from Bolivia parameters to configure the P1 link, but they are not correct. It is necessary the intervention of the technical personnel of Bolivia to provide the necessary information for the correct configuration of the systems. For the reason stated, no proof of sending and receiving messages has yet been made.

- SOUTH AFRICA:

There is not yet a link to configure the connection by P1. It is expected to be available when the new AMHS system is enabled in the new tower.

- SPAIN:

There is an available link that would allow the configuration of a connection between MTA by P1. Information is being gathered about the configuration parameters necessary to establish the link.

4.26 The connectivity tests between the La Paz MTA-Lima were carried out, which were satisfactory, therefore, the technical part is ready for its operation. As regards the operational part, the AMC addressing tables are being prepared manually. The tables are being finalized and it is estimated that the La Paz-Lima connectivity will be operational during the first quarter of 2019. Subsequently, the same work will begin with the connection between the MTA La Paz - Brasilia, La Paz - Ezeiza

4.27 Brazil has reported the operational activation of the interconnections with the SITA Gateway, with Madrid and with Paramaribo, totaling 8 interconnections. Also informed that actions are underway to activate the interconnection with FAA by the end of 2018.

4.28 Chile will consult internally a new date to initiate the coordination with Argentina to establish the interconnection between its AMHS systems.

4.29 Colombia informed in information paper IP/11 (SAM/IG/22-IP/11) that the AMHS interconnections with Brazil, Peru and Venezuela are operational. The interconnection with Panama is pending for the expansion of its bandwidth in the MEVA network. Also reported that tests with Ecuador will present problems in SS messages.

4.30 Ecuador informed in information paper IP/08 (SAM/IG/22-IP/08) that the interconnection with Caracas has been completed since October 18, 2018. The agreement between the States is being documented, but the interconnection is operative to the date. It was also highlighted that the problem reported in the SAM/IG/21, referring to the SS message, is not originated in Quito but by the conversion made by the Caracas Gateway. With Colombia, final tests will be resumed, the pre-operational were successful; it is estimated that by the end of 2018 or at the latest at the beginning of 2019 this interconnection will be completed.

4.31 Guyana informed that on October 11, 2018, the AMHS interconnection between the COM Center in Georgetown with Brasilia and Paramaribo was restored. The operational implementation of the AMHS interconnections with Caracas and Port of Spain (Trinidad and Tobago), is scheduled for the end of 2018.

4.32 French Guiana reported by email, the beginning of coordination's with the COM centers of Brasilia and Caracas. The establishment of interconnections is estimated for the end of 2018.

4.33 Panama reported that the interconnection between the Panama MTA and the Atlanta MTA through the MEVA III has been implemented and operational since May 2018. In addition, AMHS interconnection operational tests between the Bogotá MTA and the Panama MTA were successfully carried out through the MEVA III / REDDIG II interconnection. For the operational implementation of this circuit, it is required to complete the administrative procedures with the MEVA III service provider.

4.34 Paraguay has signed a contract regarding the update and maintenance with the supplier company of AMHS in Paraguay (Skysoft), in this sense successful tests with SBBR and SAEZ have been carried out, both in test terminals and in active MTAs. The last version of the TAU update is expected in order to raise again the connections at P1 level, which will be in the last week of November of this year.

4.35 Taking into account the updating carried out in the Argentine system, and the problems observed in the conversion of messages made by the Gateway of Peru, it would be necessary to carry out new tests, whose date will be agreed.

4.36 The representatives of Peru stated that they are in the initial process for the acquisition of a new AMHS System, which they estimate will be in operation by 2020.

4.37 Regarding the AFTN link between Lima and Atlanta, the representatives of Peru and the United States, it was agreed to carry out a GoToMeeting on 5 December 2018, which will determine the steps to follow for the migration of the AFTN circuit to AMHS.

4.38 Surinam reported that on October 18, 2018, the AMHS interconnection was reactivated with the COM Centers of Brasilia and Georgetown. The interconnection with the COM Center in Caracas is still pending, which is estimated for the first quarter of 2019.

4.39 Uruguay held technical meetings between November 12 and 16, with Argentina on interconnection between the two countries. In this case it was agreed to continue testing and obtain the connection of several systems including AMHS. Although the MTAs were interconnected with P1, there are still problems in the content. Link tests culminated in 2017 between Brazil and Uruguay. Although they were satisfactory at the time of receiving different levels of traffic, they presented difficulties in the Montevideo system. For the time being the preparatory work is continued, the technical visit of the system supplier is also awaited.

4.40 Efforts are initiated to obtain a new connection, this being between Lima and Montevideo. While this was outside the original table proposed for the AMHS network, in this last meeting, the extension of AMHS links between countries was recommended, according to the needs of the States, establishing links that had not been foreseen in the original project.

4.41 Venezuela informed that on October 11, 2018, the operational AMHS interconnection between the COM Center in Caracas and the COM Center in Quito was established. Likewise, positive tests have been carried out between the Caracas MTA and the Ezeiza MTA (CIPE development system) and interconnection is scheduled for the end of the first half of 2019. It also reported that for the second half of 2018 or the first semester of 2019, the operational interconnections of the Caracas MTA with the MTAs of Atlanta, Cayenne, Georgetown, Madrid and Port of Spain are planned.

4.42 The Frequentis company reported that in January 2017, Panama requested the MEVA administration to establish an IP connection to conduct AMHS tests with Colombia. The configurations were made and the tests were successful. Also reported that MEVA members agreed to the 100 kHz increase and that the REDDIG coordinator confirmed that both Colombia and Panama agreed to share the costs.

Other AMHS considerations

4.43 From August 6 to 10, 2018, the Advanced AMHS Course was held in Santiago, Chile, with the attendance of 26 representatives from Bolivia, Brazil, Chile, Ecuador, Guyana, Paraguay, Suriname, Trinidad and Tobago, Uruguay and Venezuela.

4.44 It is recalled that it is necessary that every change that a State makes in addressing AMHS, must be co communication to the AMC must be made by an external operator nominated by the State.

OTHER CNS CONSIDERATIONS

Interoperability between automated systems

4.45 The Meeting took noted of the proposal presented by the Secretariat presented in the working paper WP/14, for the creation of the Interoperability Task Force (GT Interop), with the main objective of guarantee the interoperability among the automated systems used by the areas of AIM, MET, ATM, ATFM, and CNS. This GT is made up by specific subgroups in these areas.

4.46 As a result of the discussions, the Meeting considered that the proposal is positive and will bring many benefits. In view of the foregoing, the following conclusion was formulated:

<table>
<tr><td colspan="2">CONCLUSION
SAM/IG/22-03 Interoperability Task Force (GT Interop)</td></tr>
<tr><td>That:

To create an Interoperability Task Force (GT Interop) to address the issue in the SAM Region, providing States with guidance on the processes for interconnecting systems already implemented or to be acquired.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☒ Financial
☐ Environmental
☒ Technical/Operational</td></tr>
<tr><td colspan="2">Why: With the main objective of guarantee the interoperability among the automated systems used by the areas of AIM, MET, ATM, ATFM, and CNS.</td></tr>
<tr><td>When: No later than SAM/IG/23</td><td>Status: Adopted at SAM/IG/22</td></tr>
<tr><td colspan="2">Who: ☒ Coordinators ☒ States ☒ ICAO Secretariat ☐ ICAO HQ ☒ Other: Users/industry</td></tr>
</table>

4.47 The Secretariat will circulate among the States a communication to appoint the focal points for the Interoperability Task Force. Likewise, the Secretariat will organize a teleconference to form the Task Group, define its terms of reference, schedule and other administrative measures.

CNS capacity of aircrafts

4.48 The Meeting reviewed the working paper WP/15 (SAM/IG/22-WP/15) presented by IATA, which contains the results of a survey with information provided by some airlines that operates in the Americas and North Atlantic, to know the CNS capacity of aircrafts. It also reflects the preliminary results of the of the percentage of aircraft with some CNS capacities in the South American FIR. The objective of IATA with this working paper is to provide a vision for the discussion of a strategy to support the implementation of CNS technologies in the SAM Region. The aforementioned working paper contains as Appendix A, the 3rd edition of the document *User Requirements for Air Traffic Services (URATS) - Communications, Navigation, and Surveillance (CNS) Technologies*, of July 2017, which objective is to provide a guide for the "stakeholders" of aviation based on the perspective of international airlines.

4.49 To date, 27 airlines have provided information for IATA, totaling 375 aircraft in the database. **Appendix E** to this part of the Report presents the survey conducted by IATA.

4.50 Based on the information obtained by IATA, the Meeting considered the following actions:

a) IATA will provide the survey for the States of the SAM Region, who are interested in receiving the information related to their FIR;
b) Each State must analyze the information of the survey, especially ADS-B capacity, to feed its surveillance improvement plans;
c) That the Office of ICAO-Lima send the States, until December 31, 2018, the IATA survey so that the information may be expanded to include general aviation and other airlines.

GBAS implementation

4.51 Information paper IP/10 (SAM/IG/22-IP/10), Brazil presented the status of the GBAS technology implementation project (Ground Based Augmentation System), including the results obtained to date.

4.52 Brazil informed that the SLS-4000 station can be configured for use in Brazil for precision approach only between 6AM and 6PM (local time) using the CONUS (Continental United States) threat model, with possible discontinuities during the operation due to the arrangement of geometry of the satellites. Outside of these hours, the operation cannot be guaranteed in accordance with the requirements of the ICAO SARPs of Annex 10 vol. 1. The ionosphere above all Brazil (from north to south) presents severe behavior, and the same operating restrictions must be applied in all its territory.

4.53 Each GBAS installation requires performing a specific Safety Case to guarantee the safety of the operation and it is advisable to maintain a signal monitoring and analysis infrastructure to ensure that possible ionosphere events are within the threat model installed in the station.

4.54 The final report with the work developed as well as the results and the Safety Case should be ready until March 2019. Given the results obtained, DECEA decided to continue studies of GBAS technology, data collection and analysis, as well as to keep up with its development in the world, not deploying, yet, the System in operation in Brazil and awaiting the increase in the performance of that technology.

4.55 Argentina reported on the satisfactory results of the tests done in Bariloche for GBAS use.

4.56 Peru presented an article that tries to discuss a technical point of view of the effects and/or forecast of space weather and the ionosphere in the services of air navigation (civil aviation) in low latitude SAM Region focused in Peru, where it is located the geomagnetic equator, and by extension to the South American Region (SAM), taking into account the following:

- Peru (Lima) is the center of the Equatorial Region (Low Latitude - South America), which is hostile to GNSS signals.
- There is a continuous study of the effects of scintillation and TEC on GNSS signals. Scintillation can seriously affect the continuity and availability of GNSS.
- The effects of space weather occur in the ionosphere from 80 to 600 km. Approximately, taking into account phenomena such as the solar cycle, solar storms and equatorial anomalies.
- Empirical model of a TEC Map to evaluate the feasibility of implementing a Ground Augmentation System (GBAS) or a Satellite Augmentation System (SBAS) in the Low Latitude Region - Cost-benefit analysis

Implementation of the ATN in Brazil

4.57 Brazil presented the status of implementation of the ATN network project with a description of the adopted architecture, based on the SDN (Software Defined Network) concept, which results in a large increase in network availability. Also informed that the tender to sign the first public-private partnership of the Federal Direct Administration is in progress.

4.58 Chile commented that the technological architecture adopted by Brazil could be used in REDDIG, which would make it possible to optimize the terrestrial and satellite communication media available on the network.

APÉNDICE A / APPENDIX A

Responsable Compte :	Jean Philippe SENCKEISEN	No Devis :	11662202018
Ligne Directe :	33134933535	Projet :	ORSENNA
Fax :	33134939575	Emetteur de l'offre :	Florence LAPREVOTE
Client :	ICAO	Date d'émission :	17/09/18
Contact :	Javier Vittor	Date d'expiration :	17/10/18
Email :	jvittor@icao.int	Conditions de Paiement :	Standard
Téléphone :			

MERCI BIEN VOULOIR NOUS COMMUNIQUER LE NUMERO DE DEVIS LORS DU PASSAGE DE VOTRE COMMANDE.
CE DEVIS EST SOUMIS AUX CONDITIONS GÉNÉRALES DE VENTE, DISPONIBLES SUR DEMANDE. LA DATE DE VALIDITÉ MAXIMALE DE CE DEVIS EST au 17/10/2018

Proposition Commerciale

Qté	Référence	Description	Prix Public EUR		Prix Vente EUR	Total EUR	Stock	Délais
1	KL4867XANFS	Kaspersky Endpoint Security for Business - Advanced new license 23 postes with 1 year maintenance	€ 1 465,33		€ 1 465,33	€ 1 465,33	Y	

Total H.T. EUR	€ 1 465,33
TVA	
Total EUR	€ 1 465,33

Notes :

ORSENNA: 15 Rue Croix Castel - 78600 MAISONS LAFFITTE - Tel (33) 1 34 93 35 35 Fax : (33) 1 34 93 95 75 E-Mail : Sales@orsenna.fr S.A.R.L au Capital de 96 042 Euros - RCS 338 866 775 Versailles B - APE 722 Z - Siret 338 866 775 00061 VAT FR 82 338 866 775 Numéro Agrément Formation 11 78 028178

APÉNDICE B / APPENDIX B

INEO-ES Price List for Procurement of Satelitte Equipment Spare Parts

Items	Unit	Description	Qty	Unit Price US$	Total Price US$
		INDOOR Equipment			
		Satellite modem, including:			
1	set	IDU 1070 19" NS + PS AC	1	20 664,00	**20 664,00**
2		*License Key Mesh Topology*		*included*	
		GORGY TIMING Equipment			
3	set	GPS Master Clock - RT9s including one outdoor GPS Antenna and cable	1	3 289,00	**3 289,00**
4	unit	GPS standalone outdoor Antenna for RT9s (without cable)	1	937,00	**937,00**
		LAN Port Server			
5	unit	NPORT 5610-8	1	1 230,00	**1 230,00**
		10 MHz Redundancy Equipment			
6	unit	BIAS-T switch (10MHz redundancy system)	1	2 125,00	**2 125,00**
7	unit	Passive DC-Block (Power injector 10MHz pass)	4	542,00	**2 168,00**
8	unit	Passive DC-Block (RF Bandwidth)	4	130,00	**520,00**
9	unit	Passive Splitter (2 Port RF Bandwidth)	2	265,00	**530,00**
		Spare Parts for HPE PROLIANT DL160 Server			
10	unit	Fans for HPE PROLIANT DL160 Server	10	124,00	**1 240,00**
11	unit	Hot-Plug HP Midline HDD 500GB 7.2k SATA	2	405,00	**810,00**
		OUTDOOR Equipment			
		RF Equipment			
12	unit	IBUC 80W	1	18 653,00	**18 653,00**
13	unit	Tx 1+1 switching system	1	8 707,00	**8 707,00**
14	unit	Rx 1+1 switching system	1	9 523,00	**9 523,00**
15	set	Waveguide Switch (CPRG flange) + Control cable	1	3 528,00	**3 528,00**
16	unit	LNB with external 10MHz reference	1	804,00	**804,00**
17	unit	RF Filter (for LNB path)	1	676,00	**676,00**
18	unit	N-Female Type coaxial connector (for CNT/LMR-400 Type coaxial cable)	4	45,00	**180,00**
19	unit	N-Male Type coaxial connector (for CNT/LMR-400 Type coaxial cable)	4	44,00	**176,00**
20	unit	N-Male Type coaxial connector (for CNT/LRM-600 Type coaxial cable)	4	67,00	**268,00**
		SUB-TOTAL SPARES			**76 028,00**
		ACCESSORIES			
21	Lot	Technical Documentation (applicable for documentation not previously provided)		*included*	
		SUB-TOTAL ACCESSORIES			**0,00**
		SERVICES			
22	Lot	2-Year Warranty	1	7 036,00	**7 036,00**
		SUB-TOTAL SERVICES			**7 036,00**
Grand Total					**83 064,00**
Insurance and Freight charges to Lima, Peru			1	6 658,00	6 658,00
TOTAL PRICE Up to site acceptance on site(s), on a DAP Lima, Peru, basis (Delivered at Place – Incoterms® 2010) The prices for the services, civil works and supplies subcontracted and carried out in Peru include all applicable taxes.					**89 722,00**

Augustin BAREAU
Head of Aeronautical Export Department

Suggested Payment terms and conditions
70% on Proof of Purchase Order of the Equipment
30% upon Proof of Delivery (POD to be received from the Freight Forwarder)

Validity of the offer: **6 months**

Delivery delay after PO: Usually **4 months** (for delivery at final destination, excluding Customs Clearance delay)

APÉNDICE C / APPENDIX C

Interconexiones AMHS – Región SAM / AMHS Interconnection – SAM Region

	Conexión P1 / P1 Connection	Situación / Situation	Operativa en / Operational in
1	SAEZ – SBBR	Operativa / Operational	04/04/2018
2	SAEZ – SCSC		
3	SAEZ – SGAS	En coordinación / In coordination	
4	SAEZ – SLLP		
5	SAEZ – SPIM		
6	SAEZ – SUMU		
7	SBBR – SGAS		
8	SBBR – SLLP		
9	SBBR – SKBO	Operativa / Operational	22/05/2017
10	SBBR – SMJP	Operativa / Operational	11/10/2018
11	SBBR – SOCA	En coordinación / In coordination	
12	SBBR – SPIM	Operativa / Operational	14/12/2015
13	SBBR – SUMU		
14	SBBR – SVCA	Operativa / Operational	28/02/2018
15	SBBR – SYCJ	Operativa / Operational	16/07/2017
16	SCSC – SPIM	Operativa / Operational	
17	SEQU – SKBO		
18	SEQU – SPIM	Operativa / Operational	
19	SEQU – SVCA	Operativa / Operational	11/10/2018
20	SKBO – SPIM	Operativa / Operational	
21	SKBO – SVCA	Operativa / Operational	
22	SLLP – SPIM	En coordinación / In coordination	
23	SMJP – SVCA		
24	SMJP – SYCJ	Operativa / Operational	11/10/2018
25	SOCA – SVCA	En coordinación / In coordination	
26	SPIM – SVCA	Operativa / Operational	
27	SVCA – SYCJ		
28	SAEZ – FAOR		
29	SAEZ – SITA		
30	SAEZ – SVCA		
31	SBBR – GOOO		
32	SBBR – KATL	En coordinación / In coordination	
33	SBBR – LEEE	Operativa / Operational	11/10/2018
34	SBBR – SITA	Operativa / Operational	16/08/2018
35	SKBO – MPPC		
36	SPIM – KATL		
37	SVCA – KATL	En coordinación / In coordination	
38	SVCA – LEEE		
39	SVCA – TNCC		
40	SVCA – TTPP		

APÉNDICE D / APPENDIX D

NATIONAL FOCAL POINTS/PUNTOS FOCALES NACIONALES
IMPLEMENTATION OF INTERCONNECTION OF AMHS SYSTEM /IMPLANTACIÓN INTERCONEXIÓN DE SISTEMAS AMHS

STATE/ ESTADO	ADMINISTRATION/ ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
ARGENTINA	EANA /ANAC	Hernán Gabriel Canna	Especialista CNS EANA / EANA CNS / Specialist	(54 11) 4480-2362	hcanna@eana.com.ar
		Javier Shenk	Gerente CNS / Manager CNS (Communication, Navigation and Surveillance) EANA	(54911) 28370135	Jschenk@eana.com.ar
		Moira Callegare	Jefe departamento CNS / Chief CNS Department (ANAC)	(54 11) 594-13097	mcallegare@anac.gob.ar
BOLIVIA	AASANA	Remigio Blanco	Responsable de Telecomunicaciones AASANA / Responsible of AASANA Telecommunications	(591 2) 237-0340	rblanco@aasana.bo
BRASIL/ BRAZIL	DECEA	Murilo Albuquerque Loureiro	Coordinación técnica / Technical Coordination	(55 21) 2101-6658	loureiromal@decea.gov.br
		Marcelo Mello Fagundes	Coordinación operacional / Operational Coordination	(55 21) 2101-6268	fagundesmmf@decea.gov.br
		Lucio Cavalcante	Jefe CTMA-BR / Chief CTMA-BR	(55 61) 3364-8375	luciolac@fab.mil.br
COLOMBIA	UAEAC	Gabriel Guzmán	Especialista de Comunicaciones / Communications Specialist	(571) 296-2940 (57) 317656 7202	gabriel.guzman@aerocivil.gov.co

STATE/ ESTADO	ADMINISTRATION/ ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
		Robinson Quintero	Especialista de Comunicaciones	(57) 1 296 2241	robinson.quintero@aerocivil.gov.co
CHILE	DGAC	Christian Vergara	Especialista comunicaciones	(56 2) 2836-4005 (56 2) 2644-8345	cvergara@dgac.gob.cl
ECUADOR	DAC	Darwin Manolo Yazbeck Sarmiento	Coordinador AFS / AFS Coordinator	(593) 2947400 ext 1095	darwin.yazbeck@aviacioncivil.gob.ec
		Víctor Yépez	Responsable Sistema VSAT / Responsible of VSAT System	(593)2947400 Ext.1091	victor_yepez@aviacioncivil.gob.ec
GUYANA	Guyana Civil Aviation	Mortimer Salisbury	Supervisor - AN & T / AN & T Supervisor	(592) 261-2569	mbsalisbury2000@yahoo.com
GUYANA FR./FRENCH GUIANA	Dirección de los servicios de navegación aérea (Francia)	Michel Areno	Jefe del centro de control del aeropuerto de Cayena	(594) 594 359395	michel.areno@aviation-civile.gouv.fr
PANAMÁ/PANAMA	Autoridad Aeronáutica Civil (AAC)	Daniel de Ávila	Supervisor Dep. de COM / Supervisor of COM Department	(507) 315 9877	deavila@aeronautica.gob.pa
		Abdiel Vásquez	Jefe Depart. CNS / Chief of CNS Department	(507) 315-9877/78/44	abvasquez@aeronautica.gob.pa
PARAGUAY	DINAC	Víctor Morán Maldonado	Jefe Departamento de Comunicaciones / Chief of Communications Department	(595 21) 758 5208	moranchu@gmail.com
		Juan Felix Estigarribia	Jefe departamento técnico AMHS / Chief of AMHS Technical Department	(595) 217585257 / (595) 217585255	jfe2406@gmail.com
PERÚ/PERU	CORPAC	Jorge García	Jefe de Comunicaciones / Chief of Communications	(511) 2301000 Ext 3131	jgarcia@corpac.gob.pe

STATE/ ESTADO	ADMINISTRATION/ ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
		Raúl Anastasio Granda	Supervisor Comunicaciones AMHS-AFTN Área de Comunicaciones Fijas Aeronáuticas / AMHS-AFTN Communications Supervisor Aeronautical Fixed Communications Area	(511) 230-1018	ranastacio@corpac.gob.pe
SURINAM/ SURINAME	Ministry of Transport, Communication and Tourism, Civil Aviation Department	Mitchell Themen	CNS División Técnica / CNS Technical Division	(597) 325-123 (597) 325-172 (597) 497-143	mickiano@live.com
URUGUAY	DINACIA/DGIA	Raúl Pesce	Técnico Electrónico Aeronáutico / Aeronautical Electronic Tehnicial	(598) 2604-0408 Ext.4520	raulhpesce@hotmail.com
	DINACIA/DGIA	Oscar Farías	Director de División Telecomunicaciones Aeronáuticas / Director of Aeronautical Telecommunications Division	(598) 2604-0408 Ext. 5107	dte@dinacia.gub.uy
VENEZUELA	INAC	Sabrina Rodrigues Medina	Jefe área técnica AMHS Chief of AMHS Technical Area	(58 212) 3551864	sa.rodriguez@inac.gob.ve
		Maricel Berroteran Quijada	Jefe CCAM de Maiquetía / Chief of Maiquetia CCAM	(58 212) 3552967	maricel.berroteran@inac.gob.ve

APPENDIX E / APÉNDICE E

IATA

Data compilation date: 16th September 2018

(Spanish only)

Based on a survey of 3,375 airframes

Categorized by Flight Information Region (FIR)

IATA Americas Region

COMMUNICATIONS

Replacing assumptions with facts

This report is based on unedited airspace user submissions

Refer to statistical note on page 2

CONTRIBUTING AIRSPACE USERS

AEROMEXICO, AEROMEXICO CONNECT, AEROLITORAL, AIR CANADA, AIR CANADA ROUGE, AIR NEW ZEALAND, AIR EUROPA, AVIANCA BRAZIL, AZUL, CONDOR, COPA, DELTA, ETIHAD, FEDEX, GOL, IBERIA, JETBLUE, KLM, LATAM AIRLINES, LIAT, QATAR AIRWAYS, ROYAL JORDANIAN, SAS, SWISS, SWISS GLOBAL, UNITED, UPS.

AIRFRAME TYPES

A306, A310, A319, A320, A321, A330, A332, A333, A343, A346, A359, A388, ATR42, ATR72, B737, B738, B739, B744, B757, B752, B763, B767, B772, B777, B77F, B77L, B77W, B787, B788, B789, DC10, E170, E190, MD11, MD88, MD90.

Data compilation date: 16th September 2018

Statistical Note

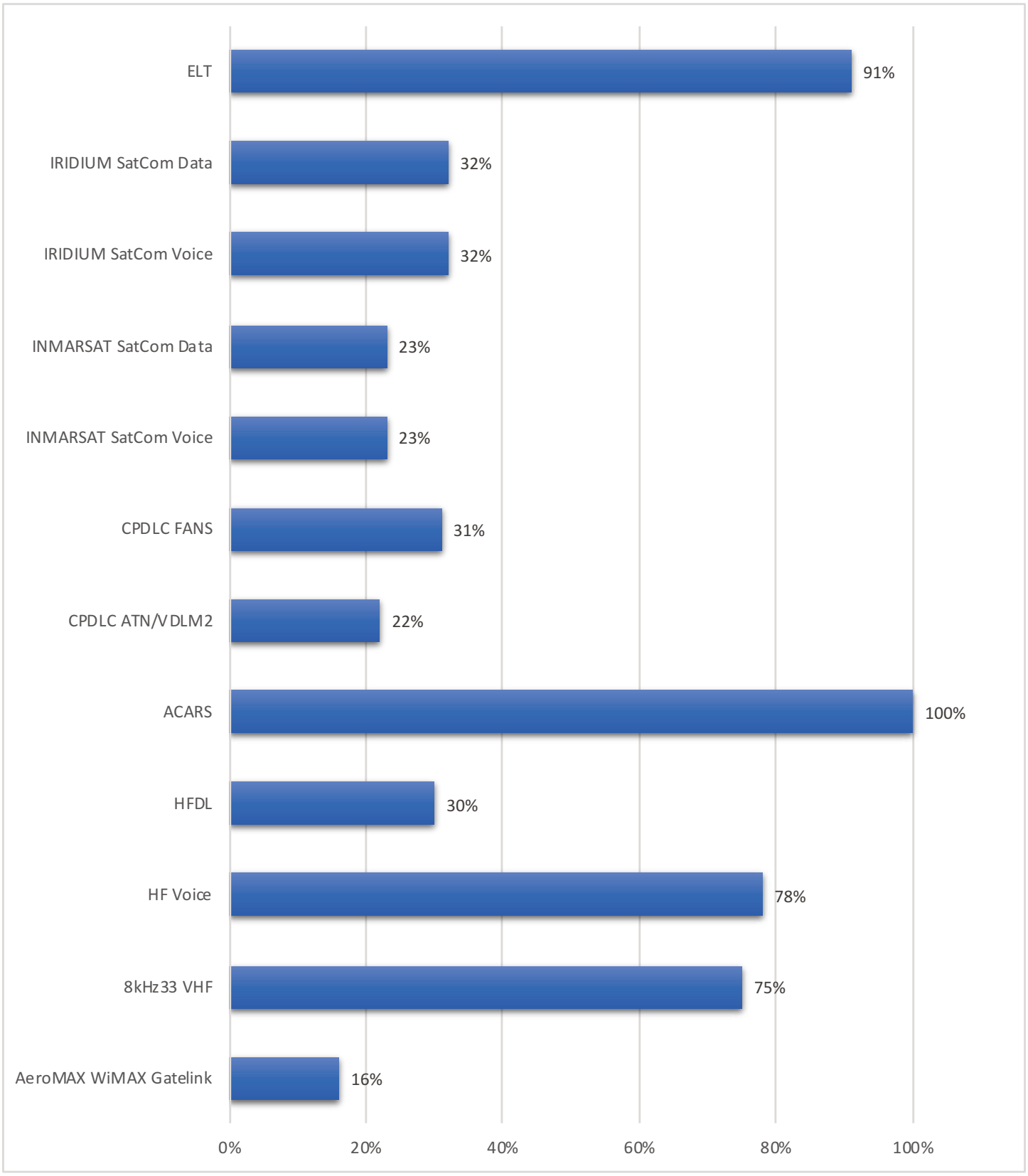
This document contains unedited airspace user data reflecting airframe COMMUNICATIONS equipage as reported by operators. The data is derived from a survey, not filed flight plans. It should be borne in mind that 70% of flight plans filed in the IATA Americas Region reflect actual airframe equipage. The remainder are generic or repetitive flight plans based on a standard fleet airframe. The results presented here are based soley on airspace user survey data.

Point of contact:

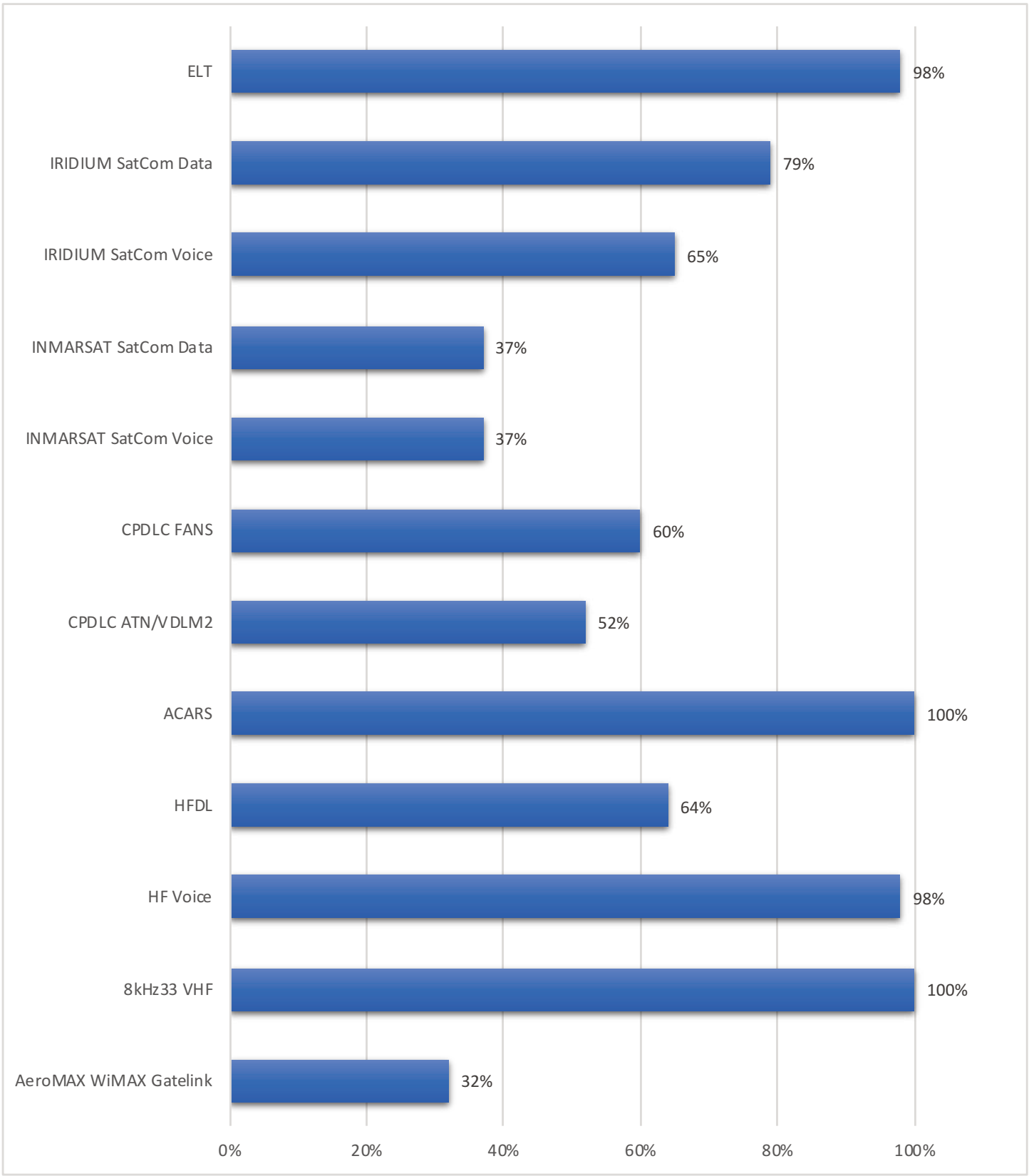
Mr. Kieran O'Carroll
Safety and Flight Operations Department
IATA Americas Region
703 Waterford Way, Suite 600
Miami, Florida 33126
USA

ocarrollk@iata.org

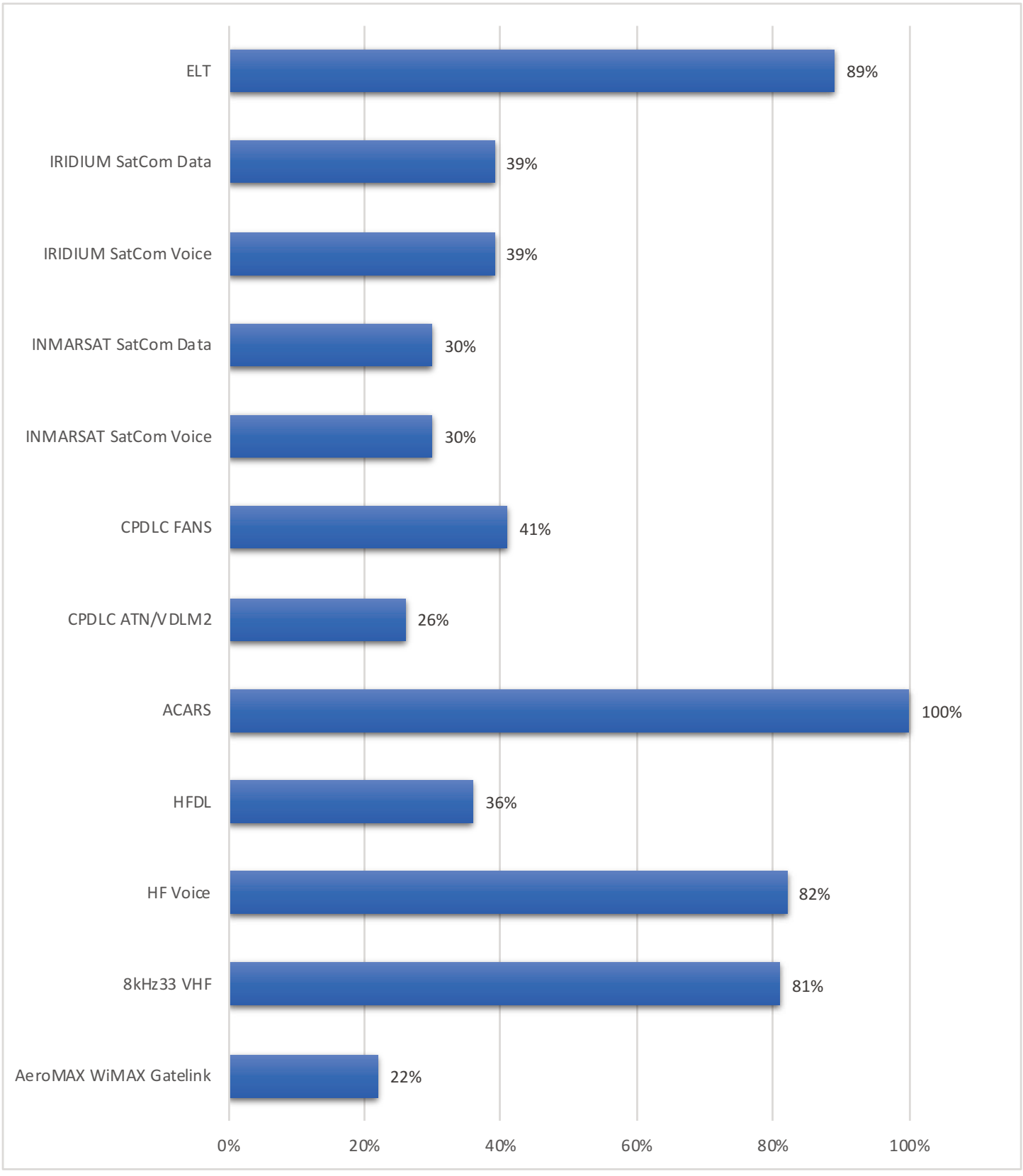
Albuquerque



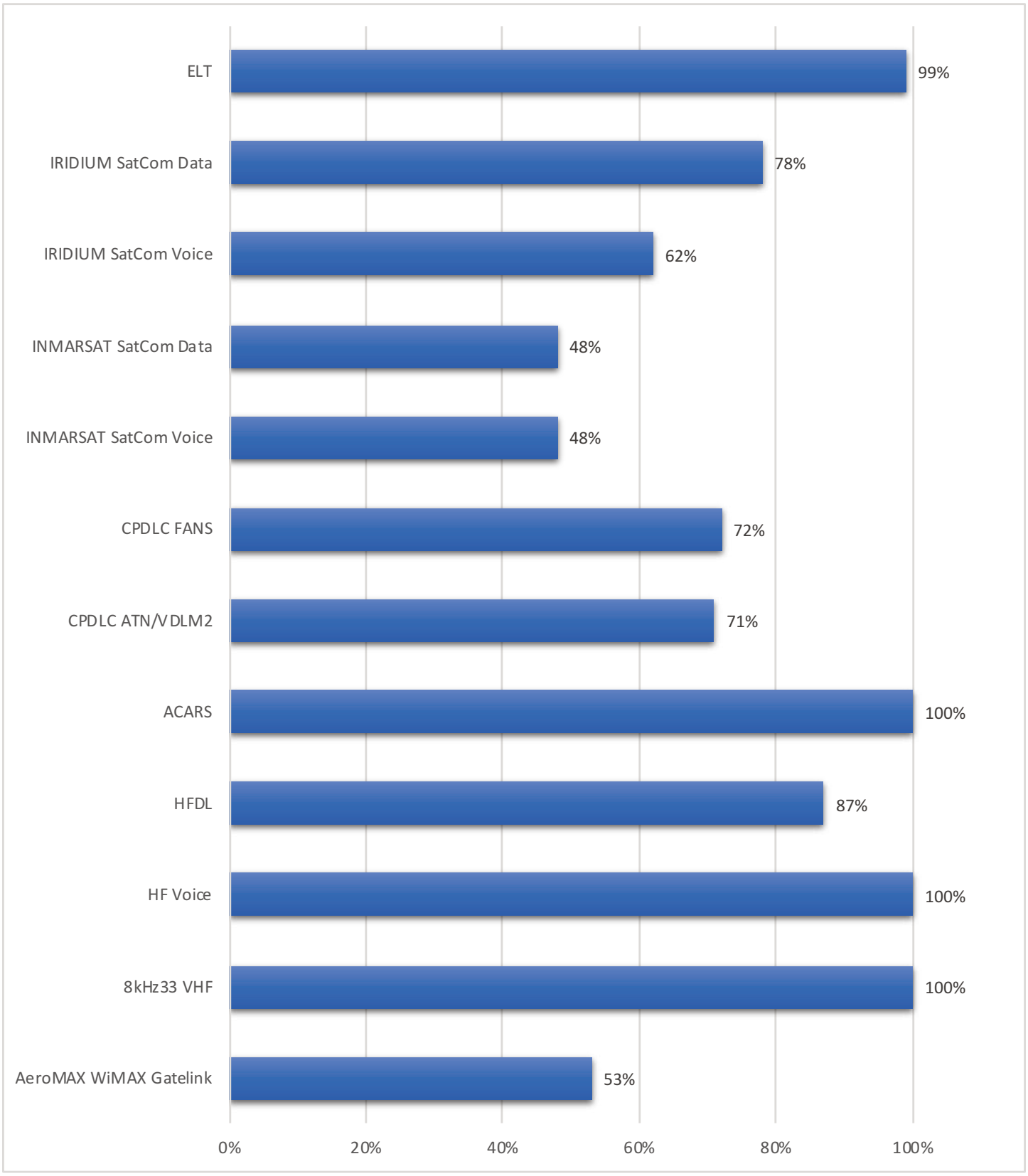
Amazónica


ELT
98%
IRIDIUM SatCom Data
79%
IRIDIUM SatCom Voice
65%
INMARSAT SatCom Data
37%
INMARSAT SatCom Voice
37%
CPDLC FANS
60%
CPDLC ATN/VDLM2
52%
ACARS
100%
HFDL
64%
HF Voice
98%
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
32%
0%
20%
40%
60%
80%
100%

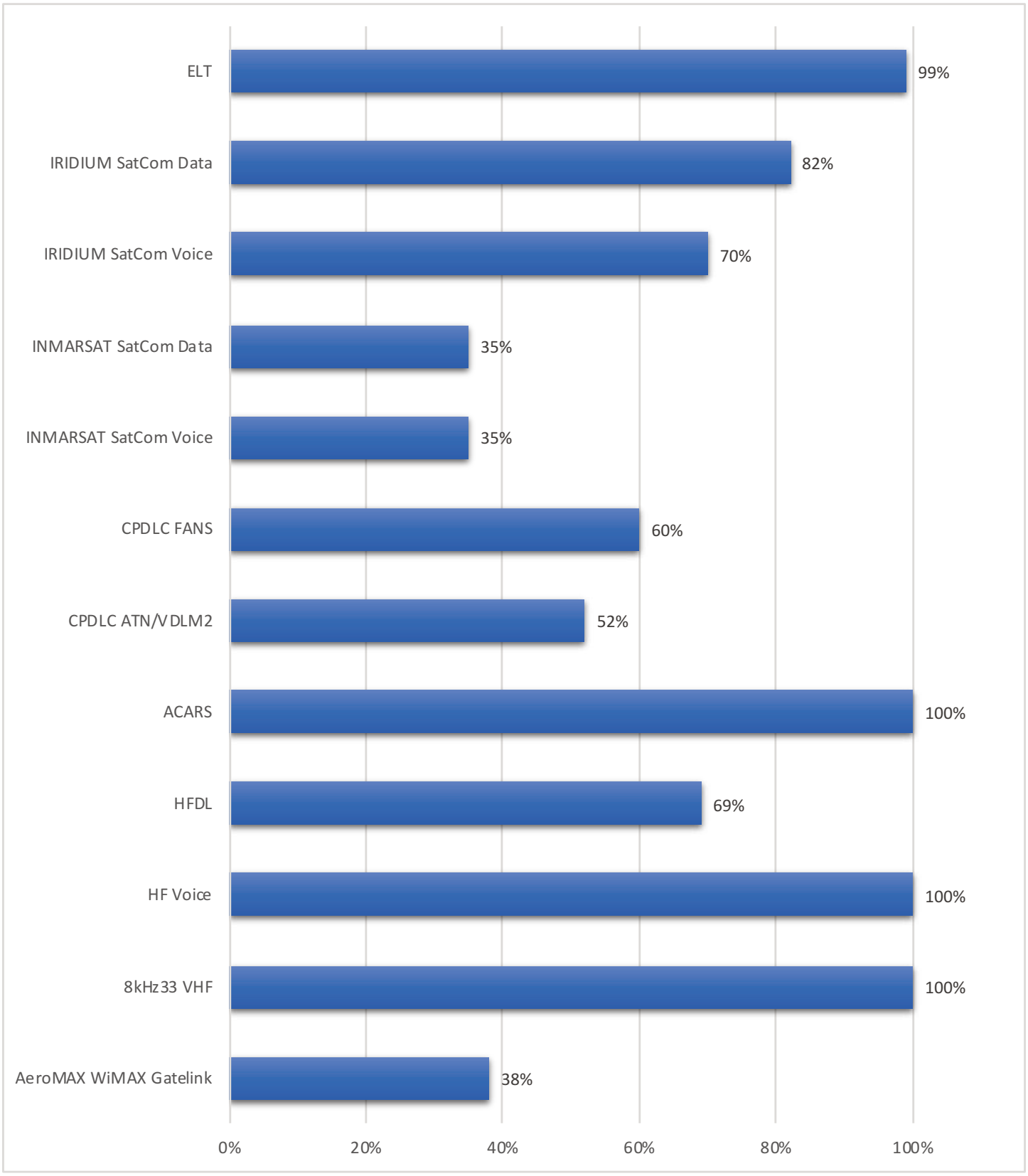
Anchorage


ELT
89%
IRIDIUM SatCom Data
39%
IRIDIUM SatCom Voice
39%
INMARSAT SatCom Data
30%
INMARSAT SatCom Voice
30%
CPDLC FANS
41%
CPDLC ATN/VDLM2
26%
ACARS
100%
HFDL
36%
HF Voice
82%
8kHz33 VHF
81%
AeroMAX WiMAX Gatelink
22%
0%
20%
40%
60%
80%
100%

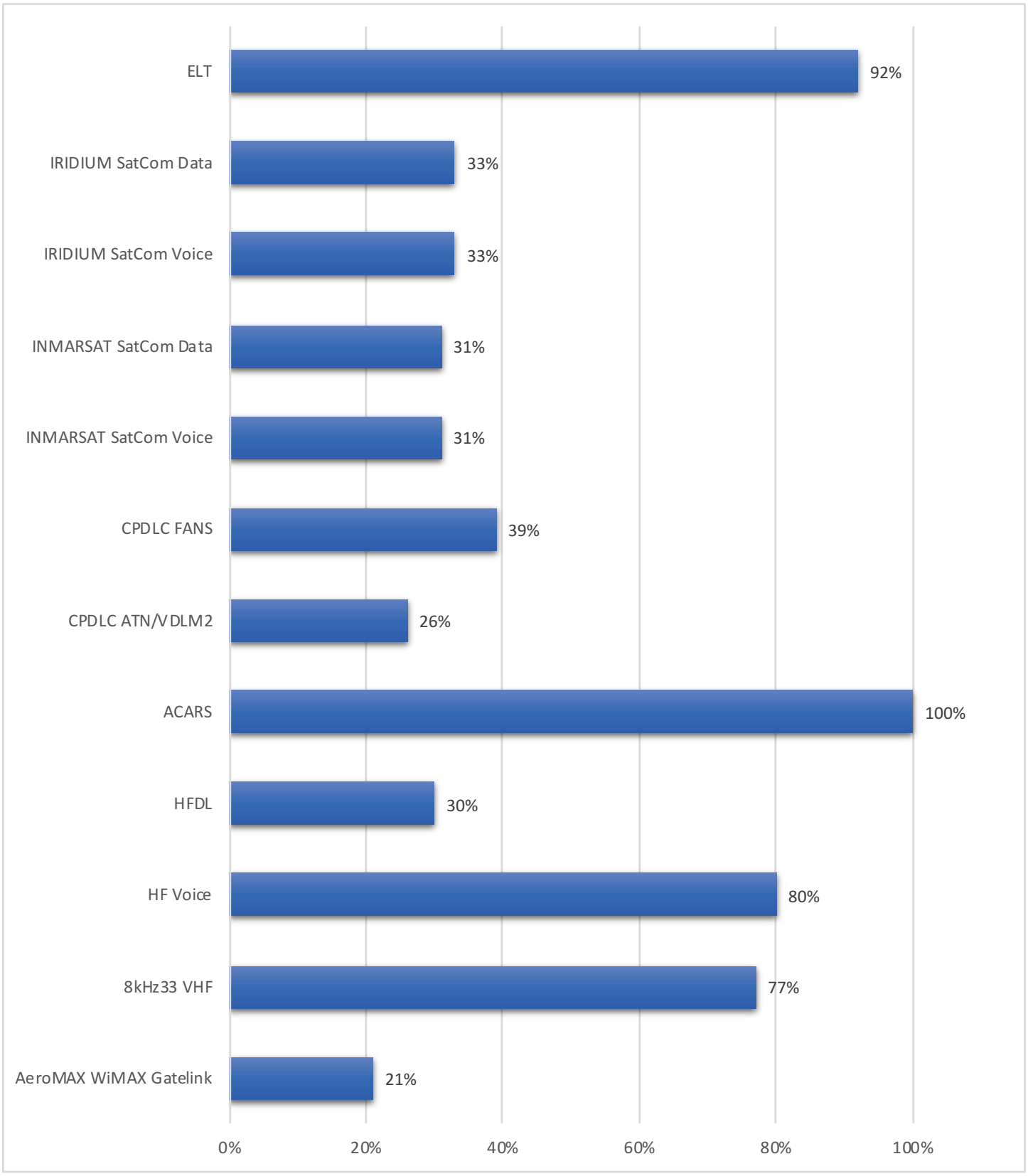
Antofagasta



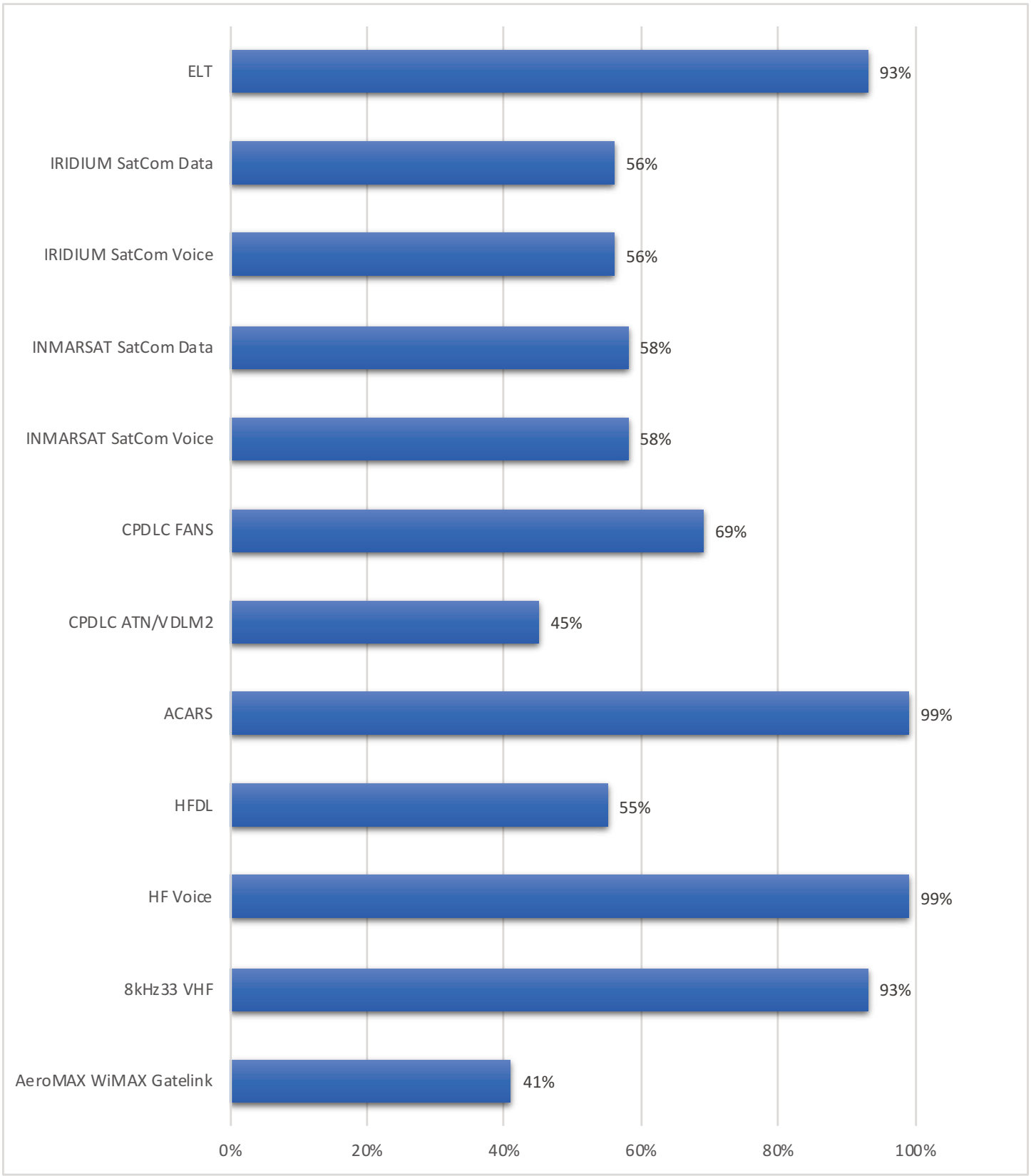
Asuncion


ELT
99%
IRIDIUM SatCom Data
82%
IRIDIUM SatCom Voice
70%
INMARSAT SatCom Data
35%
INMARSAT SatCom Voice
35%
CPDLC FANS
60%
CPDLC ATN/VDLM2
52%
ACARS
100%
HFDL
69%
HF Voice
100%
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
38%
0%
20%
40%
60%
80%
100%

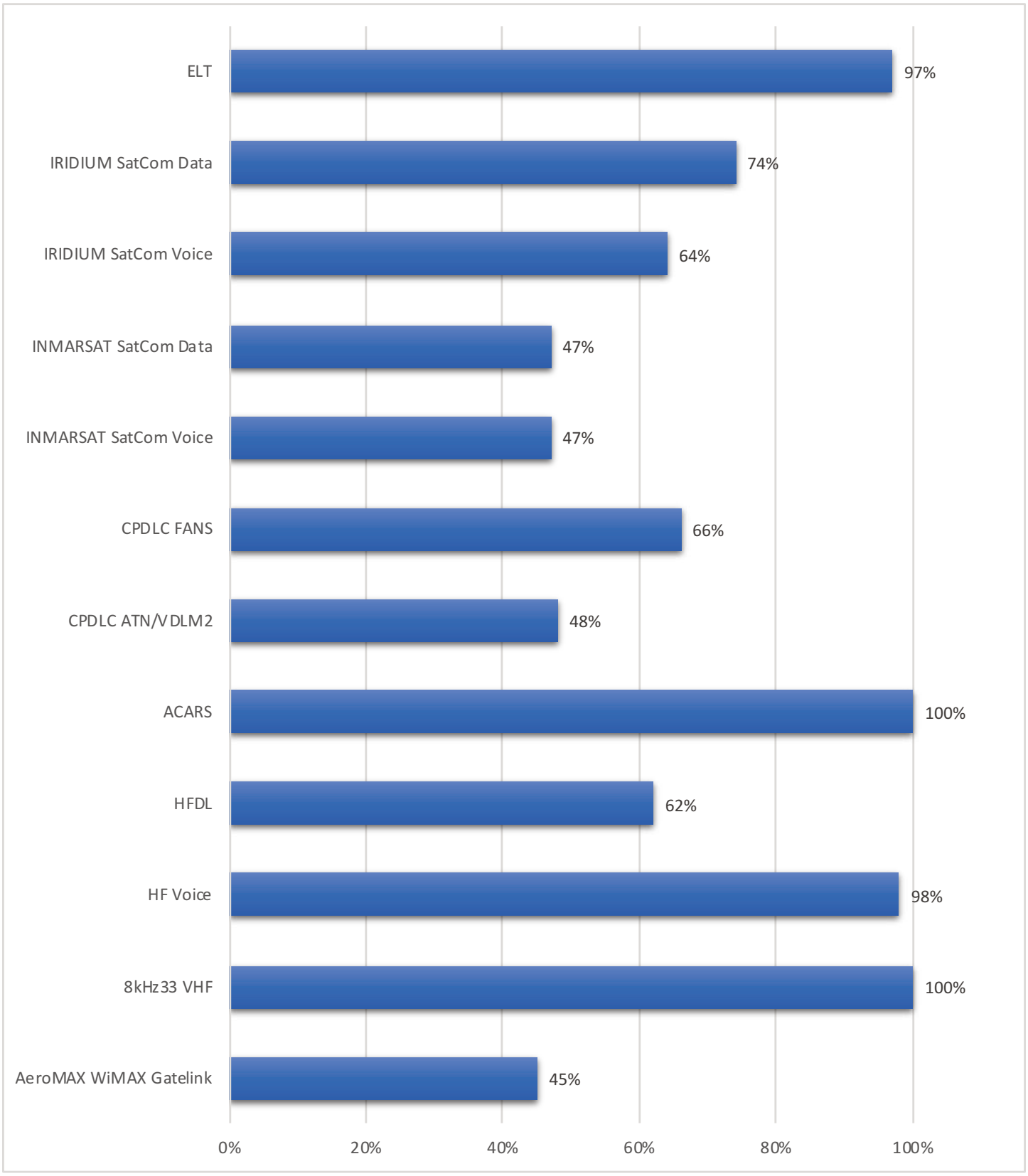
Atlanta


ELT
92%
IRIDIUM SatCom Data
33%
IRIDIUM SatCom Voice
33%
INMARSAT SatCom Data
31%
INMARSAT SatCom Voice
31%
CPDLC FANS
39%
CPDLC ATN/VDLM2
26%
ACARS
100%
HFDL
30%
HF Voice
80%
8kHz33 VHF
77%
AeroMAX WiMAX Gatelink
21%
0%
20%
40%
60%
80%
100%

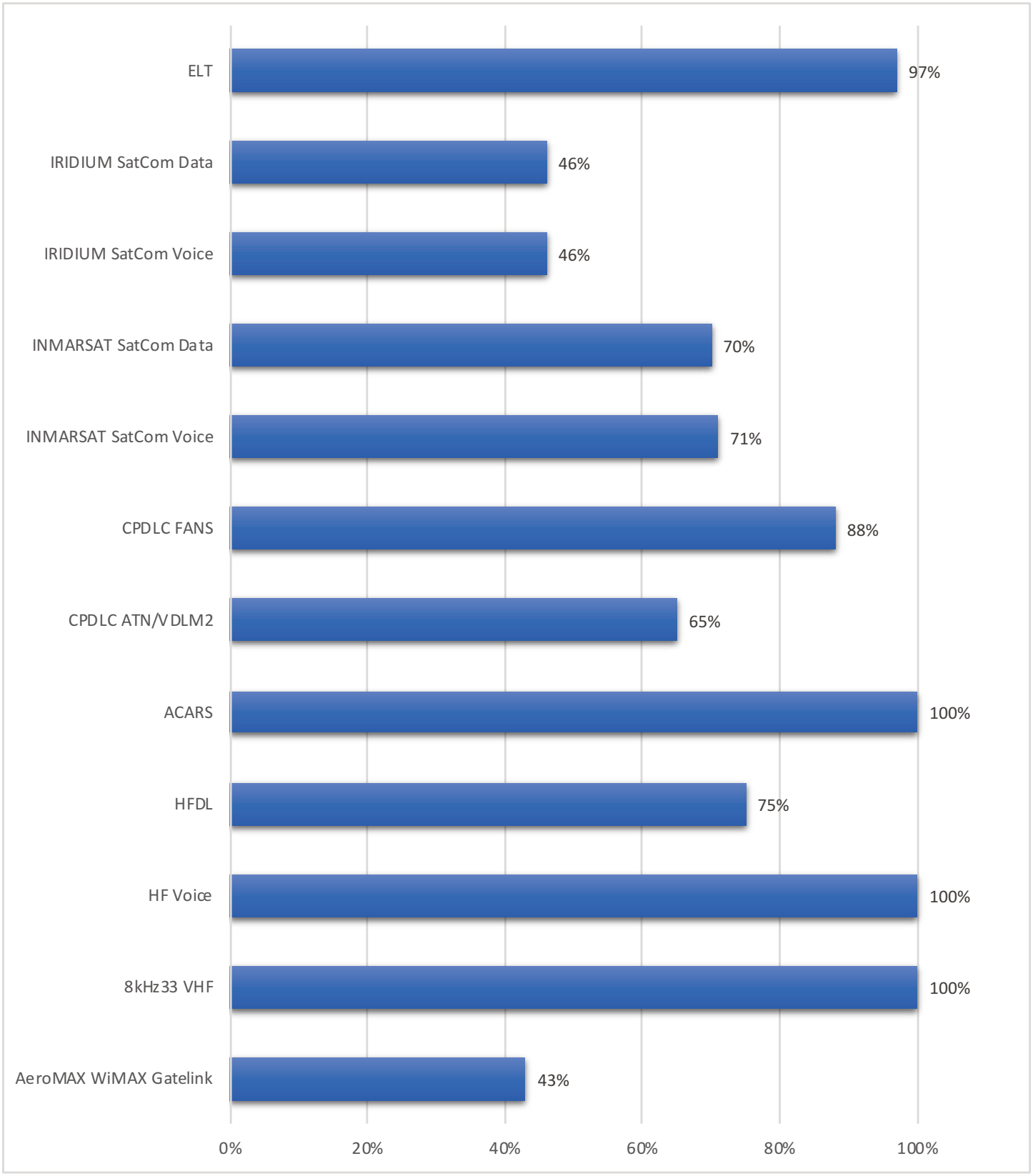
Atlantico Oceanic



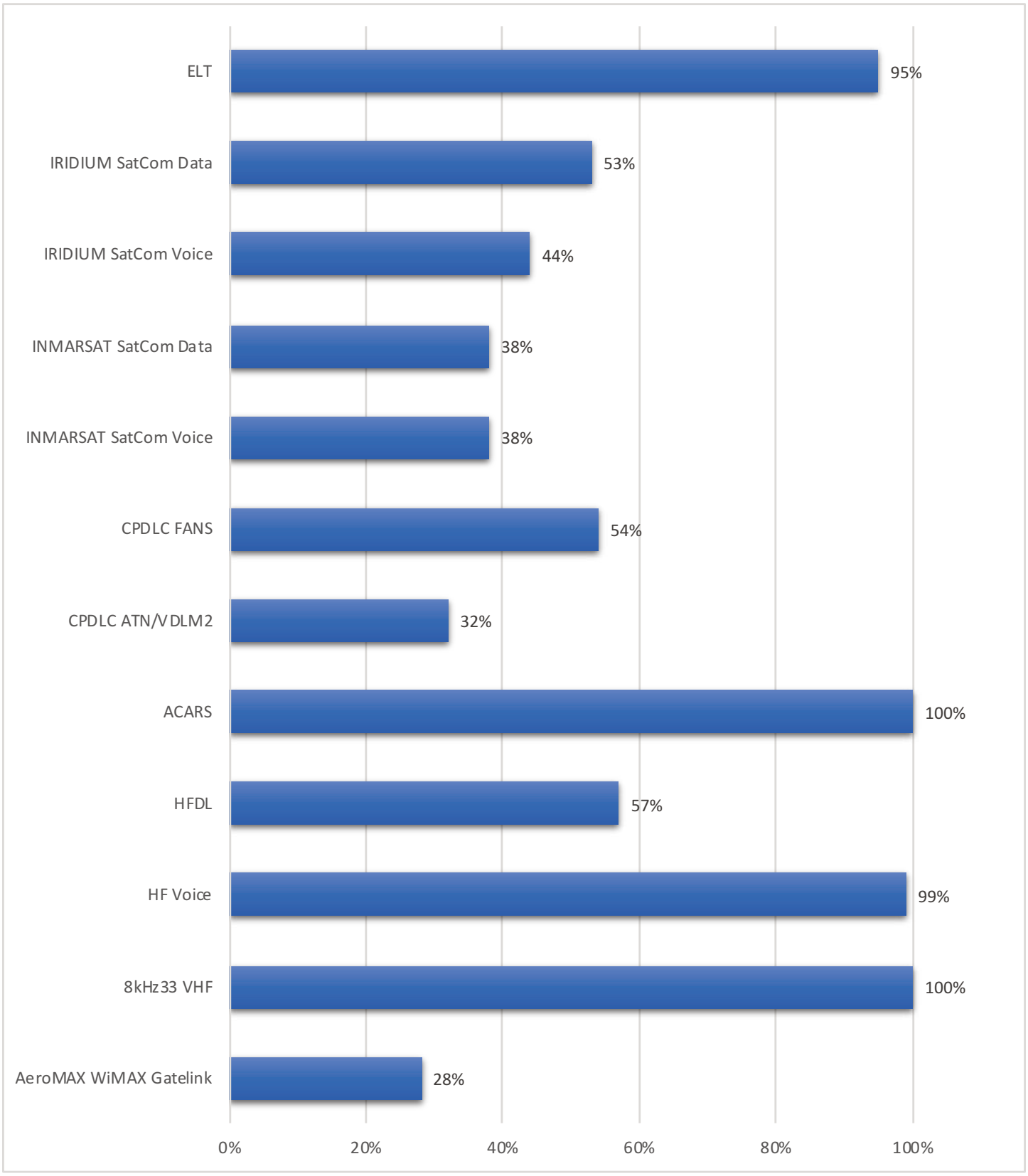
Barranquilla



Bodo Oceanic



Bogota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95%
IRIDIUM SatCom Data
53%
IRIDIUM SatCom Voice
44%
INMARSAT SatCom Data
38%
INMARSAT SatCom Voice
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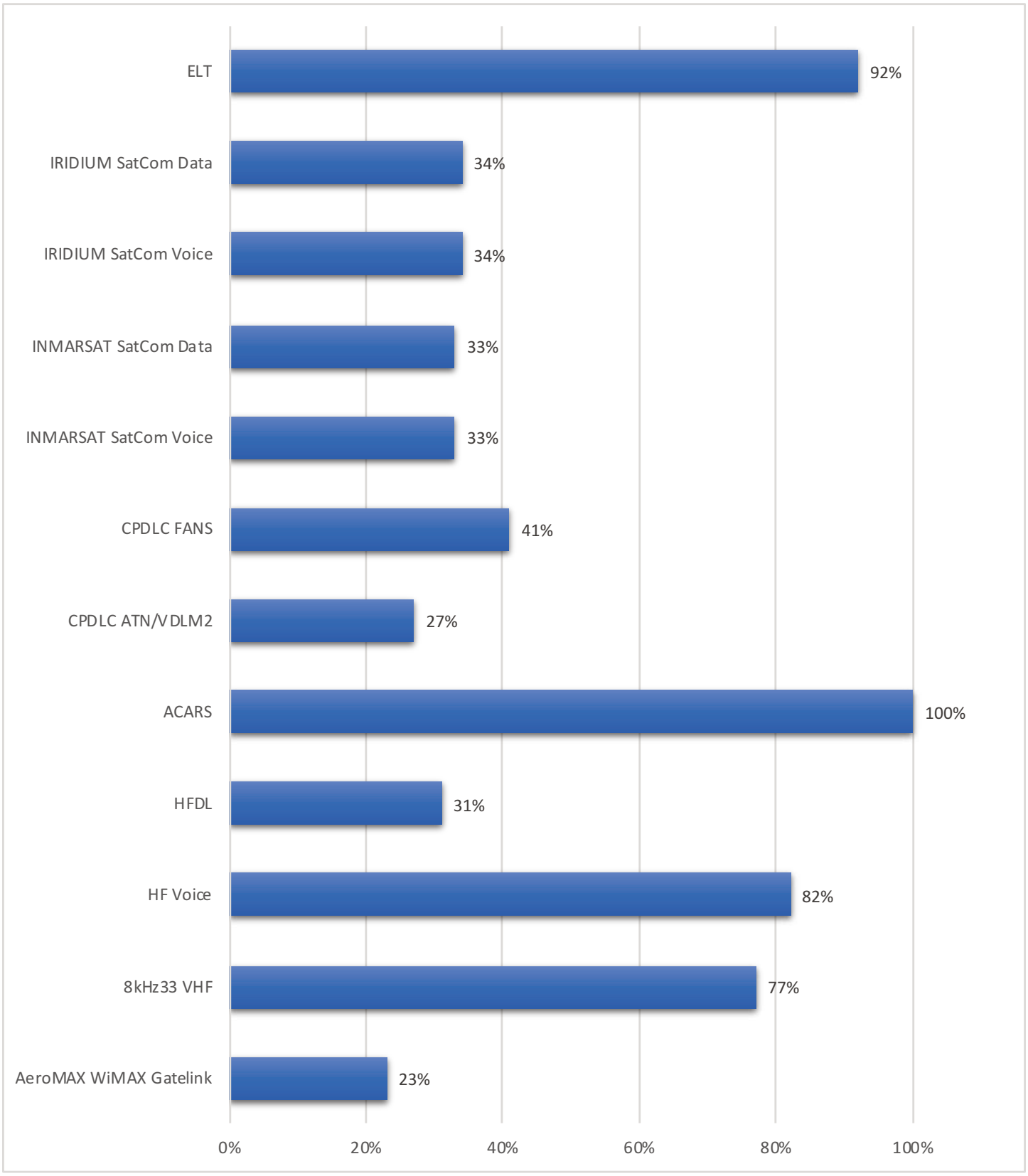
CPDLC FANS
54%
CPDLC ATN/VDLM2
32%
ACARS
100%
HFDL
57%
HF Voice
99%
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
28%
0%
20%
40%
60%
80%
100%

Boston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IRIDIUM SatCom Data
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IRIDIUM SatCom Voice
34%
INMARSAT SatCom Data
33%
INMARSAT SatCom Voice
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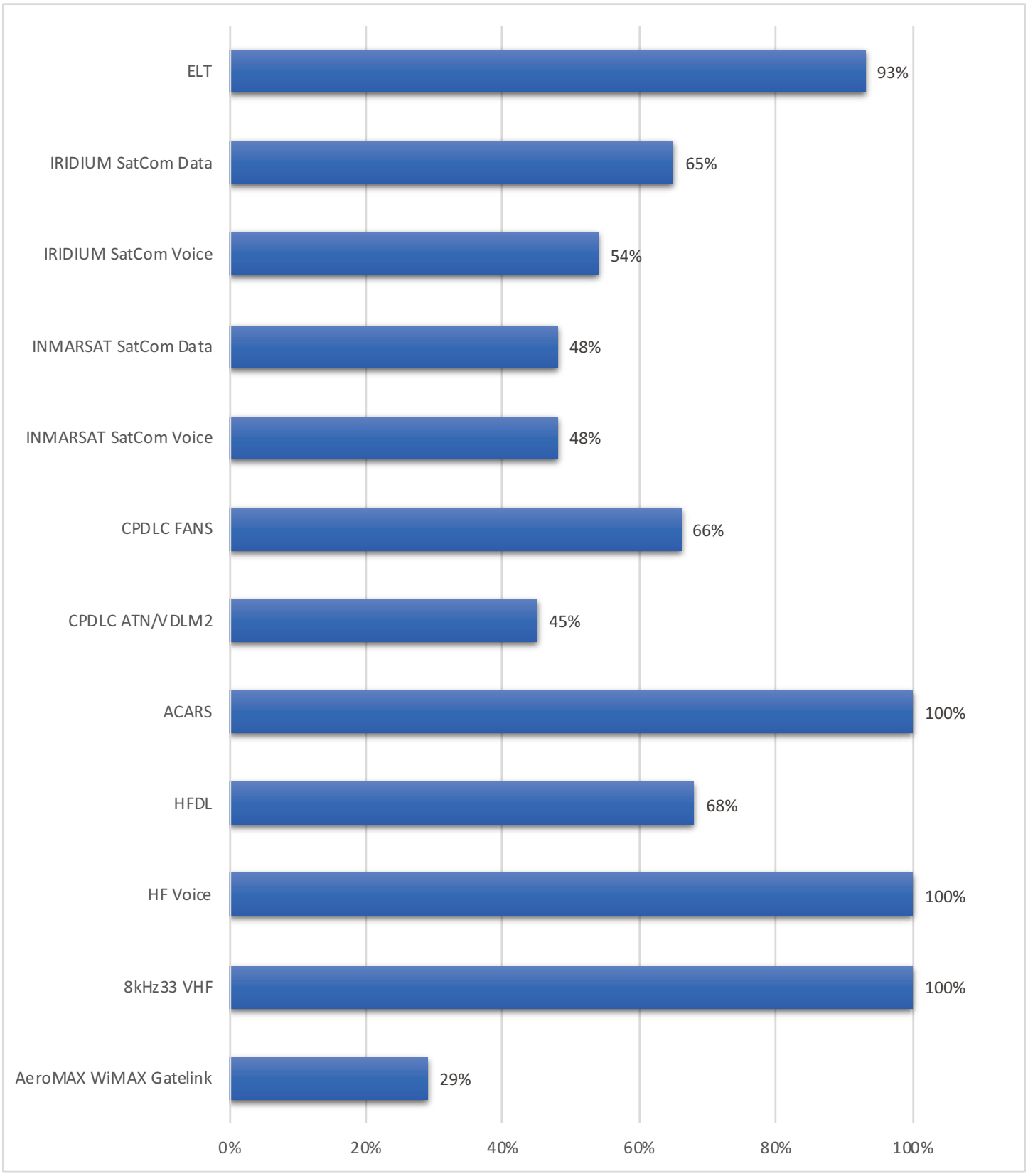
41%
CPDLC ATN/VDLM2
27%
ACARS
100%
HFDL
31%
HF Voice
82%
8kHz33 VHF
77%
AeroMAX WiMAX Gatelink
23%
0%
20%
40%
60%
80%
100%

Brasilia


ELT
93%
IRIDIUM SatCom Data
65%
IRIDIUM SatCom Voice
54%
INMARSAT SatCom Data
48%
INMARSAT SatCom Voice
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CPDLC FANS
66%
CPDLC ATN/VDLM2
45%
ACARS
100%
HFDL
68%
HF Voice
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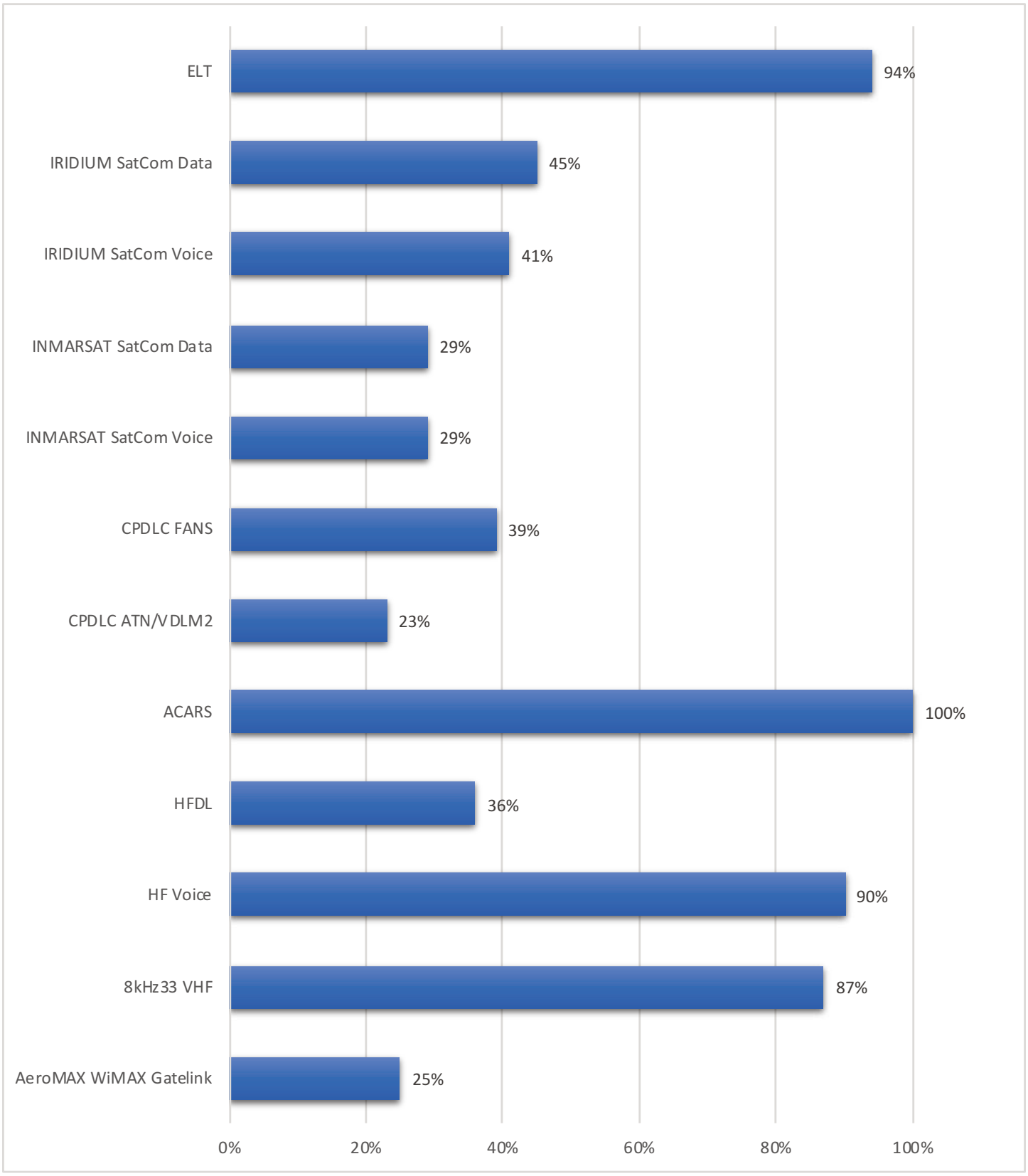
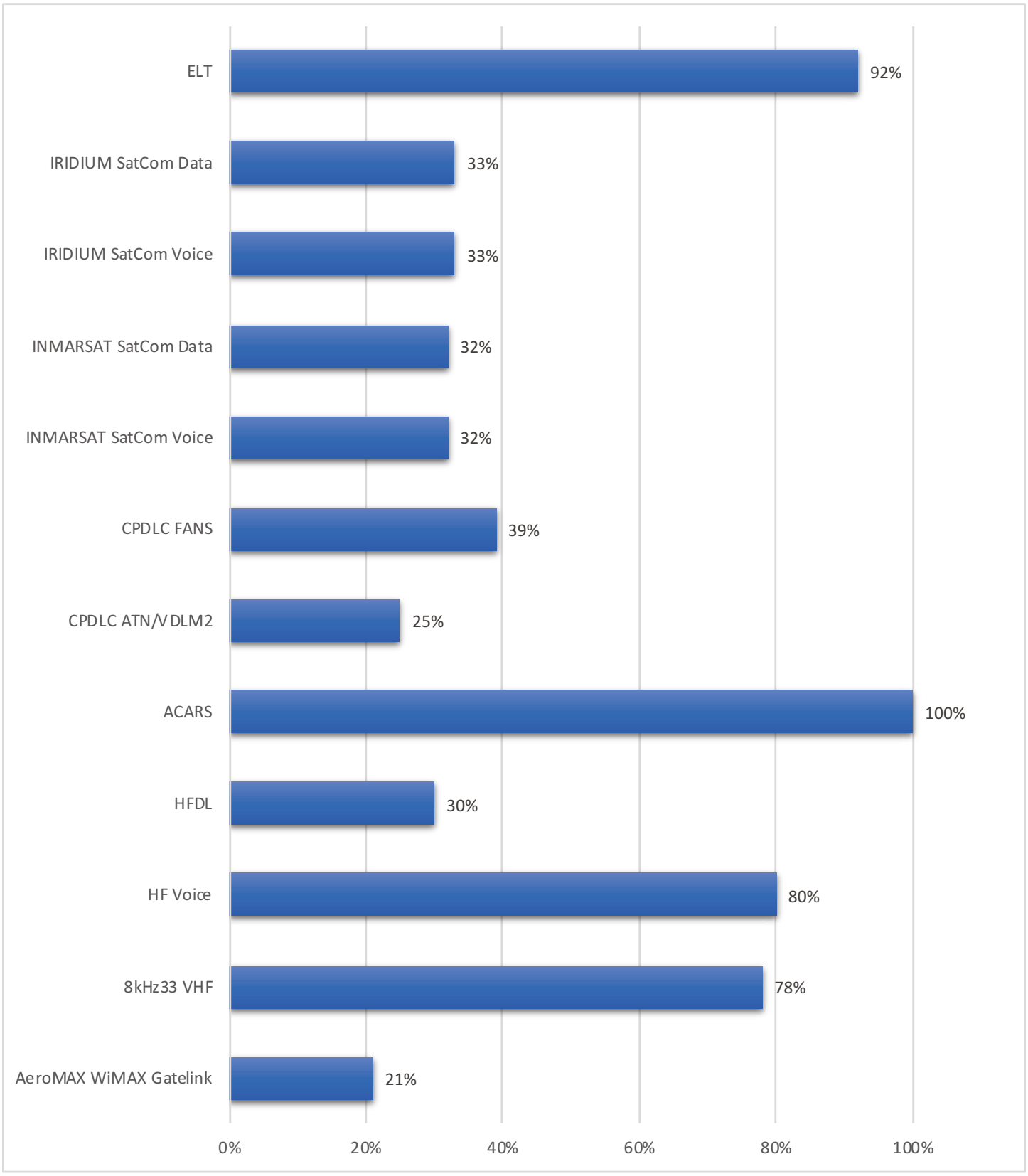
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
29%
0%
20%
40%
60%
80%
100%

Central America



Chicago


ELT
92%
IRIDIUM SatCom Data
33%
IRIDIUM SatCom Voice
33%
INMARSAT SatCom Data
32%
INMARSAT SatCom Voice
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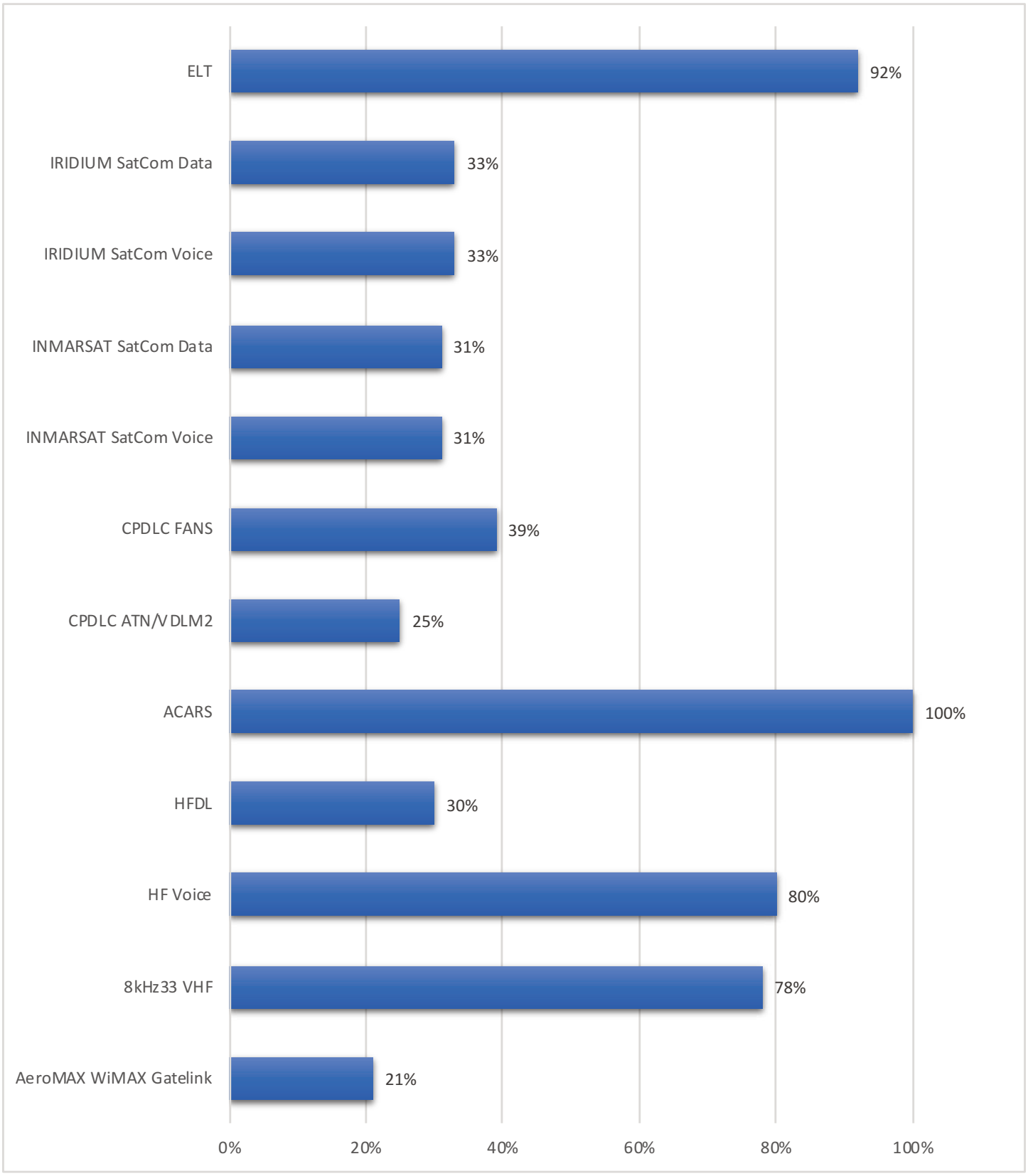
39%
CPDLC ATN/VDLM2
25%
ACARS
100%
HFDL
30%
HF Voice
80%
8kHz33 VHF
78%
AeroMAX WiMAX Gatelink
21%
0%
20%
40%
60%
80%
100%

Cleveland


ELT
92%
IRIDIUM SatCom Data
33%
IRIDIUM SatCom Voice
33%
INMARSAT SatCom Data
31%
INMARSAT SatCom Voice
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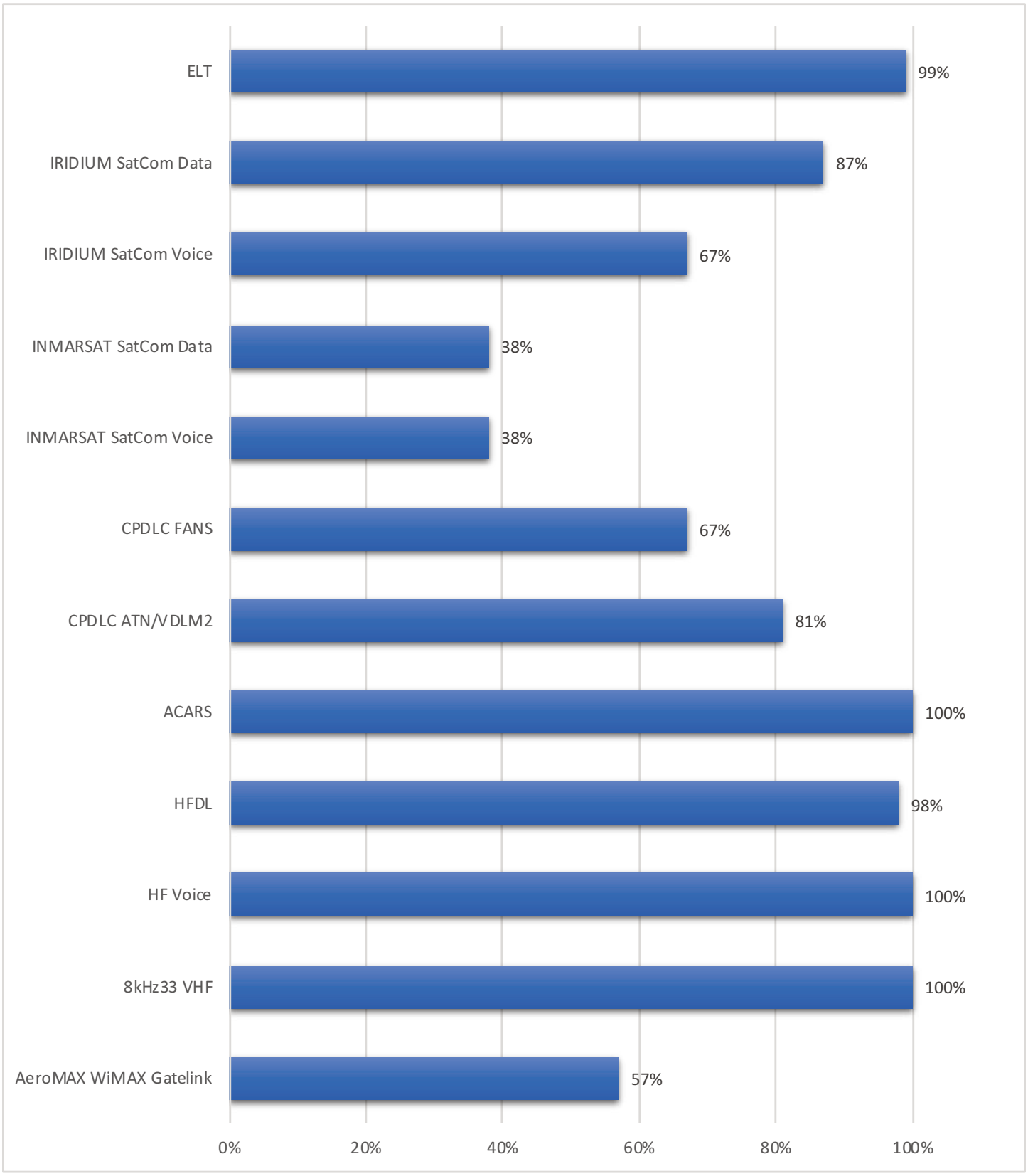
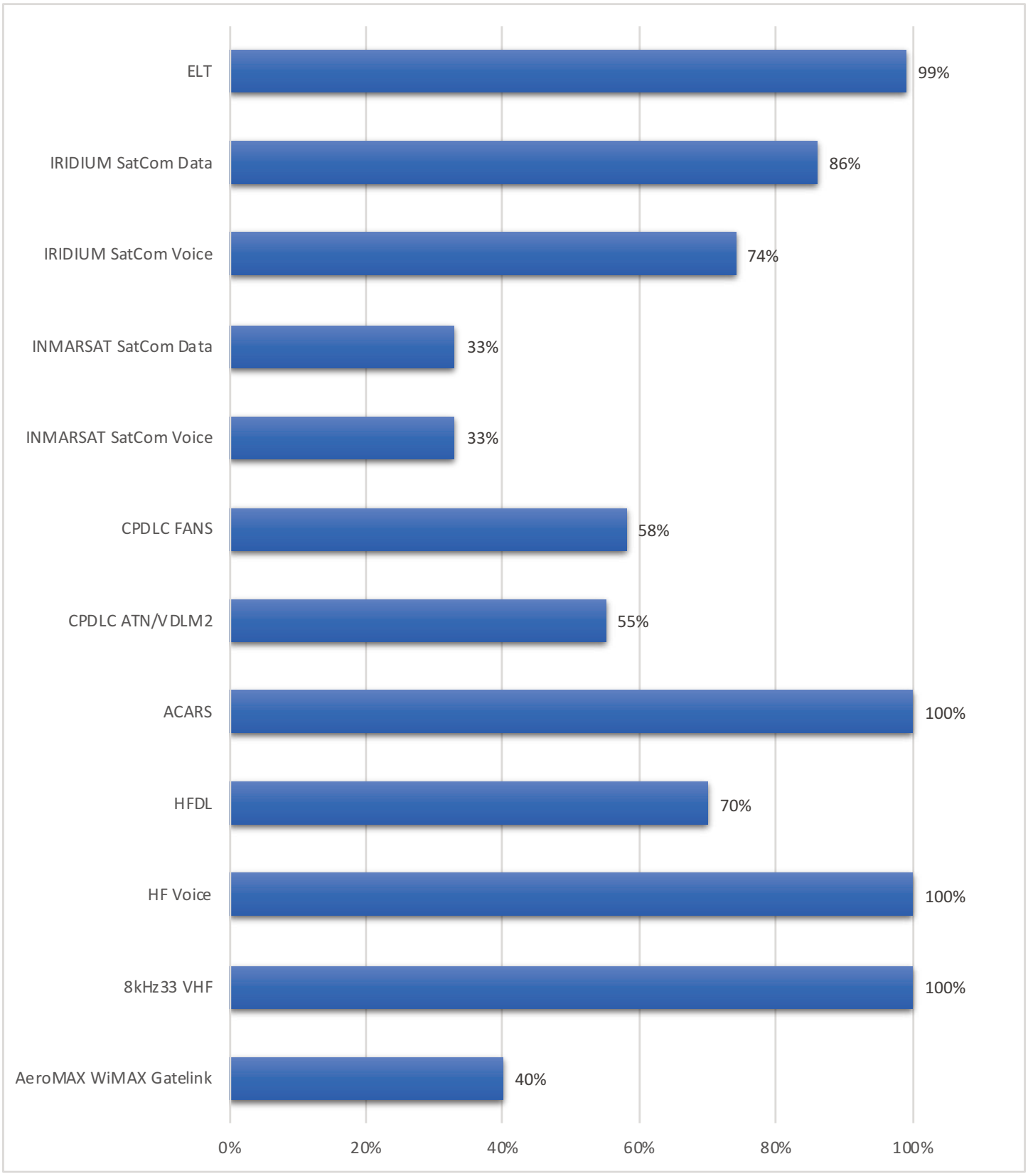
CPDLC FANS
39%
CPDLC ATN/VDLM2
25%
ACARS
100%
HFDL
30%
HF Voice
80%
8kHz33 VHF
78%
AeroMAX WiMAX Gatelink
21%
0%
20%
40%
60%
80%
100%

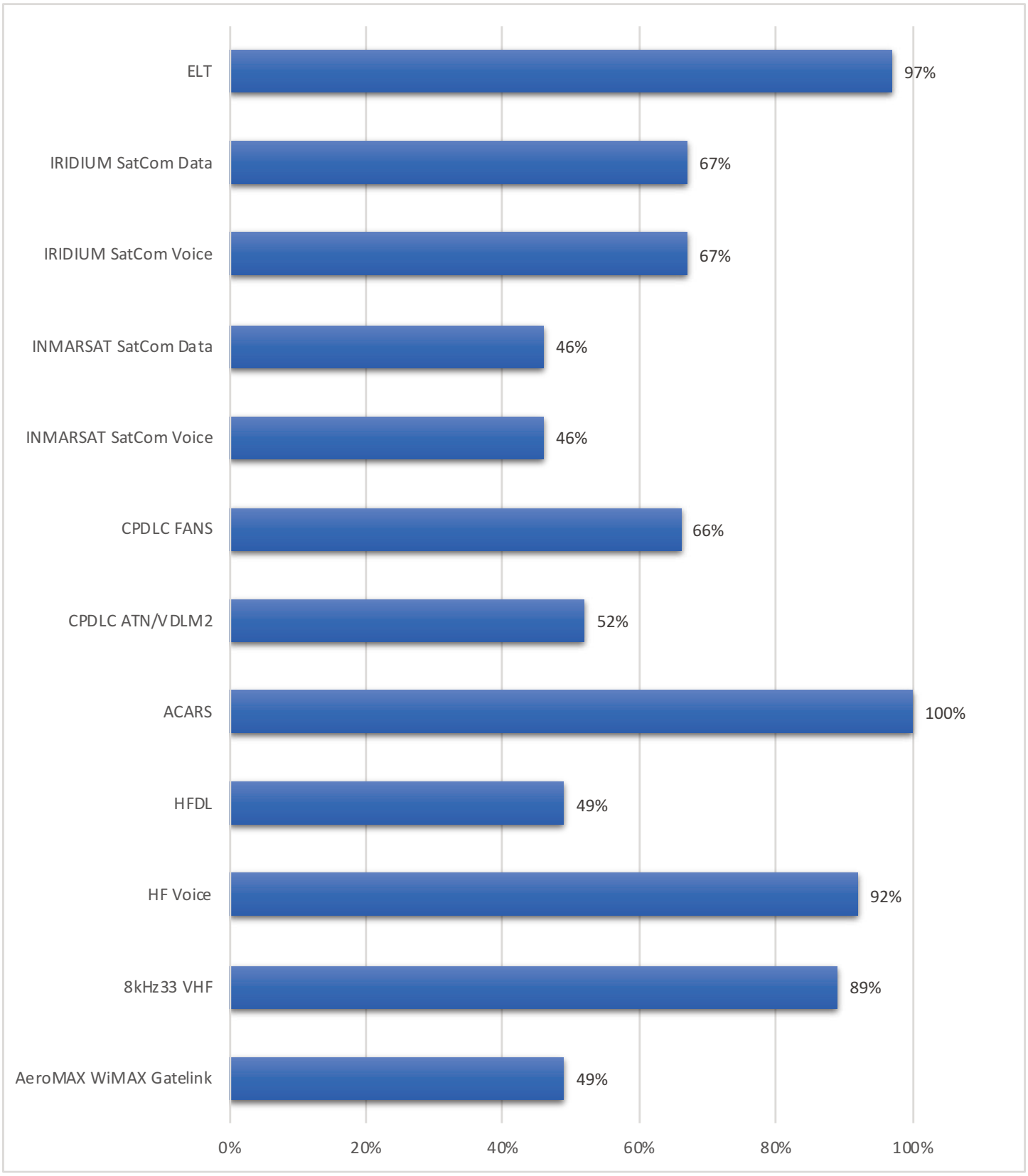
Comodoro Rivadavia



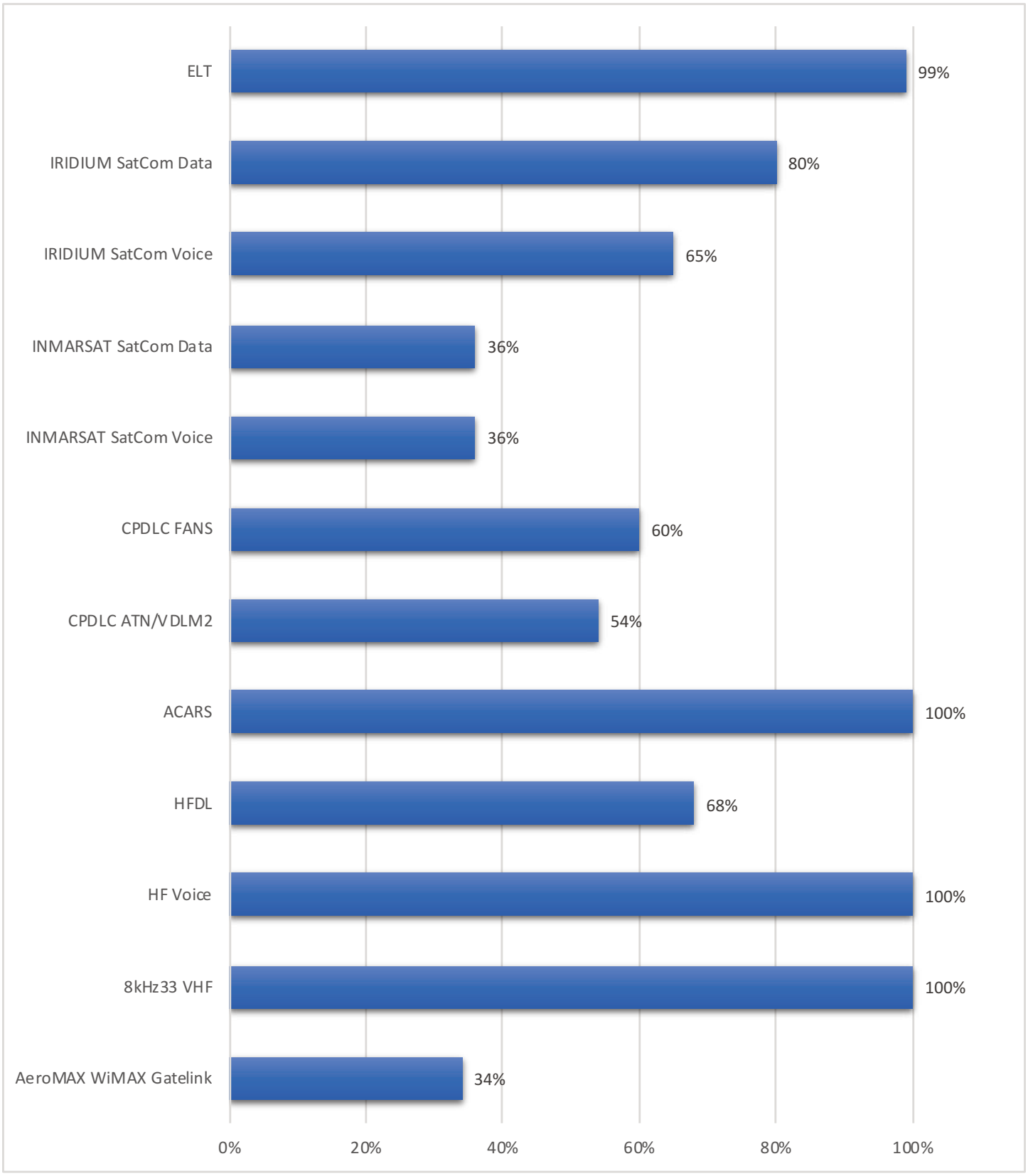
Cordoba


ELT
99%
IRIDIUM SatCom Data
86%
IRIDIUM SatCom Voice
74%
INMARSAT SatCom Data
33%
INMARSAT SatCom Voice
33%
CPDLC FANS
58%
CPDLC ATN/VDLM2
55%
ACARS
100%
HFDL
70%
HF Voice
100%
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
40%
0%
20%
40%
60%
80%
100%

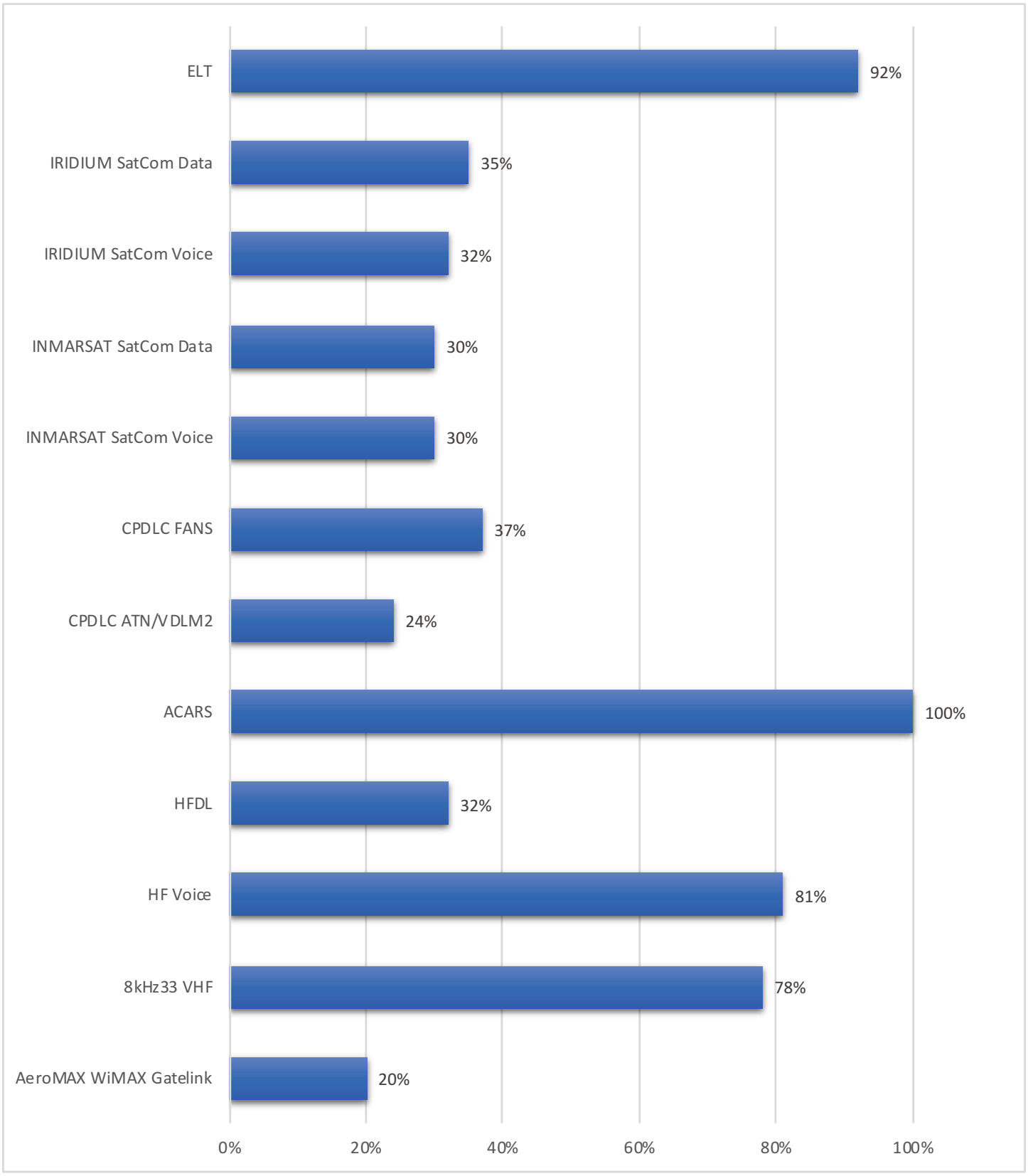
Curaco


ELT
97%
IRIDIUM SatCom Data
67%
IRIDIUM SatCom Voice
67%
INMARSAT SatCom Data
46%
INMARSAT SatCom Voice
46%
CPDLC FANS
66%
CPDLC ATN/VDLM2
52%
ACARS
100%
HFDL
49%
HF Voice
92%
8kHz33 VHF
89%
AeroMAX WiMAX Gatelink
49%
0%
20%
40%
60%
80%
100%

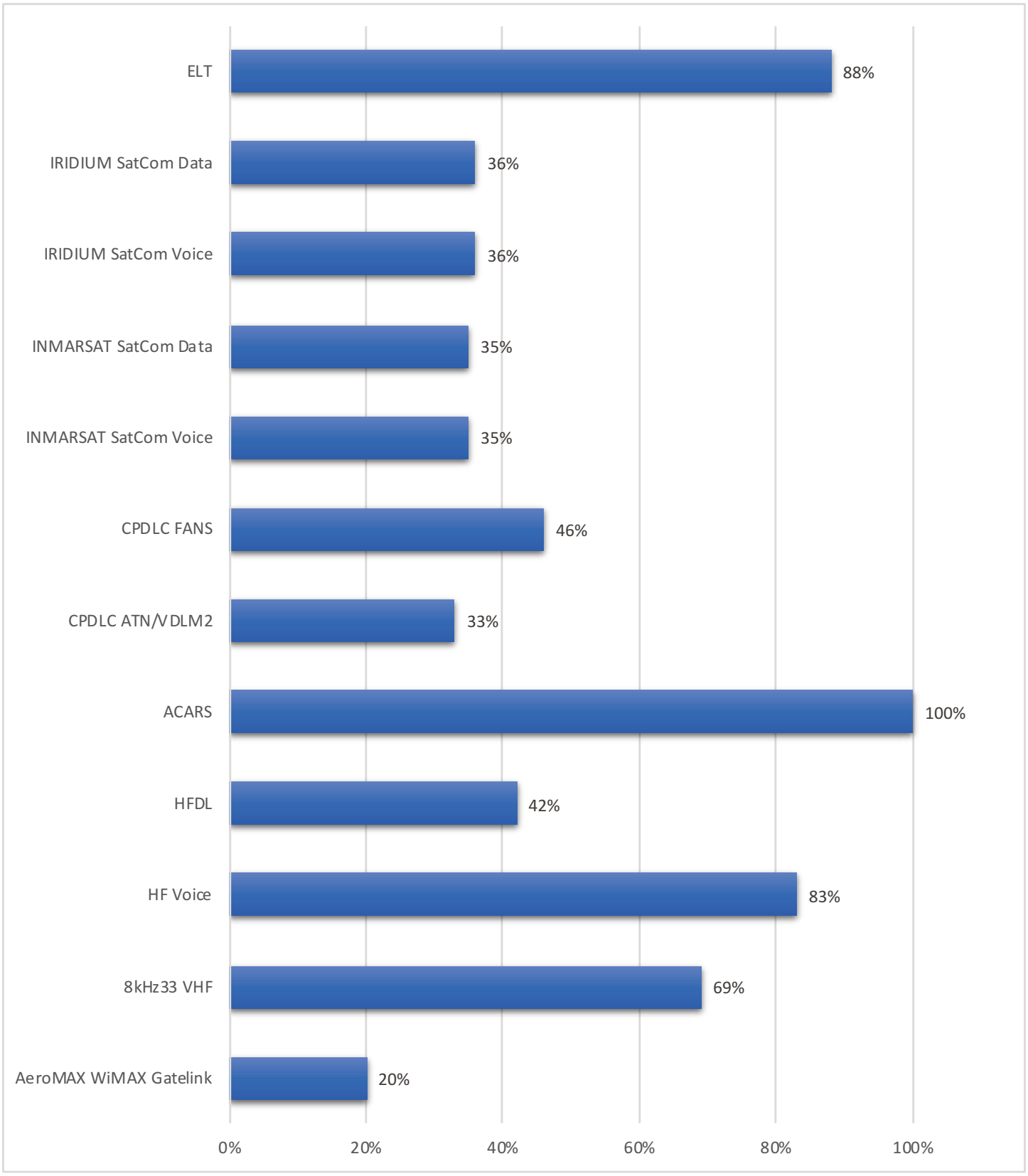
Curitiba


ELT
99%
IRIDIUM SatCom Data
80%
IRIDIUM SatCom Voice
65%
INMARSAT SatCom Data
36%
INMARSAT SatCom Voice
36%
CPDLC FANS
60%
CPDLC ATN/VDLM2
54%
ACARS
100%
HFDL
68%
HF Voice
100%
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
34%
0%
20%
40%
60%
80%
100%

Denver


ELT
92%
IRIDIUM SatCom Data
35%
IRIDIUM SatCom Voice
32%
INMARSAT SatCom Data
30%
INMARSAT SatCom Voice
30%
CPDLC FANS
37%
CPDLC ATN/VDLM2
24%
ACARS
100%
HFDL
32%
HF Voice
81%
8kHz33 VHF
78%
AeroMAX WiMAX Gatelink
20%
0%
20%
40%
60%
80%
100%

Edmonton


ELT
88%
IRIDIUM SatCom Data
36%
IRIDIUM SatCom Voice
36%
INMARSAT SatCom Data
35%
INMARSAT SatCom Voice
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CPDLC FANS
46%
CPDLC ATN/VDLM2
33%
ACARS
100%
HFDL
42%
HF Voice
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69%
AeroMAX WiMAX Gatelink
20%
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20%
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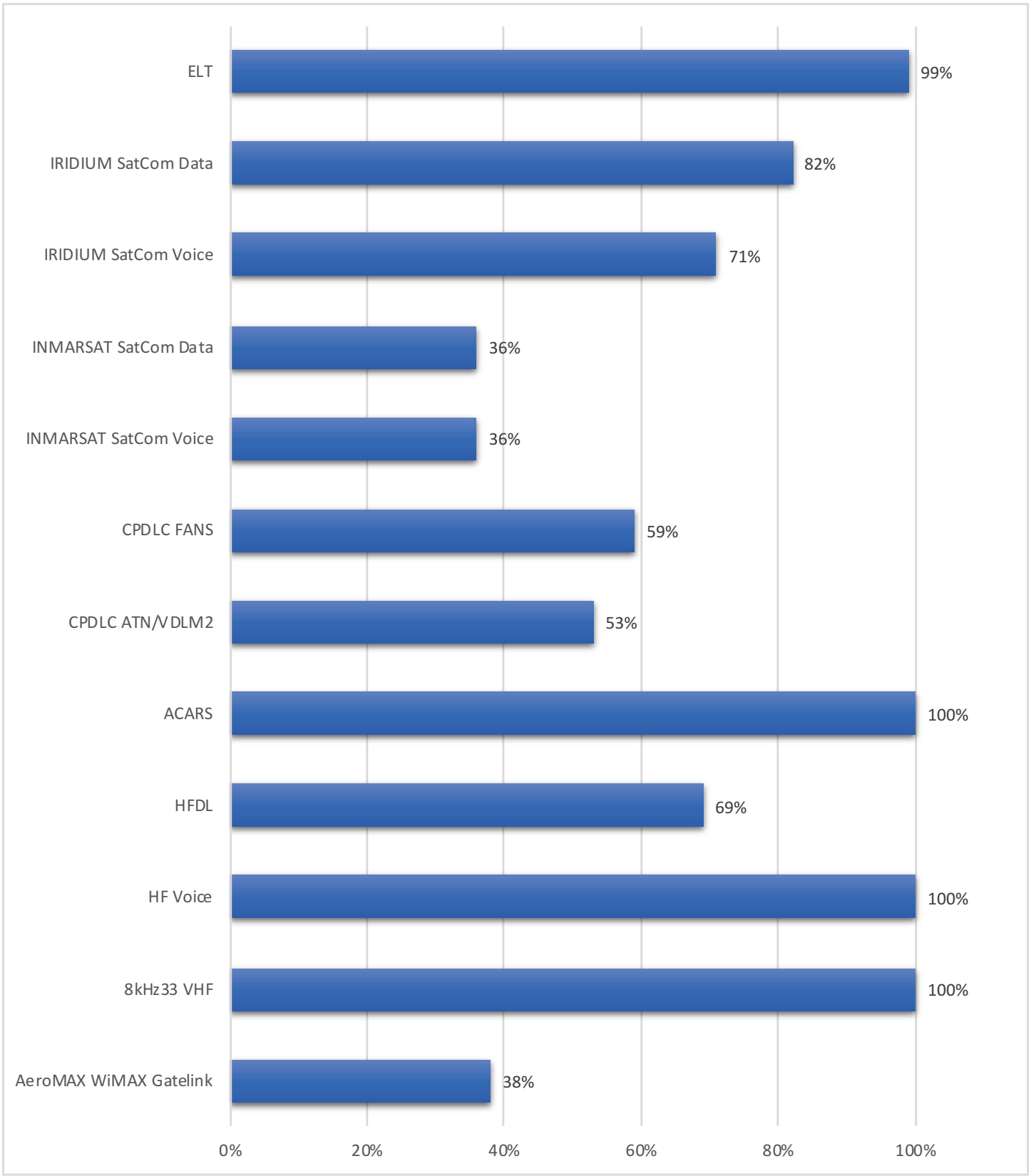
60%
80%
100%

Ezeiza


ELT
99%
IRIDIUM SatCom Data
82%
IRIDIUM SatCom Voice
71%
INMARSAT SatCom Data
36%
INMARSAT SatCom Voice
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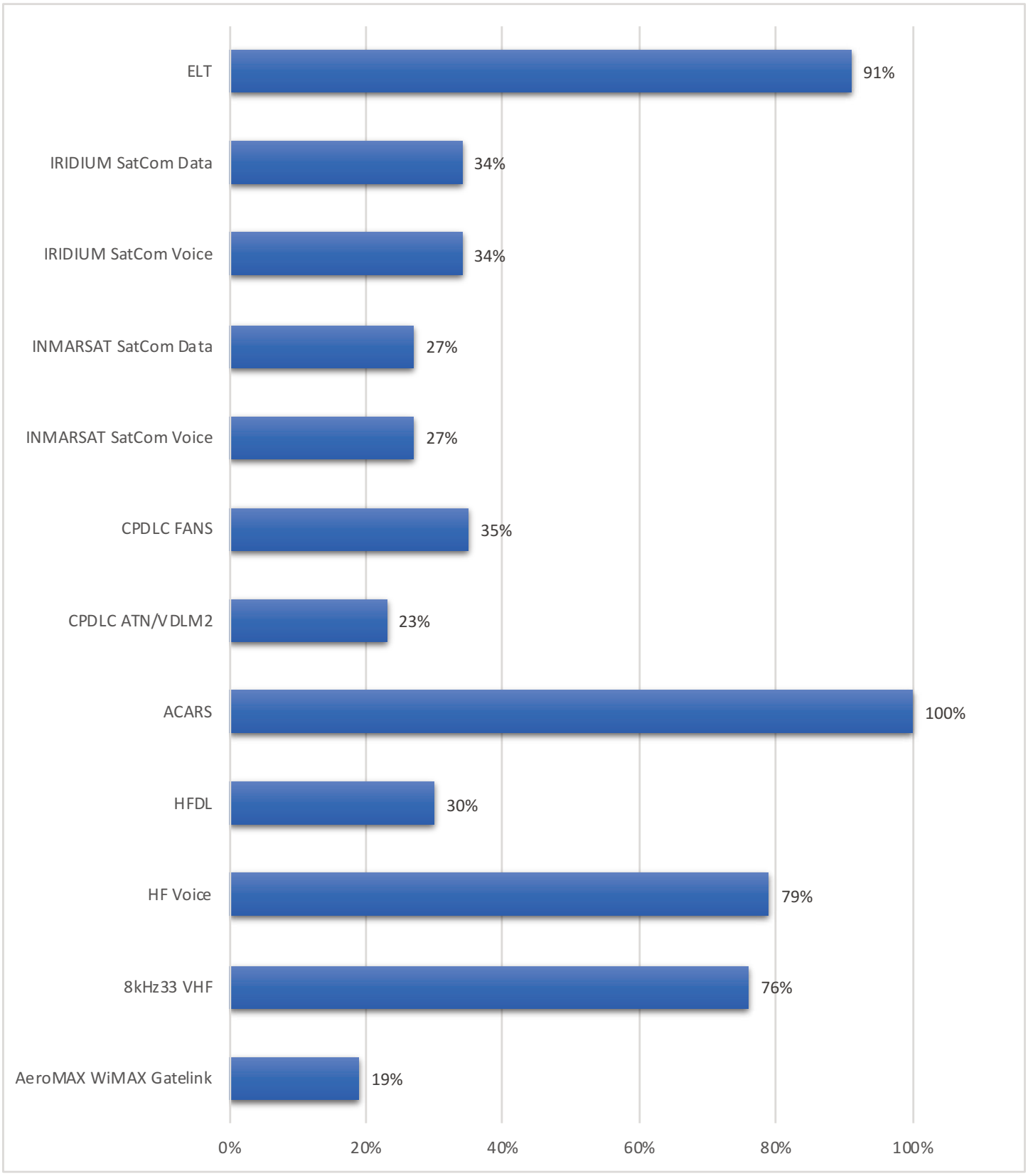
CPDLC FANS
59%
CPDLC ATN/VDLM2
53%
ACARS
100%
HFDL
69%
HF Voice
100%
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
38%
0%
20%
40%
60%
80%
100%

Fort Worth


ELT
91%
IRIDIUM SatCom Data
34%
IRIDIUM SatCom Voice
34%
INMARSAT SatCom Data
27%
INMARSAT SatCom Voice
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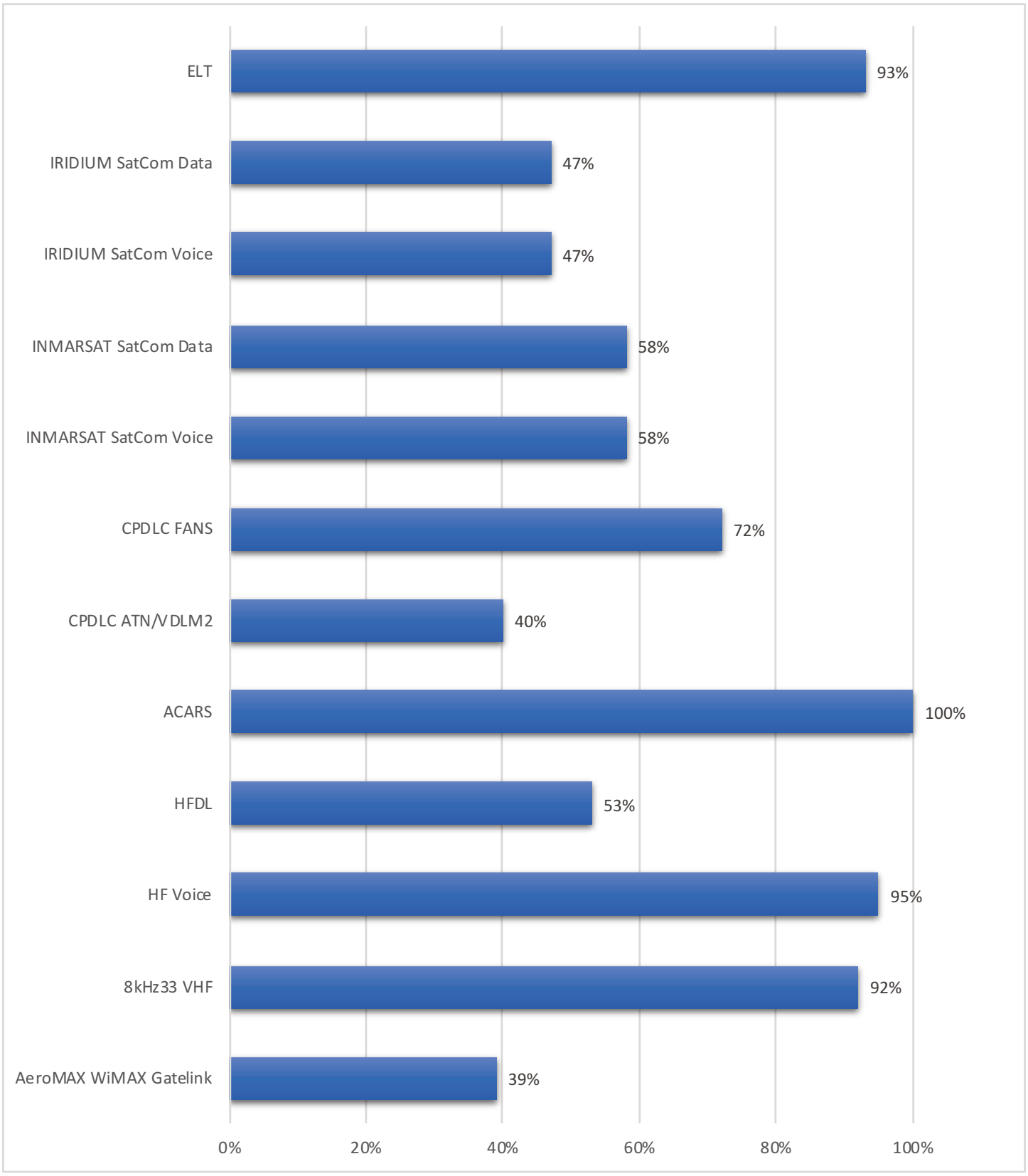
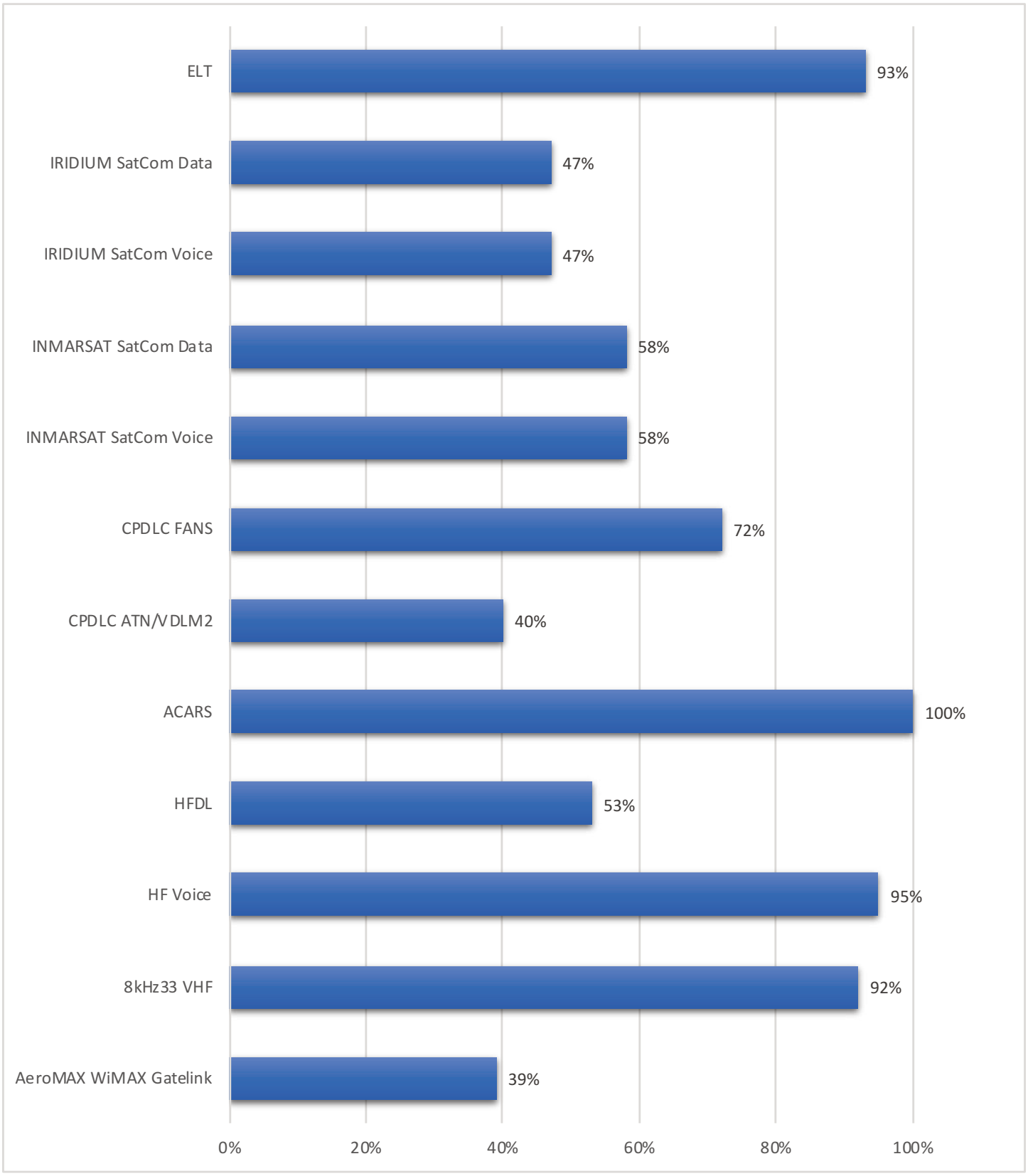
CPDLC FANS
35%
CPDLC ATN/VDLM2
23%
ACARS
100%
HFDL
30%
HF Voice
79%
8kHz33 VHF
76%
AeroMAX WiMAX Gatelink
19%
0%
20%
40%
60%
80%
100%

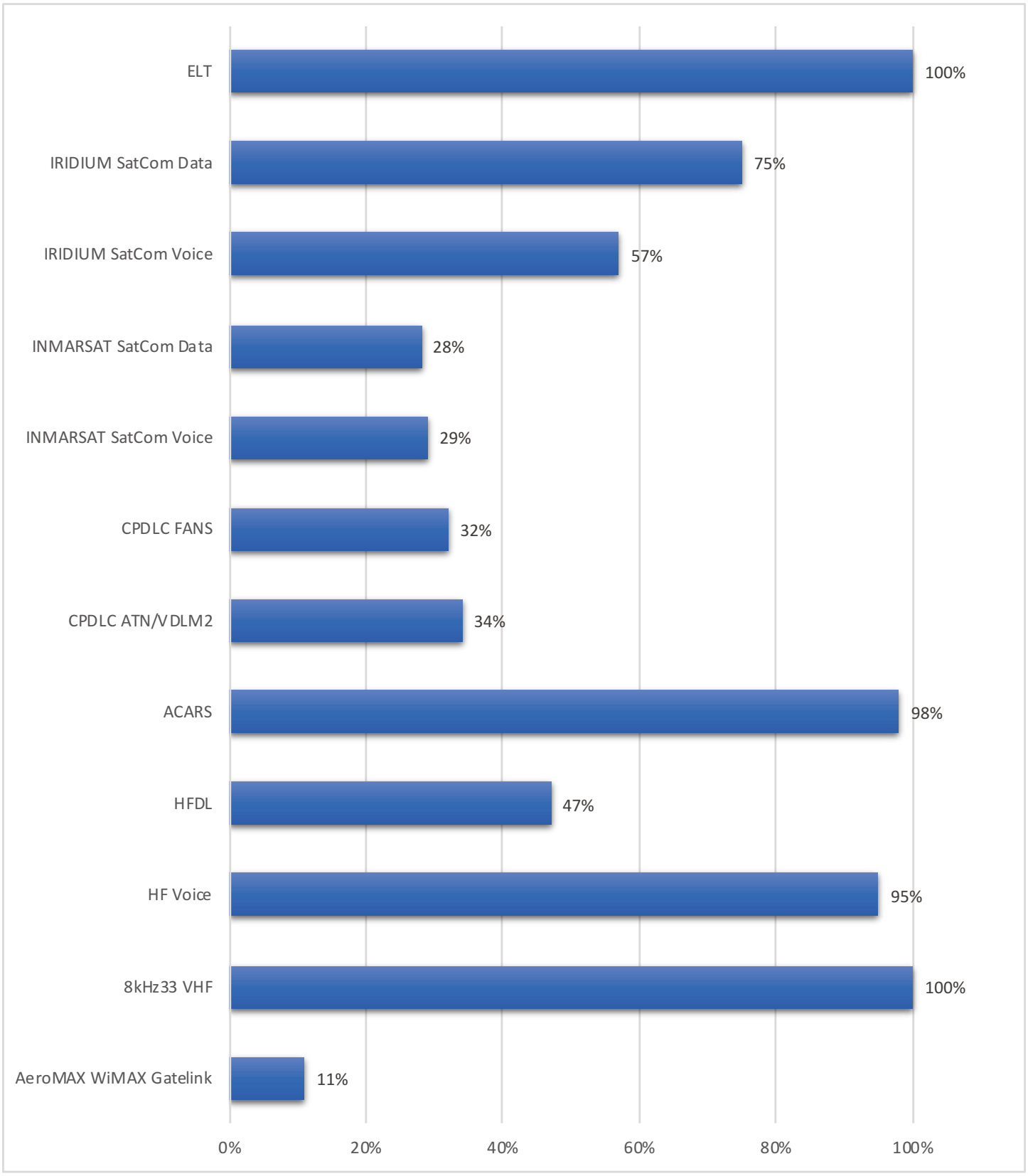
Gander Domestic



Gander Oceanic



Georgetown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IRIDIUM SatCom Voice
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INMARSAT SatCom Data
28%
INMARSAT SatCom Voice
29%
CPDLC FANS
32%
CPDLC ATN/VDLM2
34%
ACARS
98%
HFDL
47%
HF Voice
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100%
AeroMAX WiMAX Gatelink
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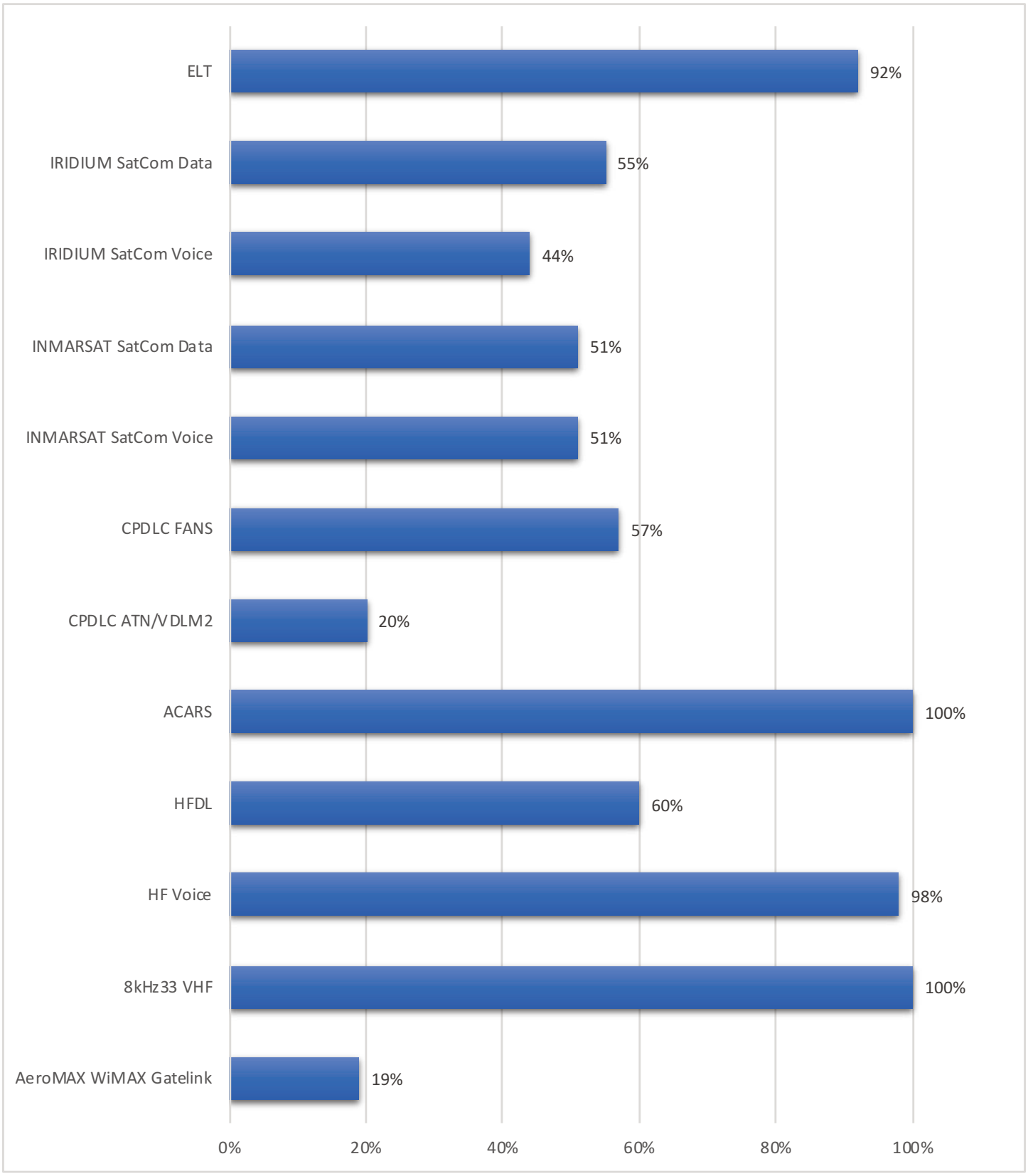
20%
40%
60%
80%
100%

Guayaquil


ELT
92%
IRIDIUM SatCom Data
55%
IRIDIUM SatCom Voice
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INMARSAT SatCom Data
51%
INMARSAT SatCom Voice
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CPDLC FANS
57%
CPDLC ATN/VDLM2
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ACARS
100%
HFDL
60%
HF Voice
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100%
AeroMAX WiMAX Gatelink
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20%
40%
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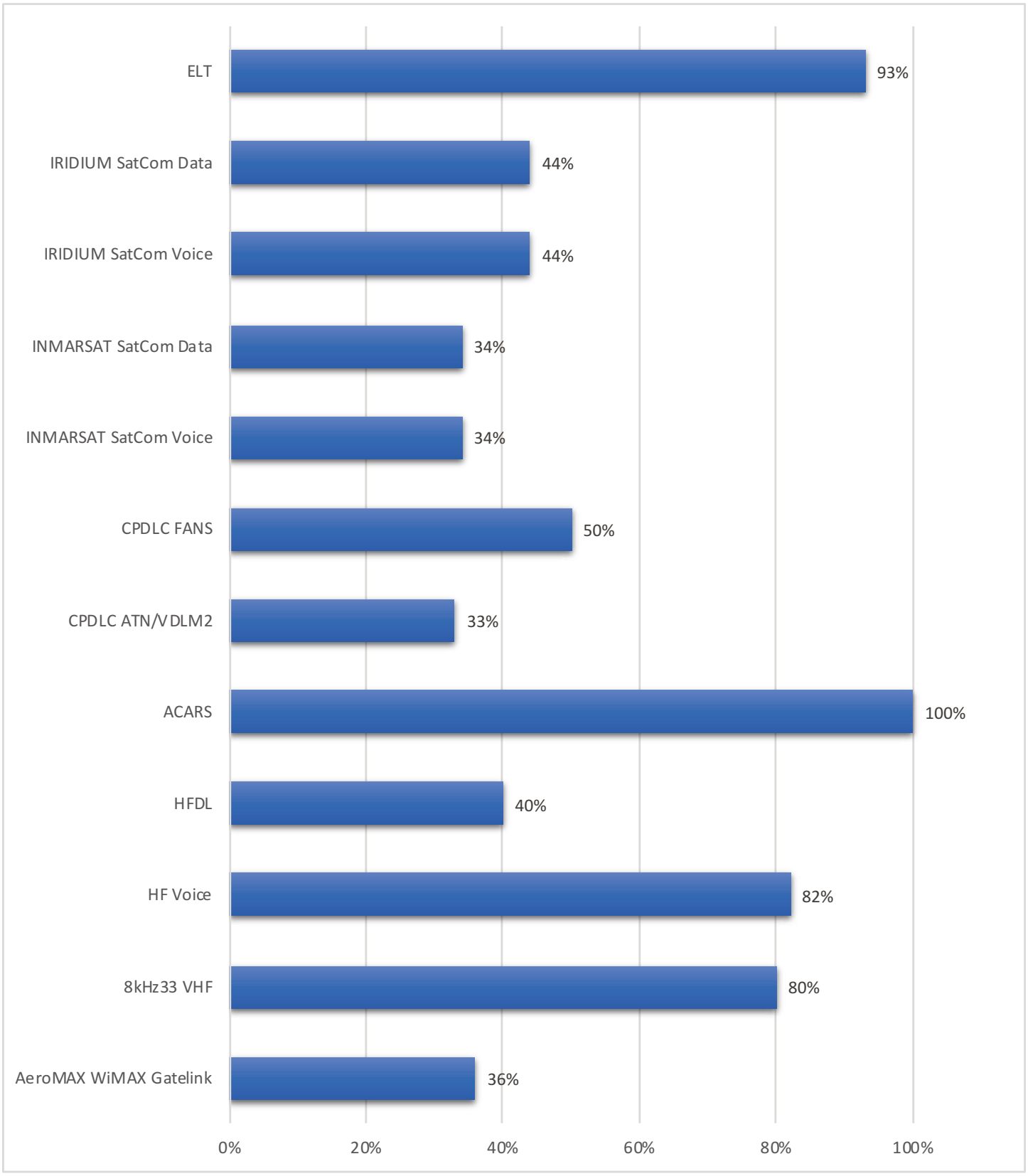
80%
100%

Habana


ELT
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IRIDIUM SatCom Data
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IRIDIUM SatCom Voice
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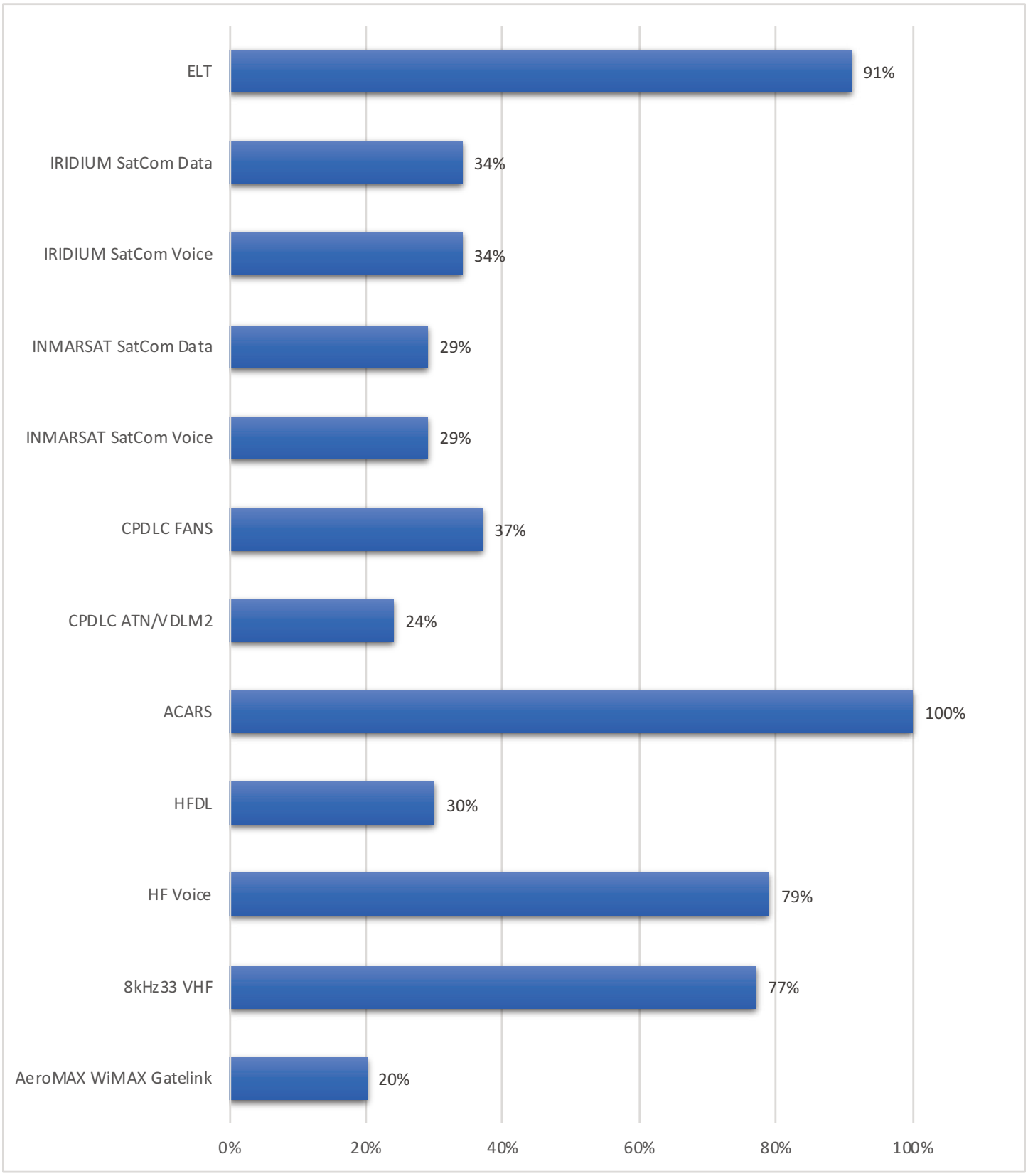
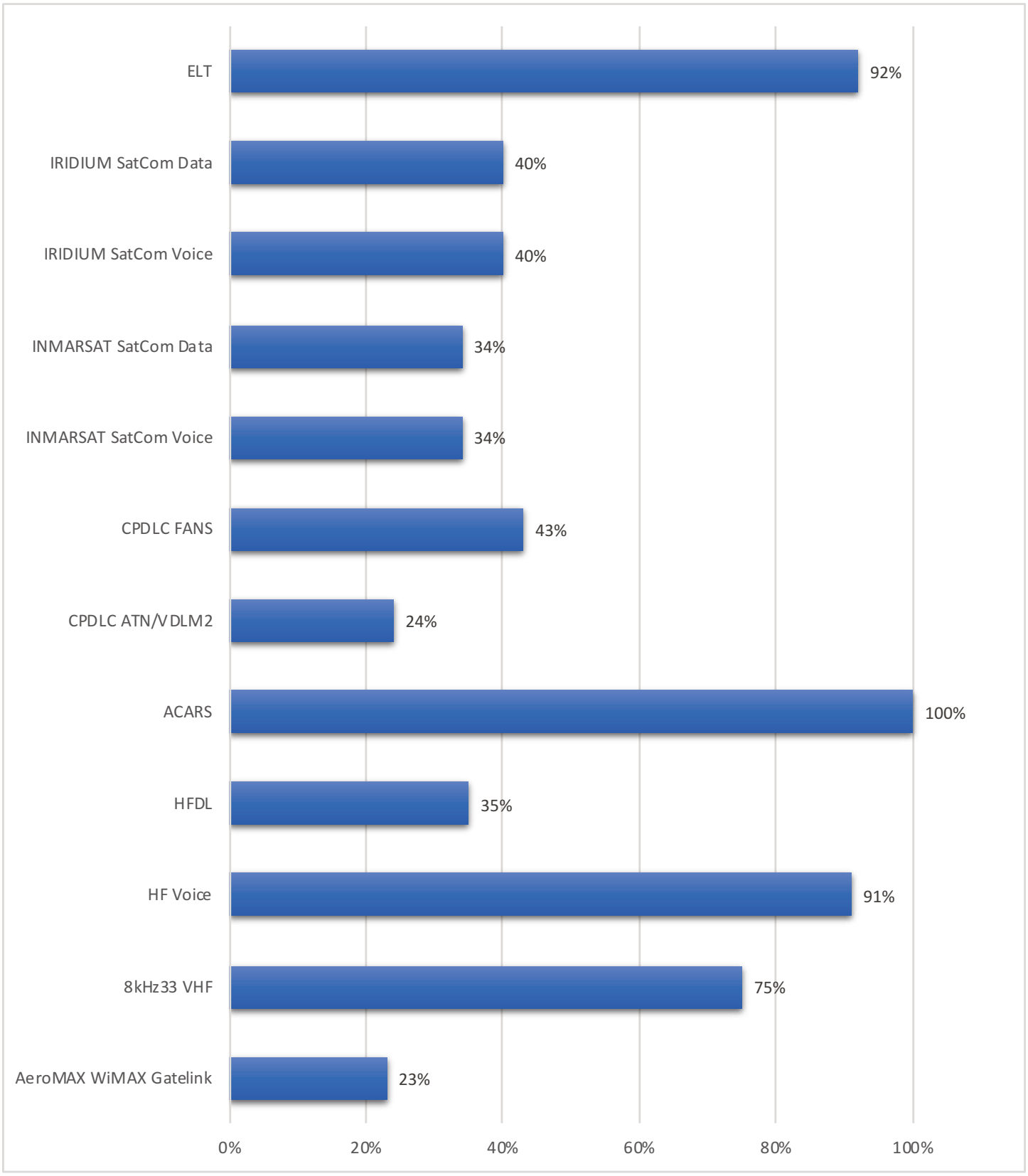
INMARSAT SatCom Data
34%
INMARSAT SatCom Voice
34%
CPDLC FANS
50%
CPDLC ATN/VDLM2
33%
ACARS
100%
HFDL
40%
HF Voice
82%
8kHz33 VHF
80%
AeroMAX WiMAX Gatelink
36%
0%
20%
40%
60%
80%
100%

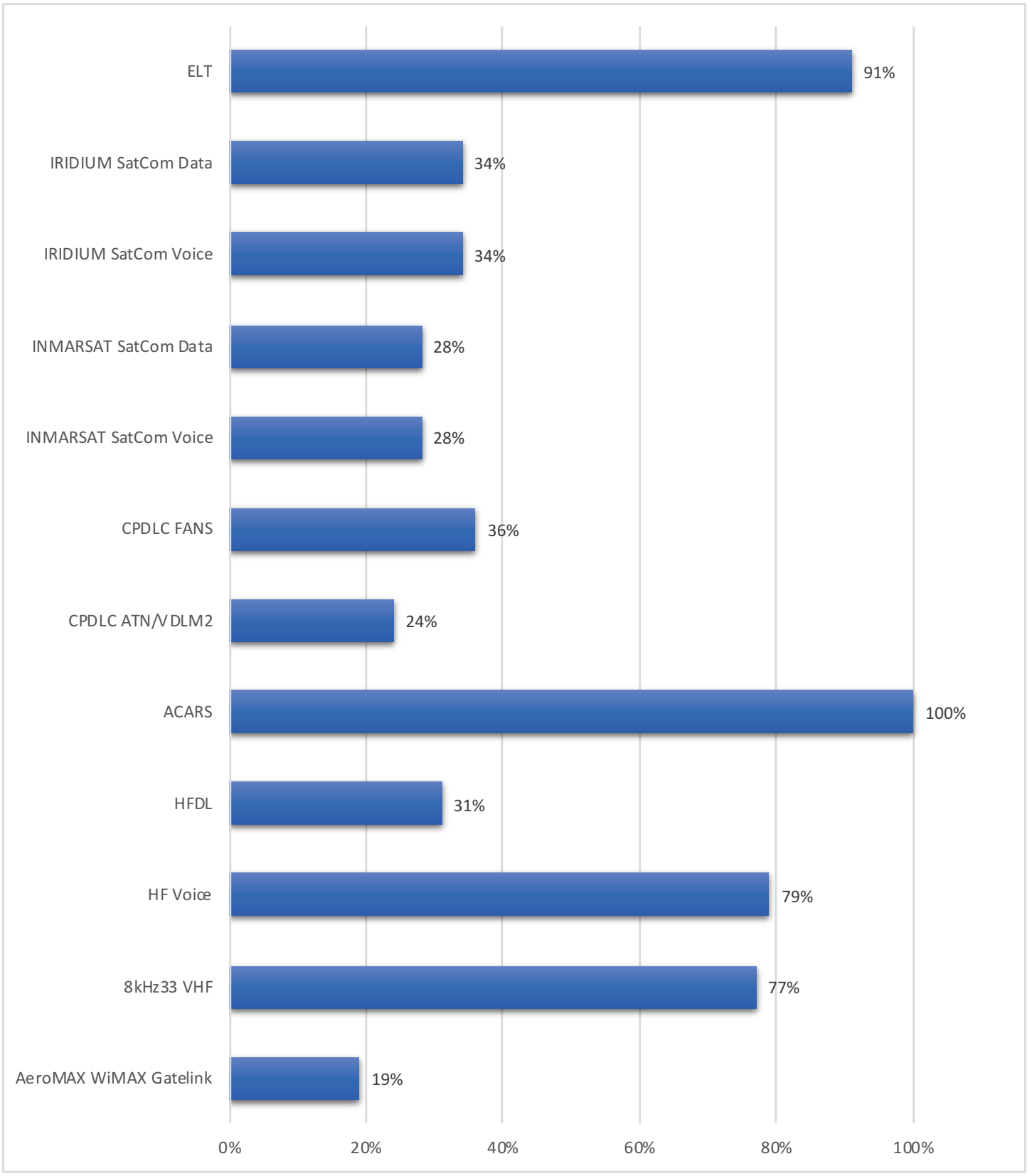
Houston Domestic



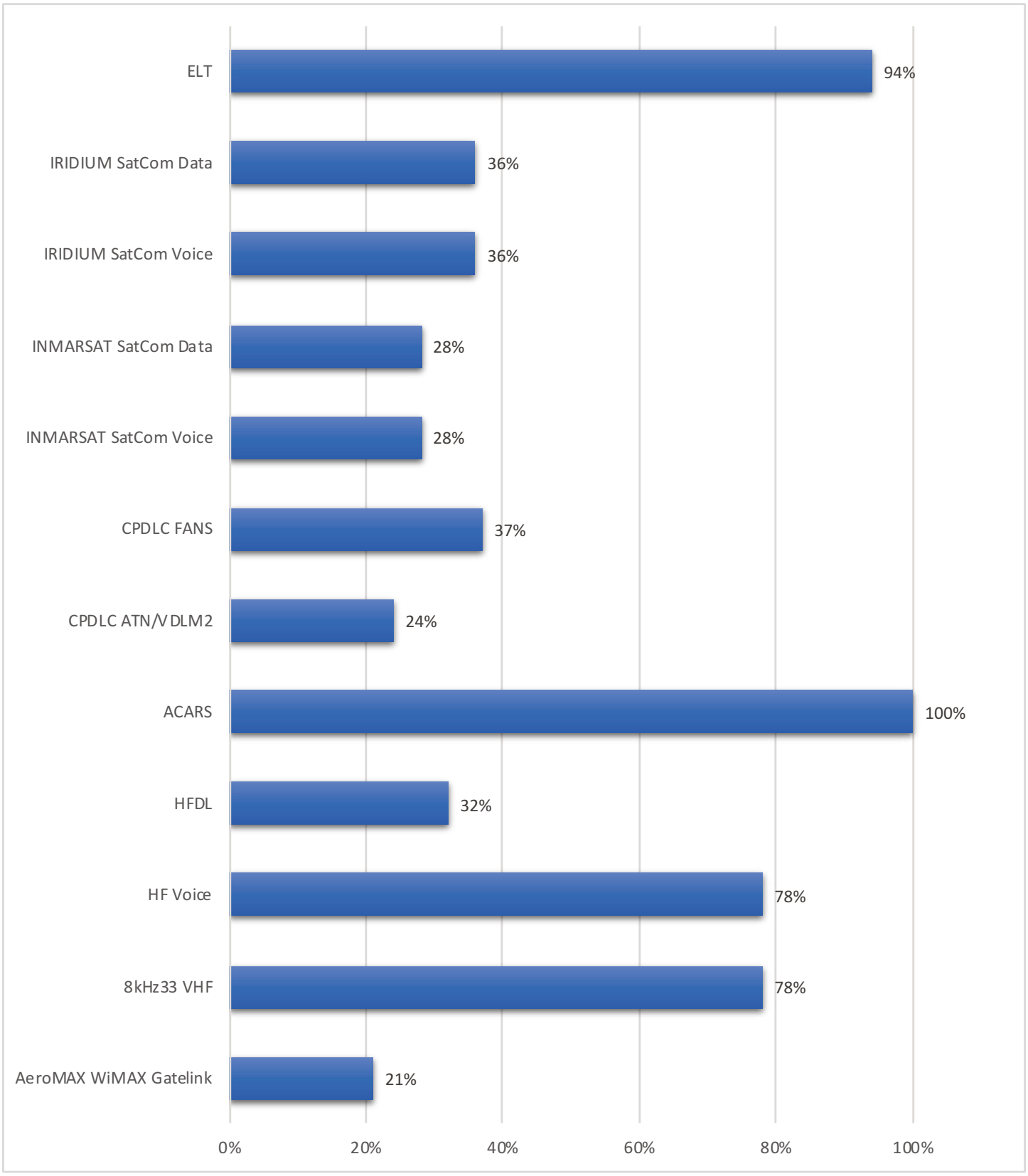
Houston Oceanic



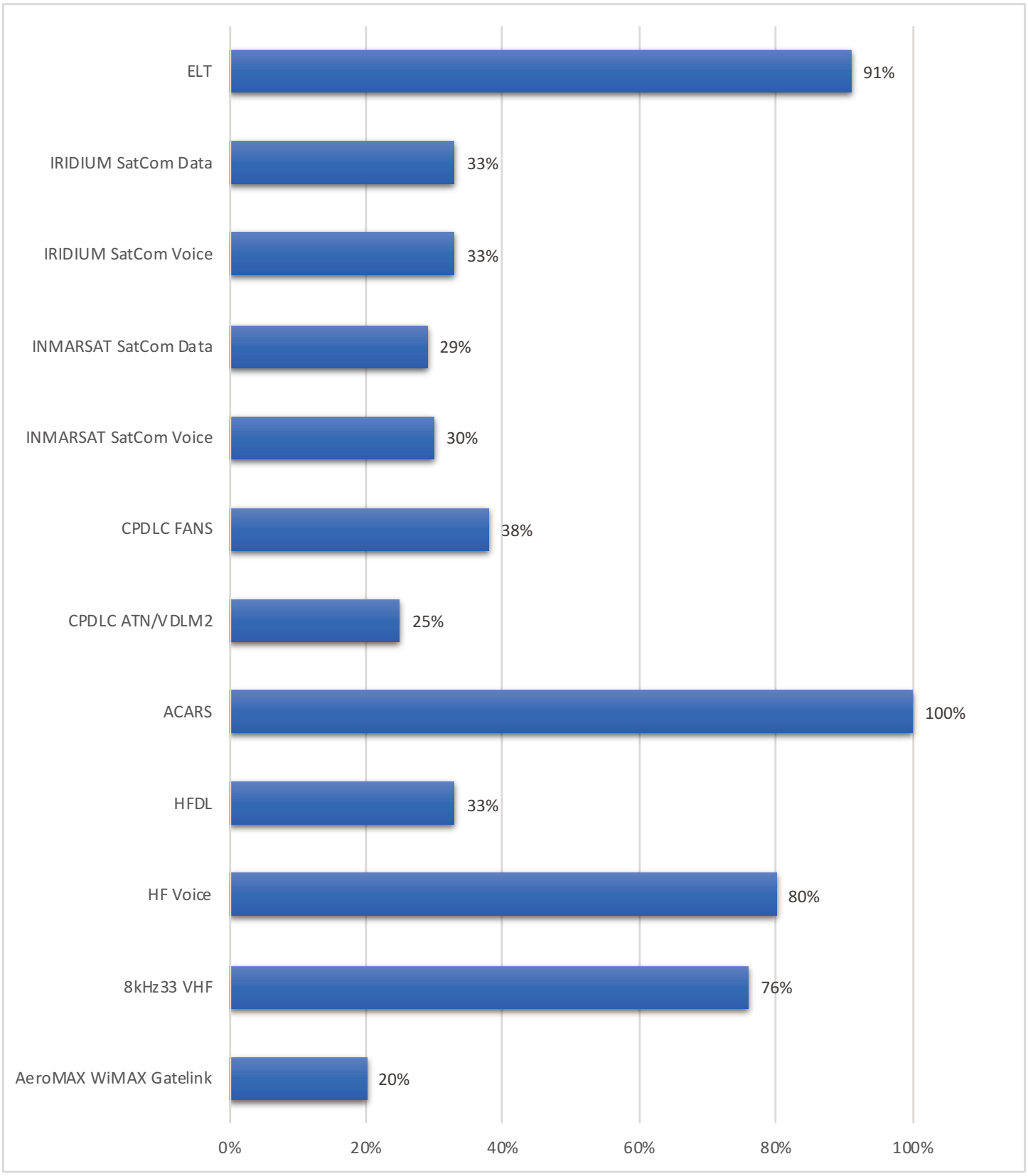
Indianapolis



Jacksonville



Kansas City


ELT
91%
IRIDIUM SatCom Data
33%
IRIDIUM SatCom Voice
33%
INMARSAT SatCom Data
29%
INMARSAT SatCom Voice
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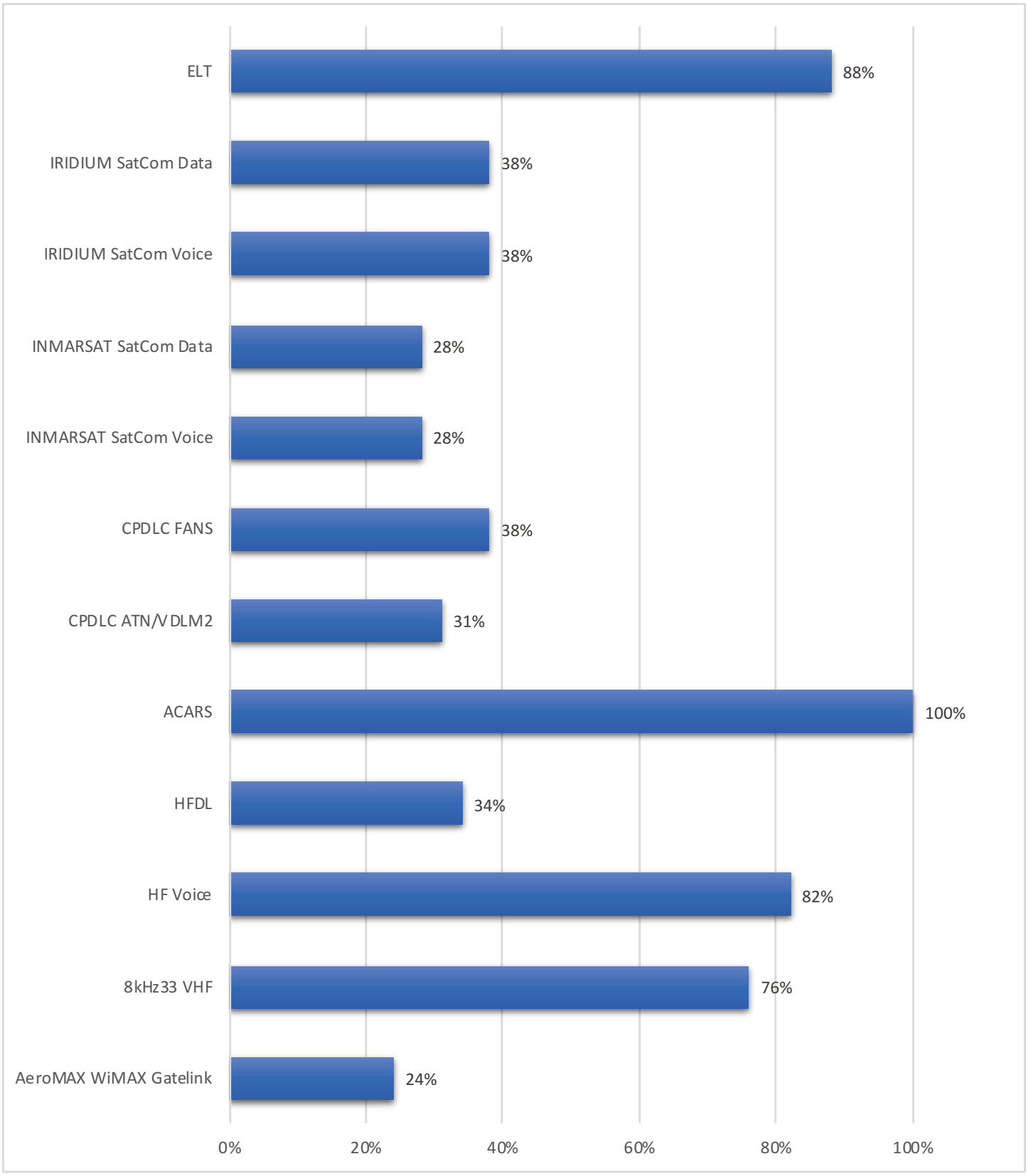
CPDLC FANS
38%
CPDLC ATN/VDLM2
25%
ACARS
100%
HFDL
33%
HF Voice
80%
8kHz33 VHF
76%
AeroMAX WiMAX Gatelink
20%
0%
20%
40%
60%
80%
100%

Kingston


ELT
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IRIDIUM SatCom Data
38%
IRIDIUM SatCom Voice
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INMARSAT SatCom Data
28%
INMARSAT SatCom Voice
28%
CPDLC FANS
38%
CPDLC ATN/VDLM2
31%
ACARS
100%
HFDL
34%
HF Voice
82%
8kHz33 VHF
76%
AeroMAX WiMAX Gatelink
24%
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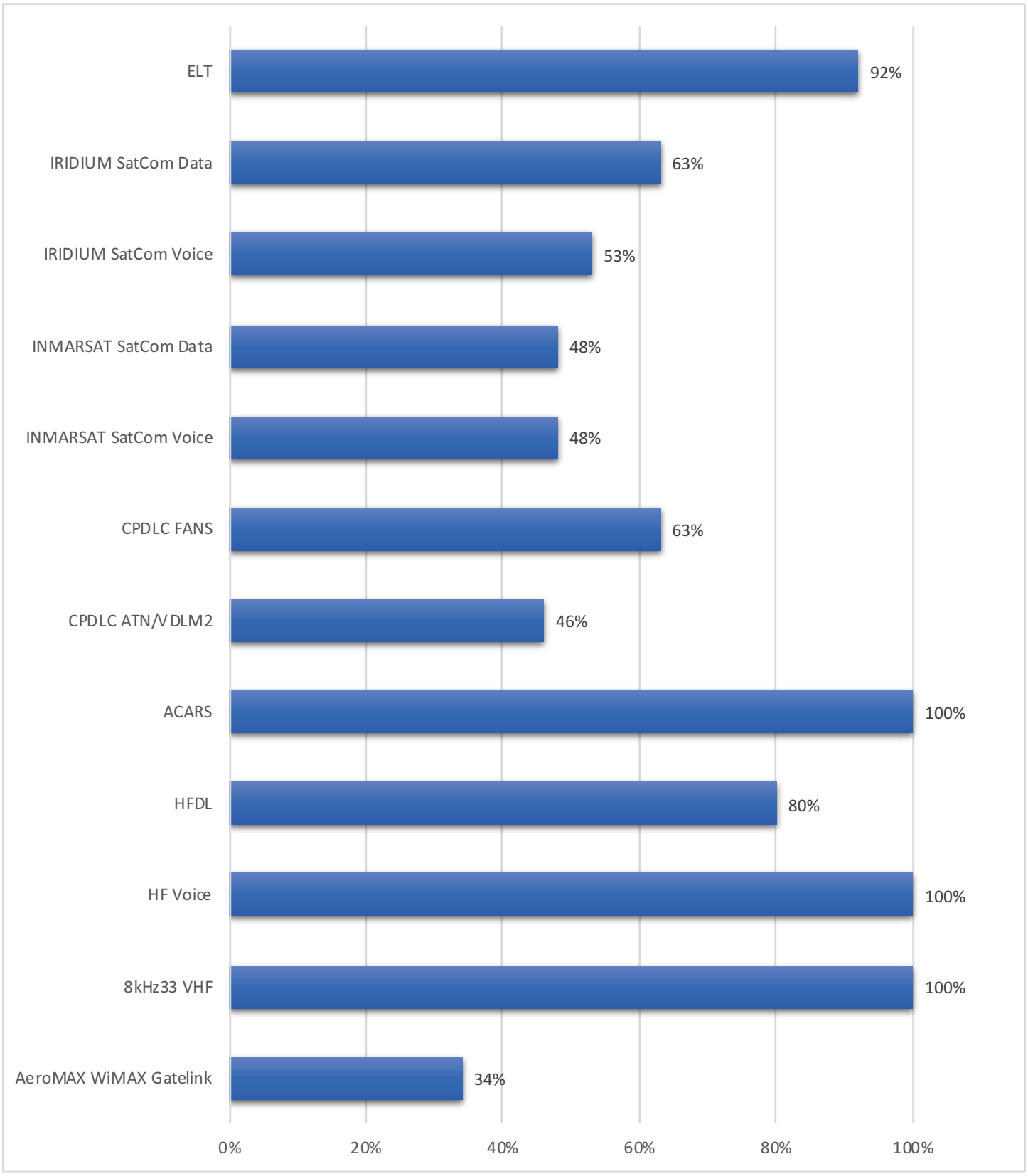
80%
100%

La Paz


ELT
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IRIDIUM SatCom Voice
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INMARSAT SatCom Data
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INMARSAT SatCom Voice
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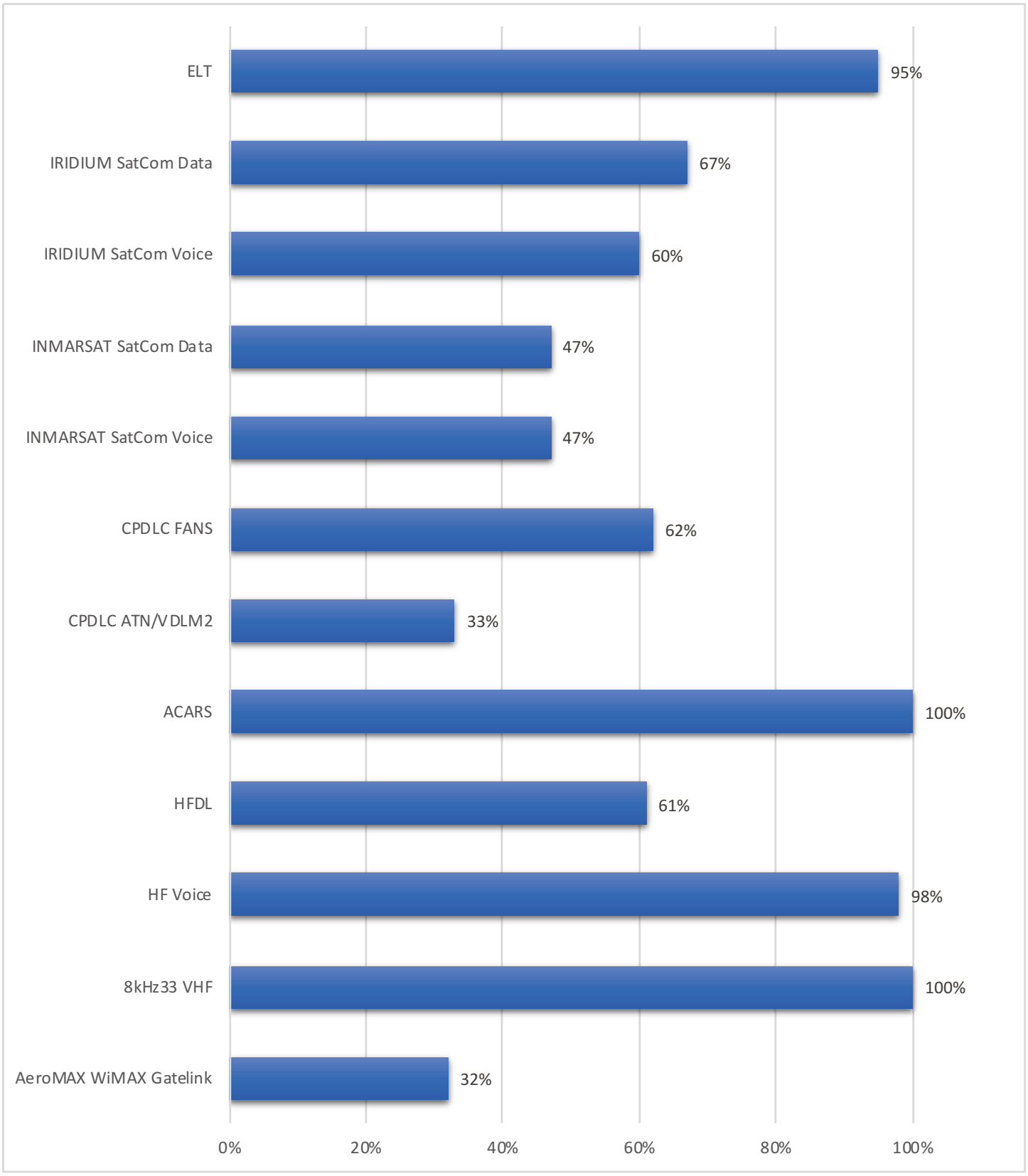
CPDLC FANS
63%
CPDLC ATN/VDLM2
46%
ACARS
100%
HFDL
80%
HF Voice
100%
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
34%
0%
20%
40%
60%
80%
100%

Lima


ELT
95%
IRIDIUM SatCom Data
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IRIDIUM SatCom Voice
60%
INMARSAT SatCom Data
47%
INMARSAT SatCom Voice
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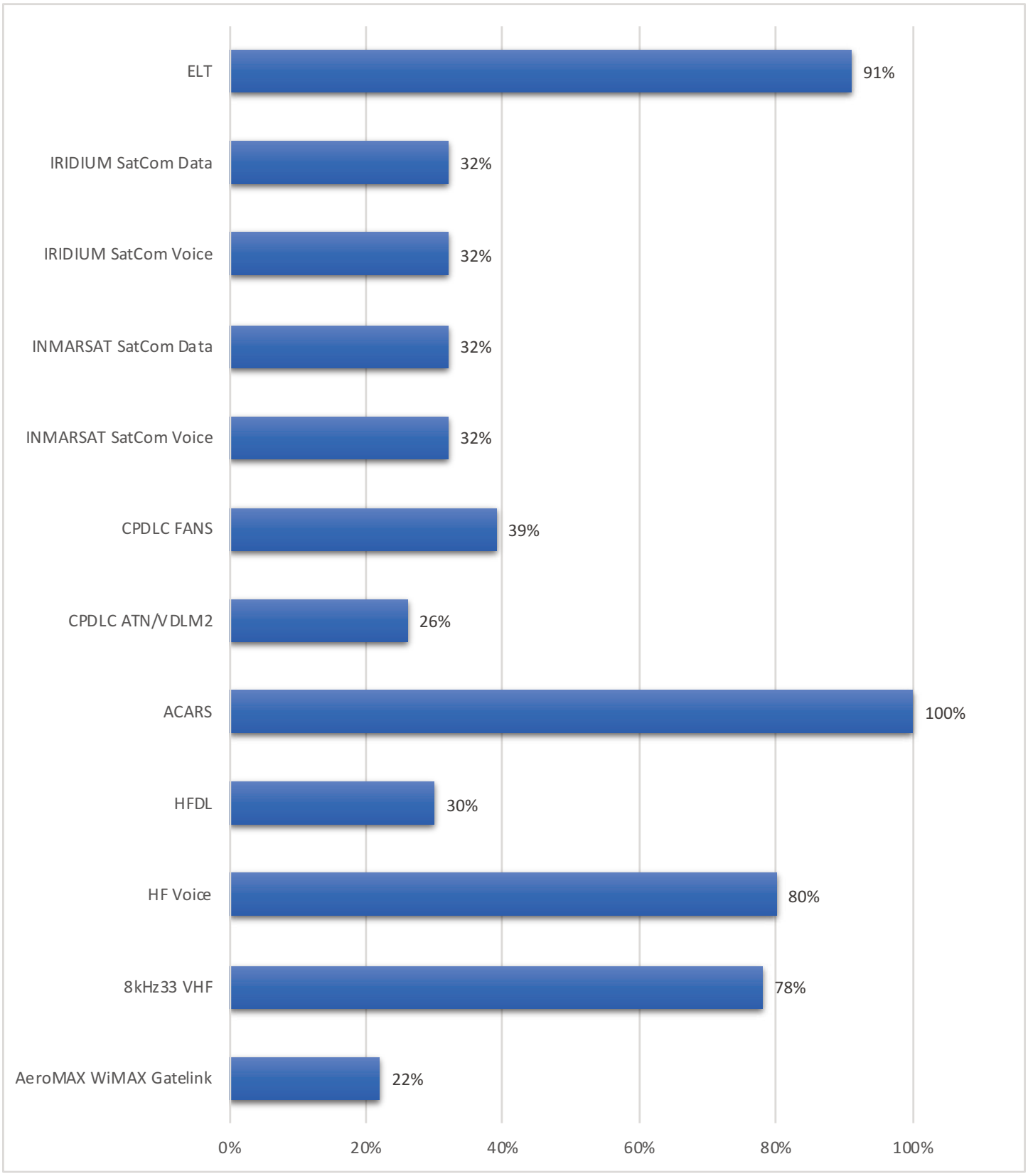
CPDLC FANS
62%
CPDLC ATN/VDLM2
33%
ACARS
100%
HFDL
61%
HF Voice
98%
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
32%
0%
20%
40%
60%
80%
100%

Los Angeles


ELT
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IRIDIUM SatCom Data
32%
IRIDIUM SatCom Voice
32%
INMARSAT SatCom Data
32%
INMARSAT SatCom Voice
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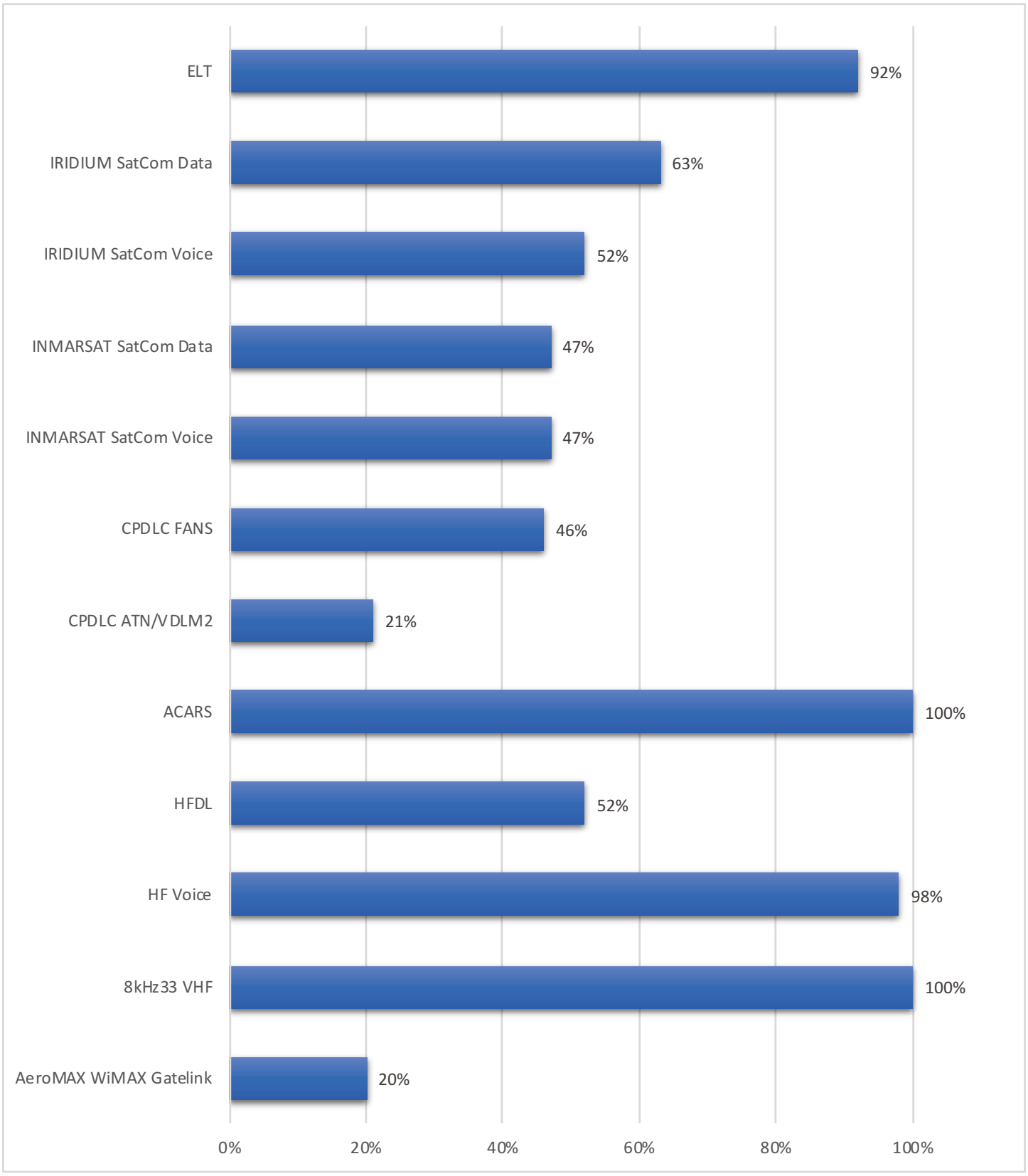
CPDLC FANS
39%
CPDLC ATN/VDLM2
26%
ACARS
100%
HFDL
30%
HF Voice
80%
8kHz33 VHF
78%
AeroMAX WiMAX Gatelink
22%
0%
20%
40%
60%
80%
100%

Maiquetia


ELT
92%
IRIDIUM SatCom Data
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IRIDIUM SatCom Voice
52%
INMARSAT SatCom Data
47%
INMARSAT SatCom Voice
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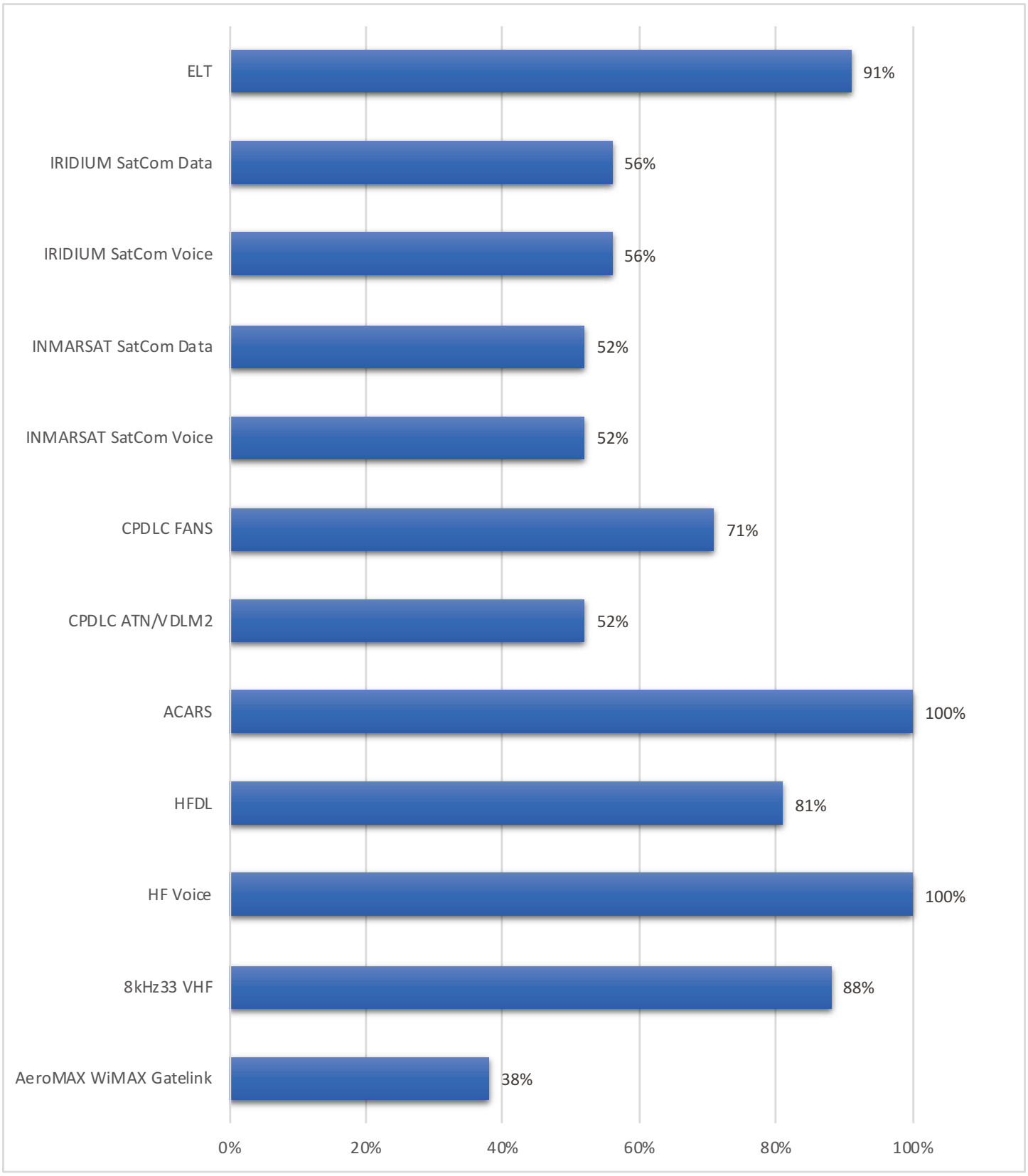
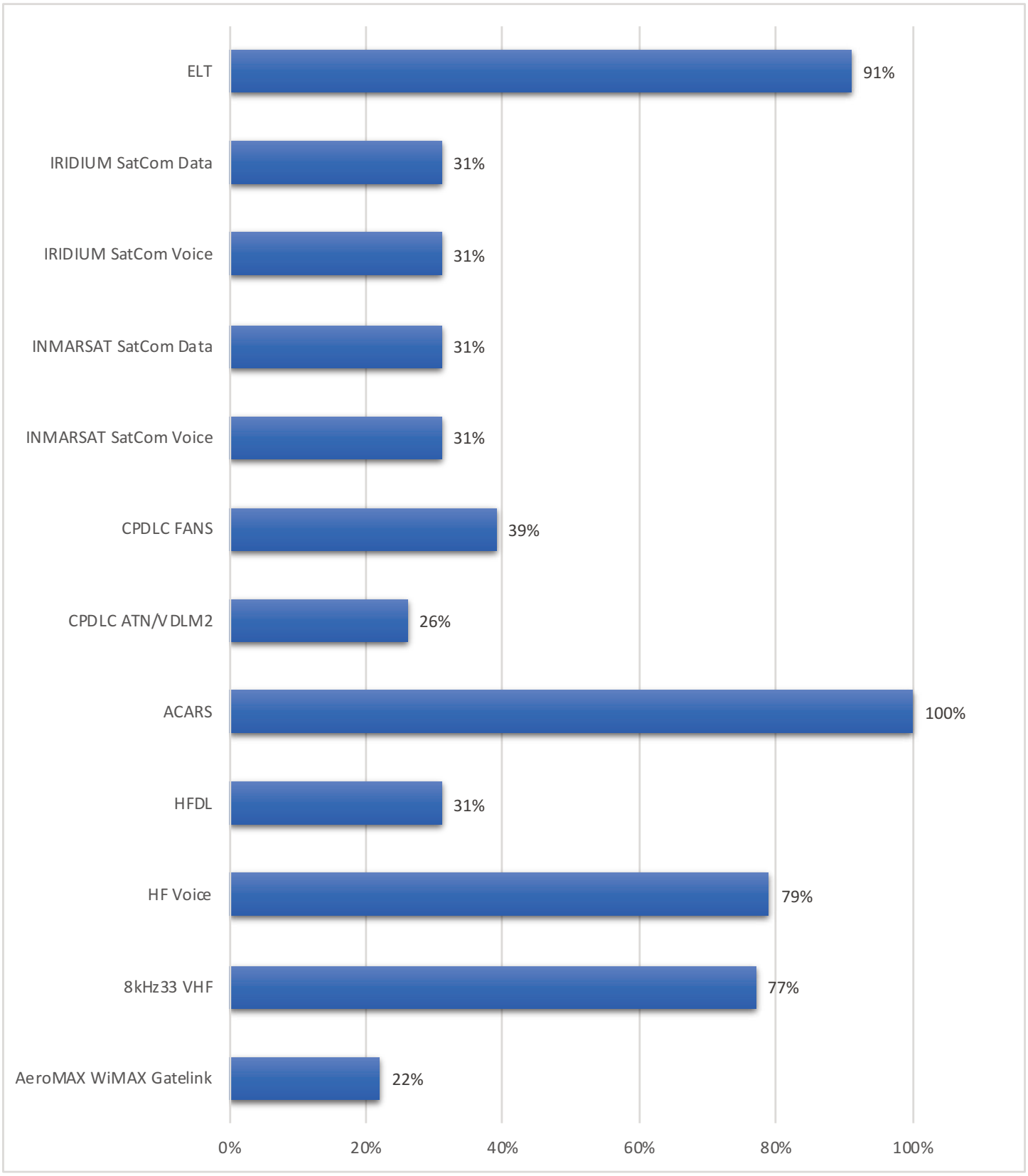
CPDLC FANS
46%
CPDLC ATN/VDLM2
21%
ACARS
100%
HFDL
52%
HF Voice
98%
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
20%
0%
20%
40%
60%
80%
100%

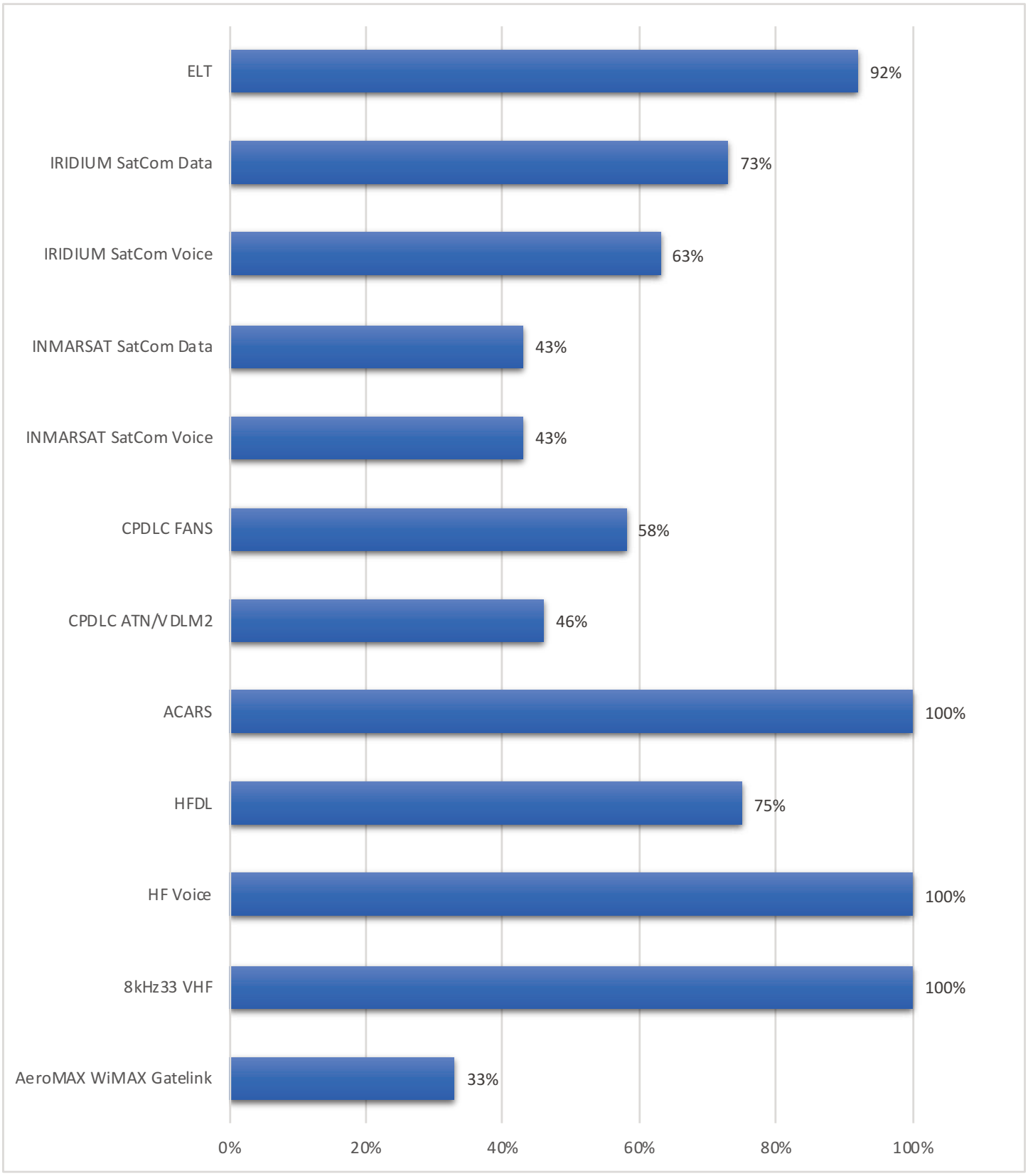
Mazatlan Oceanic



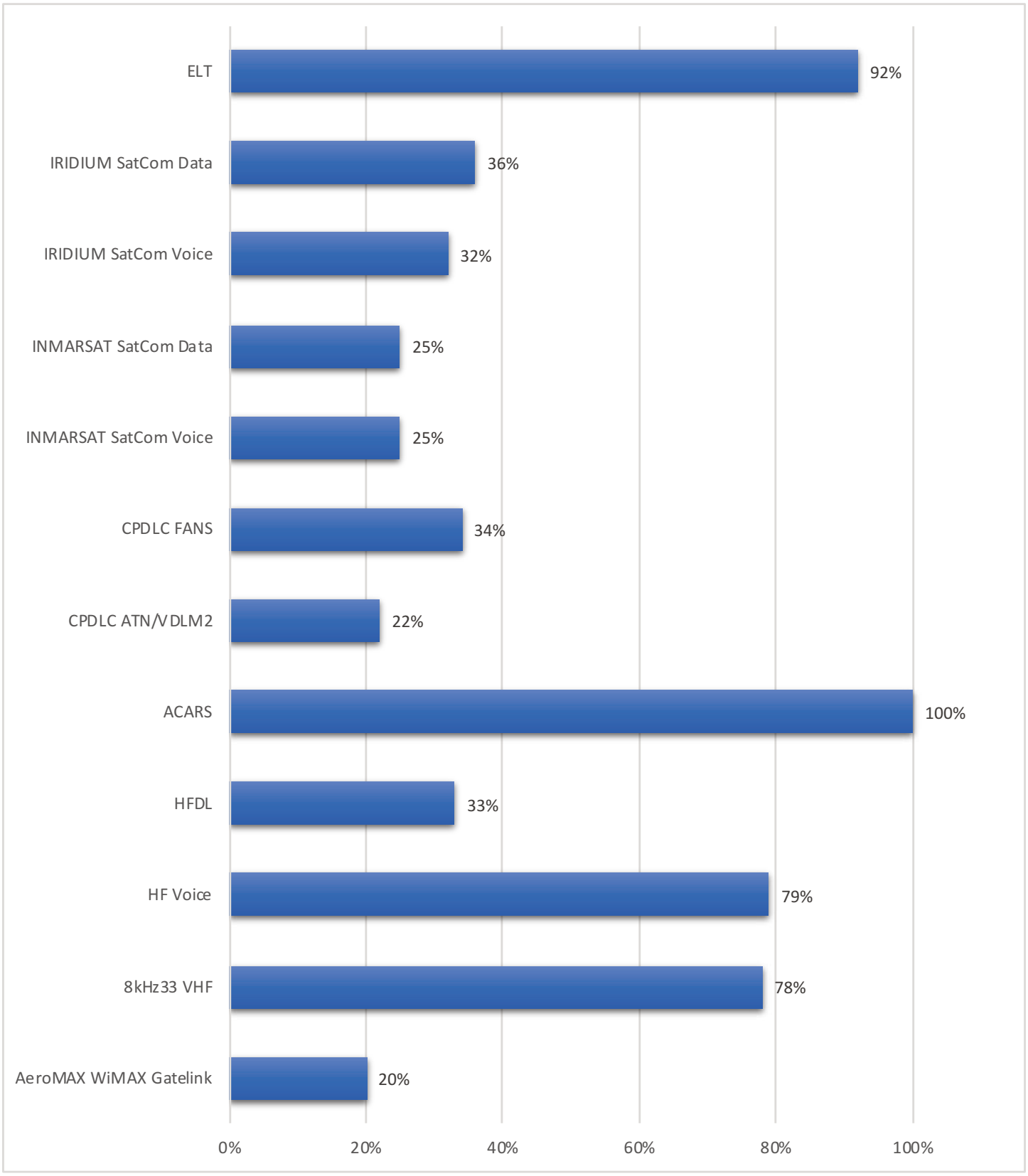
Memphis


ELT
91%
IRIDIUM SatCom Data
31%
IRIDIUM SatCom Voice
31%
INMARSAT SatCom Data
31%
INMARSAT SatCom Voice
31%
CPDLC FANS
39%
CPDLC ATN/VDLM2
26%
ACARS
100%
HFDL
31%
HF Voice
79%
8kHz33 VHF
77%
AeroMAX WiMAX Gatelink
22%
0%
20%
40%
60%
80%
100%

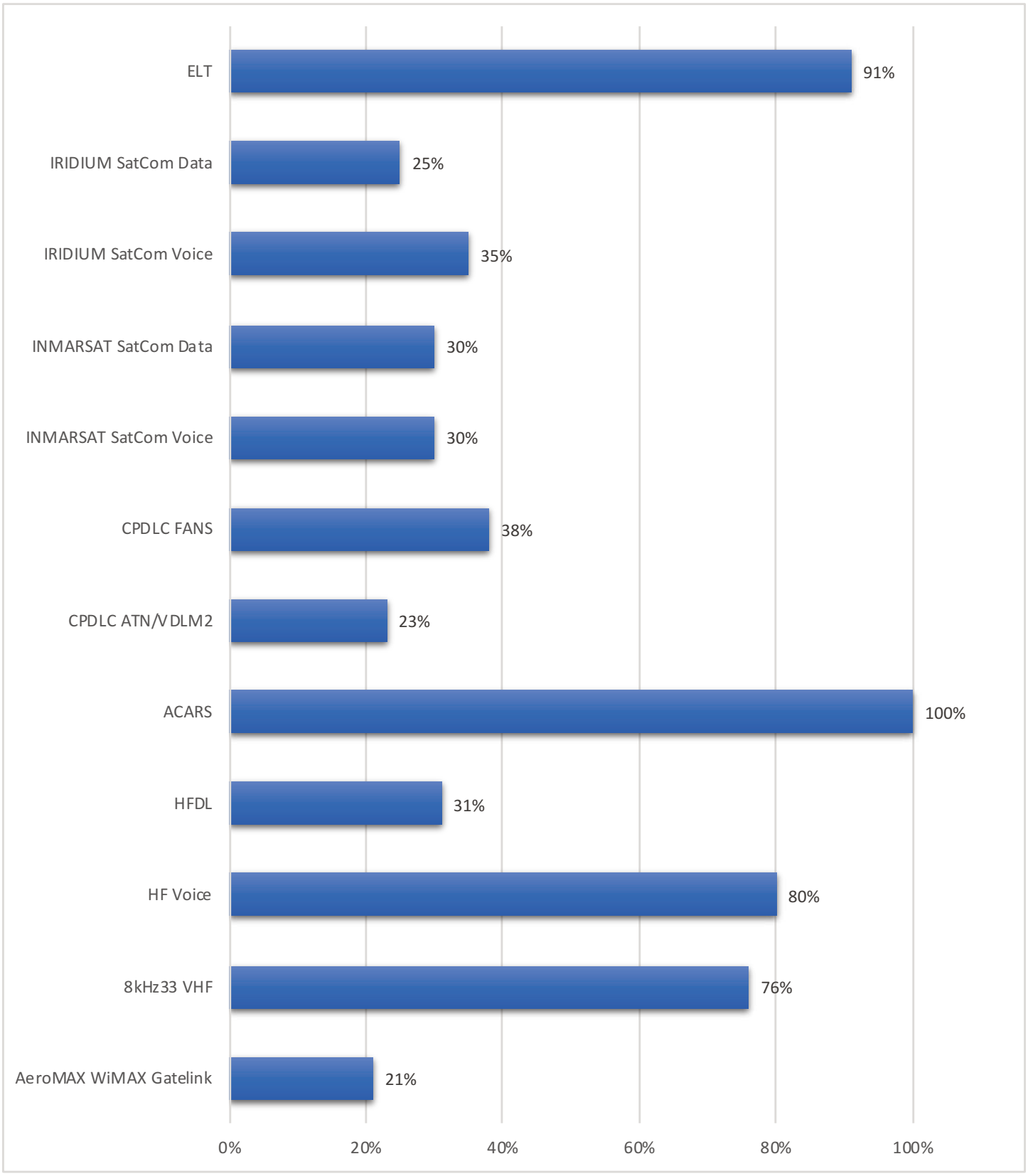
Mendoza


ELT
92%
IRIDIUM SatCom Data
73%
IRIDIUM SatCom Voice
63%
INMARSAT SatCom Data
43%
INMARSAT SatCom Voice
43%
CPDLC FANS
58%
CPDLC ATN/VDLM2
46%
ACARS
100%
HFDL
75%
HF Voice
100%
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
33%
0%
20%
40%
60%
80%
100%

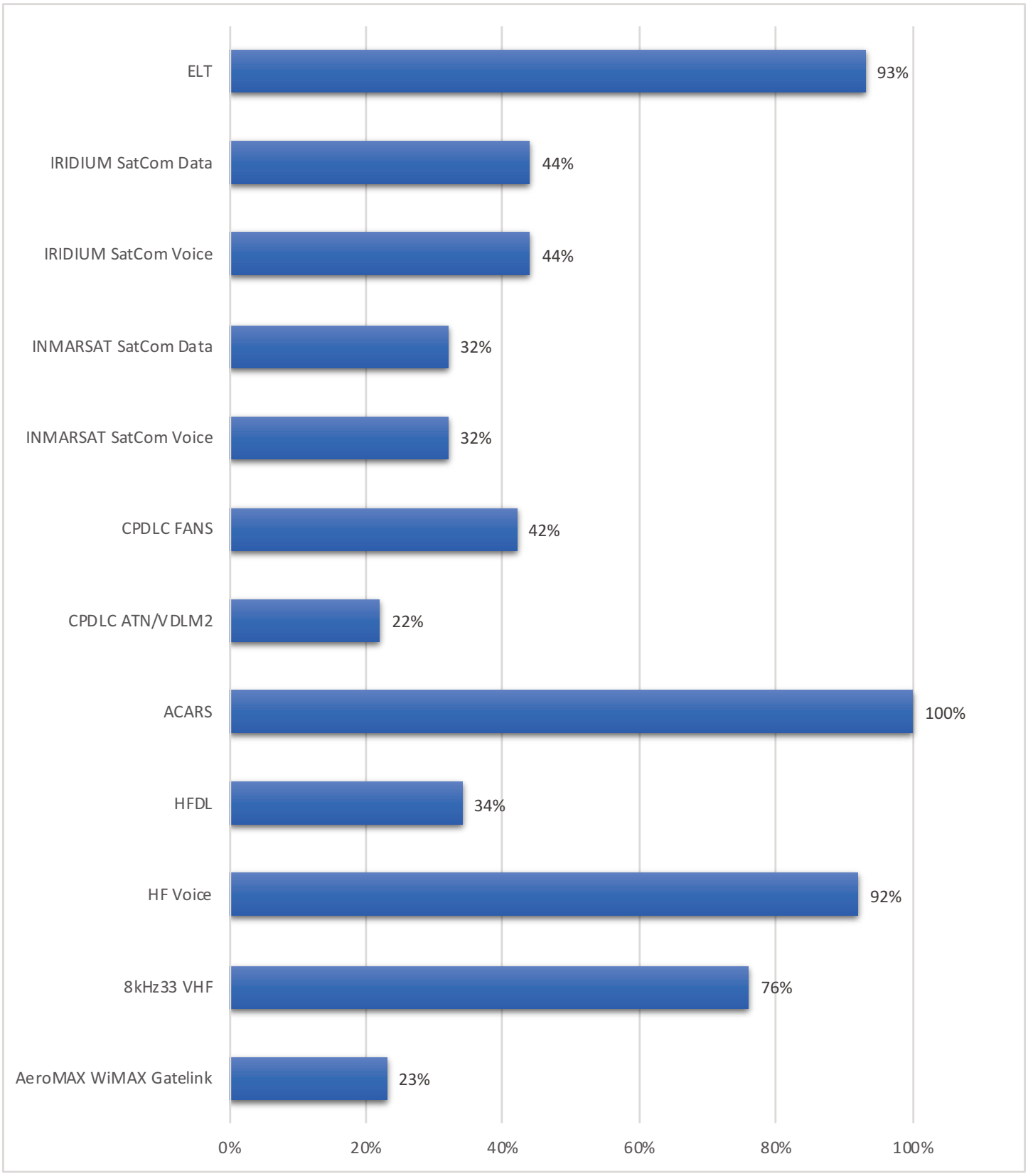
Mexico


ELT
92%
IRIDIUM SatCom Data
36%
IRIDIUM SatCom Voice
32%
INMARSAT SatCom Data
25%
INMARSAT SatCom Voice
25%
CPDLC FANS
34%
CPDLC ATN/VDLM2
22%
ACARS
100%
HFDL
33%
HF Voice
79%
8kHz33 VHF
78%
AeroMAX WiMAX Gatelink
20%
0%
20%
40%
60%
80%
100%

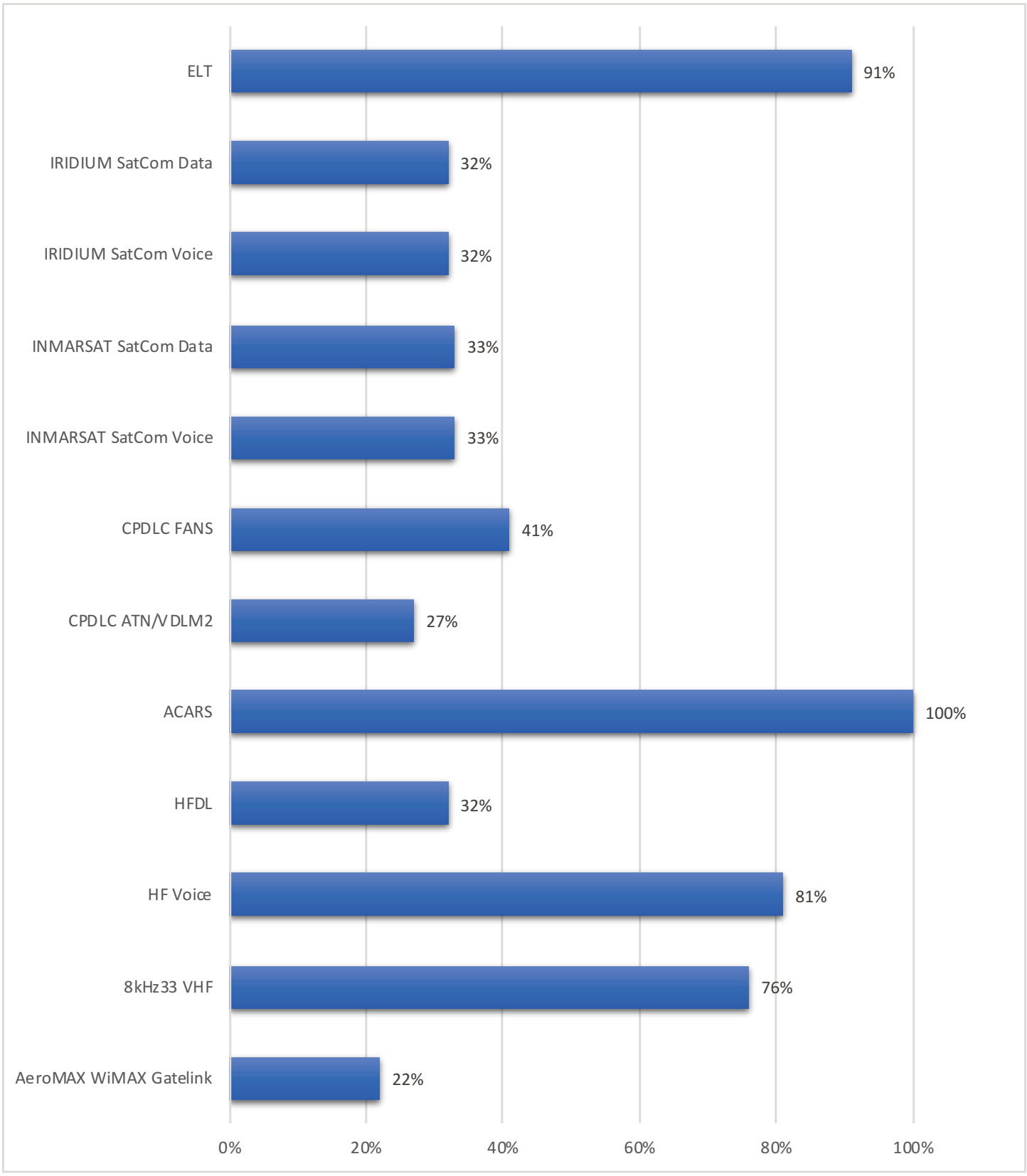
Miami Domestic



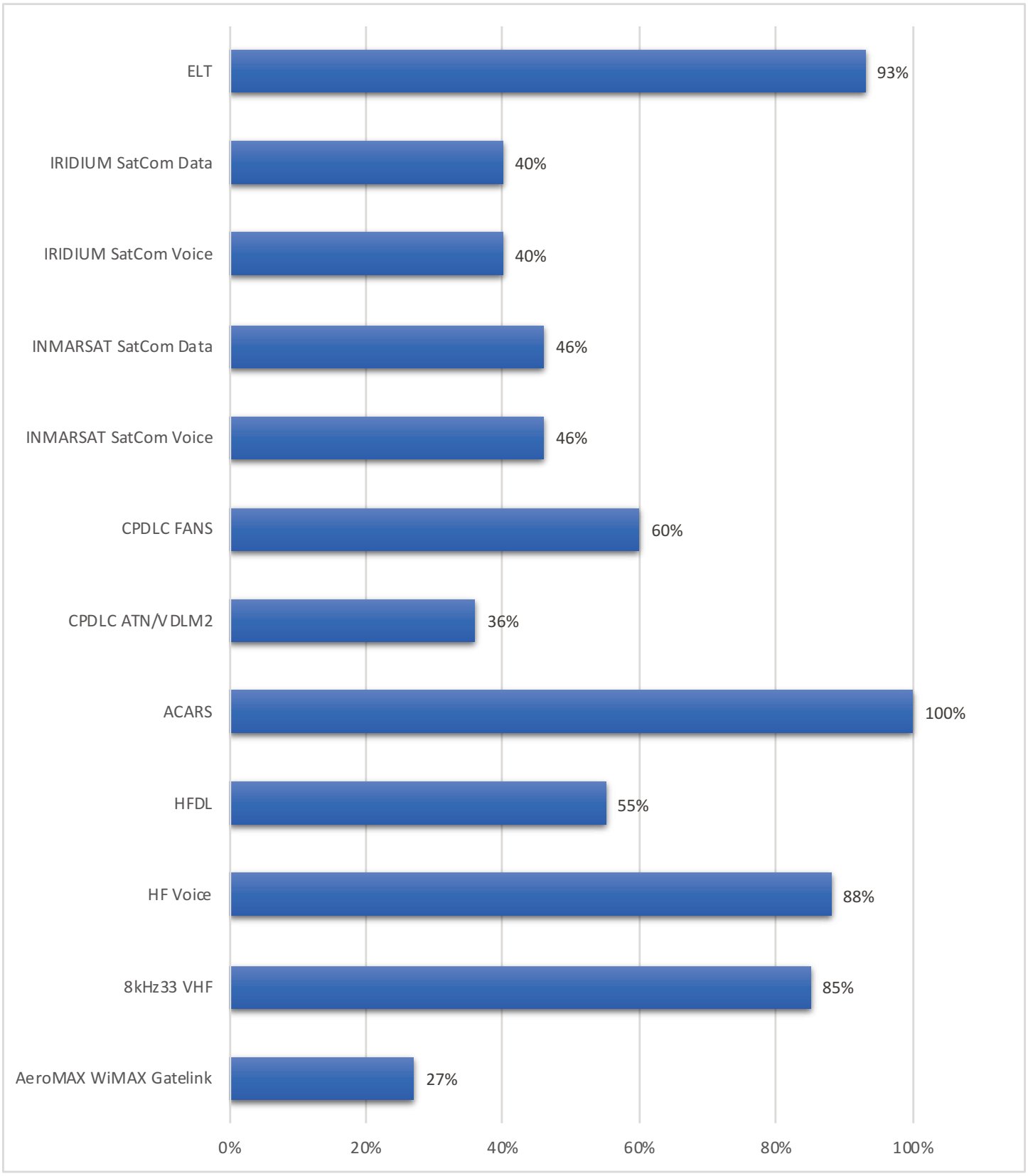
Miami Oceanic



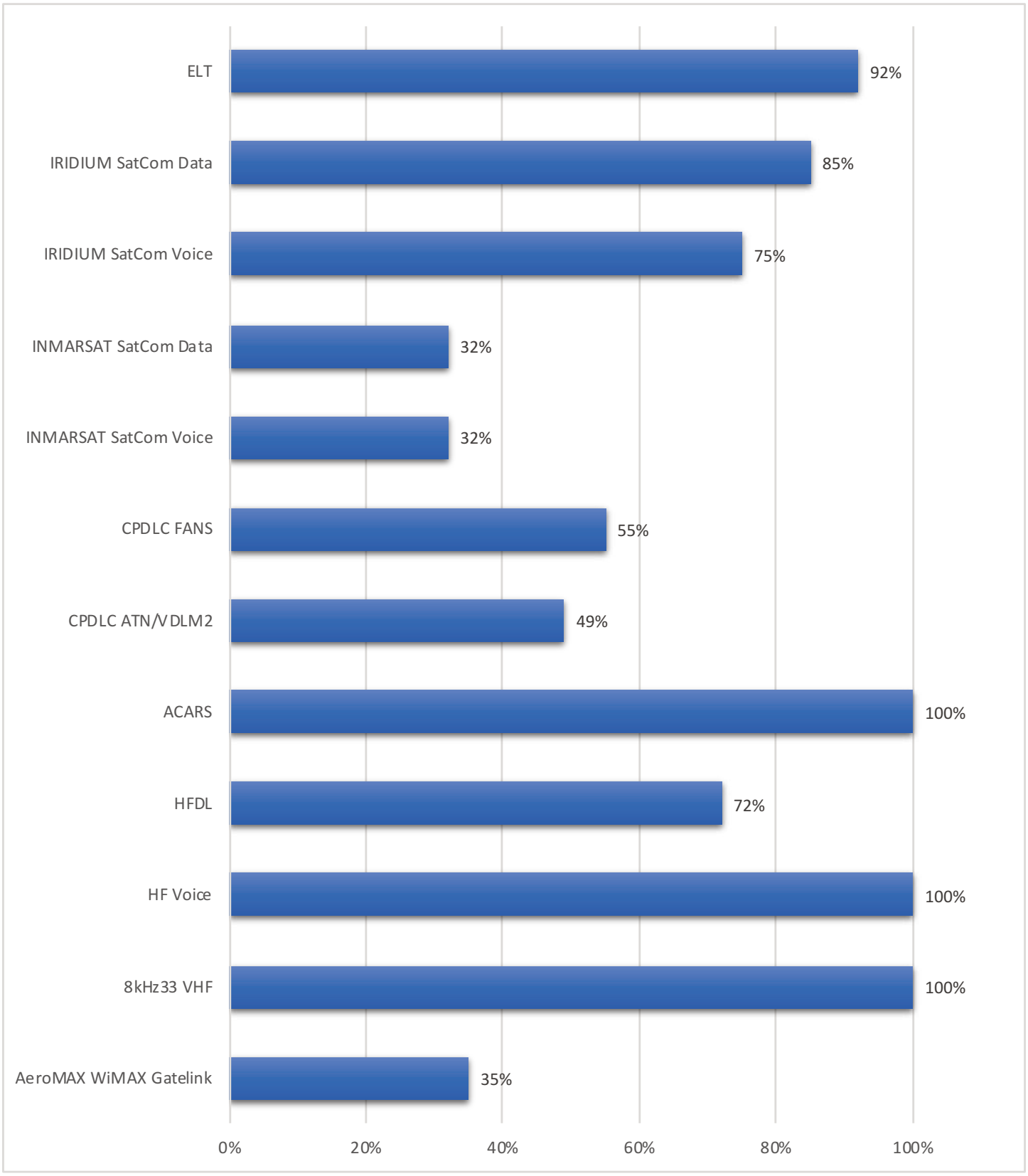
Minneapolis



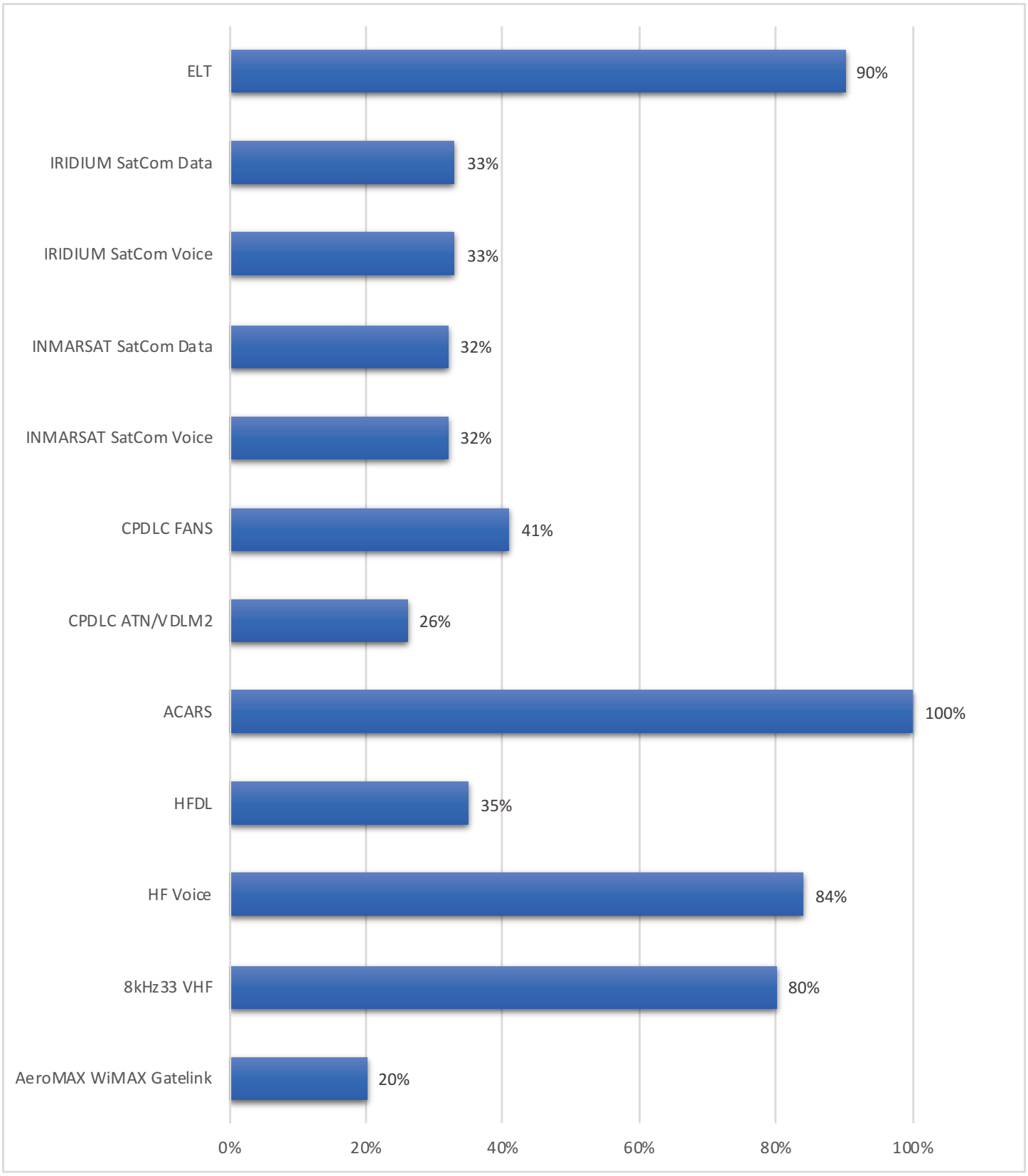
Moncton


ELT
93%
IRIDIUM SatCom Data
40%
IRIDIUM SatCom Voice
40%
INMARSAT SatCom Data
46%
INMARSAT SatCom Voice
46%
CPDLC FANS
60%
CPDLC ATN/VDLM2
36%
ACARS
100%
HFDL
55%
HF Voice
88%
8kHz33 VHF
85%
AeroMAX WiMAX Gatelink
27%
0%
20%
40%
60%
80%
100%

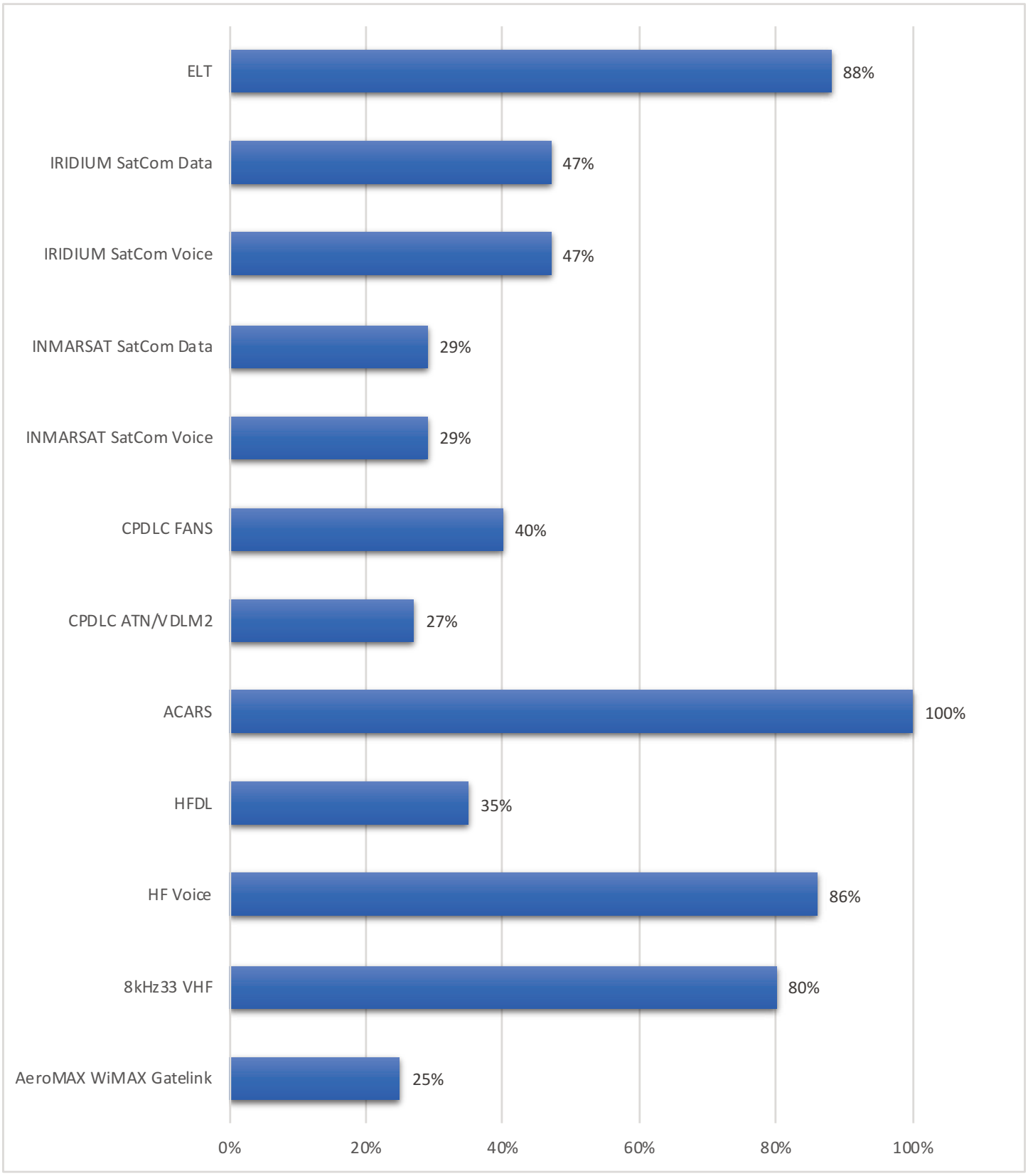
Montevideo


ELT
92%
IRIDIUM SatCom Data
85%
IRIDIUM SatCom Voice
75%
INMARSAT SatCom Data
32%
INMARSAT SatCom Voice
32%
CPDLC FANS
55%
CPDLC ATN/VDLM2
49%
ACARS
100%
HFDL
72%
HF Voice
100%
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
35%
0%
20%
40%
60%
80%
100%

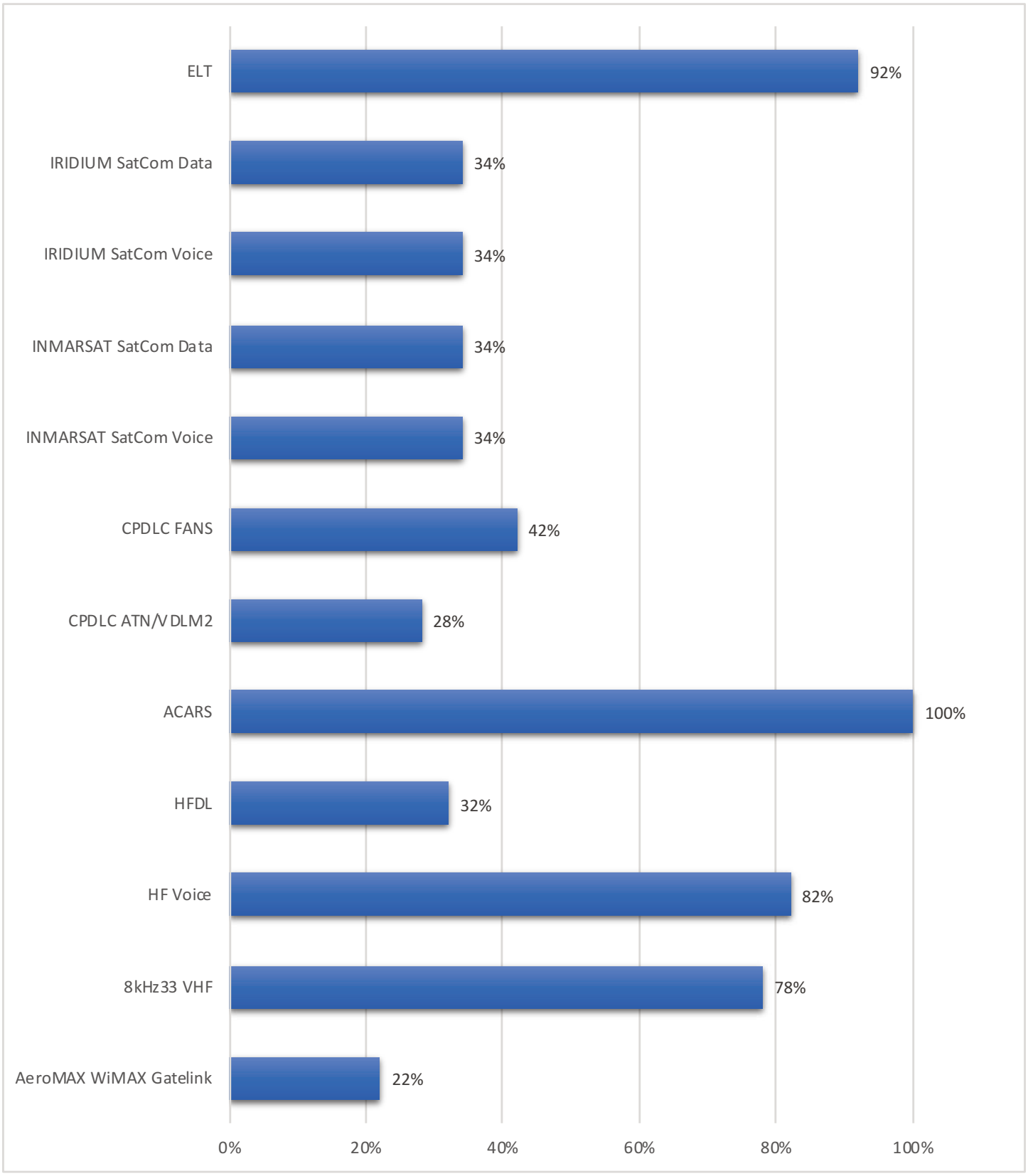
Montreal


ELT
90%
IRIDIUM SatCom Data
33%
IRIDIUM SatCom Voice
33%
INMARSAT SatCom Data
32%
INMARSAT SatCom Voice
32%
CPDLC FANS
41%
CPDLC ATN/VDLM2
26%
ACARS
100%
HFDL
35%
HF Voice
84%
8kHz33 VHF
80%
AeroMAX WiMAX Gatelink
20%
0%
20%
40%
60%
80%
100%

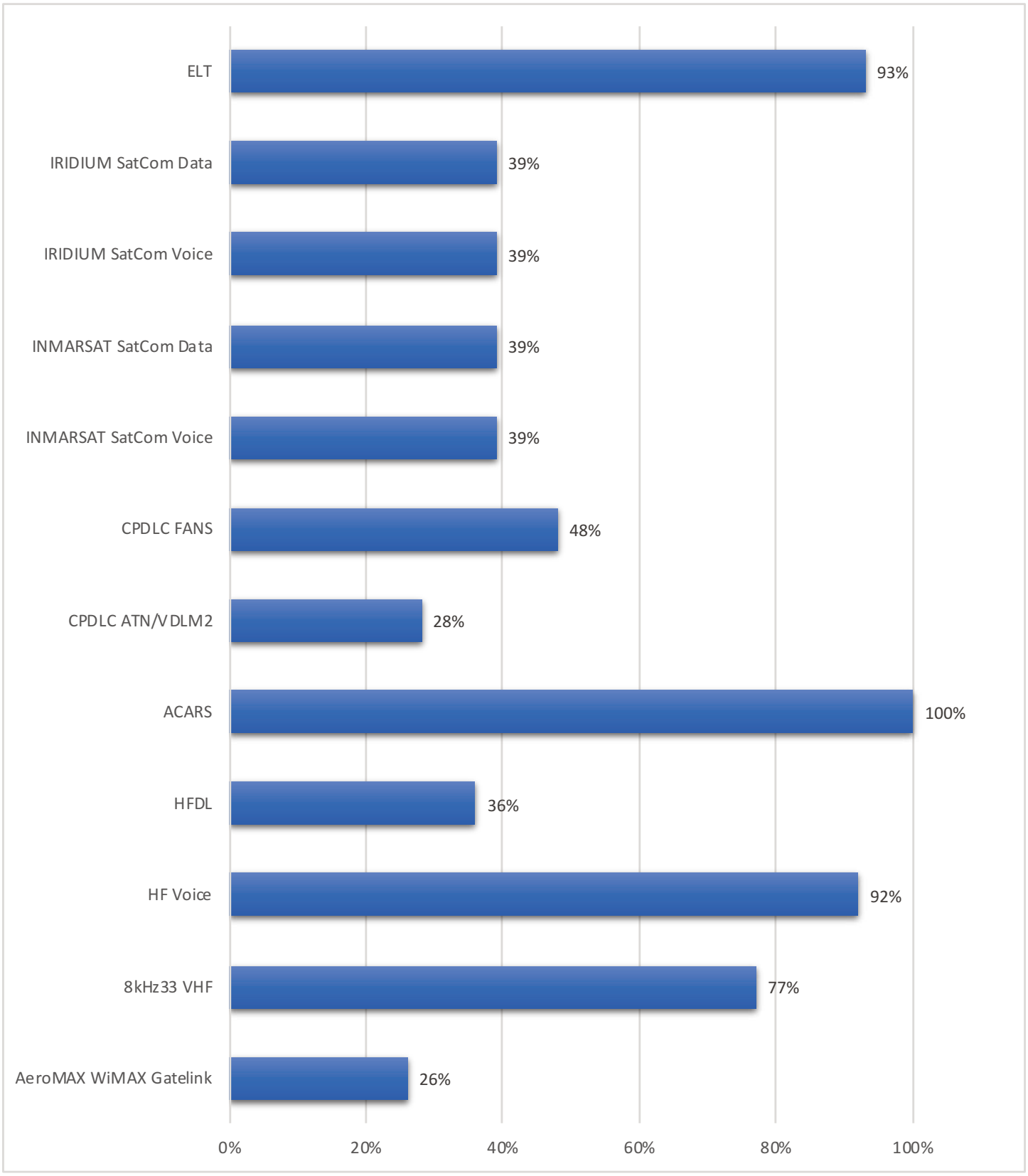
Nassau


ELT
88%
IRIDIUM SatCom Data
47%
IRIDIUM SatCom Voice
47%
INMARSAT SatCom Data
29%
INMARSAT SatCom Voice
29%
CPDLC FANS
40%
CPDLC ATN/VDLM2
27%
ACARS
100%
HFDL
35%
HF Voice
86%
8kHz33 VHF
80%
AeroMAX WiMAX Gatelink
25%
0%
20%
40%
60%
80%
100%

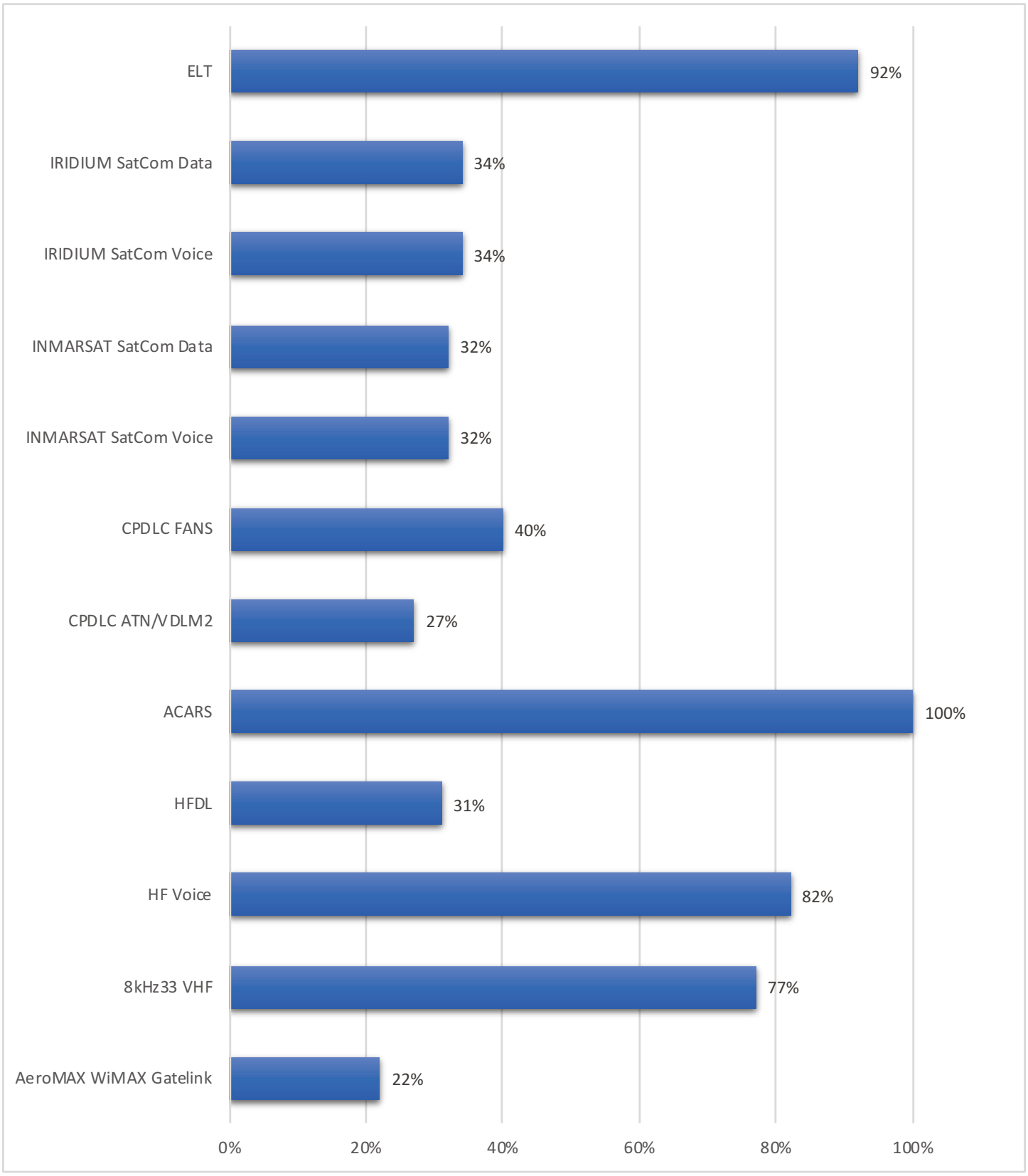
New York Domestic



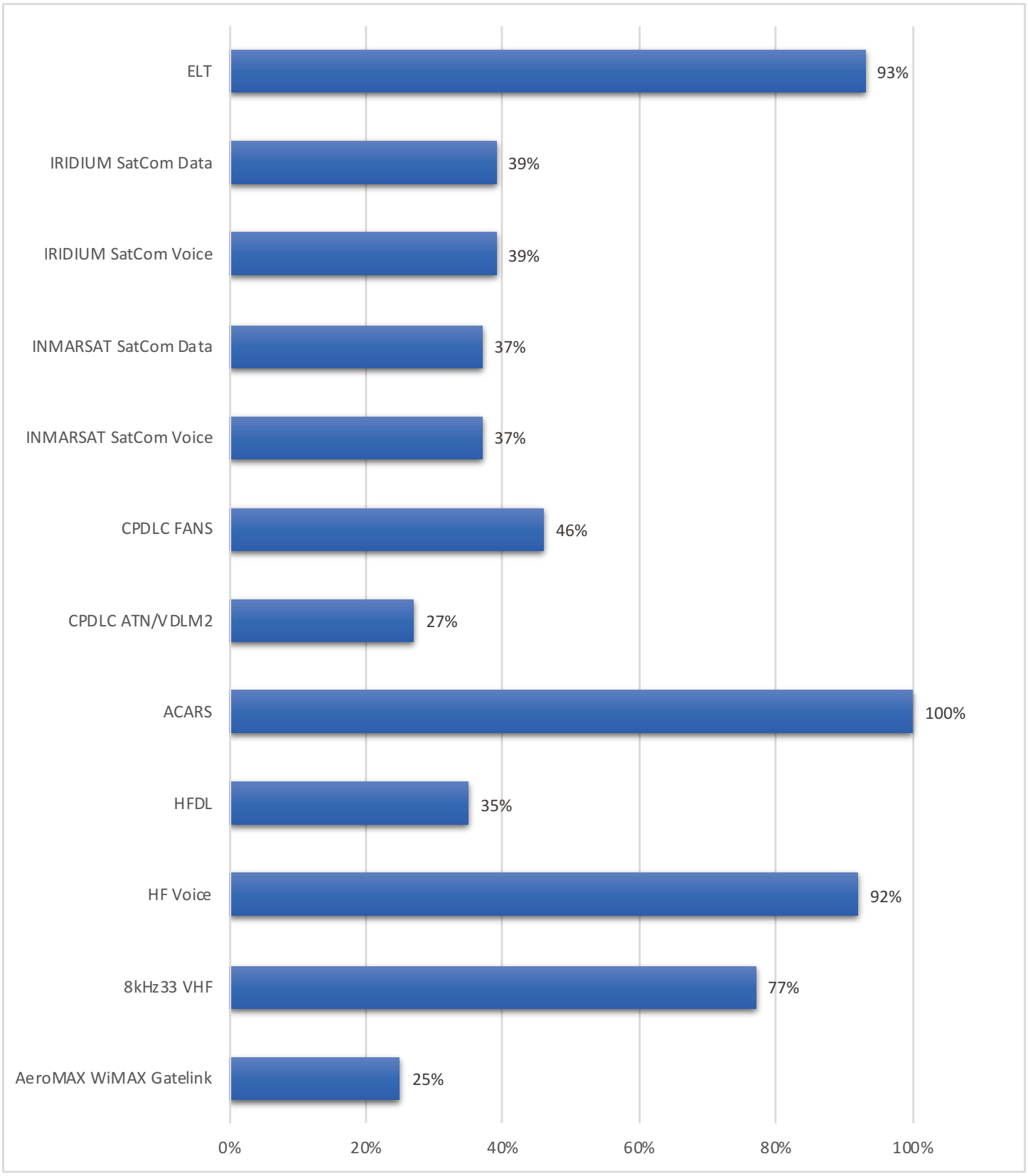
New York Oceanic



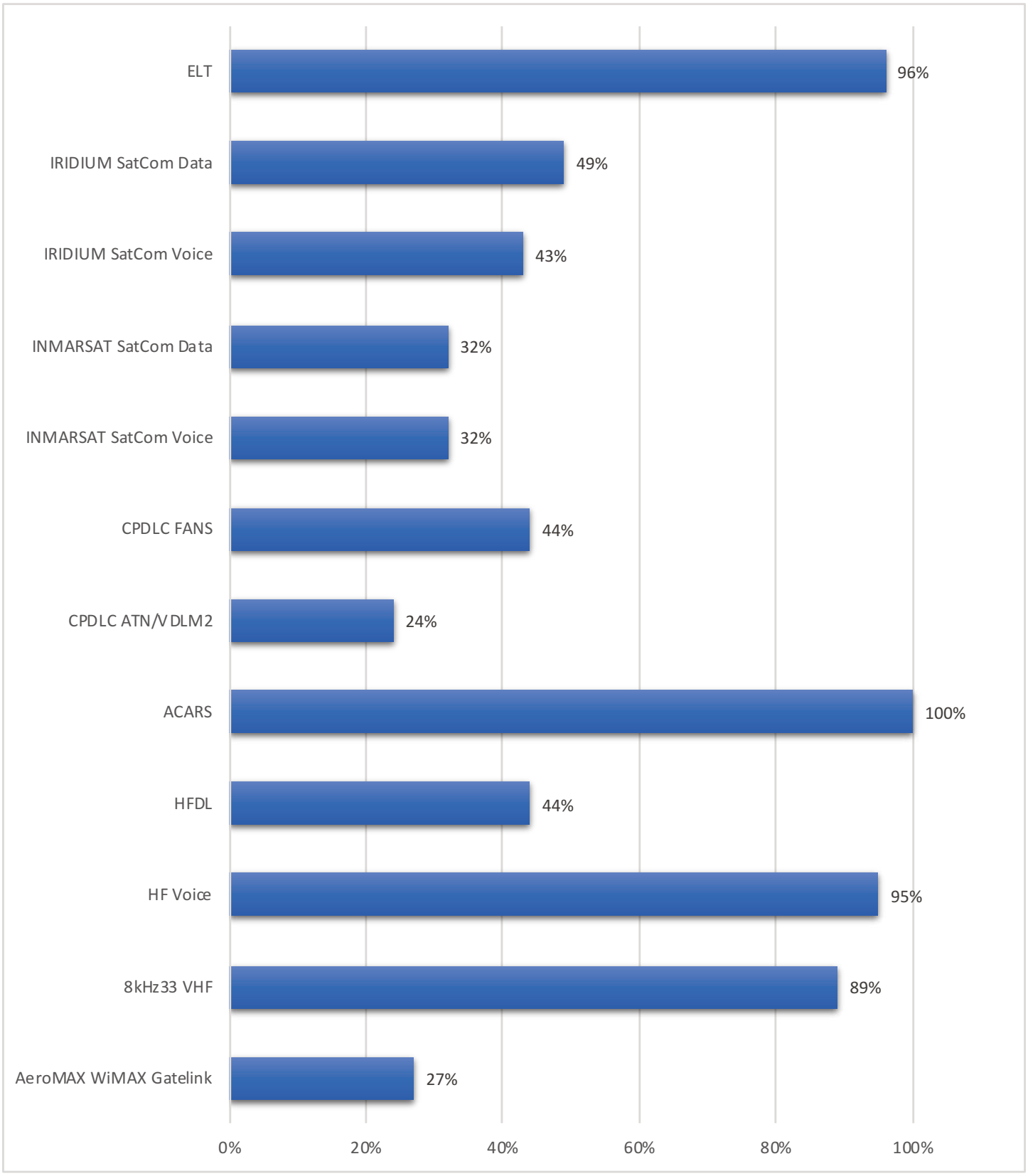
Oakland Domestic



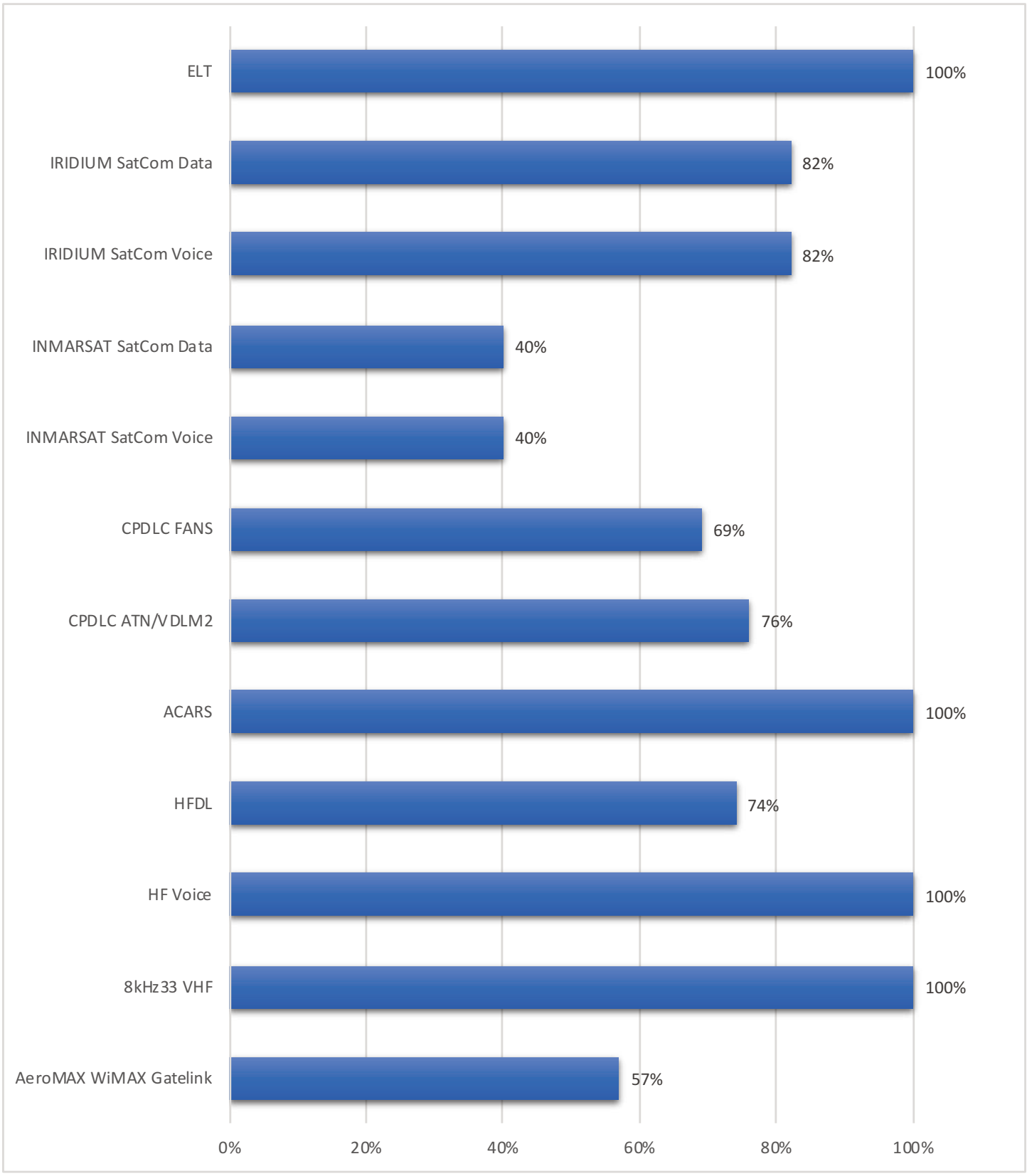
Oakland Oceanic



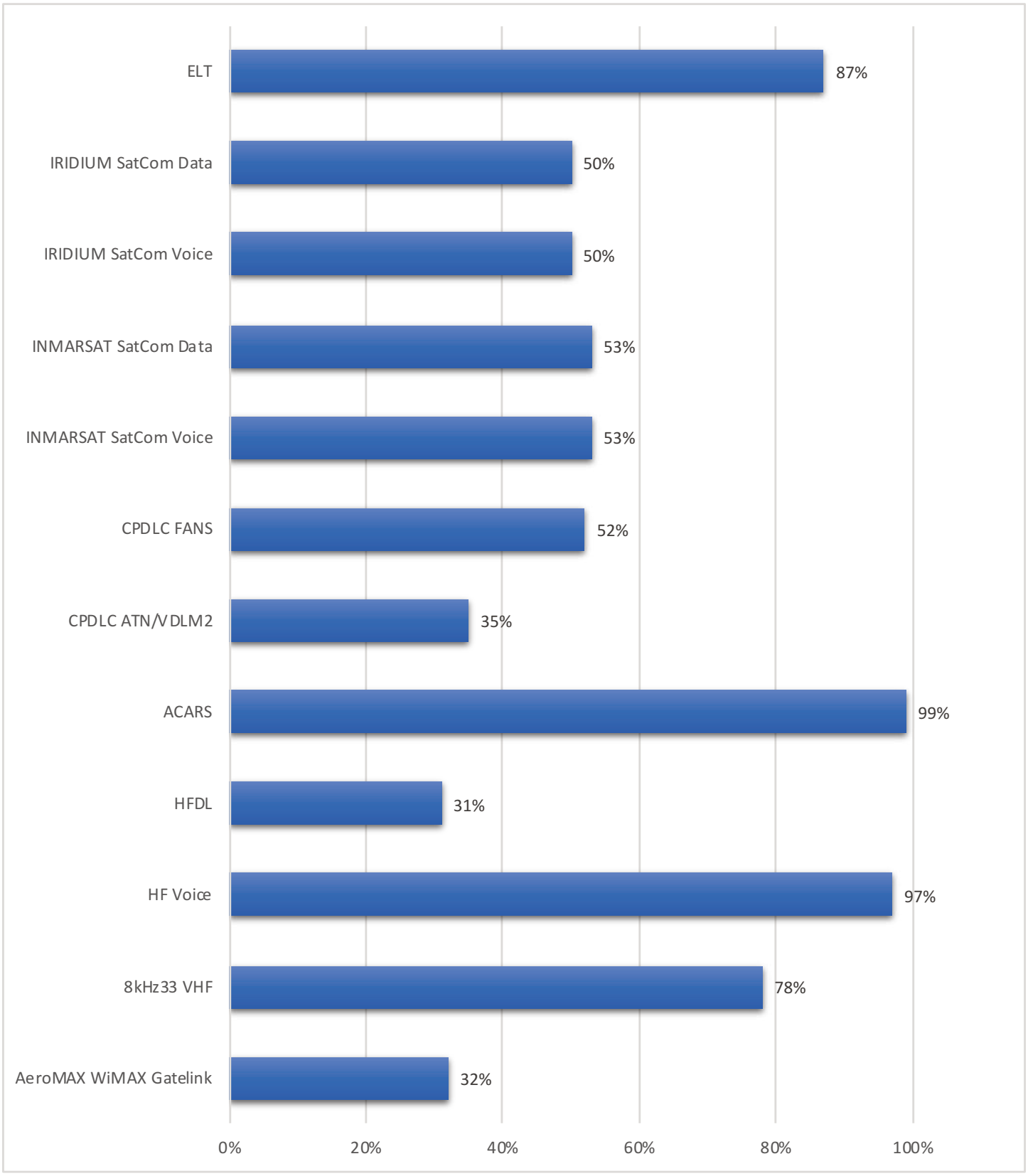
Panama


ELT
96%
IRIDIUM SatCom Data
49%
IRIDIUM SatCom Voice
43%
INMARSAT SatCom Data
32%
INMARSAT SatCom Voice
32%
CPDLC FANS
44%
CPDLC ATN/VDLM2
24%
ACARS
100%
HFDL
44%
HF Voice
95%
8kHz33 VHF
89%
AeroMAX WiMAX Gatelink
27%
0%
20%
40%
60%
80%
100%

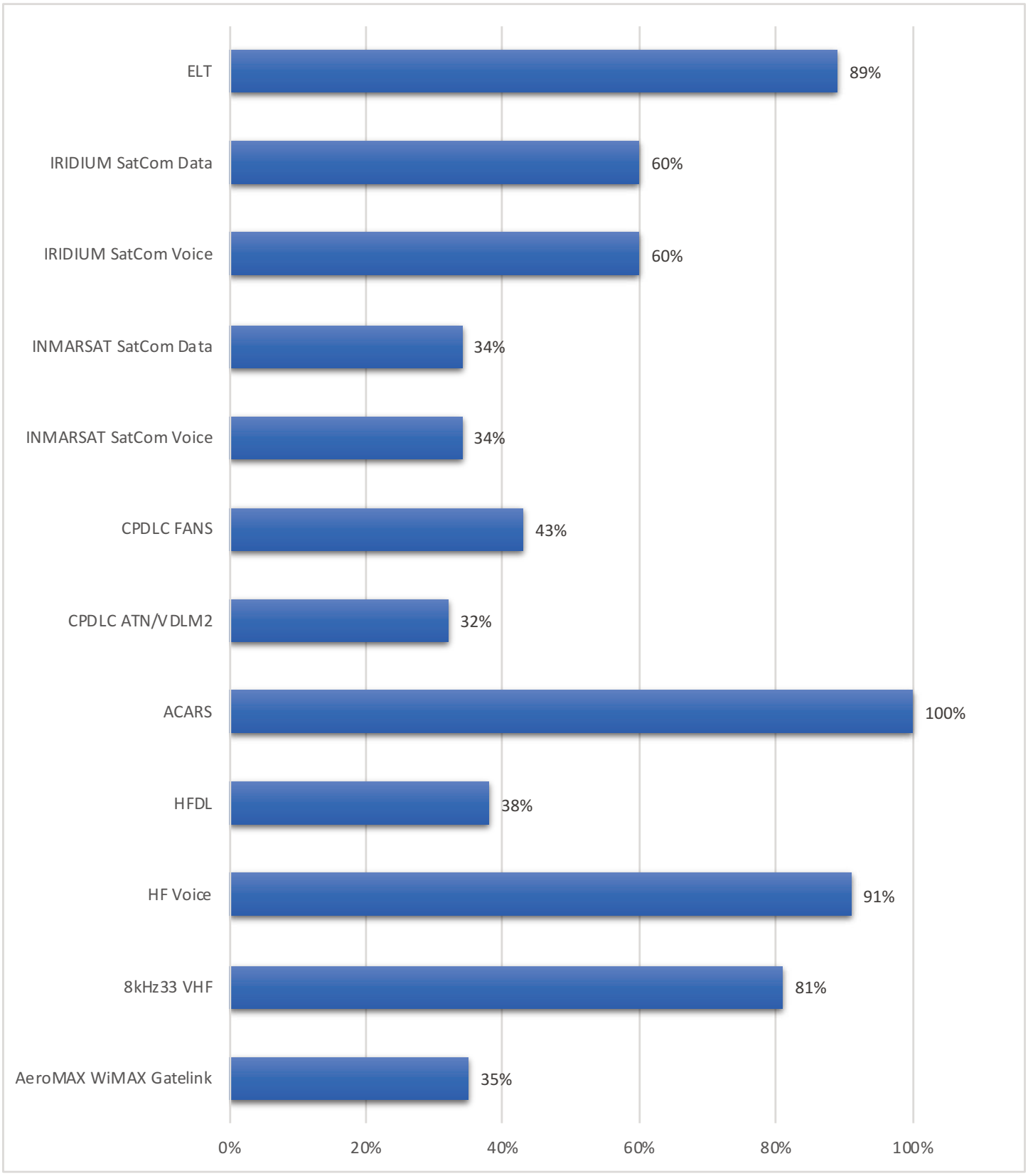
Paramaribo


ELT
100%
IRIDIUM SatCom Data
82%
IRIDIUM SatCom Voice
82%
INMARSAT SatCom Data
40%
INMARSAT SatCom Voice
40%
CPDLC FANS
69%
CPDLC ATN/VDLM2
76%
ACARS
100%
HFDL
74%
HF Voice
100%
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
57%
0%
20%
40%
60%
80%
100%

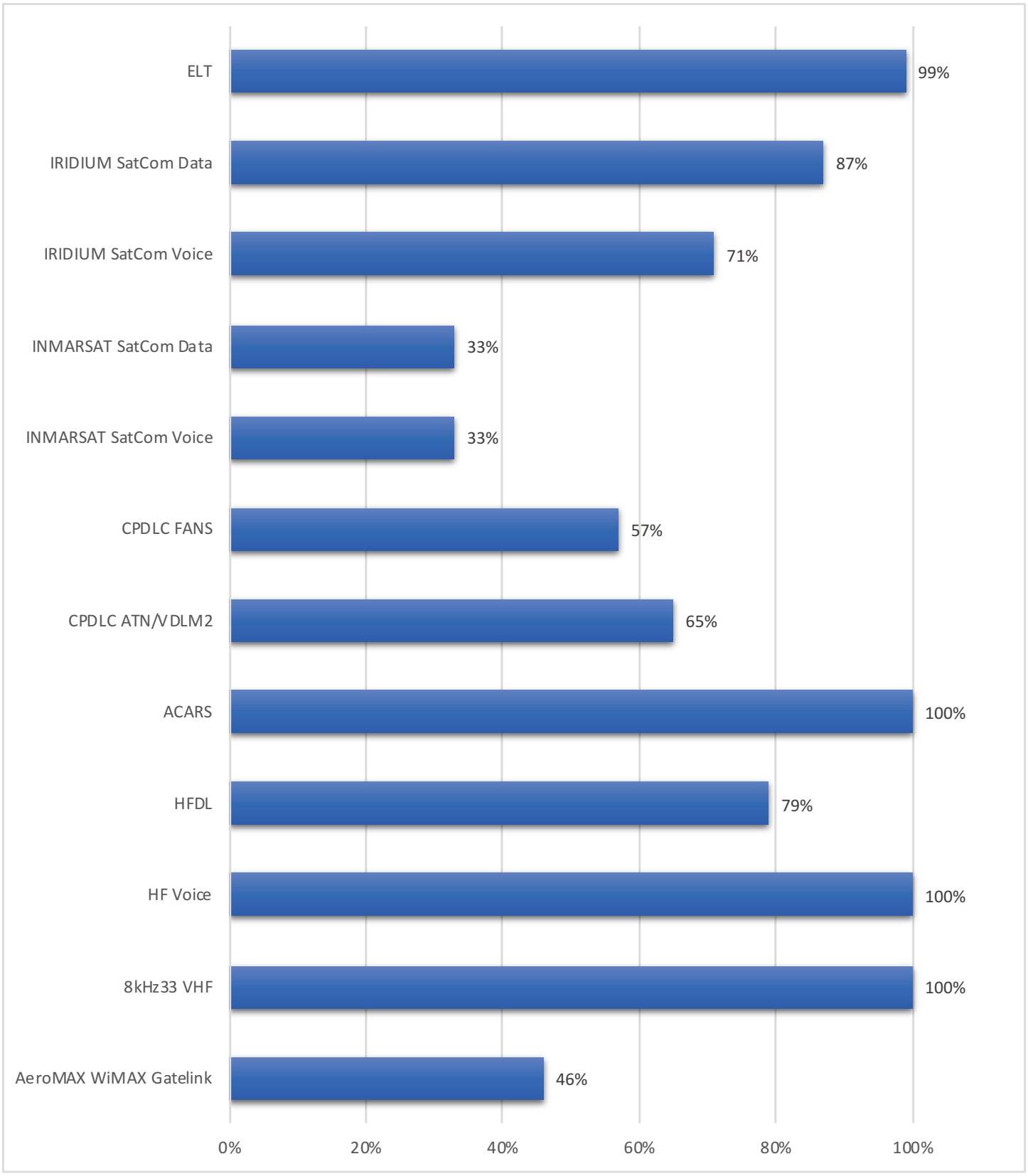
Piarco


ELT
87%
IRIDIUM SatCom Data
50%
IRIDIUM SatCom Voice
50%
INMARSAT SatCom Data
53%
INMARSAT SatCom Voice
53%
CPDLC FANS
52%
CPDLC ATN/VDLM2
35%
ACARS
99%
HFDL
31%
HF Voice
97%
8kHz33 VHF
78%
AeroMAX WiMAX Gatelink
32%
0%
20%
40%
60%
80%
100%

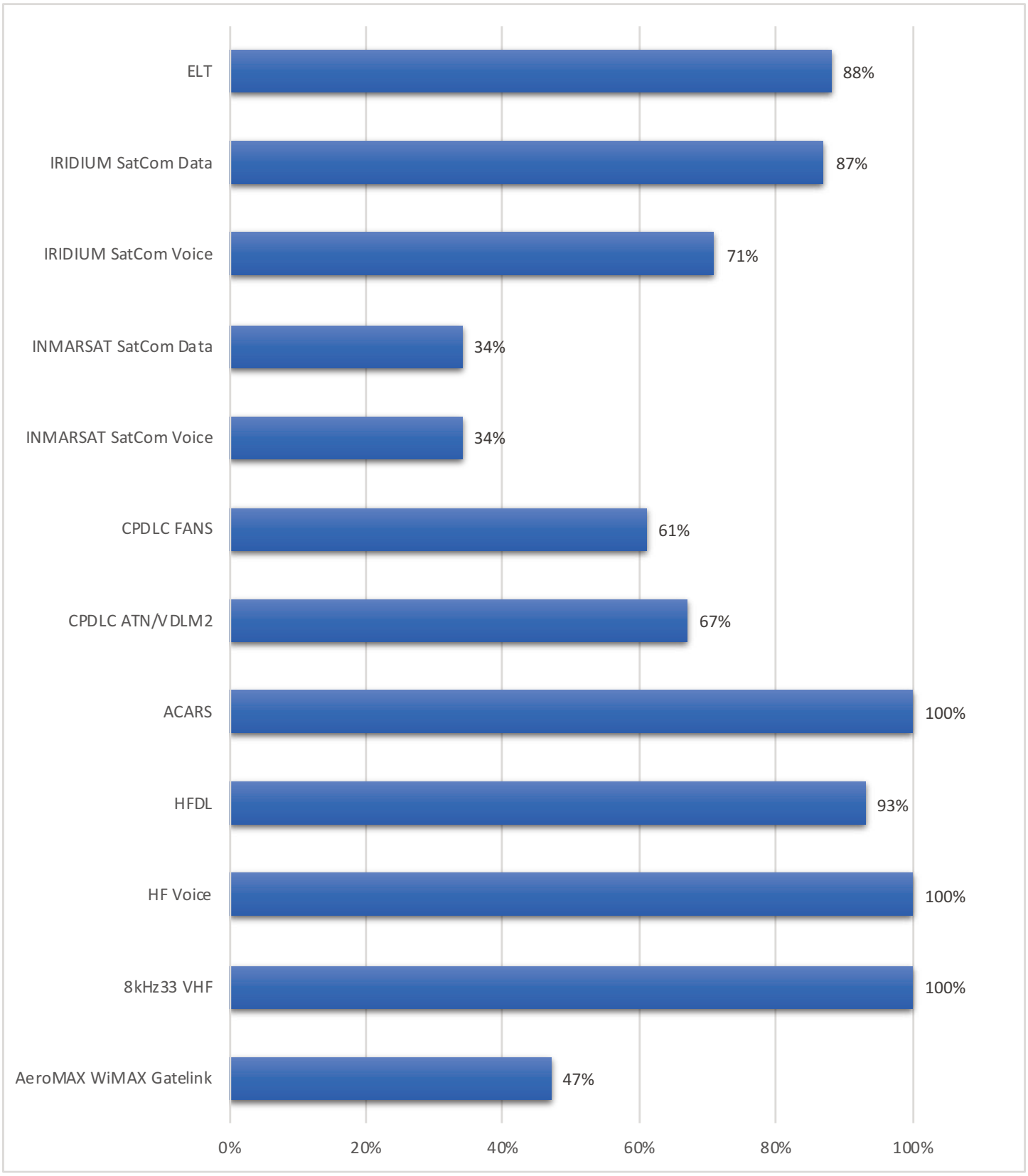
Port Au Prince



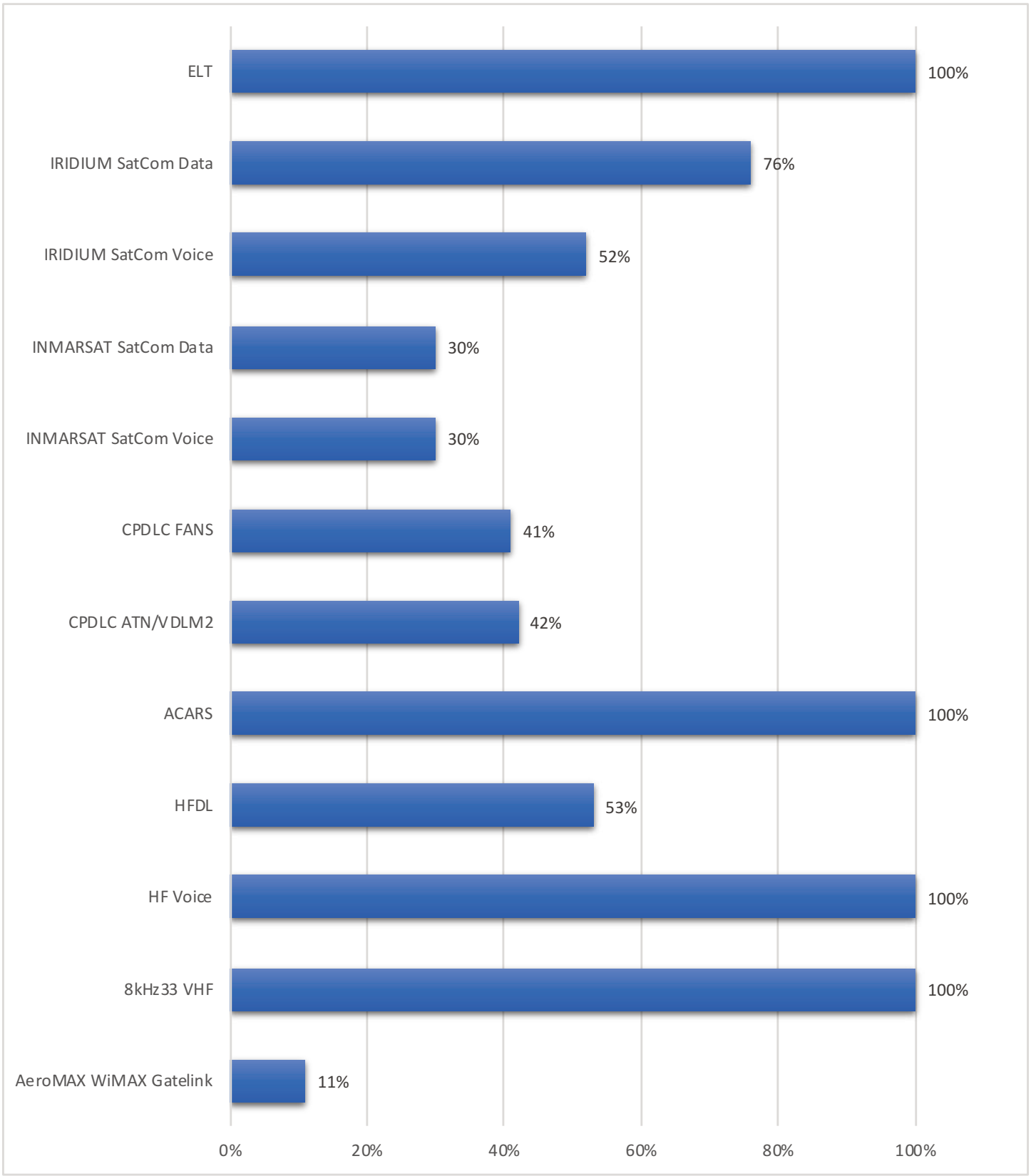
Puerto Montt



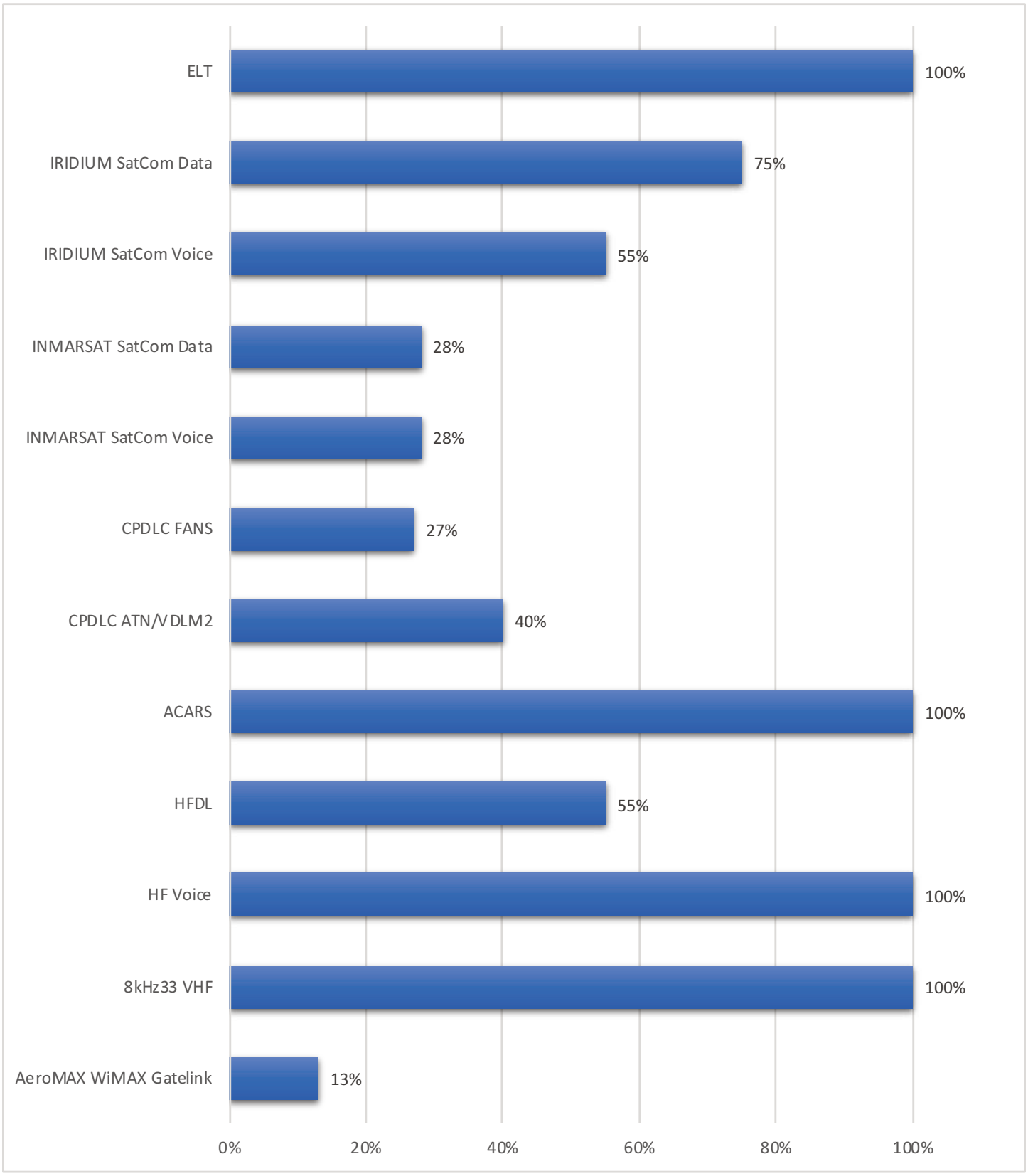
Punta Arenas



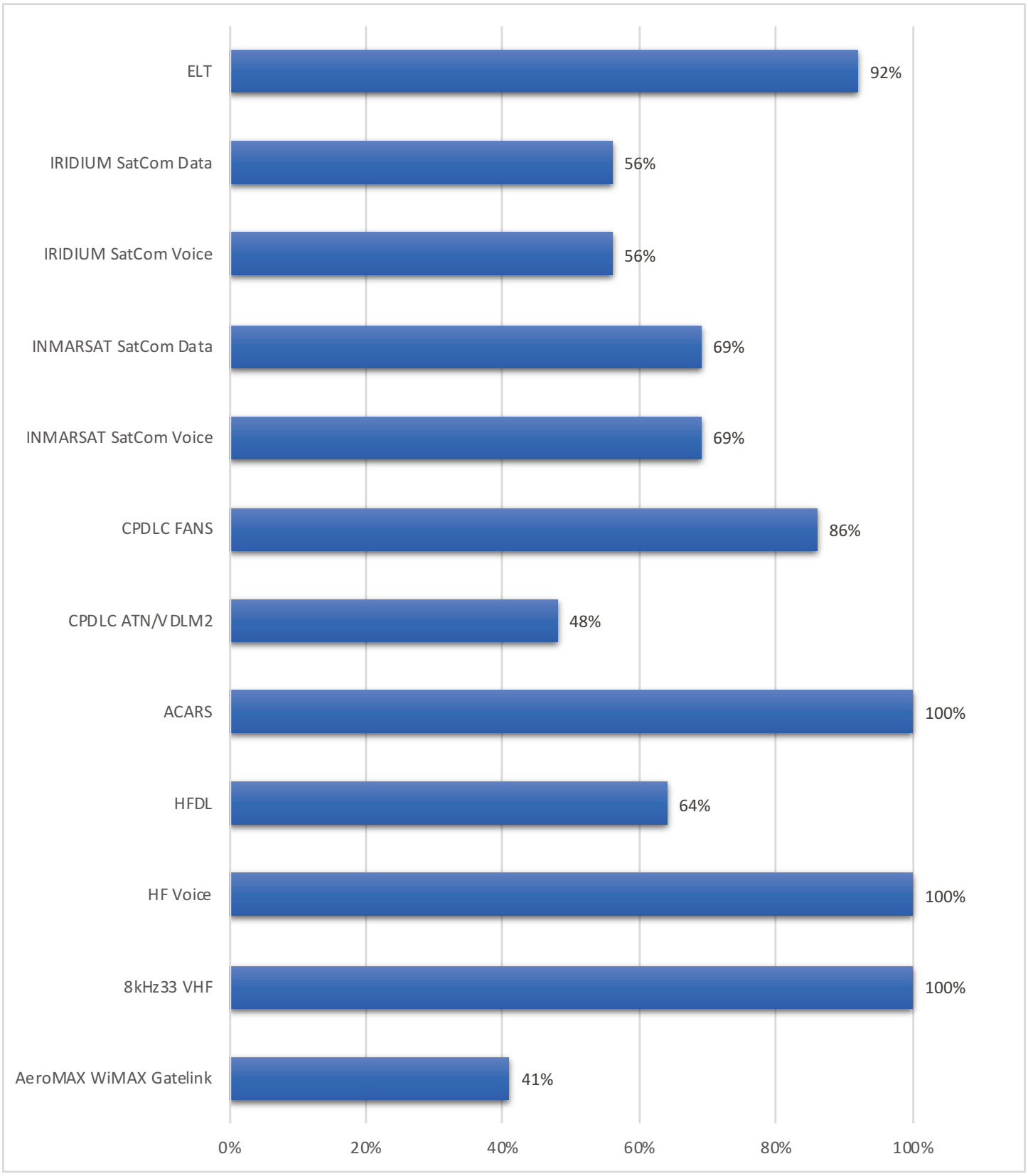
Recife


ELT
100%
IRIDIUM SatCom Data
76%
IRIDIUM SatCom Voice
52%
INMARSAT SatCom Data
30%
INMARSAT SatCom Voice
30%
CPDLC FANS
41%
CPDLC ATN/VDLM2
42%
ACARS
100%
HFDL
53%
HF Voice
100%
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
11%
0%
20%
40%
60%
80%
100%

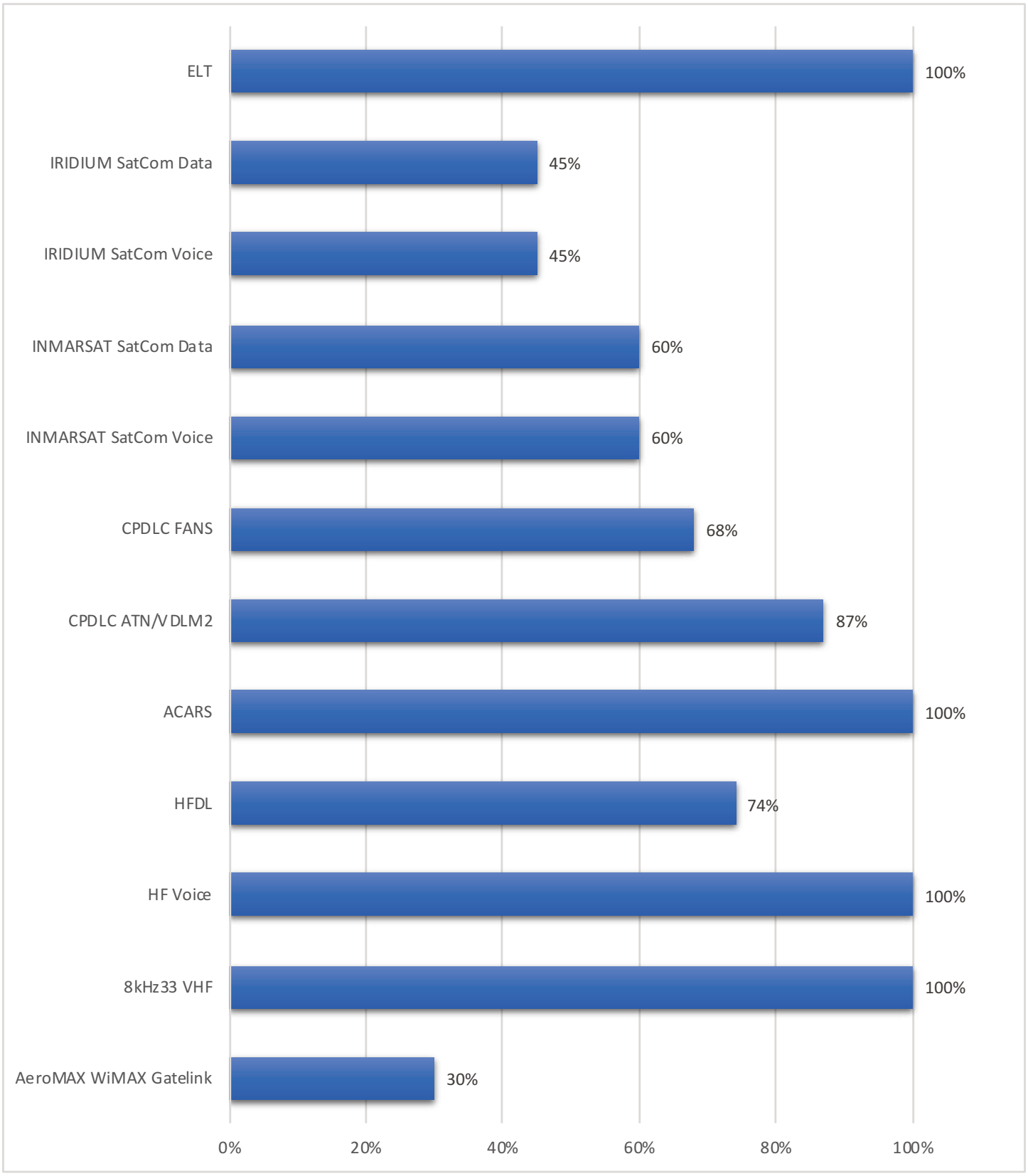
Resistencia



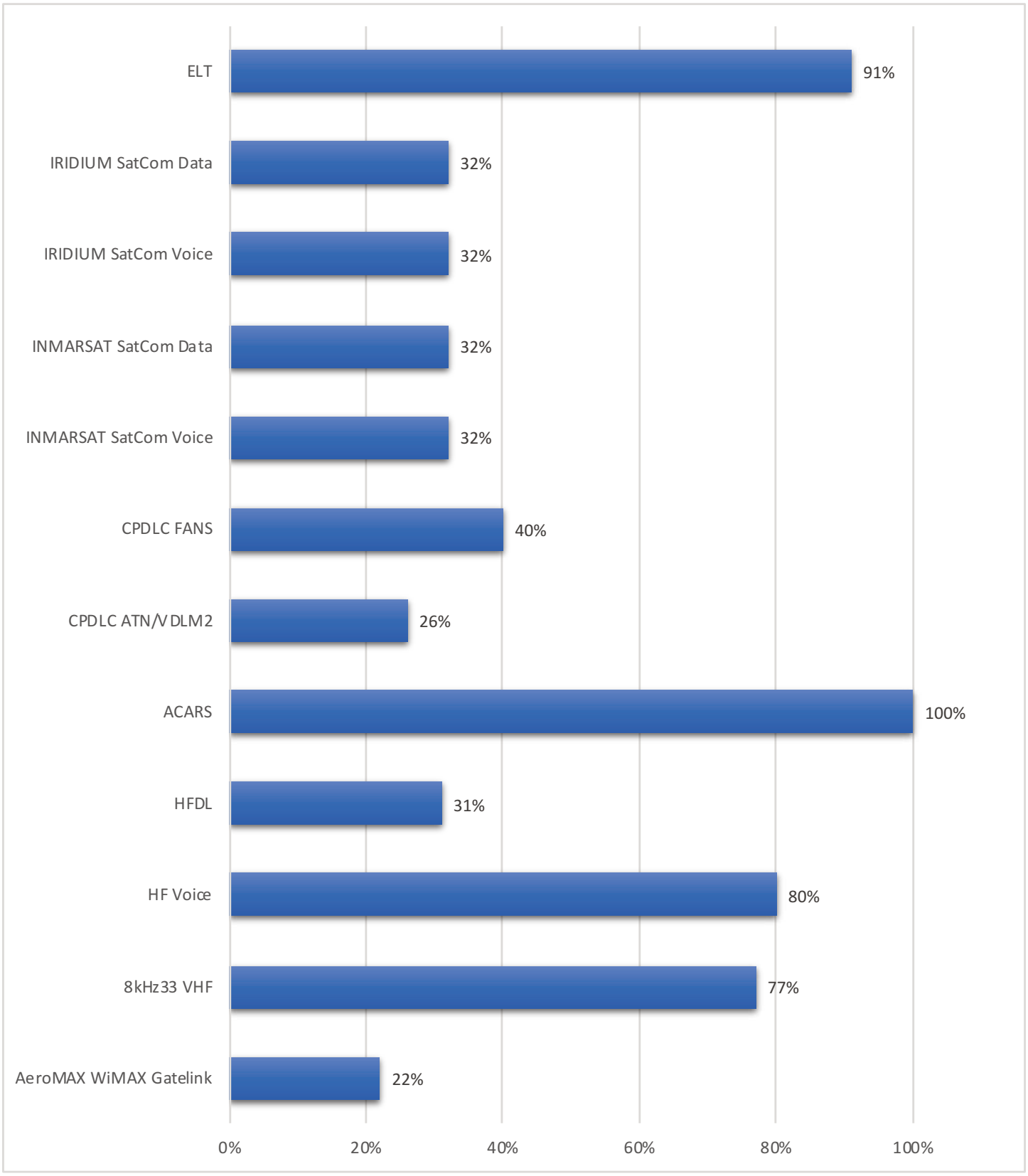
Reykjavik Oceanic



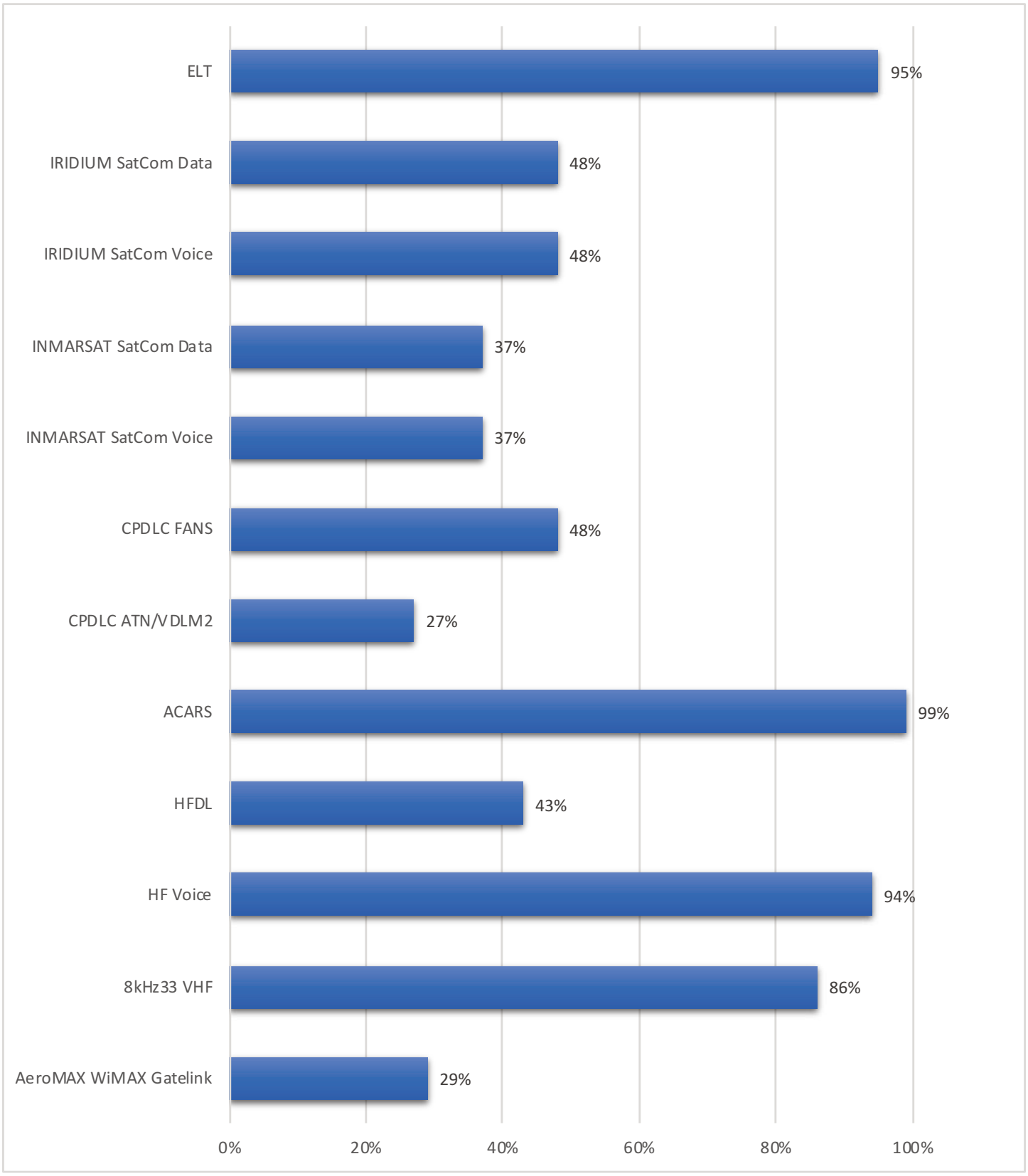
Rochambeau


ELT
100%
IRIDIUM SatCom Data
45%
IRIDIUM SatCom Voice
45%
INMARSAT SatCom Data
60%
INMARSAT SatCom Voice
60%
CPDLC FANS
68%
CPDLC ATN/VDLM2
87%
ACARS
100%
HFDL
74%
HF Voice
100%
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
30%
0%
20%
40%
60%
80%
100%

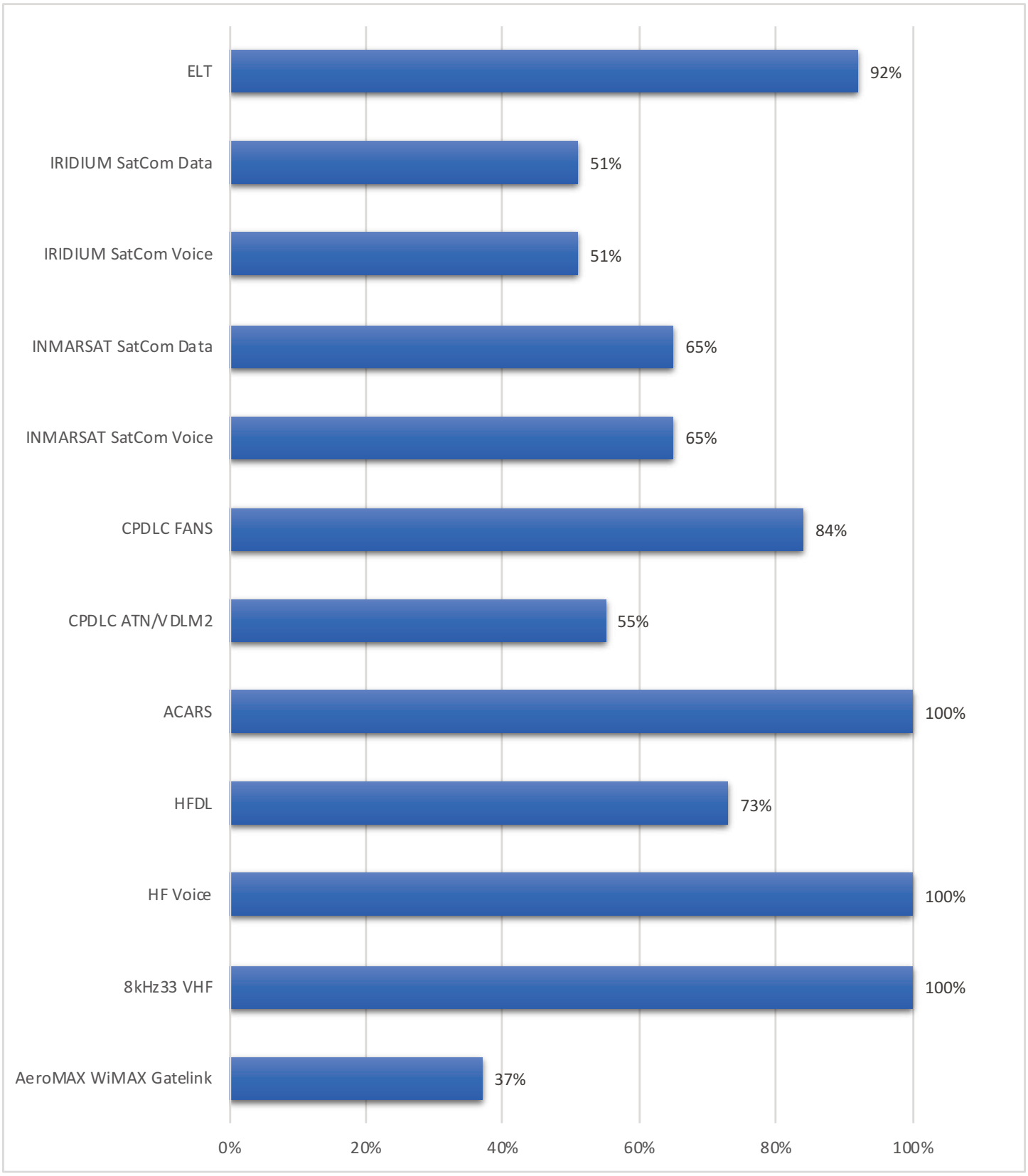
Salt Lake City



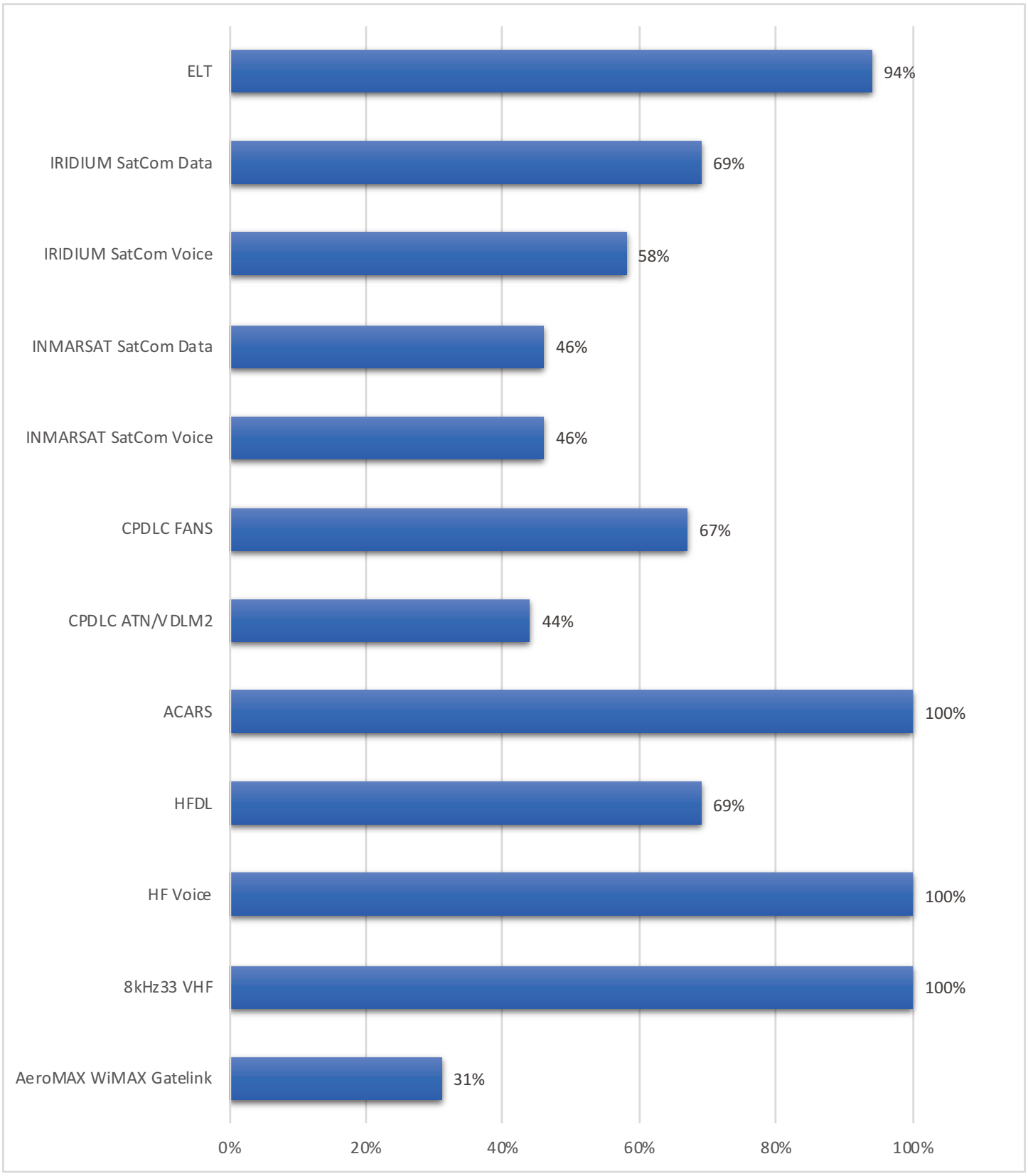
San Juan


ELT
95%
IRIDIUM SatCom Data
48%
IRIDIUM SatCom Voice
48%
INMARSAT SatCom Data
37%
INMARSAT SatCom Voice
37%
CPDLC FANS
48%
CPDLC ATN/VDLM2
27%
ACARS
99%
HFDL
43%
HF Voice
94%
8kHz33 VHF
86%
AeroMAX WiMAX Gatelink
29%
0%
20%
40%
60%
80%
100%

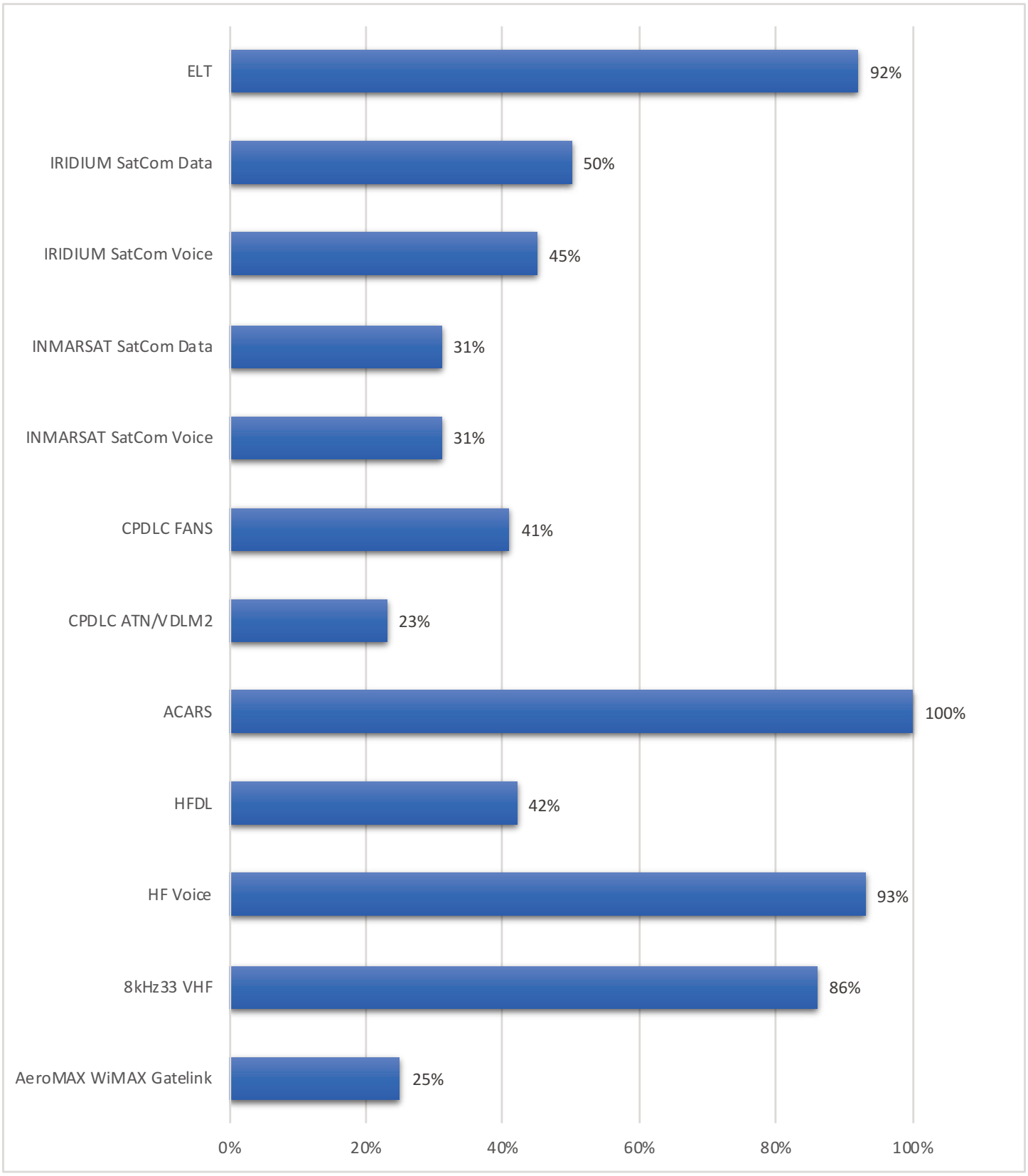
Santa Maria Oceanic



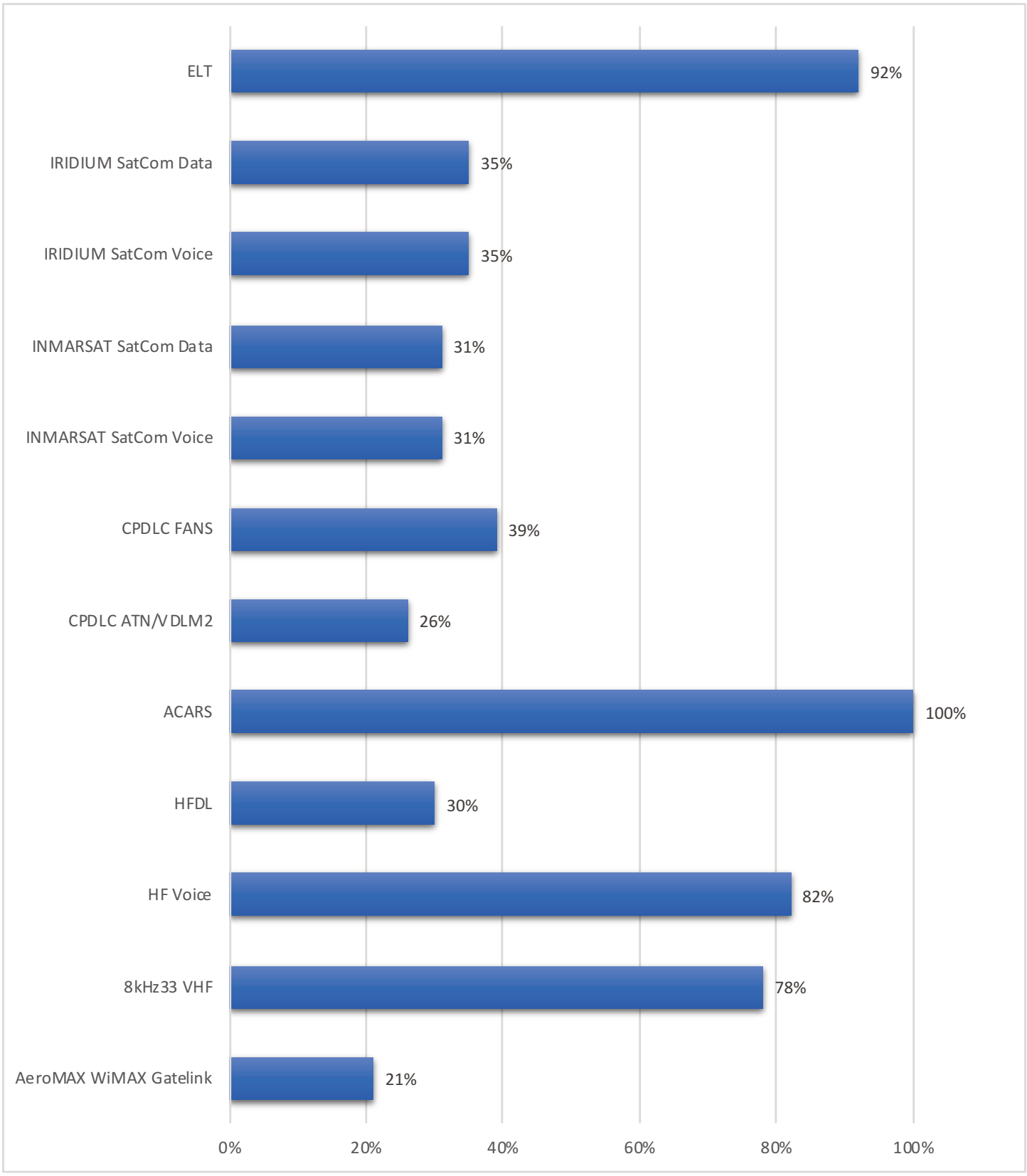
Santiago


ELT
94%
IRIDIUM SatCom Data
69%
IRIDIUM SatCom Voice
58%
INMARSAT SatCom Data
46%
INMARSAT SatCom Voice
46%
CPDLC FANS
67%
CPDLC ATN/VDLM2
44%
ACARS
100%
HFDL
69%
HF Voice
100%
8kHz33 VHF
100%
AeroMAX WiMAX Gatelink
31%
0%
20%
40%
60%
80%
100%

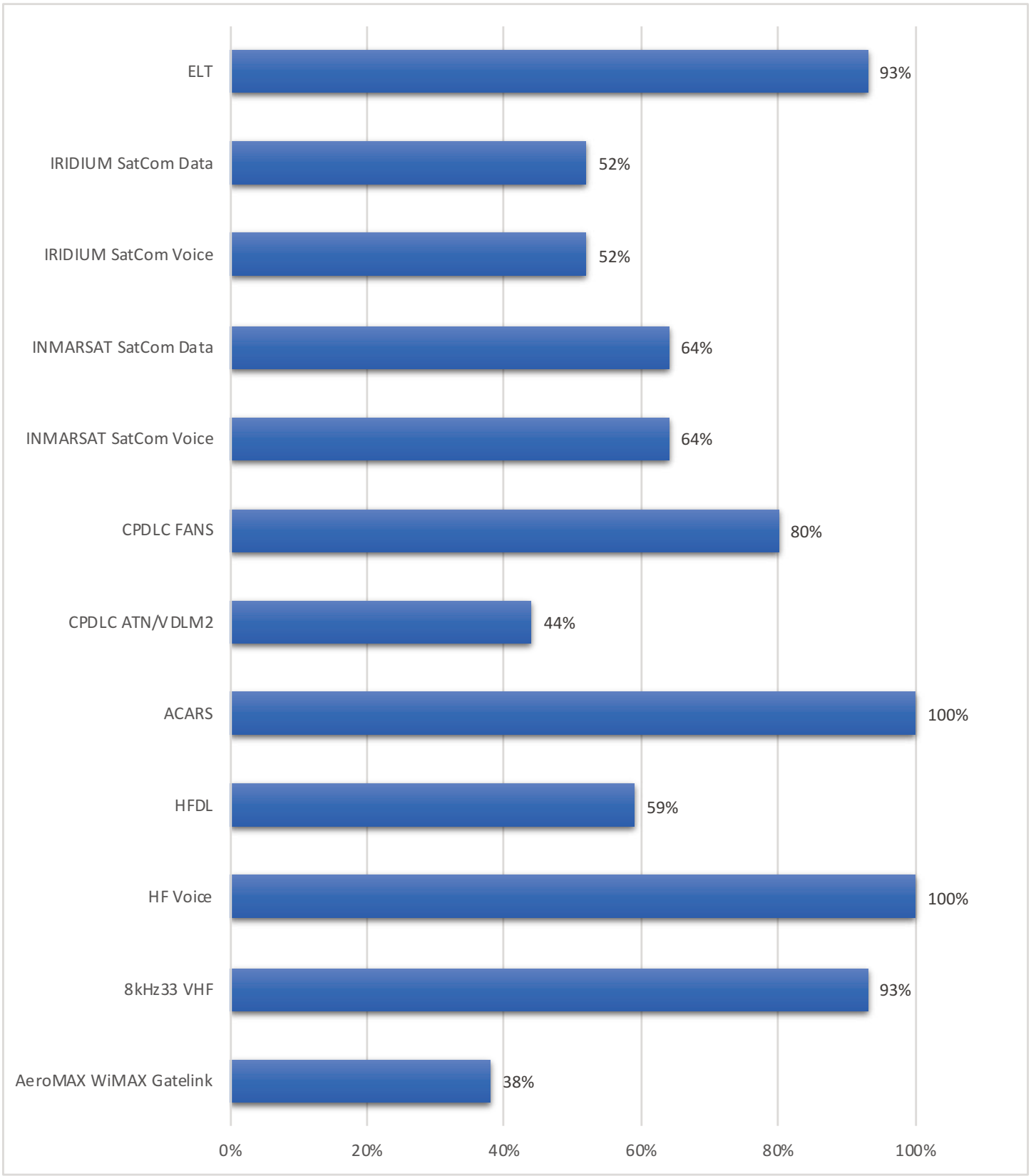
Santo Domingo



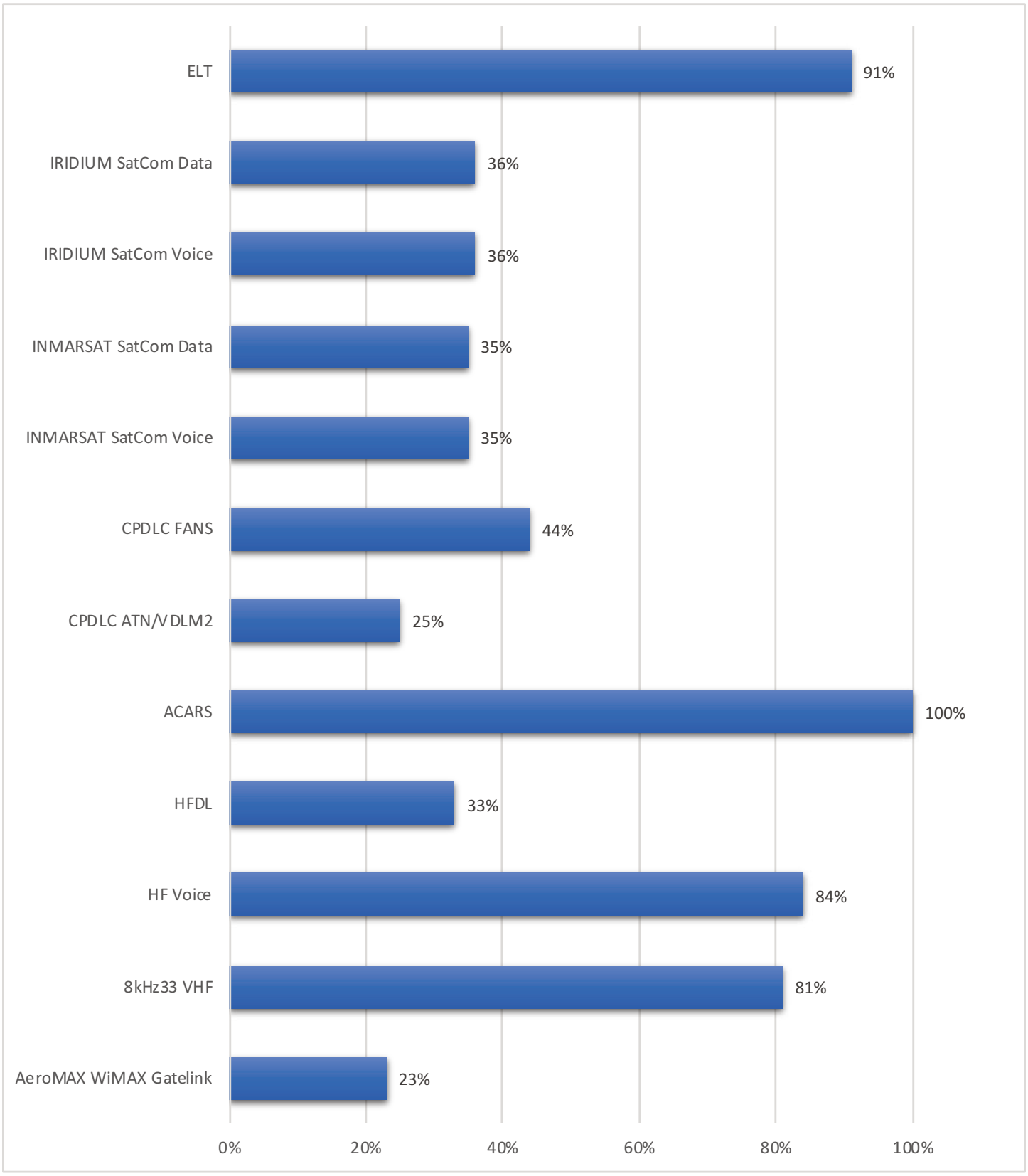
Seattle


ELT
92%
IRIDIUM SatCom Data
35%
IRIDIUM SatCom Voice
35%
INMARSAT SatCom Data
31%
INMARSAT SatCom Voice
31%
CPDLC FANS
39%
CPDLC ATN/VDLM2
26%
ACARS
100%
HFDL
30%
HF Voice
82%
8kHz33 VHF
78%
AeroMAX WiMAX Gatelink
21%
0%
20%
40%
60%
80%
100%

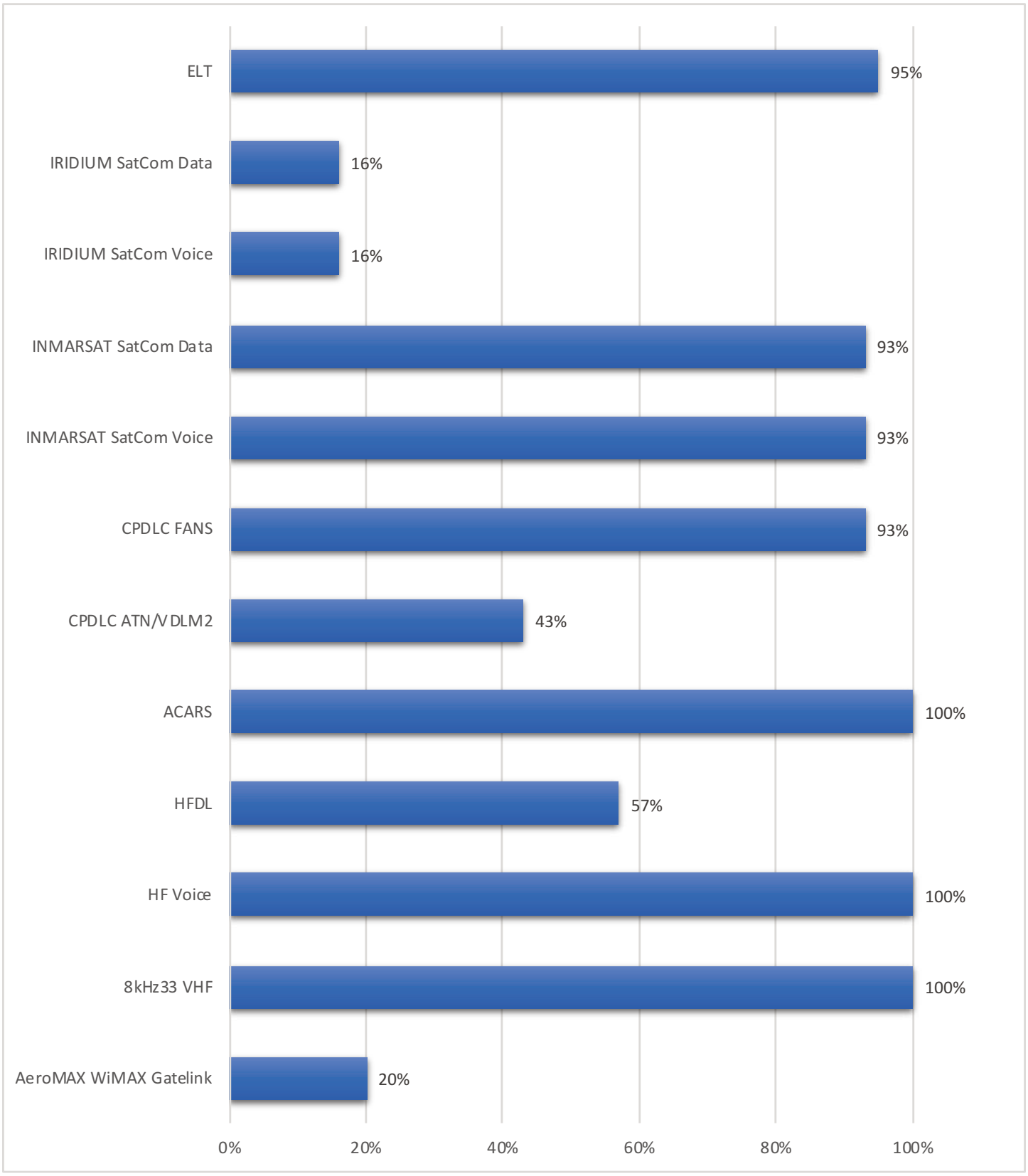
Shanwick Oceanic



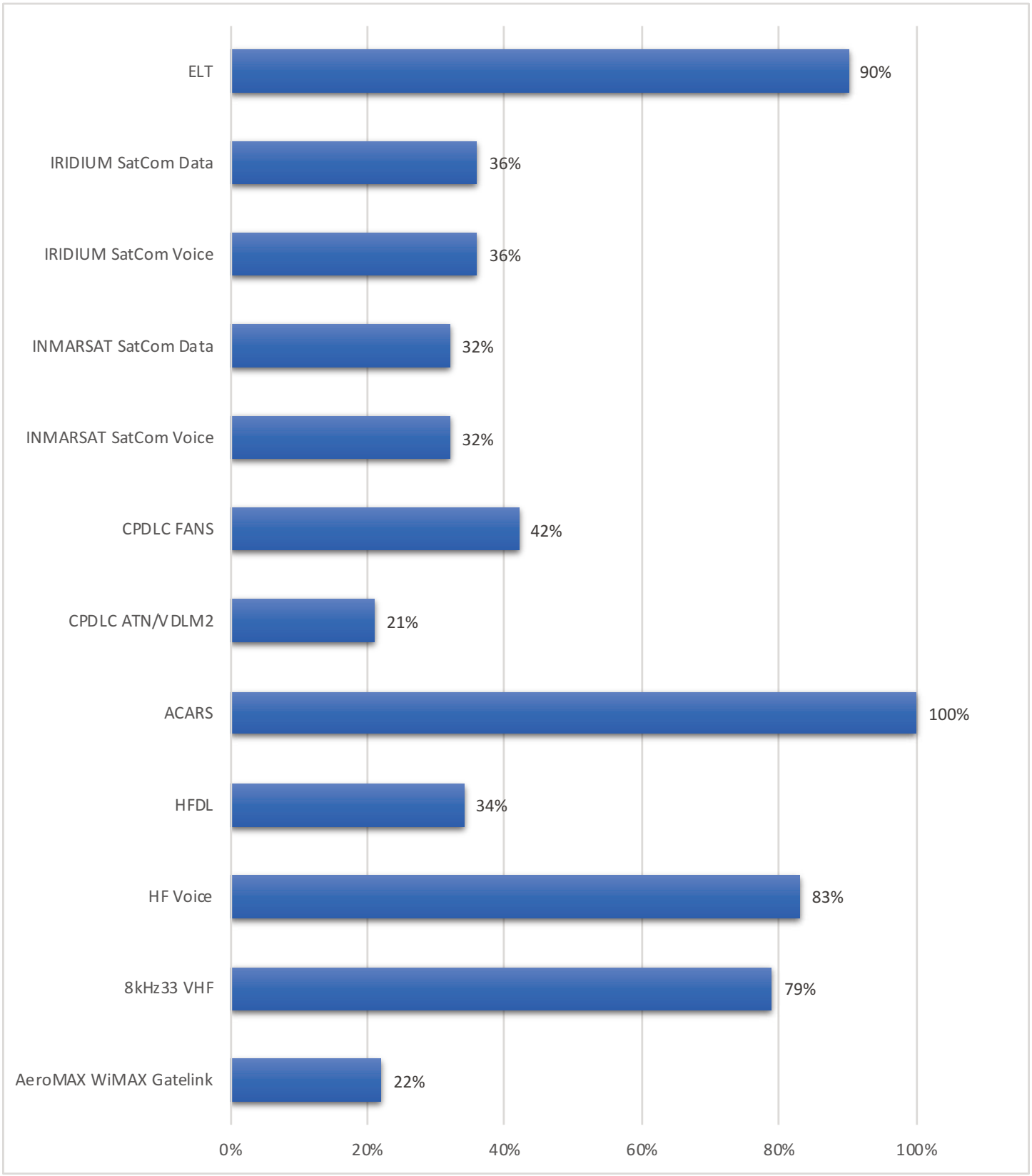
Toronto


ELT
91%
IRIDIUM SatCom Data
36%
IRIDIUM SatCom Voice
36%
INMARSAT SatCom Data
35%
INMARSAT SatCom Voice
35%
CPDLC FANS
44%
CPDLC ATN/VDLM2
25%
ACARS
100%
HFDL
33%
HF Voice
84%
8kHz33 VHF
81%
AeroMAX WiMAX Gatelink
23%
0%
20%
40%
60%
80%
100%

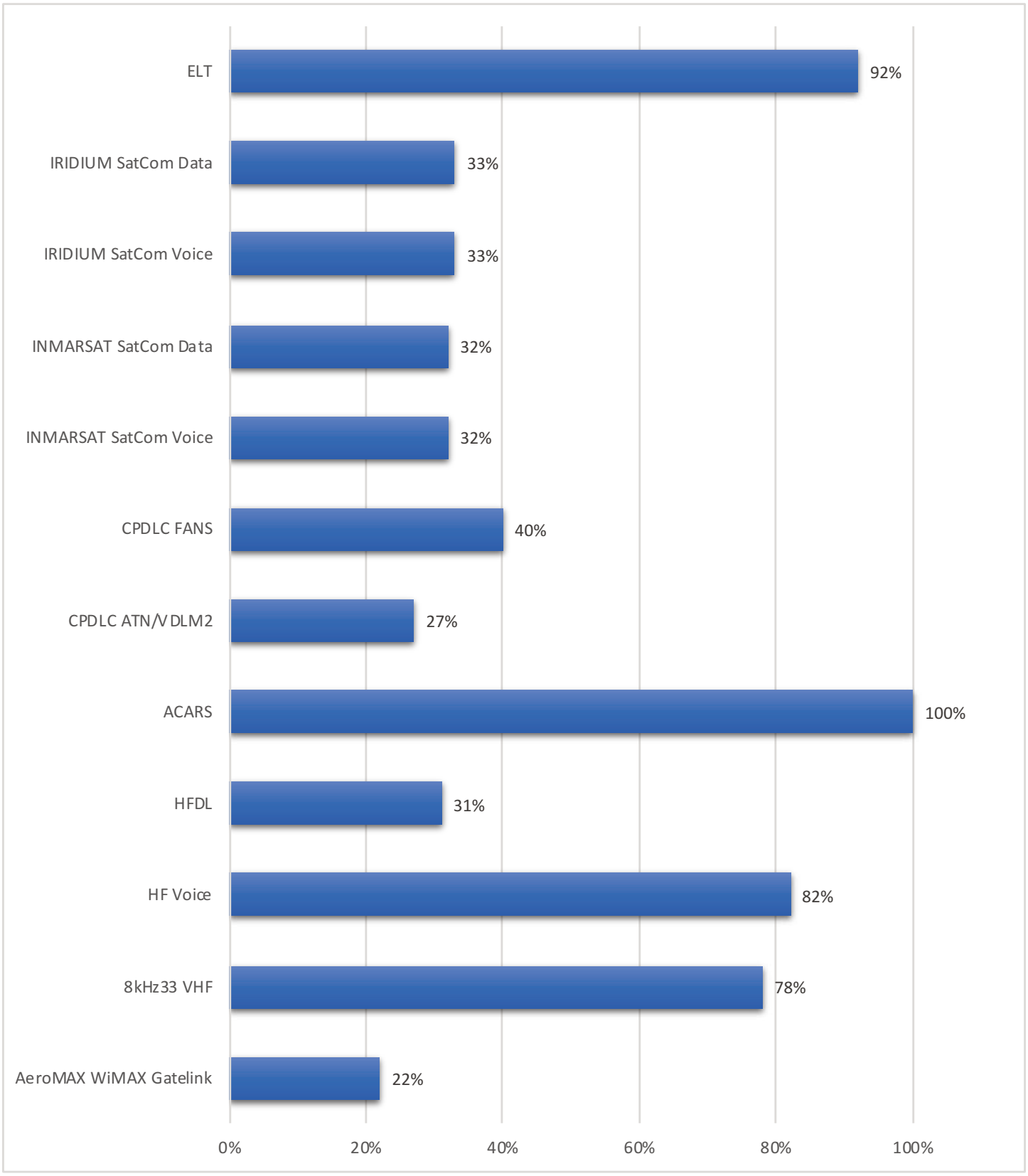
Trans-Polar (North and/or South)



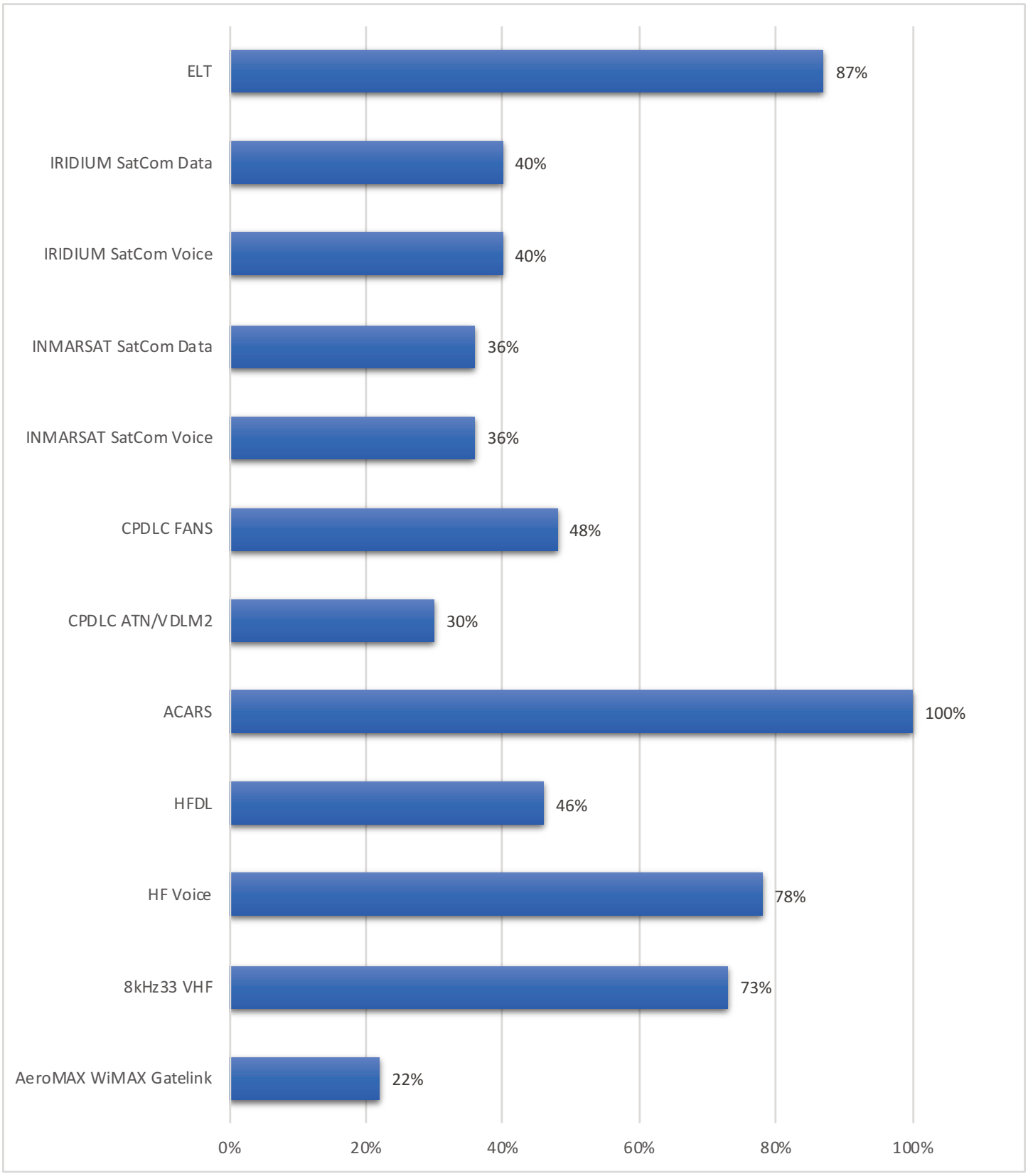
Vancouver


ELT
90%
IRIDIUM SatCom Data
36%
IRIDIUM SatCom Voice
36%
INMARSAT SatCom Data
32%
INMARSAT SatCom Voice
32%
CPDLC FANS
42%
CPDLC ATN/VDLM2
21%
ACARS
100%
HFDL
34%
HF Voice
83%
8kHz33 VHF
79%
AeroMAX WiMAX Gatelink
22%
0%
20%
40%
60%
80%
100%

Washington


ELT
92%
IRIDIUM SatCom Data
33%
IRIDIUM SatCom Voice
33%
INMARSAT SatCom Data
32%
INMARSAT SatCom Voice
32%
CPDLC FANS
40%
CPDLC ATN/VDLM2
27%
ACARS
100%
HFDL
31%
HF Voice
82%
8kHz33 VHF
78%
AeroMAX WiMAX Gatelink
22%
0%
20%
40%
60%
80%
100%

Winnipeg


ELT
87%
IRIDIUM SatCom Data
40%
IRIDIUM SatCom Voice
40%
INMARSAT SatCom Data
36%
INMARSAT SatCom Voice
36%
CPDLC FANS
48%
CPDLC ATN/VDLM2
30%
ACARS
100%
HFDL
46%
HF Voice
78%
8kHz33 VHF
73%
AeroMAX WiMAX Gatelink
22%
0%
20%
40%
60%
80%
100%

Work In Progress

All Americas Region airspace users including airlines, business, military and general aviation are welcome to contribute to this series of equipage and capability reports.

The associated survey is located here...

Aircraft Equipage and Capability Survey

Agenda Item 5: Operational implementation of new ATM automated systems and integration of the existing systems

5.1 Under this agenda item, the following papers were analysed:

a) WP/16 – *Follow-up on the Performance of the AIDC Operation in the SAM Region* (presented by the Secretariat);
b) WP/18 – *Performance of the AIDC Interconnection between the Lima ACC with Adjacent ACC* (presented by Peru);
c) WP/26 – *Follow-up of the Actions that Mitigate the Errors and the Duplicity/Multiplicity of Flight Plans in the SAM Region* (presented by Peru);
d) IP/13 – *Análisis de la implantación AIDC* (presented by Ecuador) (**Spanish only**);
e) IP/14 – *Current status of AIDC in Colombia* (presented by Colombia) (**Spanish only**);
f) IP/15 – *Implementation of new air traffic control management systems* (presented by Venezuela) (**Spanish only**);
g) IP/16 – *Status of ADS-B Implementation in Brazil* (presented by Brazil);
h) IP/18 – *AeroMacs* (presented by WIMAX Forum) (**English only**);
i) IP/19 – *ADS-B Implementation in Guyana* (presented by Guyana) (**English only**);
j) IP/22 – *Update of the implementation of the Satellite ADS-B* (presented by Aireon)
k) IP/23 – *Monitoring of the AIDC operation performance in Panama* (presented by Panama) (**Spanish only**); and
l) IP/25 – *Project of centralization of the flight plans of Brazil* (presented by Brazil) (**Spanish only**).

FOLLOW-UP TO THE PERFORMANCE OF AIDC OPERATION IN THE SAM REGION

5.2 The Meeting made an analysis and review of the current status of the AIDC interconnections among the different ACCs of the Region, emphasizing that those States in which the AIDC is maintained in the Pre-Operational phase, may achieve the Operational phase in the shortest possible time, provided there are no technical or operational impediments to this transition. In this regard, States are urged to proceed according to Conclusion SAM/IG/21-03, and report the performance results of the AIDC interconnections that are in their charge.

5.3 The entry to the Operational Phase between ACC Iquique - ACC Lima, and ACC Guayaquil - ACC Lima was highlighted. As a result, several operational benefits have been achieved, such as:

- Reduction of the workload of the ATC personnel;
- Decongestion of the oral channels;
- Reduction of LHD and operational errors; and
- More time available for ATC personnel to focus on the activity of Air Traffic Control.

5.4 As a follow-up to AIDC's performance, the progress reported by each of the States of the SAM Region updated at the Meeting is presented below:

Argentina

5.5 At the national level, the AIDC between Ezeiza and Aeroparque is in the Operational phase. The AIDC between the ACC of Córdoba and the Ezeiza ACC remains in the pre-operational phase since 2015, and among the other internal ACCs since 2018, having being amended the letters of operational agreement between the national ACCs with the introduction of operational use of AIDC as the primary means of coordination. Also, in September 2017, AIDC training was completed for the controllers of the ACCs of Comodoro, Rivadavia, Mendoza and Resistencia.

5.6 Argentina is currently in the process of technical, operational and economic evaluation; in search of fulfilling an upgrade of the current Indra AirCon 2100 Air Traffic Management system, or proceed to its change in all control centers and towers. If this option is chosen, it is possible that the dates originally planned for regional interconnections could be delayed, until the complete configuration and operation of the new system is achieved.

5.7 Regardless of these plans, the automated systems in Argentina are in a position to proceed with the initiation of technical interconnection tests with the regional ACCs.

Bolivia

5.8 An automated Thales ATM system Model Topsky is being implemented in Bolivia's main ATS units, which is expected to enter into operation by the second half of 2019. However, the manufacturer indicated that the system purchased does not include the module that allows AIDC functionality. Bolivia is managing the budget for the acquisition of the necessary module from the manufacturer Thales, which has generated a delay in the AIDC implementation plans. Date will be set once an agreement with the manufacturer is arranged.

Brazil

5.9 In the first quarter of 2018, the ATM Atech SAGITARIO system began operating in the Amazonian ACC and Atlantic ACC. In this way, Brazil has the AIDC implanted and in operation between all its national ACCs.

5.10 At the international level, the AIDC between the Amazonian ACC and the Lima ACC are in the pre-operational phase from September 6, 2018. The interconnections of the Atlantic ACC and Curitiba ACC with the adjacent ACCs of the Region are pending.

Chile

5.11 On August 18, 2018, the AIDC connection was established between the Iquique ACC and the Lima ACC. AIDC positive tests were carried out between the ACC of Iquique and the ACC of Córdoba, waiting for it to be in operation for the period 2019-2020. At the national level, the operational AIDC connection between the ACC of Punta Arenas and the ACC of Puerto Montt, and between the ACC of Iquique and the APP of Antofagasta, have been implanted since mid-2017.

Colombia

5.12 The AIDC interconnections implemented at the national level (ACC Bogotá - ACC Barranquilla) and intraregional (ACC Bogotá - ACC Guayaquil, ACC Bogotá - ACC Lima and ACC Bogotá - ACC Panama), are in the pre-operational phase since the end of 2015. Proceeded to review the operational letters of agreement between the aforesaid ACCs with the introduction of the use of the AIDC

as primary means. In November 2016, the amendment of the letter of operational agreement was signed between the Bogota ACC and the Lima ACC. It is expected that the AIDC connections between the ACC Bogota with the ACC Lima, and ACC Bogotá with ACC Guayaquil, enter the operational phase by the end of 2018, and with the ACC Panama for the first half of 2019.

5.13 Colombia indicated that they are in the process of designating new focal points for the coordination of activities related to the implementation of the AIDC.

Ecuador

5.14 At the national level, since February 2017, the AIDC between the Guayaquil ACC and the Quito APP has been operational, with an amendment to the operational agreement letter signed on February 1, 2017, with the introduction of the AIDC as primary means. AIDC positive tests were carried out between the Guayaquil ACC and the Manta and Shell APP at the end of 2017, and it is expected that by the end of the second half of 2018 they will enter the operational phase.

5.15 At the regional level, the AIDC between the ACC of Guayaquil and the ACC of Lima is in operation since August 18, 2018. The AIDC connection between the Guayaquil ACC and the Bogota ACC remains in the pre-operational phase since 2015, and an MOU has been established to retake formal pre-operational tests as of August 20, 2018. Among these ACCs, the letter of amendment was amended with the introduction of the use of AIDC as a primary means. It is expected that between the end of 2018 and the first quarter of 2019 at the latest, it will definitely enter the operational phase. Ecuador considers it necessary for Colombia to define a new focal point to coordinate AIDC implementation activities, given that the current one has announced its early withdrawal.

5.16 Positive pre-operational tests were conducted between the ACC of Guayaquil and CENAMER in the first quarter of 2017. The solution of a technical aspect regarding the sending requirement of Box 18 in the ABI message by the automated CENAMER system, is pending, whose system rejects the messages generated by the automated system of the Guayaquil ACC, which do not include or process Box 18 in the ABI message, while the automated system of ACC CENAMER requires that this information be included. Once this problem has been overcome with the intervention of the manufacturer (Indra), it is expected that by the end of 2019 it will be possible to migrate to the operational phase.

Guyana

5.17 The AIDC functionality is currently disabled in the automated INTELCAN system. Conversations have been initiated with the manufacturer to enable this functionality. The AIDC capacity is expected to be available from 2020.

Panamá

5.18 Coordination was made with the AIDC managers of CENAMER, Bogotá and Kingston to establish the respective Letters of Agreement between the adjacent ACCs. At present, the pre-operational phase between the Panama ACC with the Bogotá, Barranquilla and CENAMER ACCs has been maintained, and some inconveniences have arisen due to the fact that the operational staff has not been performing the AIDC pre-operational tests correctly (the manual coordination was maintained without leaving operate the AIDC automatically).

5.19 It is expected that the necessary agreements will be signed to migrate to the operational phase between CENAMER, Bogotá and Barranquilla, and to make the effective migration to the operational phase in the second quarter of 2019. It should be mentioned that, so far, testing between Rio Negro Control and Medellin Control, have not been done.

5.20 In compliance with Conclusion SAM/IG/21-03, Panama presented AIDC performance statistics at the pre-operational level, which are shown in **Appendix A** to this part of the report.

Paraguay

5.21 Paraguay has acquired a new ATM System, ATECH SAGITARIO. Taking into consideration the period required for the installation and commissioning, the new ATM system is foreseen to be operating by the second semester 2019, to resume the postponed tests.

Perú

5.22 The AIDC is in operational phase between Lima ACC and Guayaquil ACC (Ecuador) and Iquique ACC (Chile) since 18 August 2018. The connection with Bogota remains pre-operational since August 2015 and foreseen operational before the end of 2018. Likewise, the pre-operational phase with Amazonico began on 6 September 2018. Instructions are expected from Bolivia and Chile (Santiago ACC Oceanico ACC) to begin or continue the process of AIDC connection with the Lima ACC.

5.23 In compliance with Conclusion SAM/IG/21-03, Peru presented statistics of AIDC performance with adjacent ACCs which are presented in **Appendix B** to this Agenda Item.

5.24 In addition, Peru updated the AIDC Operations Manual, included as **Appendix C** to this part of the Report for those States that require update or develop their local manuals.

Suriname

5.25 Suriname does not have AIDC. The implementation with the ACC of adjacent States is foreseen by the period 2019-2020.

Uruguay

5.26 The implementation of the AIDC with the ACC of adjacent States is foreseen by the period 2019-2020.

Venezuela

5.27 The AIDC implementation with ACCs of adjacent States is foreseen by the end of 2019. At present, Venezuela does not have AIDC. It was informed that by the end of the first quarter of 2019 a new ATM automated system will enter into operation. This system has been purchased to company ATECH Brazil (SAGITARIO System). Once the automated system is installed and in operation, Venezuela will begin the AIDC implementation interconnection with adjacent States.

Other considerations regarding the follow-up to the AIDC interconnection implementation

5.28 The interconnection requirements of ground-ground data (AIDC) and the estimated dates of its operational implementation are presented as **Appendix D** to this part of the report. Likewise,

Appendix E presents the action plan for the implementation of the AIDC interconnection in the SAM Region and the list of focal points for the coordination of the AIDC interconnection implementation between adjacent ACCs, is presented in **Appendix F.**

5.29 The meeting for the AIDC implementation in the NAM/CAR/SAM Regions assessed the status implementation and formulated recommendations with the aim of urging the States to complete the operational implementation of the AIDC. Those recommendations have been validated by the Meeting since the AIDC implementation is pending in many States. The recommendations are presented as **Appendix G** to this part of the report.

FOLLOW-UP OF THE ACTIONS THAT MITIGATE THE ERRORS AND THE DUPLICITY / MULTIPLICITY OF FLIGHT PLANS IN THE SAM REGION

5.30 The Meeting took note on the progress made by the States regarding actions to mitigate errors and duplicity/multiplicity of flight plans. Updated information follows:

Argentina

5.31 ARO offices are being centralized with unique addresses for FPL reception in each ACC in Argentina. Completion ins foreseen by the end of 2020, with the aim of fulfilling Conclusion SAM/IG/19-2 *Implementation of procedures to mitigate the duplication/multiplicity of scheduled commercial flight plans.* At the moment FPL are transmitted only to Flight Plan units, either printed or by electronic means. Agreements are to be signed with airlines to send FPL to the ARO/AIS terminals electronically.

5.32 Repairing of flight plan positions of ATM systems has been transferred to ARO/AIS offices. ARO/AIS staff is now responsible of FPL checking and repairing. FDP position is now operated by ARO/AIS personnel from these offices.

Bolivia

5.33 Flight plans are still presented in hard copy (paper). There is a plan to implement a feature to enter flight plans on-line, via internet, and via a mobile application for cell phones.

Brazil

5.34 At the beginning of 2018, the centralization of all flight plans in the CGNA (Centro de Gerenciamento da Navegación Aérea) began using SIGMA - Integrated Air Movement Management System, which will provide this information to the automated systems of the ACC (Sagitario) and the Control Towers (TATIC). This implementation is divided into 4 phases:

a) Phase 1: In progress
   - Adoption of a single address - SBRJZPZX - to be used by SIGMA;
   - Adoption of an alphanumeric code that makes it possible to uniquely and exclusively identify each flight intention;
   - Synchronization of SIGMA and SAGITARIO databases; and
   - Presentation of feedback messages for users, with the status of their flight intentions.

b) Phase 2: Jul/2019
- Interoperability of SIGMA (GEA) with the AIM-BR system, for automatic updating of its database; and
- To have statistical reports.

c) Phase 3: Dec/2019
- Uniting SIGMA, SAGITARIO and TATIC databases; and
- Presentation of feedback messages for users, from the flight plans record in the databases of the ATC bodies (APP, TWR).

d) Phase 4: Jul/2020
- Consolidation of C-AIS; and
- Sturdiness of CGNA systems, evolution of redundancies and contingencies.

Chile

5.35 Chile contacted airlines to minimize errors when generating flight plans. The internal addressing structure is being revised to avoid multiple flight plans and a study for the implementation of a national centre to collect flight plans has been initiated.

Colombia

5.36 Colombia held meetings with air operators (Avianca, LATAM, Spirit, Viva Colombia, Iberia) in October 2017 on procedures for submitting flight plans to international AIS Offices and not directly to ACCs, in order to avoid duplication of flight plans. Draft MOUs have been prepared with these airlines.

5.37 The acquisition of an IFPS automated system for processing FPL is planned for 2019.

Ecuador

5.38 On 22 February 2018, a meeting was held with airline representatives to inform them of the adoption of a single national address to receive flight plans. In this regard, at the end of November 2018, an agreement will be signed between JETBLUE and the Civil Aviation Directorate General of Ecuador to accept the direct presentation via (AMHS) of the FPLs from their dispatch centre to the ATS systems. This procedure will be monitored for a reasonable period of time to ensure good performance. Other international companies will also be able to take advantage of this procedure.

Guyana

5.39 A centralized AFTN address has been established in order to receive FPL (SYCJZPZX for Flight Plans, SYCJYNYX for NOTAMs and SYCJYMYX). Flight Plans can be submitted in both electronic and hard (paper) copies. All FPL are received by the AID office (SYCJZPZX).

Panama

5.40 Updating of ACC Panama's automated ATM system has been completed, and the databases of the ATC system are being updated.

5.41 Although Panama initially decided that airlines (mainly Copa) should stop sending their FPL directly to the automated systems, and instead submit them through the ARO/AIS office, the possibility of resuming the way for airlines to send the FPL directly to the FDP management is currently being analysed, delegating this responsibility to them. It is hoped that this will mitigate the duplication/multiplicity problems of FPL.

Paraguay

5.42 Paraguay continues to receive duplicate flight plans. An operational instruction was issued for the personnel responsible for repairing FPL, with regard to the treatment of duplicate FPLs. Discussions were held with some airline dispatchers operating in Paraguay regarding the shipment of duplicate FPLs, especially with regard to flights departing from airports in the country where only those issued by ARO offices are considered valid, and they reported that they would communicate the situation to their bases. Duplicate FPLs continue to be received so far. There are also problems of lack of FPL in some cases, especially regarding overflights.

Peru

5.43 Using the AIC/05-2017, replaced on 9 August 2018 by AIC 09-2018 (basically updating contact details), implemented a procedure to mitigate duplicity/multiplicity of commercial scheduled flight plans by sending FPLs directly from the airlines to the single address SPIMZPZX (ARO), which has been developing quite successfully.

5.44 The ARO Office in Lima monitors all flight plans recorded in the automated ATM system via AMHS by implementing electronic reports in ARO positions, and thus detecting airlines that have errors and duplication in flight plans. It also performs constant coordination with those in charge of company operations in the headquarters where the flight plans originate.

5.45 In the months of August to November 2018, nationwide training has been conducted for all staff involved in FPL reception procedures via AMHS/AFTN.

5.46 From December 2017 to date, Letters of Agreement have been signed with 12 airlines operating regular international flights, covering 90% of these FPLs, and RPL has been discontinued. In 2019, the procedure is expected to continue with airlines operating domestic flights.

5.47 The processing capacity for ACK and REJ messages is expected to be incorporated for FPLs from February 2019.

5.48 In October 2018, an FPL error/duplication reporting system was implemented in the ARO office of the "Jorge Chávez International Airport".

5.49 The Peruvian State will implement a Flight Plan Treatment Unit for the entire FIR in order to optimize the AIDC and ATFM.

Venezuela

5.50 Venezuela has implemented in pre-operational mode, a centralized automated system for processing flight plans of the IDS brand that allows to reduce errors in their presentation. This system is located in Maiquetía's ARO Office. The SAMIG/19-2 conclusion is expected to be implemented by the end of 2019.

Other States

5.51 The States of French Guiana, Suriname, and Uruguay have made no progress in implementing Conclusion SAM/IG/19-2.

STUDY OF THE FEASIBILITY AND CONVENIENCE OF USING THE SATELLITE-BASED ADS-B SERVICE IN THE SAM REGION

5.52 The meeting took note of the Study that had been requested at the SAM/IG/19 Meeting to analyse the feasibility and convenience of adopting the ADS-B satellite service at a regional level. In order to carry out this study, an oversight expert (Mr. Iván Salas) was recruited from Ecuador, for a one-week period in April 2018, who has prepared a preliminary document, which was presented at the SAM/IG/21 Meeting.

5.53 The SAM/IG/21 Meeting (Lima, 21-25 May 2018) has requested States to review the preliminary study and provide the necessary information to complete the study. That same Meeting recommended the Coordination Committee of Project RLA/06/901 to give one more week to the surveillance expert to complete the requested study together with representatives of the service provider and the staff of the ICAO Lima Regional Office. During the week of 24-28 September 2018, the study was completed and was ready to be presented at the SAM/IG/22 Meeting.

5.54 The completed study presents information on the characteristics, performance, coverage and costs of current oversight technologies, allowing States to compare the adoption of the ADS-B Satellite service with other aeronautical surveillance possibilities such as secondary radar (SSR) and terrestrial ADS-B stations.

5.55 At the SAM/IG/19 Meeting, States had already recognized the operational benefits and advantages that could be provided by the satellite ADS-B service, such as:

- Coverage of existing gaps in the surveillance systems of the States in the Region;
- Coverage in boundary areas as an alternative to the exchange of surveillance data between adjacent States;
- Coverage in oceanic areas out of reach of ground surveillance systems;
- Surveillance solution for non-FIR airspace;
- Constant update of target positions, unlike periodic update provided by ADS-C.

5.56 The study concludes that the use of the satellite-based ADS-B system in the region is feasible due to its coverage, response time in the information transfer process or latency, and availability of information, for en-route airspaces above 10,000 feet, which was the airspace analysed in this study.

5.57 The following benefits of a regional implementation are identified in the study:

a). **Safety** – Effective surveillance in areas that currently lack coverage, definitely contributing to increased safety.

b). **Flight efficiency** – Effective surveillance of ADS-B information, providing the means to optimise flights and increase airspace utilisation capacity.

c). **Flexibility** – The service provided allows the ANSP to hire specific areas or volumes at the flight levels of operational interest, as the only means of surveillance or as

augmentation of the existing surveillance infrastructure, and as redundancy in areas of critical operational interest.

d). **Homogeneity** – With States obtaining information from a single source, with the same parameter levels, it is possible to standardise air navigation services throughout the region.

e). **Environment** – Improved flight management, increasing capacity, more direct flights and reduced waiting times contribute to reduce adverse impact of aviation on the environment.

f). **Profitability** – With more efficient and economic flights, the profitability for aircraft operators becomes sustainable, with positive impact for the final user. From the point of view of the ANSPs, the reduction in implemented infrastructure and the required maintenance have a significant impact on this aspect.

5.58 A comparative table summarizing the relationship between FL, coverage percentage, and annual cost per % Coverage and Km2 of FIRs is presented in **Appendix H** to this part of the report.

5.59 The Secretariat will circulate this study to REDDIG participating States for comments and expression of interest in participating in discussions of a regional implementation.

IATA's position on satellite ADS-B

5.60 IATA expressed its opinion and considerations regarding the ADS-B satellite system which are presented in **Appendix I** to this agenda item (*Spanish only*). The Meeting did not define any position with respect to IATA's position on satellite ADS-B.

EVOLUTION OF AERONAUTICAL MOBILE COMMUNICATION INFRASTRUCTURE

5.61 The meeting took note of the Future Communications Infrastructure (FCI), which comprises a set of data link technologies integrated into a single communications network: LDACS (L-band Digital Aeronautical Communications System) for air/ground communications, a dedicated data link to be used at large airports (AeroMACS, Aeronautical Mobile Airport Communications System), a satellite component, and a direct air/air data link.

5.62 Also, the Meeting took note of the availability and benefits of the AeroMACS data link system, as standardised by ICAO and designed to support the exchange of safety and regularity communications of flight operations at airfield level. This system is based on IEEE 802.16-2009 (WiMAX) and consists of a wireless mobile communication system providing broadband connectivity on the airport surface.

AeroMACS

5.63 The Meeting took note of the information presented by the WiMAX Forum on the application of AEROMACS technology in the aeronautical community, highlighting the following points:

- A set of studies and performance tests have been carried out and AeroMACS was identified as the wireless technology capable of supporting the growing need for secure connectivity on airport surface.

- ITU has assigned the internationally protected and licensed aviation spectrum band to AeroMACS. The FAA has already identified more than 330 potential fixed and mobile applications of AeroMACS.
- The first site to install AeroMACS was Cleveland Airport with NASA. The benefits of AeroMACS have been demonstrated across multiple applications and it continues to grow.
- In China, AeroMACS was authorized to be installed in 110 airports. They have already been installed in 11 airports and the rest will be installed before the end of 2019 at 30 other airports with high traffic.
- The Lisbon Airport has chosen AeroMACS for several reasons, including the ability to easily implement and maintain it, expanding the project without interruptions on a reduced budget.
- The first installation in Latin America was in Rio de Janeiro, Brazil, where the multilateration and mobility solution has been tested in the same multiservice network.
- In airplanes, AeroMACS has been tested with Boeing, Bombardier, and has also performed telemetry tests with Embraer. Airbus has the aeronautical and rational project for its installation.
- In short, AeroMACS is the secure and standardized technology now available to improve communications on the airport surface.

TABLA 1 MENSAJERIA QUE RECIBE EL AIDC PANAMA

DÍA	ABI	EST	ACP	LAM	LRM	TOC	AOC	CDN
19 AGOSTO IN	313	277	203	592	111	14	1	33
20 AGOSTO IN	307	283	237	715	86	42	4	37
21 AGOSTO IN	307	276	189	597	107	31	0	35
22 AGOSTO IN	302	260	200	625	100	31	0	48
23 AGOSTO IN	331	278	222	697	95	38	3	40
24 AGOSTO IN	289	277	213	657	225	16	0	38
25 AGOSTO IN	320	291	219	680	66	4	7	36
26 AGOSTO IN	309	259	206	647	93	31	0	36
27 AGOSTO IN	284	281	212	735	127	29	0	32
28 AGOSTO IN	316	276	226	689	191	44	0	36
29 AGOSTO IN	299	269	217	671	118	29	3	44
30 AGOSTO IN	346	287	214	696	100	36	5	44
31 AGOSTO IN	283	273	202	644	113	49	0	45
1 SEPTIEMBRE IN	323	280	236	738	81	43	0	47
2 SEPTIEMBRE IN	317	271	208	668	92	53	1	44
3 SEPTIEMBRE IN	285	263	205	690	227	91	16	49
4 SEPTIEMBRE IN	276	274	202	642	158	53	2	45
5 SEPTIEMBRE IN	268	232	187	589	170	47	1	41
6 SEPTIEMBRE IN	330	300	223	721	165	92	2	46
7 SEPTIEMBRE IN	298	273	190	618	179	48	0	34
8 SEPTIEMBRE IN	329	282	204	679	192	55	2	39
9 SEPTIEMBRE IN	327	280	195	649	151	42	0	45
10 SEPTIEMBRE IN	287	277	209	677	211	50	1	54
11 SEPTIEMBRE IN	300	253	213	653	139	45	1	52
12 SEPTIEMBRE IN	308	271	211	673	81	48	1	40
13 SEPTIEMBRE IN	298	293	223	712	104	77	0	42
14 SEPTIEMBRE IN	304	280	212	674	110	53	7	51
15 SEPTIEMBRE IN	274	265	221	712	113	78	3	41
16 SEPTIEMBRE IN	294	266	202	650	102	40	0	39
17 SEPTIEMBRE IN	298	288	207	727	121	106	8	41
PROMEDIO	304.066667	274.5	210.266667	670.566667	130.933333	47.1666667	2.26666667	41.8
TOTAL	9122	8235	6518.26667	20787.5667	4058.93333	1462.16667	70.2666667	1295.8

TABLA 1 MENSAJERIA QUE RECIBE EL AIDC PANAMA

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PROMEDIO	304.066667	274.5	210.266667	670.566667	130.933333	47.1666667	2.26666667	41.8
TOTAL	9122	8235	6518.26667	20787.5667	4058.93333	1462.16667	70.2666667	1295.8

TABLA 3 MENSAJERÍA QUE MANDA EL AIDC PANAMÁ

DÍA	ABI	EST	ACP	LAM	LRM	TOC	AOC	CDN
19 AGOSTO OUT	298	216	160	594	256	3	3	7
20 AGOSTO OUT	334	257	174	650	270	5	18	5
21 AGOSTO OUT	299	209	168	615	234	1	29	1
22 AGOSTO OUT	309	236	163	621	232	0	8	1
23 AGOSTO OUT	334	244	188	694	231	7	20	5
24 AGOSTO OUT	325	234	159	598	242	0	6	4
25 AGOSTO OUT	314	247	182	641	242	8	1	5
26 AGOSTO OUT	308	239	164	645	207	1	30	6
27 AGOSTO OUT	414	233	171	599	250	0	20	1
28 AGOSTO OUT	316	240	178	678	234	8	53	10
29 AGOSTO OUT	336	244	173	631	241	5	22	8
30 AGOSTO OUT	321	237	197	702	244	13	21	8
31 AGOSTO OUT	316	226	179	633	235	0	46	2
1 SEPTIEMBRE OUT	347	259	189	711	231	0	27	6
2 SEPTIEMBRE OUT	314	226	189	684	232	4	31	2
3 SEPTIEMBRE OUT	315	227	193	709	212	18	74	6
4 SEPTIEMBRE OUT	310	223	185	651	212	6	55	7
5 SEPTIEMBRE OUT	294	214	164	581	218	4	21	5
6 SEPTIEMBRE OUT	338	244	191	726	281	3	65	3
7 SEPTIEMBRE OUT	295	221	178	625	233	0	43	5
8 SEPTIEMBRE OUT	335	227	202	701	225	4	45	4
9 SEPTIEMBRE OUT	308	226	179	657	237	1	51	6
10 SEPTIEMBRE OUT	317	229	199	675	212	2	40	7
11 SEPTIEMBRE OUT	313	234	167	644	235	1	23	9
12 SEPTIEMBRE OUT	310	233	186	676	219	4	24	2
13 SEPTIEMBRE OUT	336	246	191	673	272	1	44	4
14 SEPTIEMBRE OUT	305	230	181	678	238	7	64	4
15 SEPTIEMBRE OUT	331	236	193	688	205	5	57	9
16 SEPTIEMBRE OUT	309	228	184	643	218	0	36	4
17 SEPTIEMBRE OUT	324	239	205	717	240	18	72	6
PROMEDIO	320.833333	233.466667	181.066667	658	234.6	4.3	34.9666667	5.06666667
TOTAL	9625	7004	5432	19740	7038	129	1049	152

TABLA 4 MENSAJES QUE RECHAZA EL AIDC PANAMÁ

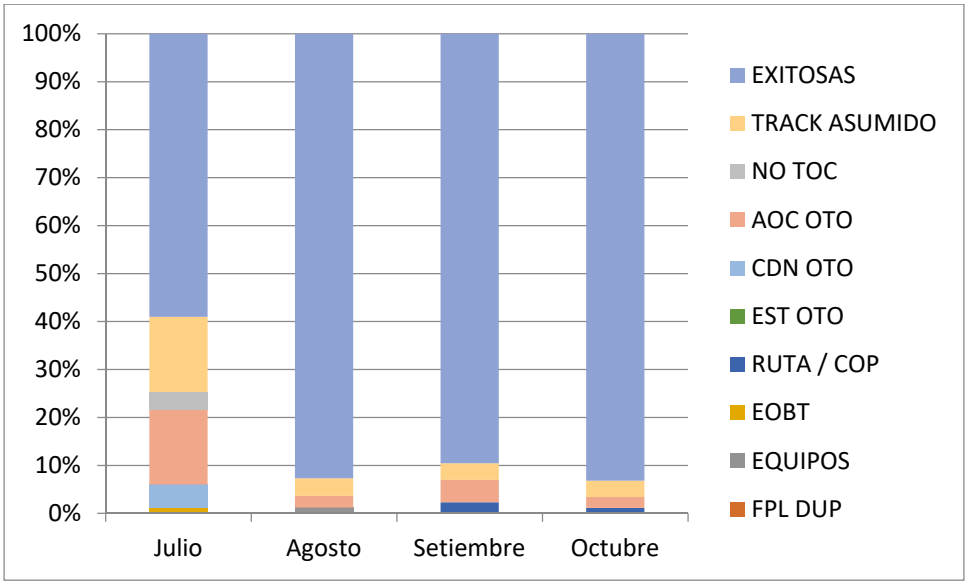
FPL NOT PREAC	MSG WRONG UPSTEAM FIR	FPL NOT COOR	AC TYPE UN	SAME CALLSING	NOT PROPER STA	PBN	POINT DATABASE	SSR ERROR	POINT AWY	NO ASS FPL	BPN LIST
175	23	9	2	19	6	6	3	5	2	8	3
169	34	21	9	12	9	0	5	1	7	6	3
151	47	7	8	6	7	4	7	2	4	5	5
155	20	13	5	14	6	2	2	0	2	7	3
108	42	20	7	18	0	0	6	6	6	8	2
168	20	10	4	8	6	1	0	2	5	14	3
153	15	23	4	6	3	0	2	1	1	8	0
148	20	11	6	8	4	1	0	1	0	6	0
151	23	17	6	20	4	1	10	4	3	23	0
143	30	13	12	15	5	0	2	0	4	8	0
144	28	20	4	12	7	2	0	1	2	9	0
141	27	18	5	19	5	0	2	0	3	13	0
139	28	17	5	17	6	2	0	2	7	10	0
109	22	17	11	9	11	1	13	3	12	17	0
142	24	25	7	5	8	1	3	0	3	9	0
108	18	39	5	15	7	3	0	1	3	7	3
125	21	24	8	6	6	1	3	0	1	12	4
102	28	30	7	15	8	1	4	3	2	9	1
150	26	44	10	12	6	0	3	1	7	7	8
130	27	20	12	16	4	2	2	3	2	8	1
124	16	23	13	21	1	1	2	2	7	12	4
159	15	14	7	10	5	3	0	1	0	9	7
147	20	21	5	8	3	2	3	2	1	12	5
132	28	27	11	7	5	2	5	3	0	11	2
115	25	25	9	11	7	2	0	2	8	8	6
146	26	42	8	10	5	2	4	2	6	18	0
122	37	18	8	0	5	26	8	1		12	1
107	23	37	9	9	7	3	0	5	0	0	0
120	16	20	8	14	7	6	1	2	4	11	0
130	32	42	8	6	1	2	1	0	0	10	0
137.1	25.36666667	22.23333333	7.43333333	11.6	5.46666667	2.5667	3.033333333	1.8666667	3.51724138	9.9	2.033333
4113	761	667	223	348	164	77	91	56	102	297	61

APPENDIX B

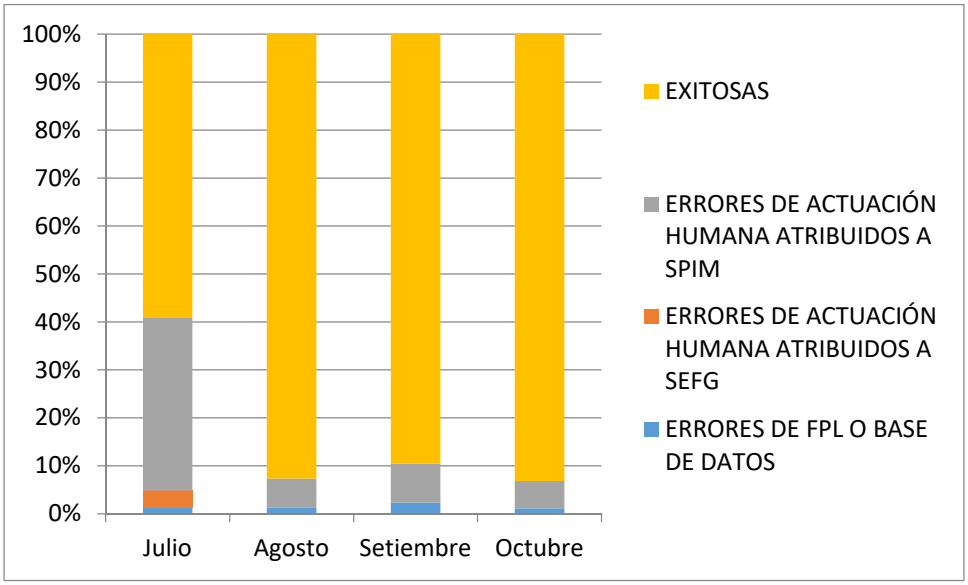
PERFORMANCE OF THE AIDC BETWEEN LIMA AND GUAYAQUIL´S ACC

1.1. FLOW OF AIDC MESSAGES IN SEFG-SPIM DIRECTION

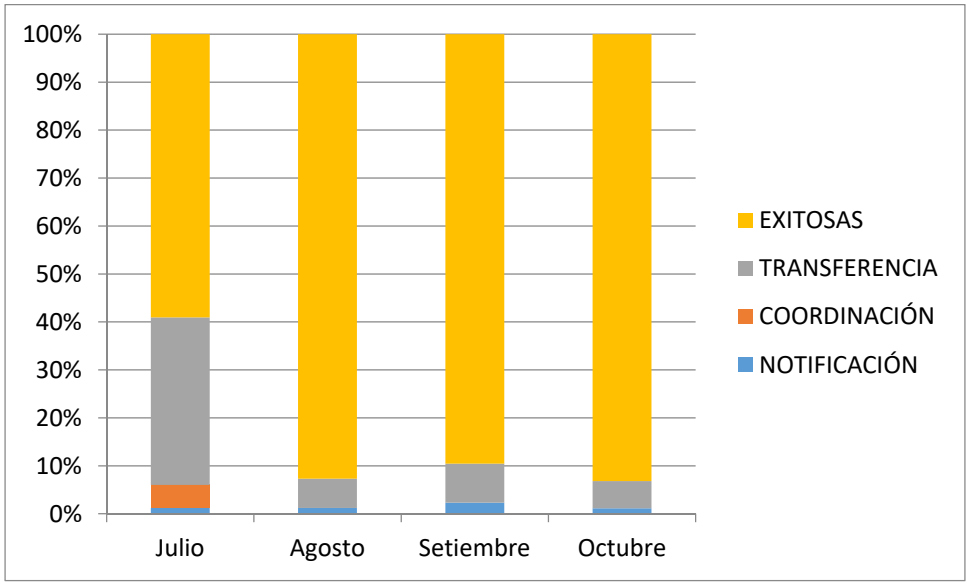
BY TYPE OF ERROR



BY CAUSE OF ERROR

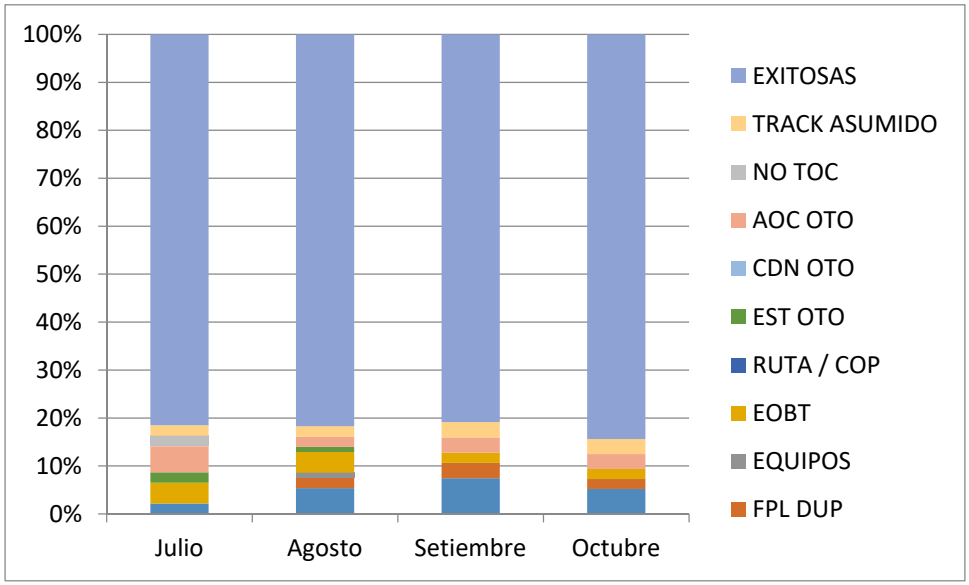


BY PHASE

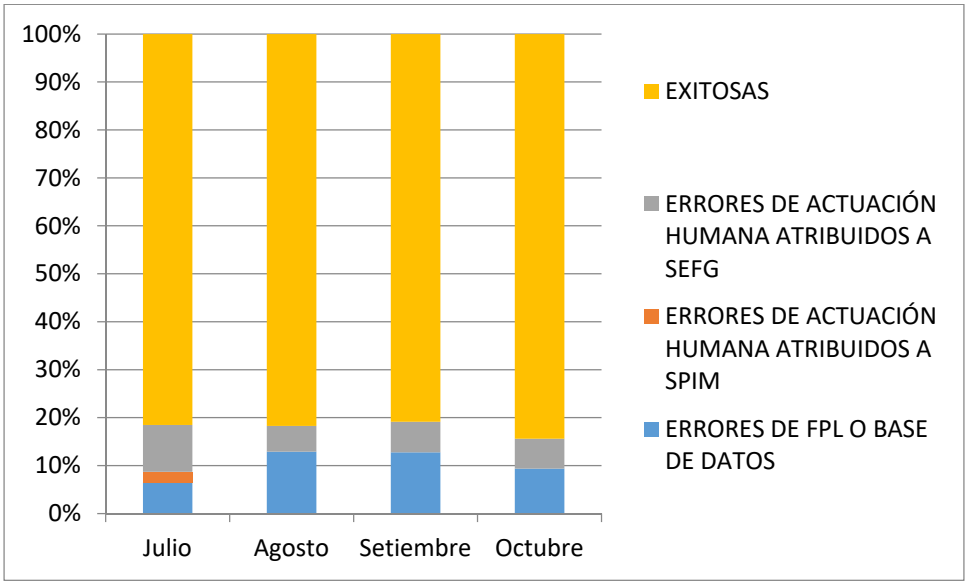


1.2. FLOW OF AIDC MESSAGES IN SPIM-SEFG DIRECTION

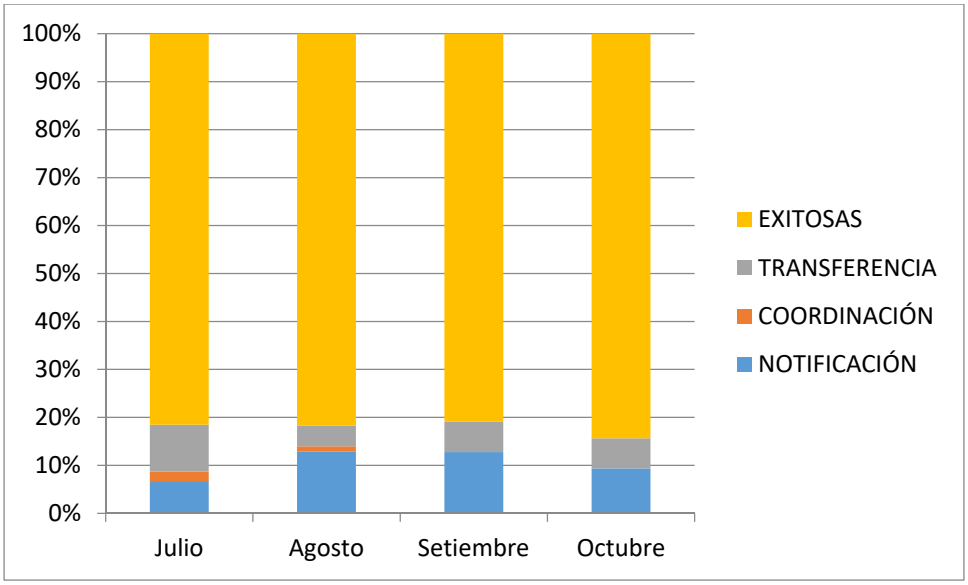
BY TYPE OF ERROR



BY CAUSE OF ERROR



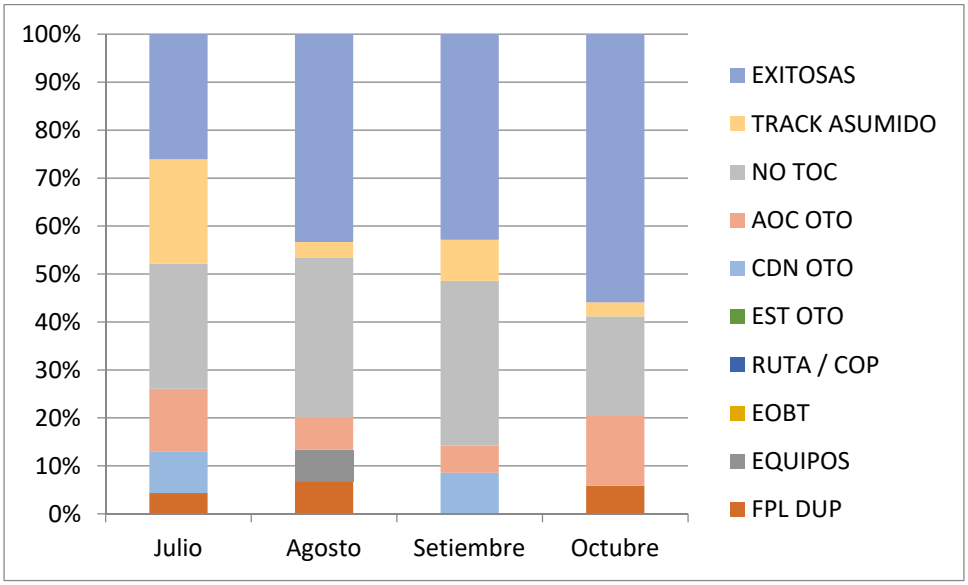
BY PHASE



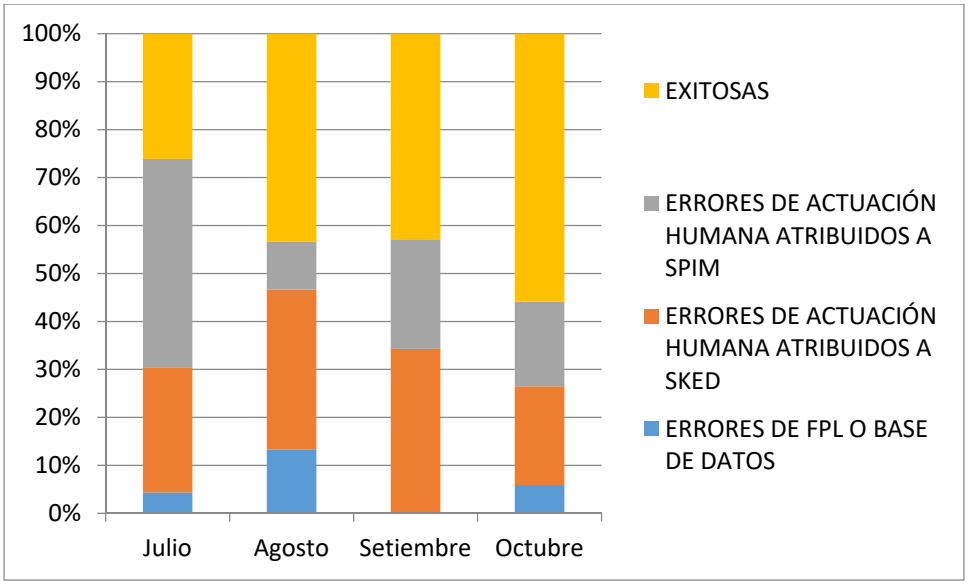
PERFORMANCE OF THE AIDC BETWEEN LIMA AND BOGOTA´S ACC

2.1. FLOW OF AIDC MESSAGES IN SKED-SPIM DIRECTION

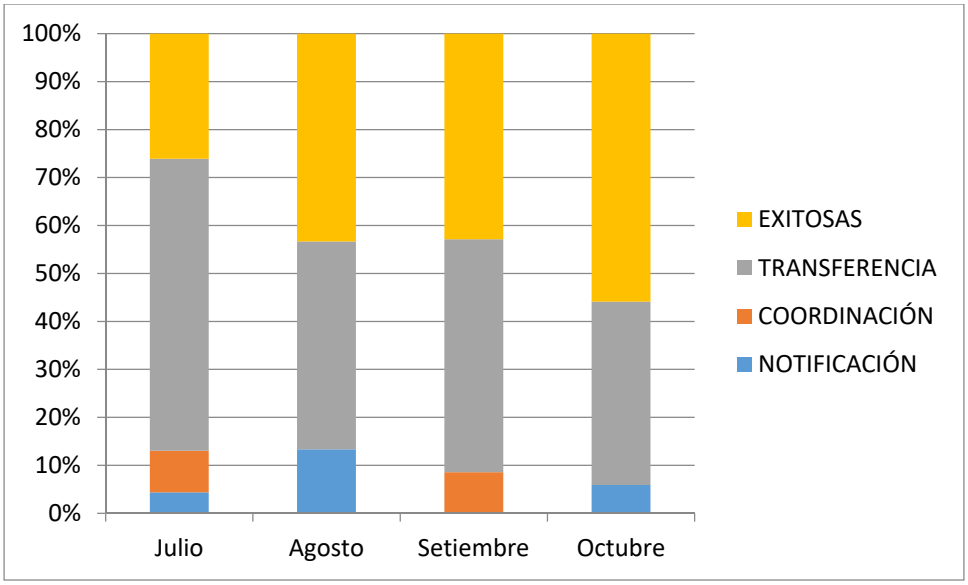
BY TYPE OF ERROR



BY CAUSE OF ERROR

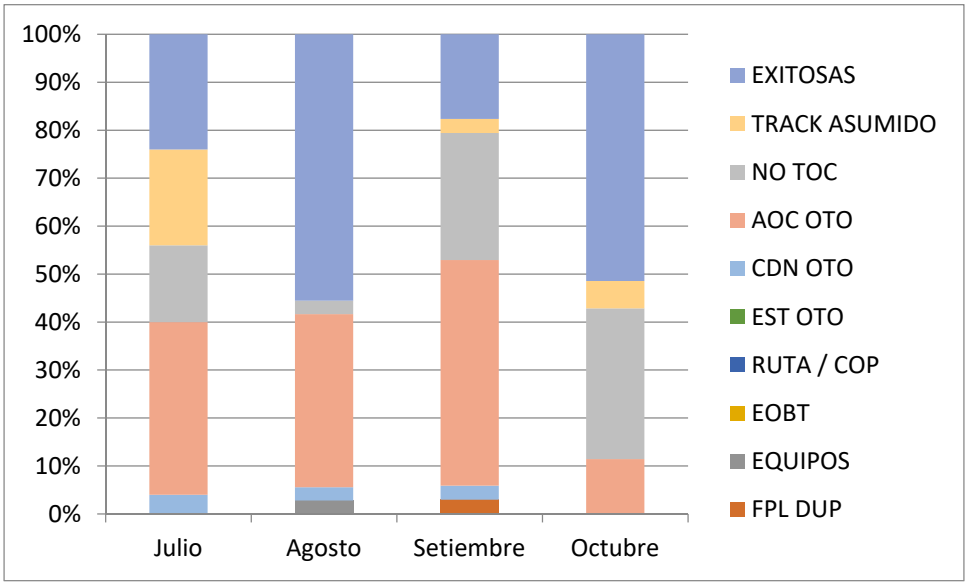


BY PHASE

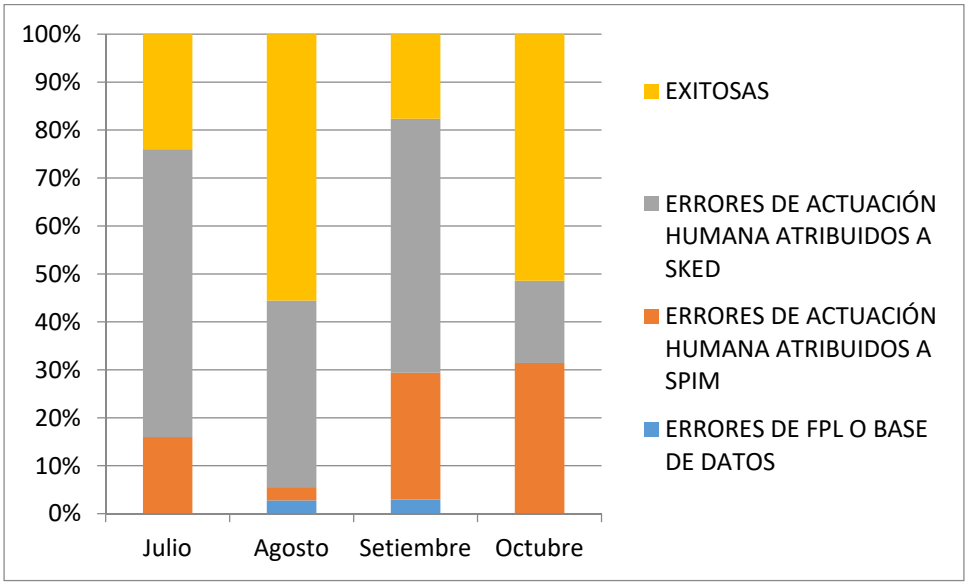


2.2. FLOW OF AIDC MESSAGES IN SPIM-SKED DIRECTION

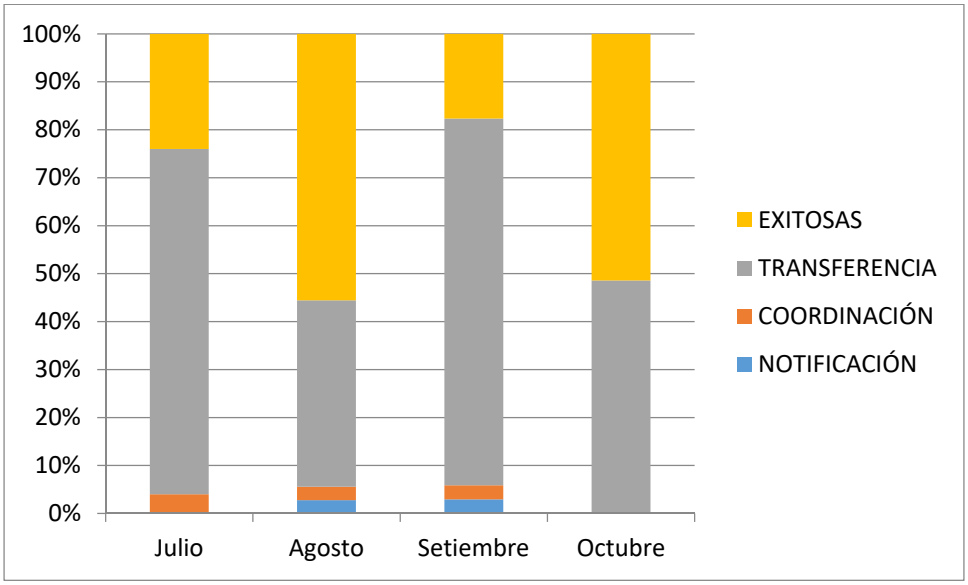
BY TYPE OF ERROR



BY CAUSE OF ERROR



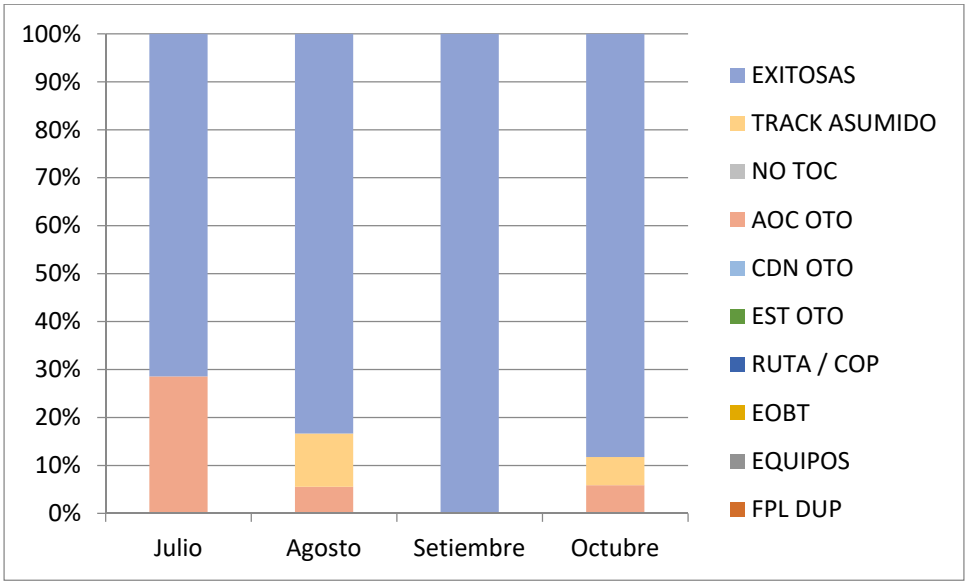
BY PHASE



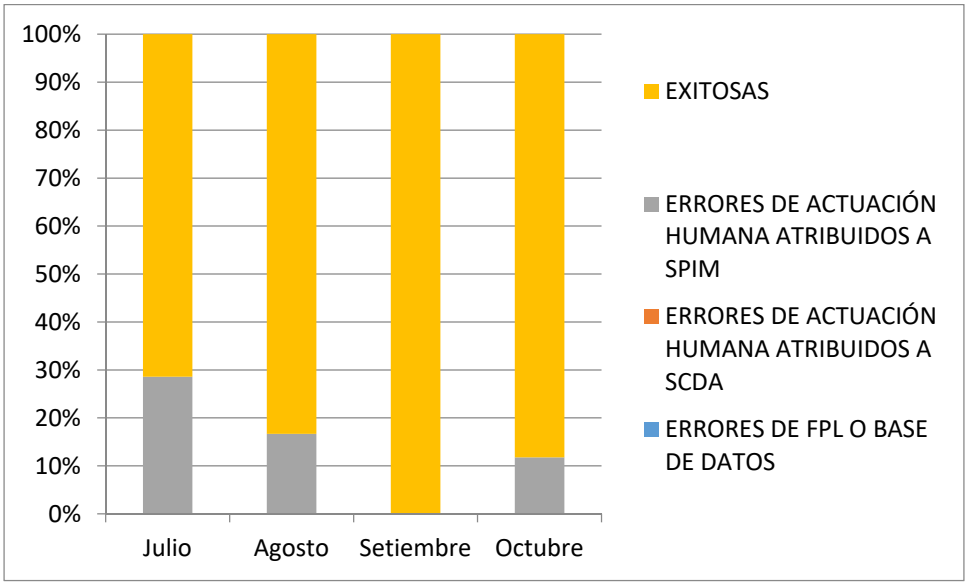
PERFORMANCE OF THE AIDC BETWEEN LIMA AND IQUIQUE´S ACC

3.1. FLOW OF AIDC MESSAGES IN SCDA-SPIM DIRECTION

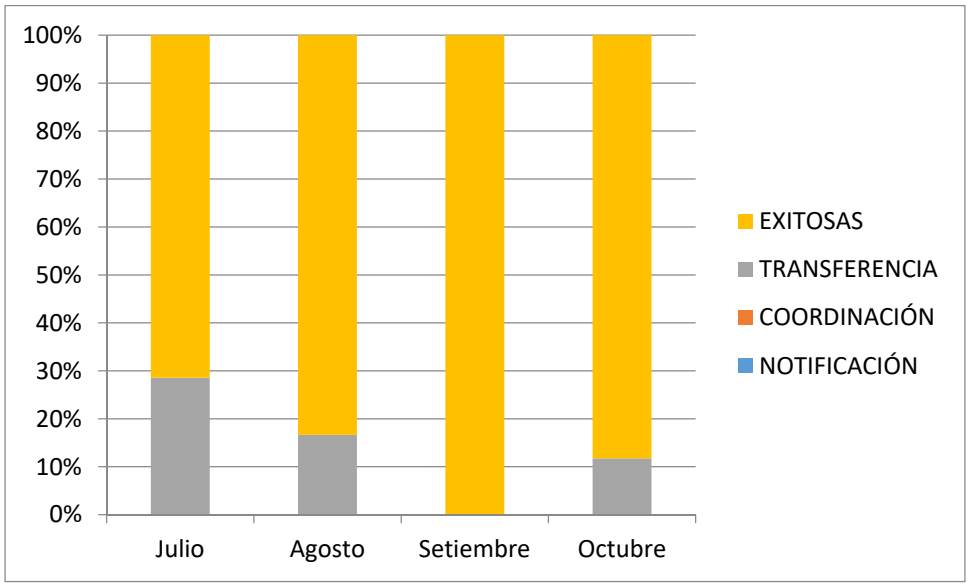
BY TYPE OF ERROR



BY CAUSE OF ERROR

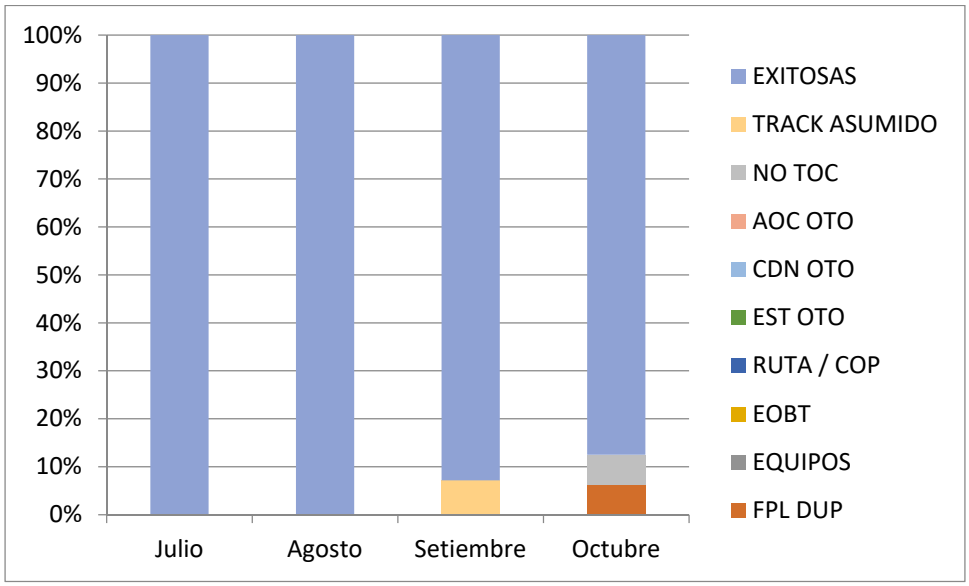


BY PHASE

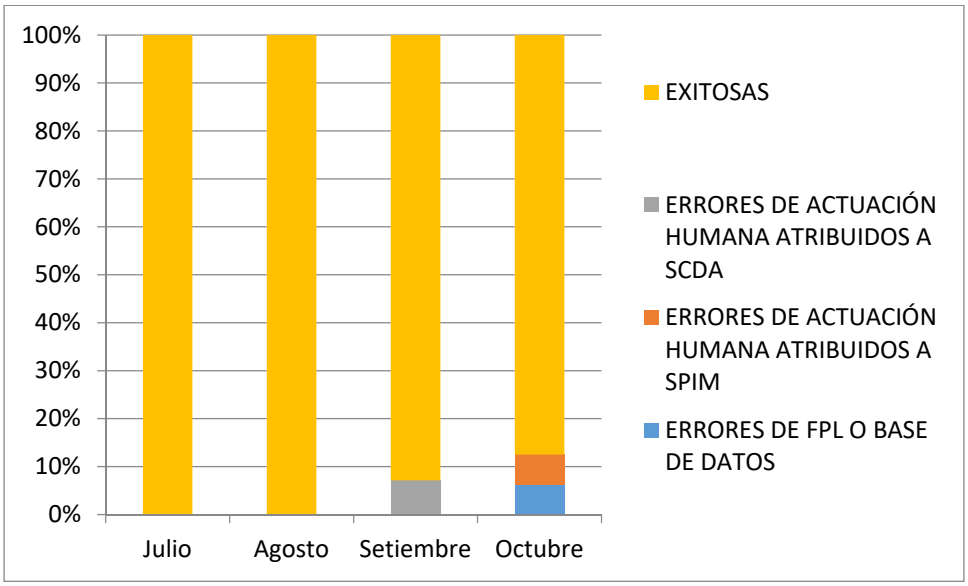


3.2. FLOW OF AIDC MESSAGES IN SPIM-SCDA DIRECTION

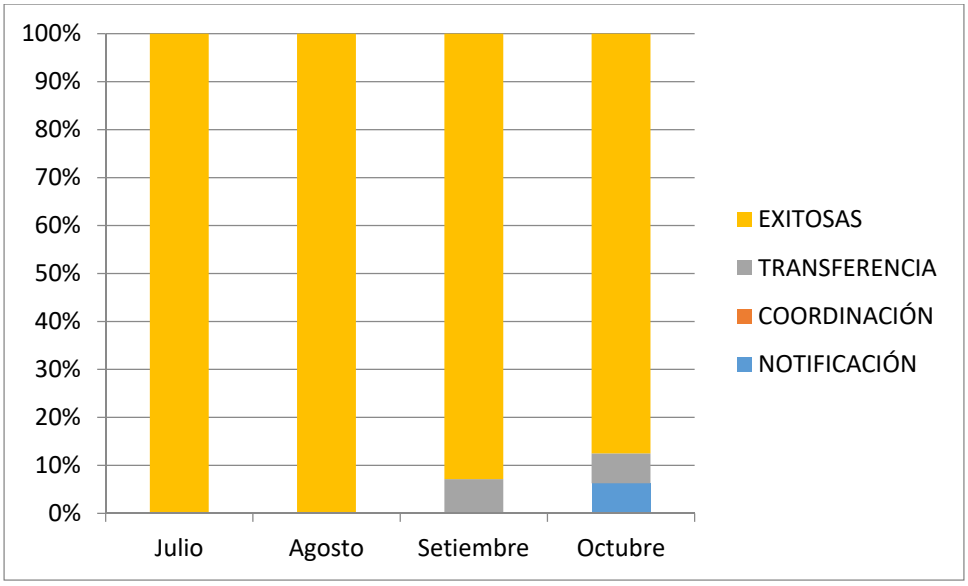
BY TYPE OF ERROR



BY CAUSE OF ERROR



BY PHASE



APÉNDICE C / APPENDIX C

MANUAL DE OPERACIÓN AIDC
(ATS INTERFACILITY DATA COMMUNICATIONS)
SISTEMA INDRA AIRCON 2100
ACC LIMA

Revisión 01
2018

(SPANISH ONLY)

ADJUNTO 1

MANUAL DE OPERACIÓN AIDC
(ATS INTERFACILITY DATA COMMUNICATIONS)
SISTEMA INDRA AIRCON 2100
ACC LIMA

Revisión 01

2018

ELABORADO	REVISADO	APROBADO
Sr. Jorge Eduardo Merino Rodríiguez Controlador de Tránsito Aéreo	Sr. Fredy Reynaldo Núñez Munarriz Gerente de Sistema de Gestión de la Seguridad Operacional(e)	Sr. Jorge Luis Ráez Ancaya Gerente Central de Aeronavegación (e)
	Sr. Jaime Enrique Maura Vidal Jefe de Área de los Servicios de Tránsito Aéreo (e)	
	Sra. Jaime Félix Rojas Paredes Coordinador General de Centro de Control (e)	
	Sr. Víctor Arturo Martínez Serna Jefe de Área de Gestión de la Calidad (e)	
	Lic. Hugo Cama de la Cruz Jefe de Área de Organización y Métodos	

PERSONAL QUE PARTICIPÓ EN LA ELABORACIÓN DEL PRESENTE DOCUMENTO:

NOMBRE	CARGO	SEDE
Sr. Jorge Merino Rodríguez	Controlador de Tránsito Aéreo	Callao

ÍNDICE

CONTROL DE ESTADO DE REVISIÓN

CODIGO: R01-OyM.CD-05 **REVISIÓN: 03/04-03-2011**

REVISIÓN	FECHA DE LA MODIFICACIÓN	OBSERVACIONES
00	23/02/2016	Documento Inicial
01	06/07/2018	Adecuación a nueva versión AIRCON 2100

INTRODUCCIÓN

El presente manual tiene como objetivo facilitar el uso y operación de la interface AIDC a todo el personal ATS involucrado, para lograr que las coordinaciones automáticas entre el ACC Lima y los ACC adyacentes sean exitosas y fluidas.

Por esta razón, el manual ha sido concebido en un formato de fácil lectura, con instrucciones puntuales centradas en temas relacionados específicamente con el AIDC, y cuando es aplicable, listas de verificación de actividades; y separado en secciones dirigidas a los grupos de personal de los Servicios de Tránsito Aéreo involucrados en la gestión de los vuelos y planes de vuelo.

Es importante que cada grupo de personal ATS involucrado se familiarice con el contenido de este manual, y principalmente con la parte que les concierne, y que lo tengan a la mano para usarlo como referencia cuando exista duda acerca de cómo proceder en determinada situación.

Se ha tratado de incluir todas las situaciones conocidas posibles. Sin embargo, este manual no pretende ser exhaustivo, y está previsto que siga evolucionando de acuerdo a la generalización del uso de la herramienta AIDC por parte del personal ATS. Por lo tanto, si se detectara alguna situación no cubierta por el manual, o algún punto que requiera de aclaración, dirigir sus aportes, comentarios y requerimientos al Punto Focal AIDC, ATCO Jorge Merino Rodríguez, para la actualización correspondiente.

SECCIÓN 1

PERSONAL ARO/AIS

1.1. CONFECCIÓN DEL FPL:

Ruta FPL:

Ingresar el campo de Ruta (Casilla 15) correctamente.

Verificar:

1. Integridad de la Ruta desde el aeródromo de salida hasta el destino.
2. Continuidad de la Ruta (No hacer mutilaciones de la ruta por ningún motivo injustificado).
3. No existencia de incoherencias en la ruta, tales como:
   3.1. Puntos con nombres duplicados en la FIR Lima y alguna otra FIR por donde pasa la Ruta FPL.
   3.2. Puntos que no existen en la Base de Datos.
   3.3. Otros problemas que impidan al sistema el procesamiento de la ruta.

Nota: *De encontrarse incoherencias como las mencionadas en el Punto 3, y cuando sea indispensable mutilar la Ruta para permitir su procesamiento por parte del sistema:*

a) Reemplazar en la medida de lo posible los puntos conflictivos por otros puntos en la misma Ruta para mantener su integridad (a no ser que sea imposible obtener esa información).
b) Reportar esos hallazgos al Punto Focal AIDC, ATCO Jorge Merino Rodríguez.

1.2. ACTUALIZACIÓN DEL FPL:

MENSAJES:

Envío de Cambios en el FPL
Enviar el mensaje CHG con los cambios pertinentes en el FPL

Envío de CPL
Enviar el mensaje CPL con el Plan de Vuelo Actualizado

Cancelación de FPL anterior
Si se va a enviar un nuevo mensaje de FPL:
1. Enviar un mensaje CNL del FPL anterior
2. Enviar un mensaje FPL con el nuevo Plan de Vuelo

Nota: *Esto es importante para evitar FPL duplicados en el sistema*

CONTENIDO DEL FPL:

Ruta FPL:

Cuando haya un cambio en la Ruta FPL, ingresar la nueva Ruta (Casilla 15) correctamente,

Verificar:

1. Integridad de la Ruta desde el aeródromo de salida hasta el destino.
2. Continuidad de la Ruta (No hacer mutilaciones de la ruta por ningún motivo injustificado).
3. No existencia de incoherencias en la ruta, tales como:
   3.1. Puntos con nombres duplicados en la FIR Lima y alguna otra FIR por donde pasa la Ruta FPL.
   3.2. Puntos que no existen en la Base de Datos.
   3.3. Otros problemas que impidan al sistema el procesamiento de la ruta.

Nota 1: *De encontrarse incoherencias como las mencionadas en el Punto 3, y cuando sea indispensable mutilar la Ruta para permitir su procesamiento por parte del sistema:*

a) Reemplazar en la medida de lo posible los puntos conflictivos por otros puntos en la misma Ruta para mantener su integridad (a no ser que sea imposible obtener esa información).
b) Reportar esos hallazgos al Punto Focal AIDC, ATCO Jorge Merino Rodríguez.

Nota 2: *No enviar FPL correspondientes a un mismo vuelo de manera repetitiva a los ACC Adyacentes. Esto solo se debe hacer cuando se tenga la certeza de que el ACC Adyacente no cuenta con determinado FPL. De lo contrario, se estaría causando errores de duplicidad o multiplicidad de FPL.*

EOBT:
Hacer lo posible por mantener proactivamente actualizado el EOBT de los vuelos. De ser necesario, coordinar con los operadores aéreos o sus representantes, o instruirles para que informen de cualquier demora con anticipación.

Nota: *Esto es indispensable para evitar la emisión de mensajes ABI prematuros respecto a vuelos retrasados que aún no despegan.*

SECCIÓN 2

PERSONAL FDP

2.1. REVISIÓN DEL LISTADO DE FPL

Eliminación de FPL Duplicados:

Verificar que no existan FPL duplicados de un mismo vuelo (mismo Callsign y misma Procedencia y Destino).

De darse el caso, eliminar todos los duplicados y dejar sólo el FPL que se considera válido.

2.2. TRATAMIENTO DE LOS FPL

Cambio o Actualización de Ruta FPL:

Ingresar el campo de Ruta (Casilla 15) correctamente.

Verificar:

1. Integridad de la Ruta desde el aeródromo de salida hasta el destino.
2. Continuidad de la Ruta (No hacer mutilaciones de la ruta por ningún motivo injustificado).
3. No existencia de incoherencias en la ruta, tales como:
   3.1. Puntos con nombres duplicados en la FIR Lima y alguna otra FIR por donde pasa la Ruta FPL.
   3.2. Puntos que no existen en la Base de Datos.
   3.3. Otros problemas que impidan al sistema el procesamiento de la ruta.

Nota 1: *De encontrarse incoherencias como las mencionadas en el Punto 3, y cuando sea indispensable mutilar la Ruta para permitir su procesamiento por parte del sistema:*

a) Reemplazar en la medida de lo posible los puntos conflictivos por otros puntos en la misma Ruta para mantener su integridad (a no ser que sea imposible obtener esa información).

b) Reportar esos hallazgos al Punto Focal AIDC, ATCO Jorge Merino Rodríguez.

Nota 2: *No enviar FPL correspondientes a un mismo vuelo de manera repetitiva a los ACC Adyacentes. Esto solo se debe hacer cuando se tenga la certeza de que el ACC Adyacente no cuenta con determinado FPL. De lo contrario, se estaría causando errores de duplicidad o multiplicidad de FPL.*

SECCIÓN 3

PERSONAL ATC – TORRE DE CONTROL SPJC

3.1. POSICIÓN LIMA AUTORIZACIONES:

EOBT:
Actualizar de manera obligatoria el EOBT de los FPL de acuerdo a la información de ETD brindada por el Piloto, y la predicción calculada por el Controlador.

Nota 1: *Esto es indispensable para evitar la emisión de mensajes ABI prematuros respecto a vuelos retrasados que aún no despegan.*

Nota 2: *Esta actividad no requiere de coordinación previa con la oficina de ARO/AIS.*

3.2. POSICIÓN LIMA SUPERFICIE:

EOBT:
Si se observa o prevé alguna variación respecto al EOBT ingresado en el FPL, actualizar el EOBT del FPL de acuerdo a la predicción del Controlador en base al tránsito conocido u observado.

SECCIÓN 4

PERSONAL ATC – ACC LIMA

4.1. CONFIGURACIÓN DE CWP:

Verificar:

1. EXTENDED LABEL WINDOW: Activa
2. Ventana EXECUTIVE: Activa y ubicada de preferencia en la Pantalla FDD
3. Ventana PLANNER: Activa y ubicada de preferencia en la Pantalla FDD
4. Ventana COORD IN: Cuando aparece, posicionada en la Pantalla SDD
5. Ventana COORD OUT: Cuando aparece, posicionada en la Pantalla SDD

4.2. CONFIGURACIÓN DE LAS VENTANAS EXECUTIVE / PLANNER:

4.2.1. VENTANA EXECUTIVE

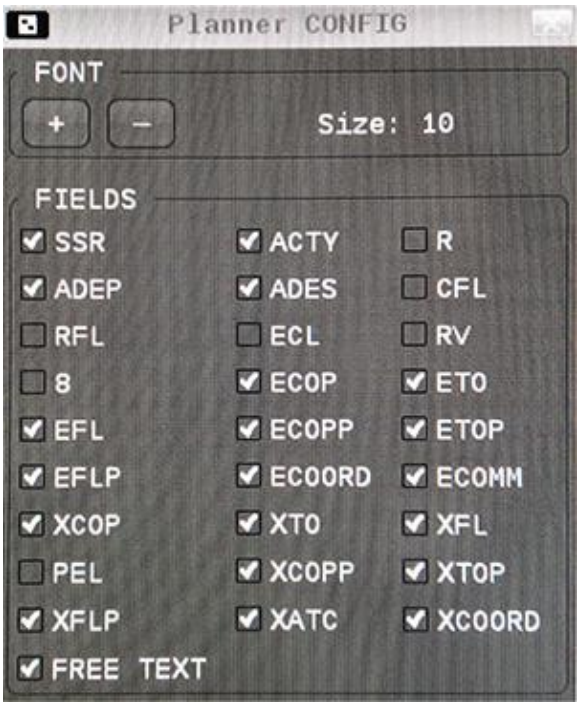
Configuración recomendada:

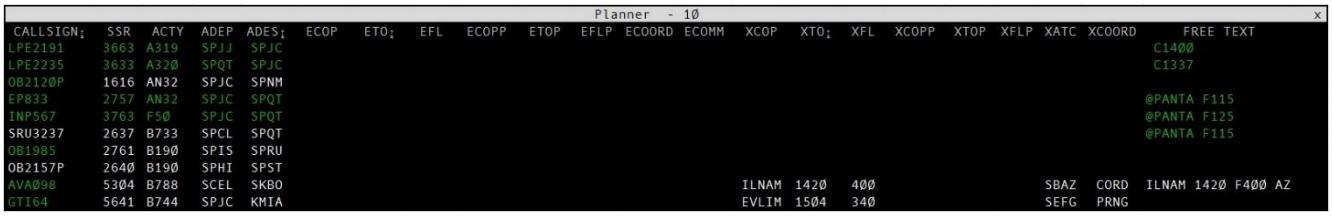
Executive - 12

D	CALLSIGN	ADEP	ADES	SSR	ACTY	XCOP	XTO	XFL	XCOPP	XTOP	XFLP	XATC	COORD	COMM
C	LPE2355	SPST	SPJC	1742	A32Ø									
C	FAP329	SPCL	SPJC	3734	C27J									
C	TPU925	SVMI	SPJC	5225	A321									
C	PVN125	SPQT	SPJC	1725	B733									
C	AAL918	SPJC	KMIA	5611	B763	EVLIM	Ø215	36Ø				SEFG	CORG	LRM
C	AVAØ24	SPJC	SKBO	56Ø2	B788	TERAS	Ø218	41Ø				SEFG	CORD	
C	GTIØ42	SPJC	KMIA	5612	B744	EVLIM	Ø219	4ØØ				SEFG	CORD	
C	IBE665Ø	SPJC	LEMD	56Ø6	A346	SIGOB	Ø229	31Ø				SBAZ	NOTG	LMO
C	TPU132	SPJC	SKBO	56Ø4	A32Ø	TERAS	Ø237	37Ø				SEFG	NOTG	RCV
C	TPU148	SPJC	SKCL	5614	A32Ø	LOBOT	Ø241	36Ø				SEFG	NOTG	RCV
S	RCH217	SPJC	KIAH	56Ø3	C17	LOBOT	Ø3Ø4	34Ø				SEFG	PRNG	
C	ROI151Ø	SPJC	SVMI	56Ø7	B734	PLG	Ø315	29Ø				SKBO	PRNG	

4.2.1. VENTANA PLANNER

Configuración recomendada:





4.3. CONFIGURACIÓN DE LAS VENTANAS COORD IN / COORD OUT

4.3.1. VENTANA COORD IN

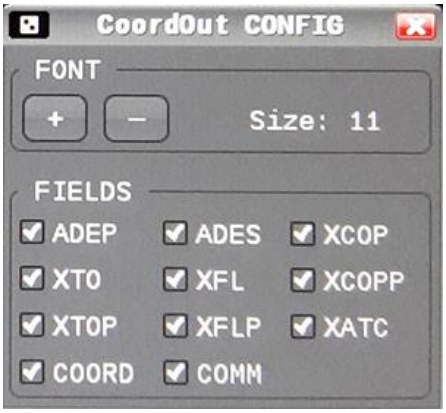
Configuración recomendada:

CoordIn - 2

CALLSIGN	ADEP	ADES	ECOP	ETO	EFL	ECOPP	ETOP	EFLP	COORD	COMM	EMG/MIS
LPE2595	MDPC	SPJC	TERAS	Ø328	38Ø				CORG	RCV	
TPU141	SKBO	SPJC	TERAS	Ø249	34Ø	TERAS	Ø248	36Ø	RNGG	RCV	

4.3.2. VENTANA COORD OUT

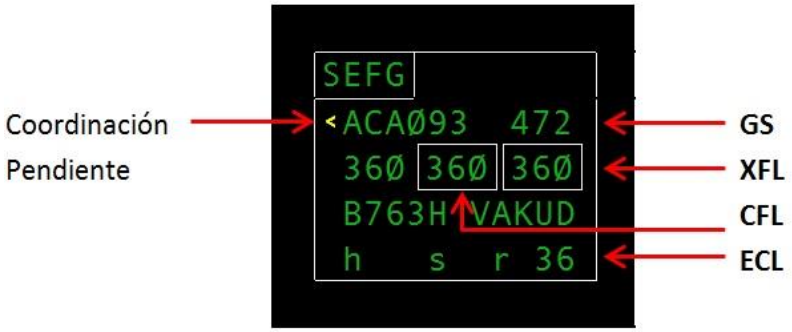
Configuración recomendada:



CoordOut - 5

CALLSIGN	ADEP	ADES	XCOP	XTO	XFL	XCOPP	XTOP	XFLP	XATC	COORD	COMM
AAL918	SPJC	KMIA	EVLIM	Ø215	36Ø				SEFG	NOTG	LRM
AVAØ24	SPJC	SKBO	TERAS	Ø218	41Ø				SEFG	CORG	RCV
GTIØ42	SPJC	KMIA	EVLIM	Ø219	38Ø	EVLIM	Ø219	4ØØ	SEFG	RNGG	RCV
IBE665Ø	SPJC	LEMD	SIGOB	Ø229	31Ø				SBAZ	NOTG	LMO
TPU132	SPJC	SKBO	TERAS	Ø237	37Ø				SEFG	NOTG	RCV

4.4. TRATAMIENTO DE LA ETIQUETA:



Coordinación Pendiente:
Cuando hay un mensaje AIDC pendiente de respuesta por parte de la FIR Adyacente, en este campo aparecerá el símbolo "<" en color Amarillo. Si la coordinación no es respondida a tiempo o no es exitosa, el color cambiará a Rojo.

GS (Ground Speed):
Es la Velocidad sobre el Terreno expresada en Nudos. Monitorear el valor de GS una vez que la aeronave esté completamente establecida en su nivel de crucero, y contrastarlo con la velocidad del FPL. Actualizarlo si se observan diferencias significativas.

Nota: *Si hay diferencias significativas entre la velocidad del FPL y la GS, el sistema puede arrojar estimados erróneos a los puntos de transferencia.*

XFL (Exit Flight Level):
Es el Nivel de Vuelo con el que la aeronave va a salir de nuestro espacio aéreo y va a ser transferida a la FIR Adyacente. Es obligatorio mantenerlo actualizado.

Nota: *Si no se actualiza este campo, el AIDC usará el RFL del FPL, y puede generar LHD si este es distinto del FL actual de la aeronave.*

CFL (Cleared Flight Level):
Es el Nivel de Vuelo al que ha sido autorizada la aeronave para determinada parte del vuelo o su totalidad.

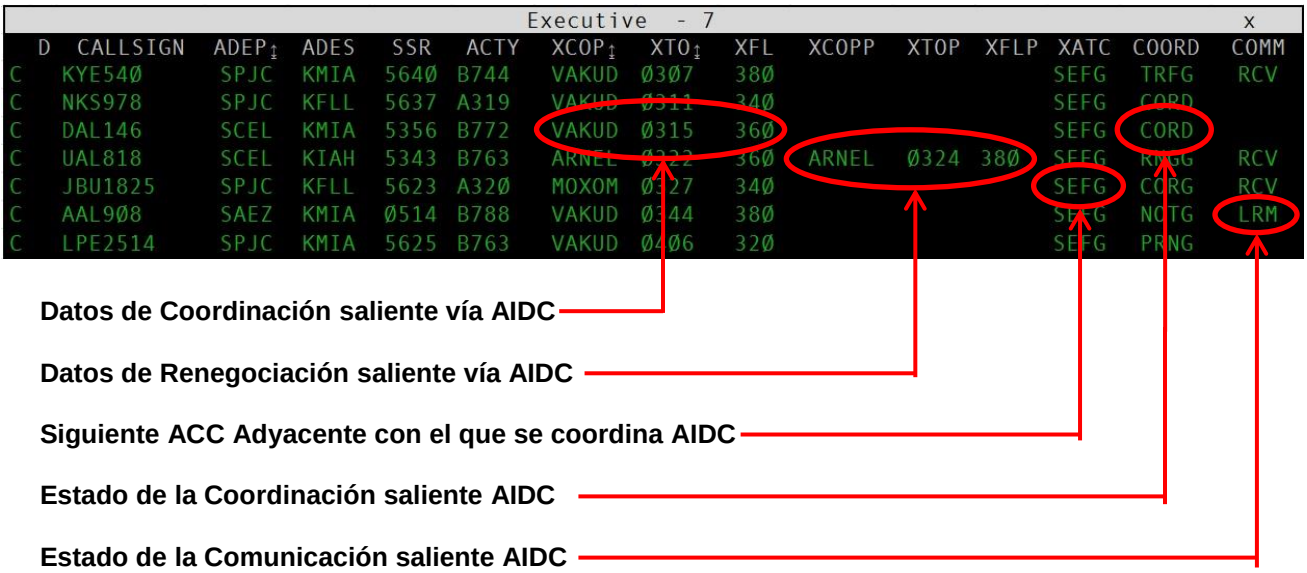
Nota: *El sistema asume el valor del campo CFL como un FL temporal, no definitivo (Por ejemplo, puede estar asociado a una restricción temporal por tránsito). Por lo tanto, este dato no es utilizado como referencia para las coordinaciones AIDC.*

ECL (Enroute Coordination Level):
Es el Nivel de Vuelo Final de referencia al que se va a autorizar a la aeronave de acuerdo a la solicitud del piloto o a las condiciones de tránsito. Debe actualizarse cada vez que el piloto solicite un FL distinto al del FPL, y se tenga previsto otorgarlo, o cuando se tenga planificado un FL distinto al actual o al solicitado por condiciones de tránsito.

Nota: *El sistema calcula la predicción de conflictos a mediano plazo (MTCD) en base al RFL, al cual se puede acceder desde el selector ECL/RFL ubicado en la ventana emergente de la casilla del ECL de la etiqueta, o desde la plantilla del FPL.*

4.5. TRATAMIENTO DE LAS VENTANAS EXECUTIVE / PLANNER:

4.5.1. VENTANA EXECUTIVE



4.5.2. VENTANA PLANNER

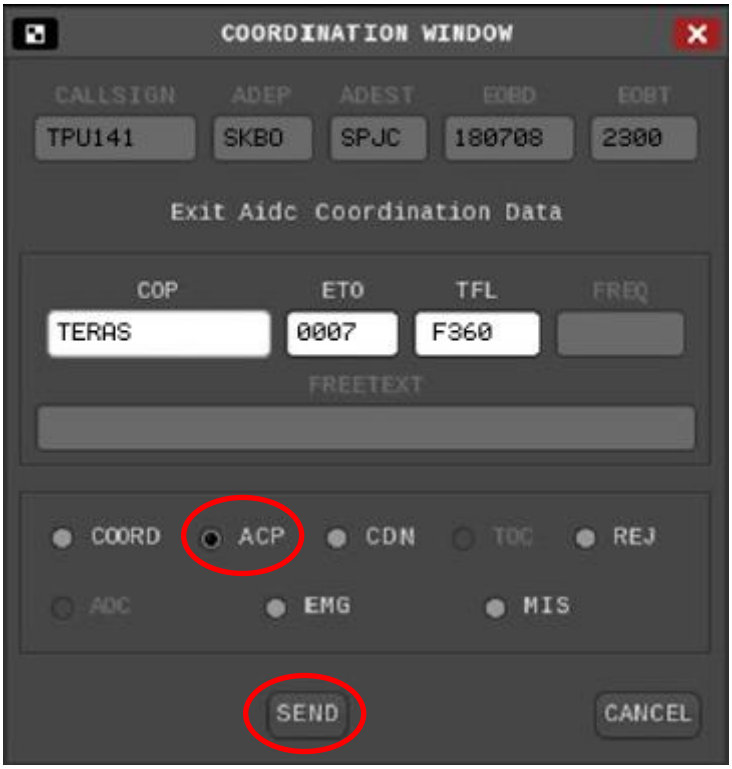
EJECUTIVO	PLANIFICADOR
Verificar: Ventana EXECUTIVE en pantalla FDD. Ventana PLANNER en pantalla FDD. Configuración – La recomendada en 4.2	Verificar: Ventana EXECUTIVE en pantalla FDD. Ventana PLANNER en pantalla FDD. Configuración – La recomendada en 4.2
	Verificar periódicamente si los datos de Transferencia de los vuelos bajo su responsabilidad están actualizados.
	Verificar el Estado de Coordinación y Comunicación (Campos COORD y COMM)
	Campo COMM en Blanco o con RCV: No hacer nada
	Campo COMM con Error: • LRM (Logical Reject Message) • LMO (LAM Timeout) • MAN (Manual Coordination) • OTO (Operation Timeout) 1. Realizar la Transferencia del vuelo afectado vía Canal Oral. 2. Anotar los datos de Transferencia en el Campo FREE TEXT. 3. Anotar los datos de Transferencia en la franja de progreso de vuelo correspondiente.
	Proceder de acuerdo a la Sección 4.10

4.6. TRATAMIENTO DE COORDINACIONES ENTRANTES (COORD IN):

4.6.1. COORDINACIÓN DE TRANSFERENCIA ENTRANTE MANUAL:

EJECUTIVO	PLANIFICADOR
	Dar Click Izquierdo con el Mouse en el campo de Estado de Coordinación (Campo COORD) del vuelo con coordinación entrante.

EJECUTIVO	PLANIFICADOR
	Aceptar la coordinación entrante: 1. Botón ACP seleccionado. 2. Presionar botón SEND
	Recibir las franjas de progreso de vuelo impresas y colocarlas apropiadamente en el tablero.



4.6.2. COORDINACIÓN DE TRANSFERENCIA ENTRANTE AUTOMÁTICA:

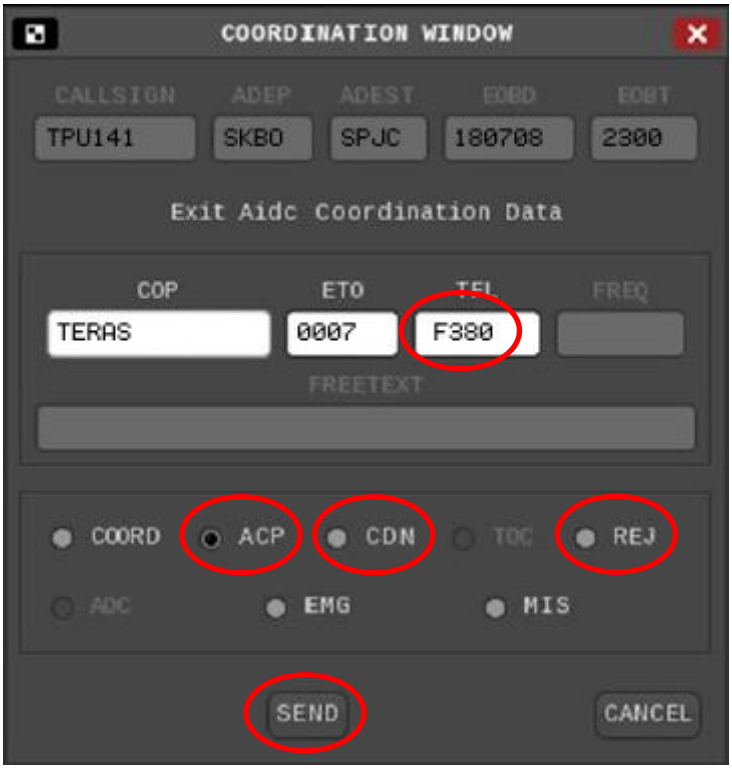
EJECUTIVO	PLANIFICADOR
	Recibir las franjas de progreso de vuelo impresas y colocarlas apropiadamente en el tablero.

Nota: *El sistema automatizado del ACC Lima está configurado para aceptar las Coordinaciones de Transferencia de manera automática.*

4.6.3. COORDINACIÓN ENTRANTE DE CAMBIOS EN LA TRANSFERENCIA:

EJECUTIVO	PLANIFICADOR
	Dar Click Izquierdo con el Mouse en el campo de Estado de Coordinación (Campo COORD) del vuelo con coordinación entrante.

EJECUTIVO	PLANIFICADOR
	Analizar las nuevas condiciones propuestas.
	Responder la coordinación entrante: 1. Seleccionar la respuesta apropiada: a) ACP (Aceptar la solicitud) b) REJ (Rechazar la solicitud) c) CDN (Proponer una nueva condición distinta a la propuesta) 2. Presionar botón SEND. ***Nota:*** *CDN requiere tipear en el campo apropiado el valor de la nueva condición propuesta.*
	Enmendar manualmente los nuevos valores en los campos afectados de las franjas de progreso de vuelo existentes.


COORDINATION WINDOW
CALLSIGN
ADEP
ADEST
EOBD
EOBT
TPU141
SKBO
SPJC
180708
2300
Exit Aidc Coordination Data
COP
ETO
TEL
FREQ
TERAS
0007
F380
FREETEXT
COORD
ACP
CDN
TOC
REJ
ADC
EMG
MIS
SEND
CANCEL

4.7. TRATAMIENTO DE COORDINACIONES SALIENTES (COORD OUT):

4.7.1. COORDINACIÓN DE TRANSFERENCIA SALIENTE:

EJECUTIVO	PLANIFICADOR
	Campo COMM con estado RCV: Esperar aceptación de la FIR Adyacente. (No hacer nada más mientras no haya error).

Nota: *Cuando la Coordinación AIDC haya sido aceptada por la FIR Adyacente, el vuelo desaparecerá de la ventana COORD OUT, y el Estado de Coordinación en la ventana SECTOR LIST habrá cambiado a "CORD".*

EJECUTIVO	PLANIFICADOR
	Campo COMM con Error: • LRM (Logical Reject Message) • LMO (LAM Timeout) • MAN (Manual Coordination) • OTO (Operation Timeout) 1. Realizar la Transferencia del vuelo afectado vía Canal Oral 2. Anotar los datos de Transferencia en el Campo FREE TEXT 3. Anotar los datos de Transferencia en la franja de progreso de vuelo correspondiente.
	Proceder de acuerdo a la Sección 4.10

Nota: *Cuando haya falla en algún sensor de vigilancia y se pierda cobertura en zonas que puedan afectar el XTO (hora estimada de paso por el COP o punto de transferencia) o sea evidente que este estimado difiere considerablemente de lo esperado, a través del control por procedimientos se deberá solicitar al piloto su estimado al COP. Luego, en la plantilla del FPL, editar la casilla de Ruta, y colocar manualmente dicho estimado a continuación del COP de acuerdo al siguiente formato:*

COP/Hhhmm

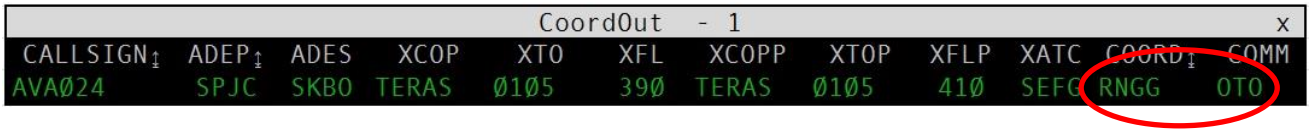
Ejemplo: PLG/H1724

4.7.2. COORDINACIÓN SALIENTE DE CAMBIOS DE NIVEL:

Para el caso de Cambios de Nivel en vuelos que ya han sido Coordinados (Estado de Coordinación “CORD”, al cambiar el valor del campo XFL (Tercer campo de nivel de la Etiqueta), automáticamente se generará un mensaje de Renegociación.

EJECUTIVO	PLANIFICADOR
Actualizar el campo XFL con el nuevo FL que ocupará la aeronave.	Campo COMM con estado RCV: Esperar la aceptación o nueva propuesta de cambio por parte de la FIR Adyacente. (No hacer nada más mientras no haya error).
	Enmendar manualmente el nuevo FL en las franjas de progreso de vuelo existentes.

Nota: *Cuando la Coordinación AIDC haya sido aceptada por la FIR Adyacente, el vuelo desaparecerá de la ventana COORD OUT, y el Estado de Coordinación en las ventanas EXECUTIVE y PLANNER habrá cambiado a “CORD”.*

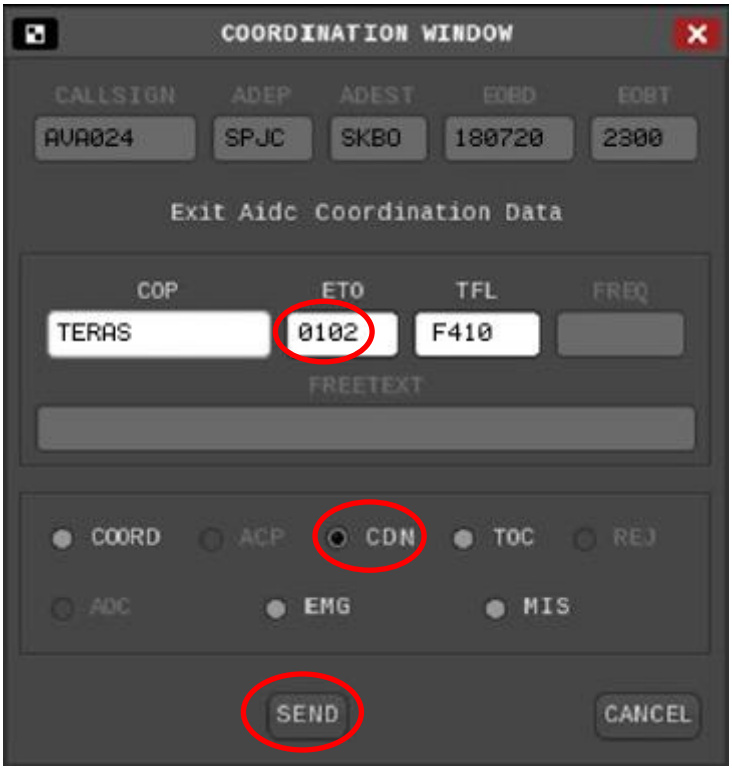


EJECUTIVO	PLANIFICADOR
	Campo COMM con Error: • LRM (Logical Reject Message) • LMO (LAM Timeout) • MAN (Manual Coordination) • OTO (Operation Timeout) 1. Realizar la Revisión del vuelo afectado vía Canal Oral 2. Anotar los datos de Revisión en el Campo FREE TEXT 3. Anotar los datos de la Revisión en la franja de progreso de vuelo correspondiente
	Proceder de acuerdo a la Sección 4.10

4.7.3. COORDINACIÓN SALIENTE DE REVISIÓN DE HORA:

Para el caso de Revisión de Hora de Transferencia para los vuelos que ya han sido Coordinados (Estado de Coordinación “CORD”), se deberá abrir la Ventana de Coordinación.

EJECUTIVO	PLANIFICADOR
Actualizar la ruta de la aeronave mediante las herramientas Elastic Vector y/o GRM Tool en caso de haber ocurrido desviaciones o vuelos directos que puedan afectar el estimado al Punto de Transferencia (COP).	Dar Click Izquierdo con el Mouse en el campo de Estado de la Coordinación (Campo COORD) del vuelo pendiente de revisión.
	Enviar la coordinación de Revisión de Hora de Transferencia: 1. Seleccionar la opción CDN. 2. Presionar el botón SEND.
	Enmendar la nueva Hora de Transferencia revisada en la franja de progreso de vuelo correspondiente.



Nota: *El sistema automáticamente mostrará la hora actualizada.*

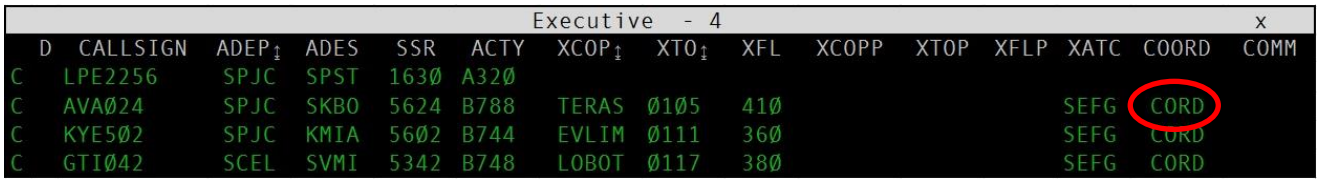
EJECUTIVO	PLANIFICADOR
	Campo COMM con estado RCV: Esperar la aceptación de la Revisión de Hora de Transferencia por parte de la FIR Adyacente. (No hacer nada más mientras no haya error).

Nota: *Cuando la Coordinación AIDC haya sido aceptada por la FIR Adyacente, el vuelo desaparecerá de la ventana COORD OUT, y el Estado de Coordinación en las ventanas EXECUTIVE y PLANNER habrá cambiado a " CORD".*

EJECUTIVO	PLANIFICADOR
	Campo COMM con Error: • LRM (Logical Reject Message) • LMO (LAM Timeout) • MAN (Manual Coordination) • OTO (Operation Timeout) 1. Realizar la Revisión del Estimado del vuelo afectado vía Canal Oral 2. Anotar los datos de Revisión en el Campo FREE TEXT 3. Anotar los datos de la Revisión en la franja de progreso de vuelo correspondiente
	Proceder de acuerdo a la Sección 4.10

4.8. TRANSFERENCIA DE CONTROL (HAND OFF):

4.8.1. A TRAVÉS DE LA VENTANA DE COORDINACIÓN:

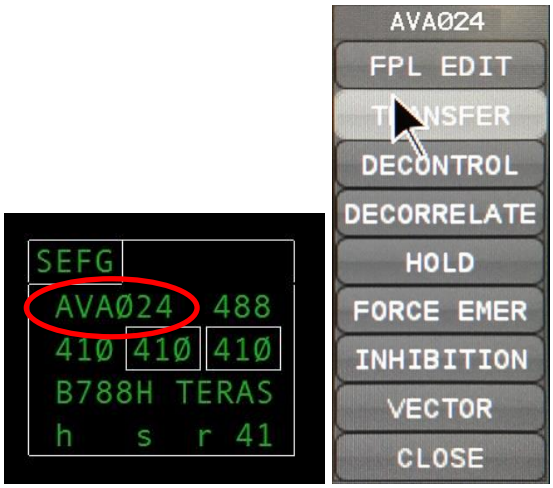


EJECUTIVO	PLANIFICADOR
En la ventana EXECUTIVE o PLANNER, dar Click Izquierdo en el campo COORD del vuelo al que se va a hacer Hand Off a la FIR Adyacente	Monitorear la acción ATCO Ejecutivo.

EJECUTIVO	PLANIFICADOR
Realizar la Transferencia de Control: 1. Seleccionar Botón TOC. 2. Presionar botón SEND.	Monitorear la acción ATCO Ejecutivo.

4.8.2. A TRAVÉS DEL MENÚ PULLDOWN DE LA ETIQUETA: (Método recomendado)

EJECUTIVO	PLANIFICADOR
Realizar la Transferencia de Control: 1. Dar Click Izquierdo en el Callsign de la Etiqueta del vuelo al que se va a hacer Hand Off a la FIR Adyacente. 2. En el Menú Pulldown desplegado, dar Click Izquierdo en TRANSFER	Monitorear la acción ATCO Ejecutivo.



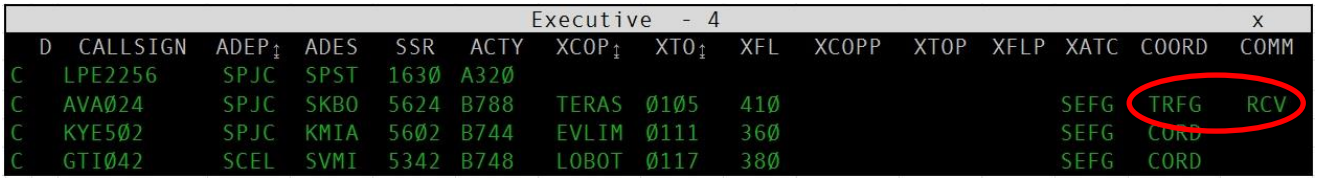
Nota: *Si al intentar hacer la Transferencia, en vez del designador de la FIR Adyacente apareciera el de algún sector doméstico (por ejemplo: NOR1, NOR2, ORI2, SUR1, etc.), se deberá solicitar a dicho sector que le de SKIP al vuelo afectado. Luego de esto, se debe normalizar la situación y será posible realizar la Transferencia.*

4.8.3. SEGUIMIENTO DE LA TRANSFERENCIA:

Luego de realizar la Transferencia de Control (Hand Off) mediante el TOC debe ocurrir lo siguiente:

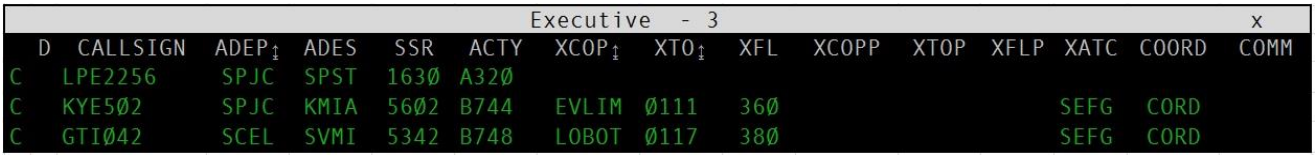
a) El designador de la FIR Adyacente en la Etiqueta del vuelo transferido cambiará de color a Naranja y parpadeará mientras se espera la aceptación de la transferencia.

b) El Estado de Coordinación AIDC en las ventanas EXECUTIVE y PLANNER cambiará a "TRFG".

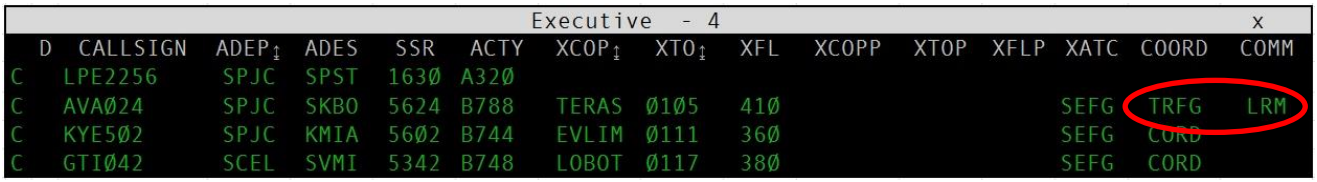


EJECUTIVO	PLANIFICADOR
Campo COMM en estado RCV: Esperar la aceptación de la FIR Adyacente. (No hacer nada más mientras no haya error)	Campo COMM en estado RCV: Monitorear la aceptación por parte de la FIR Adyacente. (No hacer nada más mientras no haya error).
Transferir las Comunicaciones de la aeronave a la frecuencia correspondiente de la FIR Adyacente.	Retirar del tablero las franjas de progreso de vuelo correspondientes a la aeronave transferida.

Nota: *Luego de que la FIR Adyacente haya aceptado la Transferencia de Control (Hand Off), el Estado de Coordinación AIDC cambiará a "TRFD". El vuelo desaparecerá de las ventanas EXECUTIVE y PLANNER, y el color de la Etiqueta de la aeronave cambiará al correspondiente a un tránsito No Controlado por el sector.*

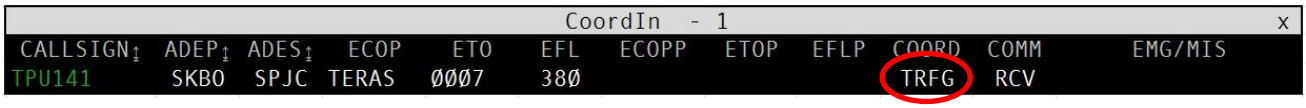


EJECUTIVO	PLANIFICADOR
Campo COMM con Error: • LRM (Logical Reject Message) • LMO (LAM Timeout) • OTO (Operation Timeout) Informar al Planificador sobre el error.	Campo COMM con Error: • LRM (Logical Reject Message) • LMO (LAM Timeout) • OTO (Operation Timeout) Proceder de acuerdo a la Sección 4.10
Transferir las Comunicaciones de la aeronave a la frecuencia correspondiente de la FIR Adyacente.	Retirar del tablero las franjas de progreso de vuelo correspondientes a la aeronave transferida.

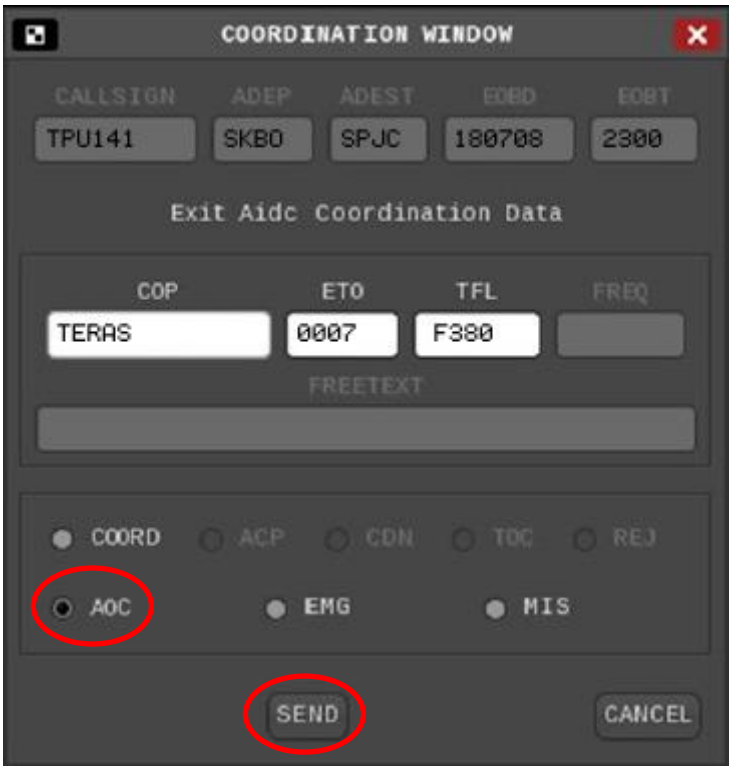


4.9. ACEPTACIÓN DE TRANSFERENCIA DE CONTROL (AOC):

4.9.1. A TRAVÉS DE LA VENTANA DE COORDINACIÓN:

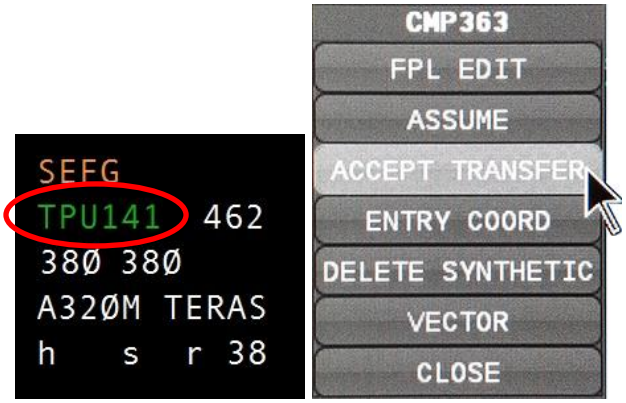


EJECUTIVO	PLANIFICADOR
	En la ventana COORD IN, dar Click Izquierdo en el campo COORD del vuelo al que se va a aceptar el Hand Off de la FIR Adyacente.



EJECUTIVO	PLANIFICADOR
	Aceptar la Transferencia de Control: 1. Seleccionar Botón AOC. 2. Presionar botón SEND.
Monitorear la acción del ATCO Planificador.	Informar al ATCO Ejecutivo que se ha aceptado la transferencia del vuelo correspondiente.

4.9.2. A TRAVÉS DEL MENÚ PULLDOWN DE LA ETIQUETA:



EJECUTIVO	PLANIFICADOR
Dar Click Izquierdo con el Mouse en el Callsign de la etiqueta de la aeronave a la que se va a dar aceptación de Transferencia.	
En el Menú Pulldown emergente, dar Click Izquierdo en ACCEPT TRANSFER.	Monitorear la acción del ATCO Ejecutivo.

Nota: *Para aceptar una Transferencia AIDC no se debe dar click en ASSUME, ya que esta función del sistema solo asume el vuelo, pero no genera mensaje AOC en respuesta a la FIR Adyacente, la cual verá el vuelo como que no ha sido aceptado. Se deberá utilizar siempre la función ACCEPT TRANSFER, que es la que genera el mensaje AOC correspondiente.*

4.9.3. A TRAVÉS DE LA ETIQUETA: (Método recomendado)

EJECUTIVO	PLANIFICADOR
Dar Click Izquierdo con el Mouse en el designador de la FIR Adyacente de la etiqueta de la aeronave a la que se va a dar aceptación de Transferencia.	
En el Menú Pulldown emergente, dar Click Izquierdo en ACCEPT.	Monitorear la acción del ATCO Ejecutivo.

Nota: *El track o etiqueta de la aeronave entrante no deberá ser asumido manualmente de manera anticipada si es que no se ha recibido un TOC (Hand Off), pues esto podría generar errores LRM en las posteriores coordinaciones AIDC de la FIR Adyacente.*

Solo se deberá asumir manualmente el track o etiqueta:

1. *Cuando la aeronave haya cruzado el Punto de Transferencia o la Línea de Frontera (si está fuera de ruta).*
2. *Cuando el piloto de la aeronave se haya comunicado con el sector correspondiente del ACC de Lima y se haya establecido contacto radial en ambos sentidos.*
3. *Cuando se tenga un grado razonable de seguridad de que la FIR Adyacente omitió realizar el TOC correspondiente, o este no haya sido efectivo por un LRM previo.*

Lo que ocurra más tarde.

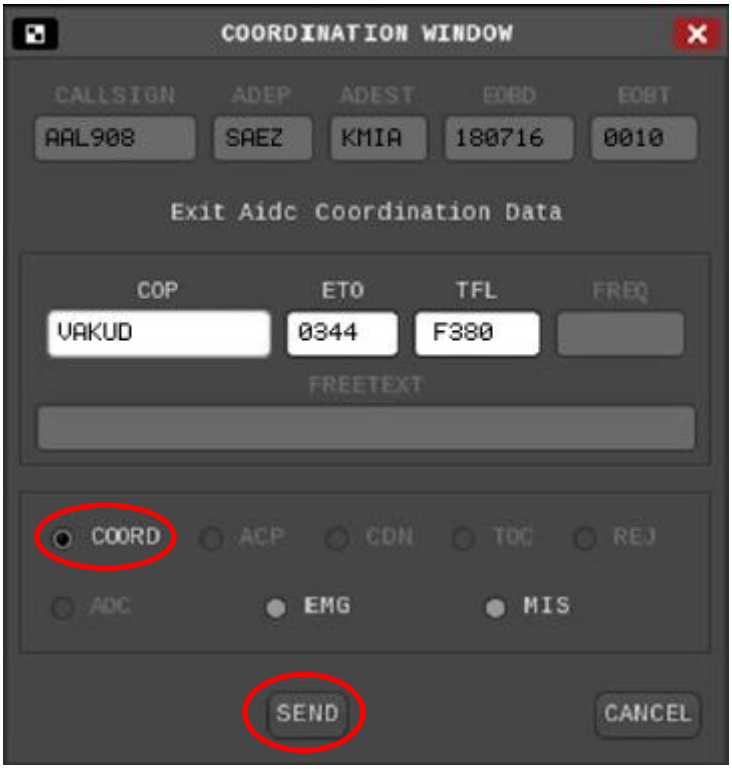
4.10. TRATAMIENTO DE UN VUELO CON ERROR EN EL CAMPO COMM:

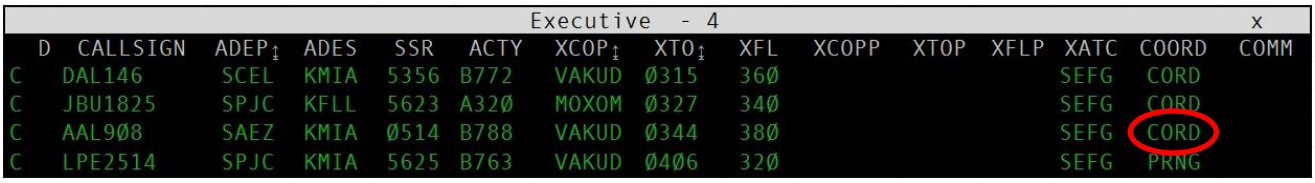
4.10.1. TRATAMIENTO GENERAL DE LOS ERRORES AIDC:

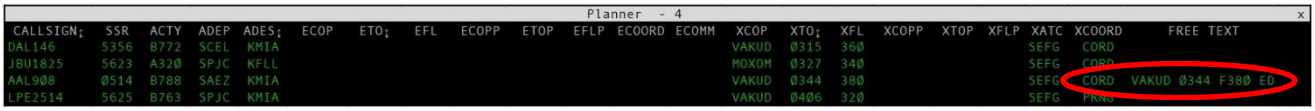
Nota 1: *Si el campo COMM tiene un código de error, la ventana COORD OUT va a estar necesariamente abierta, mostrando el vuelo afectado dentro del listado de vuelos con coordinaciones pendientes. Asimismo, aparecerá el símbolo "<" en color rojo al lado izquierdo del Callsign de la aeronave en la etiqueta correspondiente. Proceder al tratamiento del vuelo afectado de acuerdo a las instrucciones indicadas.*

Nota 2: *El tratamiento de un vuelo con error se puede hacer indistintamente desde las ventanas EXECUTIVE, PLANNER o COORD OUT, dando click izquierdo en el campo COORD (Estado de la Coordinación) del vuelo afectado.*

EJECUTIVO	PLANIFICADOR
	Solo cuando la Transferencia o Revisión del vuelo afectado fue realizada exitosamente vía Canal Oral (Excepto si el error ocurre luego de un TOC, en cuyo caso no requiere confirmación): 1. Ingresar en el campo FREE TEXT los datos de Transferencia del vuelo afectado 2. Abrir Diálogo AIDC a) Click Izquierdo en el campo COORD del Vuelo afectado b) Click en el Botón COORD c) Click en el Botón SEND El Estado de Coordinación del vuelo deberá cambiar a CORD en las ventanas EXECUTIVE y PLANNER. El vuelo afectado deberá desaparecer de la ventana COORD OUT.







Nota: *Nunca dar COORD para eliminar un error en el AIDC sin que se haya gestionado previamente dicho error a través de los medios alternos (Canales Orales) y se tenga la certeza de que la información pertinente ha sido correctamente recibida por el ACC Adyacente (Excepto en la Fase de Transferencia. Si el error se presenta luego del TOC puede ser ignorado).*

4.10.2. ERRORES LRM MÁS COMUNES Y SU TRATAMIENTO:

4.10.2.1. Fase de Notificación (NOTG):

Código de LRM	Causa	Tratamiento
06	FPL no recibido	Enviar FPL manualmente. Darle COORD.
07	FPL duplicado o múltiple	Avisar al ACC Adyacente acerca de la duplicidad. Darle COORD.
15	Error en Equipos	Darle COORD.
21, 22, 23 y, 24	Errores relacionados a los Estimados o EOBT.	Darle COORD.
41	Error en Ruta	Enmendar la Ruta FPL si es posible. Darle COORD..
43	Error en Punto Significativo	Enmendar la Ruta FPL si es posible. Darle COORD.
57	Mensaje Inválido	Darle COORD
63, 64 y 65	Errores relacionados a la secuencia de mensajes	Darle COORD.

Cualquier otro error LRM no listado en esta tabla debería ser gestionado a través de los canales orales. Luego proceder de acuerdo a lo indicado en 4.10.1.

Nota 1: *Luego de darle COORD en la Fase de Notificación después de gestionar estos errores, la coordinación AIDC en la Fase de Coordinación debería funcionar de manera exitosa en la mayoría de los casos (Excepto cuando se hace una renegociación de un FPL ya coordinado que dio previamente LRM RMK/21, 22, 23 o 24, que al renegociar dará nuevamente el mismo código LRM).*

Nota 2: *Si se obtiene un LMO, significa que el enlace AIDC con el ACC Adyacente no se ha podido establecer para el vuelo afectado. En este caso, las coordinaciones relativas a dicho vuelo deberán necesariamente realizarse mediante el uso del Canal Oral.*

Nota 3: *No enviar FPL correspondientes a un mismo vuelo de manera repetitiva a los ACC Adyacentes. Esto solo se debe hacer cuando se tenga la certeza de que el ACC Adyacente no cuenta con determinado FPL (LRM RMK/06). De lo contrario, se estaría causando errores de duplicidad o multiplicidad de FPL (La duplicidad de FPL causa LRM RMK/07).*

4.10.2.2. Fase de Coordinación (CORG / RNGG / CONF):

Cualquier error que se presente en la Fase de Coordinación requiere ser gestionado a través de los canales orales. Luego proceder de acuerdo a lo indicado en 4.10.1.

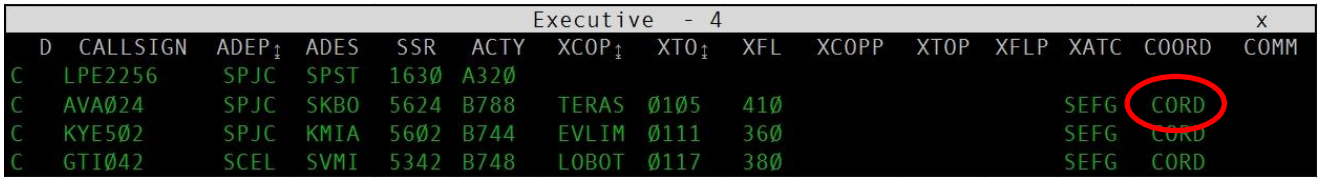
4.10.2.3. Fase de Transferencia (TRFG):

Cualquier error que se presente en la Fase de Transferencia puede ser ignorado. Proceder de acuerdo a lo indicado en 4.10.1 y transferir las comunicaciones de la aeronave con el ACC Adyacente.

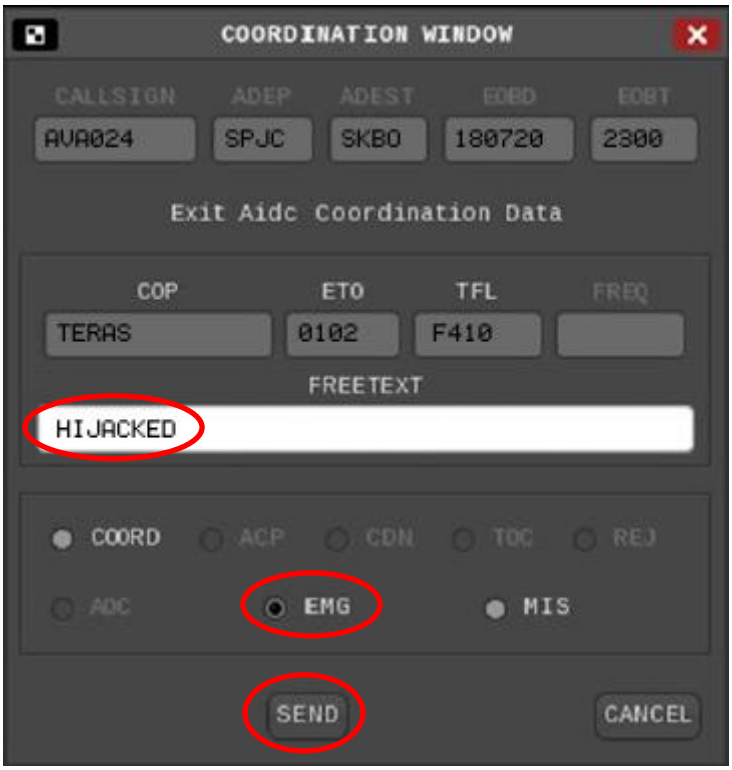
Nota: *Cualquier error distinto a un LRM (por ejemplo: LMO, OTO o MAN) necesariamente requiere gestionar la coordinación a través de los Canales Orales, indistintamente de la Fase en que se haya presentado.*

4.11. MENSAJES DE EMERGENCIA (EMG) Y TEXTO LIBRE (MIS):

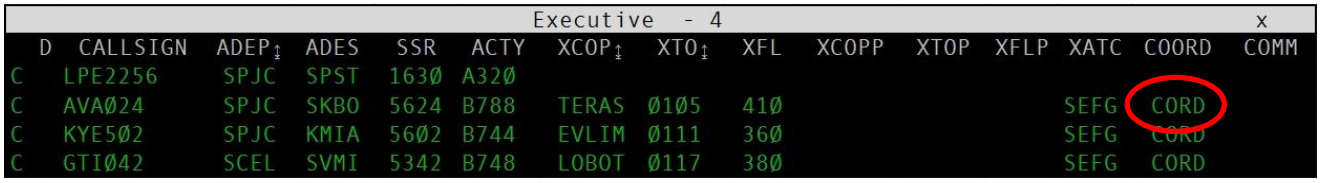
4.11.1. MENSAJES DE EMERGENCIA (EMG):



EJECUTIVO	PLANIFICADOR
	Dar Click Izquierdo con el Mouse en el campo de Estado de la Coordinación (Campo COORD) del vuelo al que se va a reportar en Emergencia.
	Seleccionar el botón EMG (Se activará el campo FREE TEXT).
	Ingresar la información de Emergencia a transmitir en el campo FREE TEXT.
	Presionar el botón SEND.



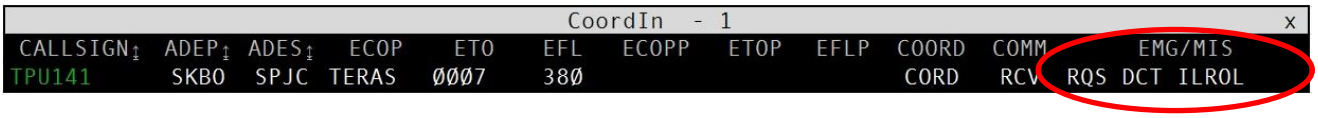
4.11.2. MENSAJES DE TEXTO LIBRE (MIS):



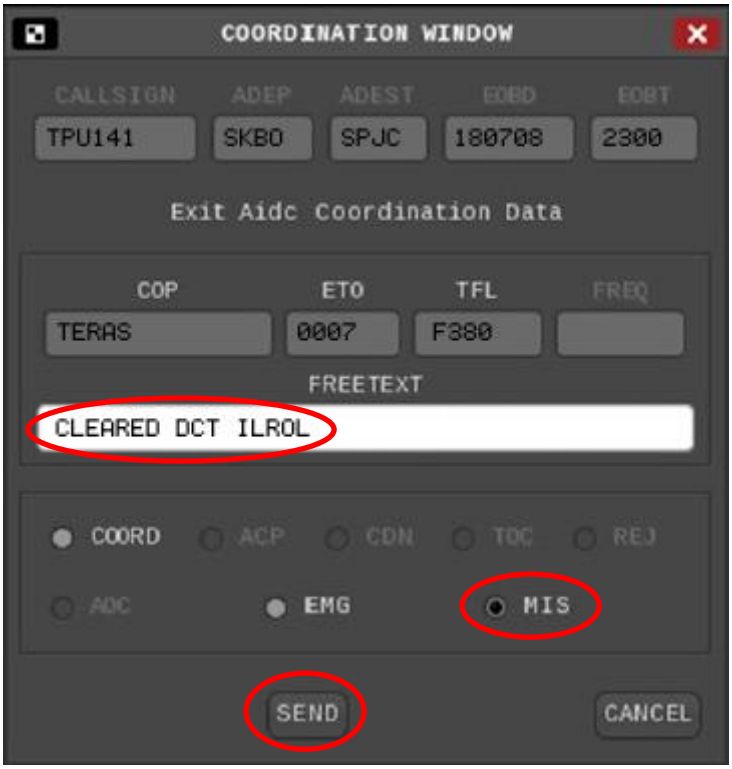
EJECUTIVO	PLANIFICADOR
	Dar Click Izquierdo con el Mouse en el campo de Estado de la Coordinación (Campo COORD) del vuelo al que se requiere realizar una coordinación de Texto Libre.
	Seleccionar el botón MIS (Se activará el campo FREE TEXT).
	Ingresar la información de Texto Libre a transmitir en el campo FREE TEXT.
	Presionar el botón SEND.

4.11.3. RECEPCIÓN DE MENSAJES DE EMERGENCIA (EMG) O TEXTO LIBRE (MIS):

Los mensajes de Emergencia (EMG) o Texto Libre (MIS) entrantes se presentan en la ventana COORD IN de la siguiente manera (Campo EMG/MIS):



EJECUTIVO	PLANIFICADOR
	Dar Click Izquierdo con el Mouse en el campo de Estado de la Coordinación (Campo COORD) del vuelo pendiente respuesta en la ventana COORD IN.
	Seleccionar el botón EMG o MIS de acuerdo a la necesidad de respuesta del mensaje entrante (Se activará el campo FREE TEXT).
	Ingresar la respuesta a transmitir en el campo FREE TEXT.
	Presionar el botón SEND.



Si el mensaje no requiere respuesta, se le puede dar simplemente COORD y presionar el botón SEND para cerrar el diálogo luego de haber tomado conocimiento de su contenido.

4.12. VISUALICACIÓN Y ANÁLISIS DE MENSAJES AIDC:

4.12.1. VENTANA DE VISUALICACIÓN DE COORDINACIONES MÚLTIPLES:

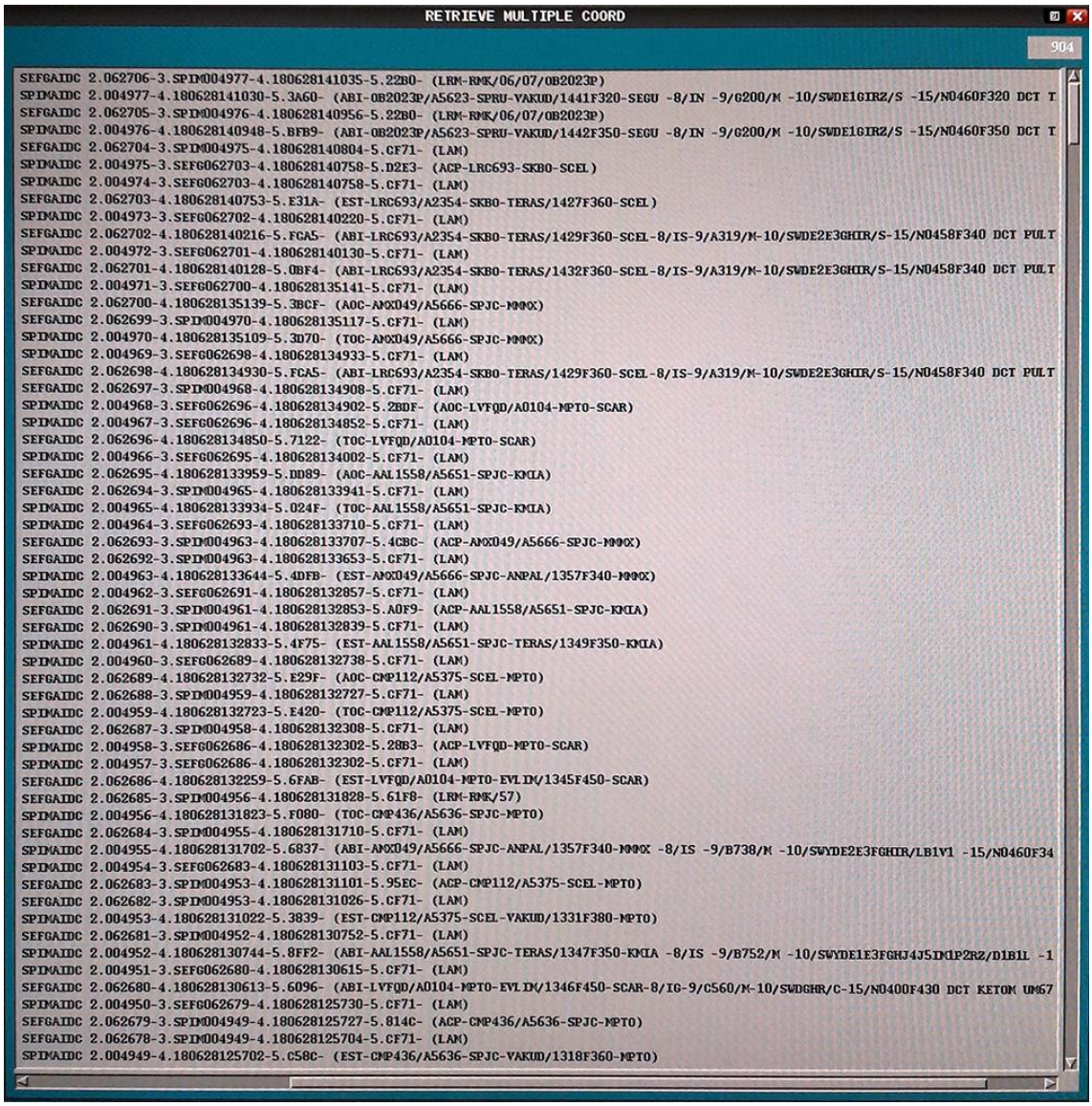
1. En la pantalla FDD, el ATCO Planificador abrirá el Menú ARCHIVE y seleccionará la opción COORD.

2. Se abrirá la siguiente ventana de diálogo, en la que se puede filtrar la información a través de los siguientes campos:

DATE	**:**	La fecha de los mensajes a ser analizados (YYMMDD)
CTRL CENTER	**:**	Designador de la FIR Adyacente
TX TIME INTERVAL:	**FROM :**	Hora inicial (HHMM)
	TO :	Hora final (HHMM)
FREE SEARCH	**:**	Filtro por texto específico (LRM, ACP, EST, Callsign, etc.)

3. Presionar UPDATE (Luego presionar periódicamente UPDATE para refrescar la lista).

4. Se abrirá la siguiente ventana mostrando todos los mensajes de la FIR Adyacente seleccionada, y de los filtros que se hayan aplicado cuando correspondan (LRM, ACP, EST, Callsign, etc.), recibidos y enviados, en Orden Descendente (Del más reciente al más antiguo).

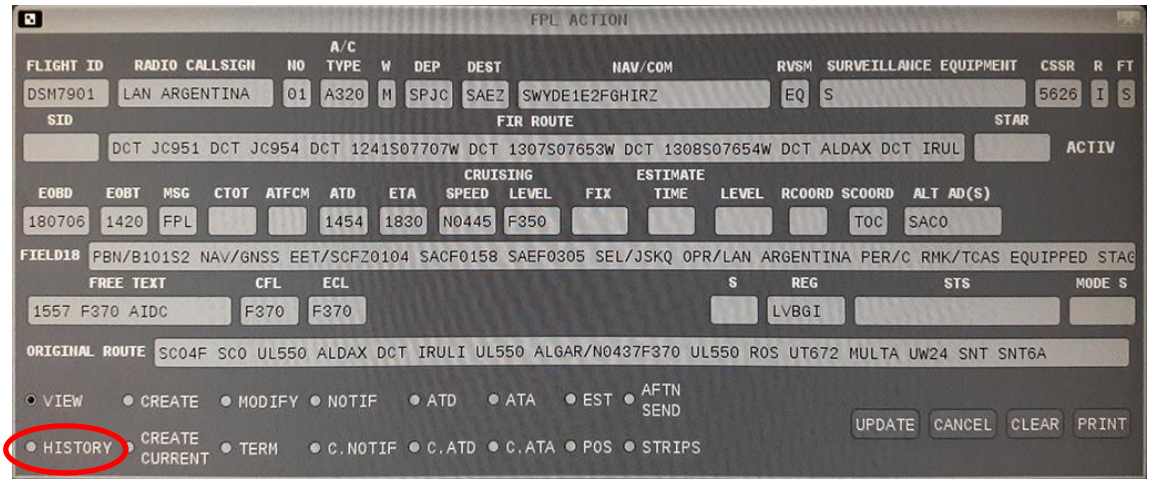


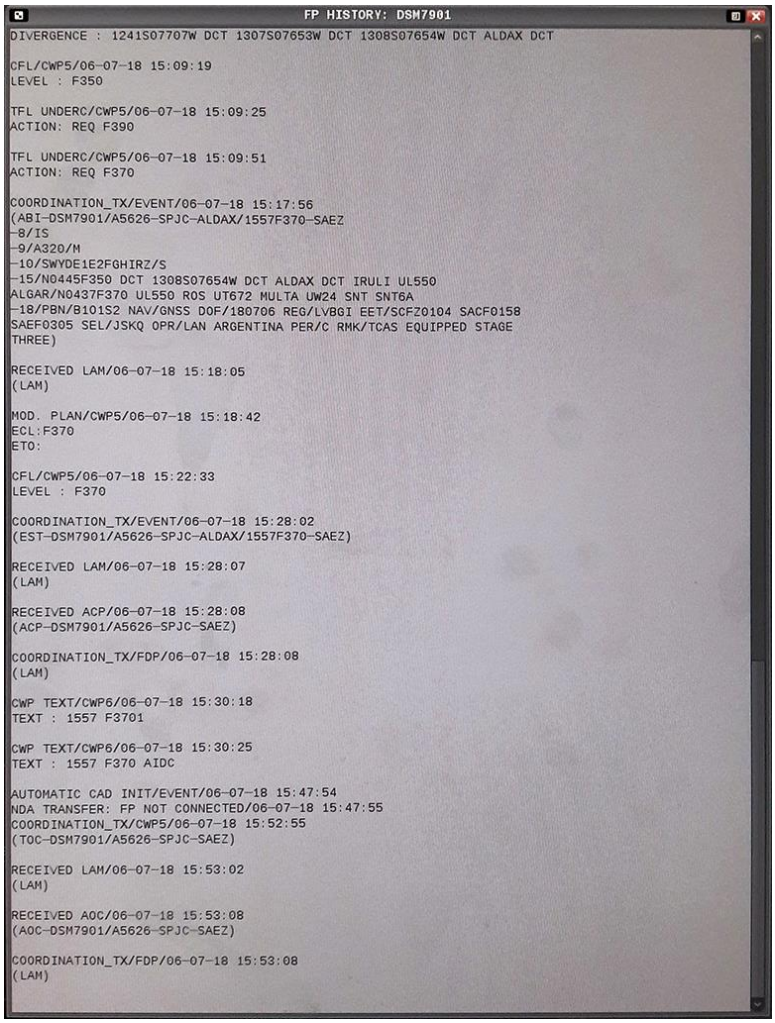
Nota 1: *Para el caso de los mensajes ACP, en esta ventana se puede visualizar el Callsign de los vuelos aceptados por el ACC adyacente, lo que dará la certeza de que la coordinación AIDC para dichos vuelos se ha realizado exitosamente.*

Nota 2: *Para el caso de los mensajes LRM, en esta ventana se puede visualizar el Código de Error LRM y el campo afectado de cada Plan de Vuelo en donde la Coordinación AIDC ha fallado (Ver Apéndice 5).*

4.12.2. VENTANA DE HISTORIAL DEL FPL:

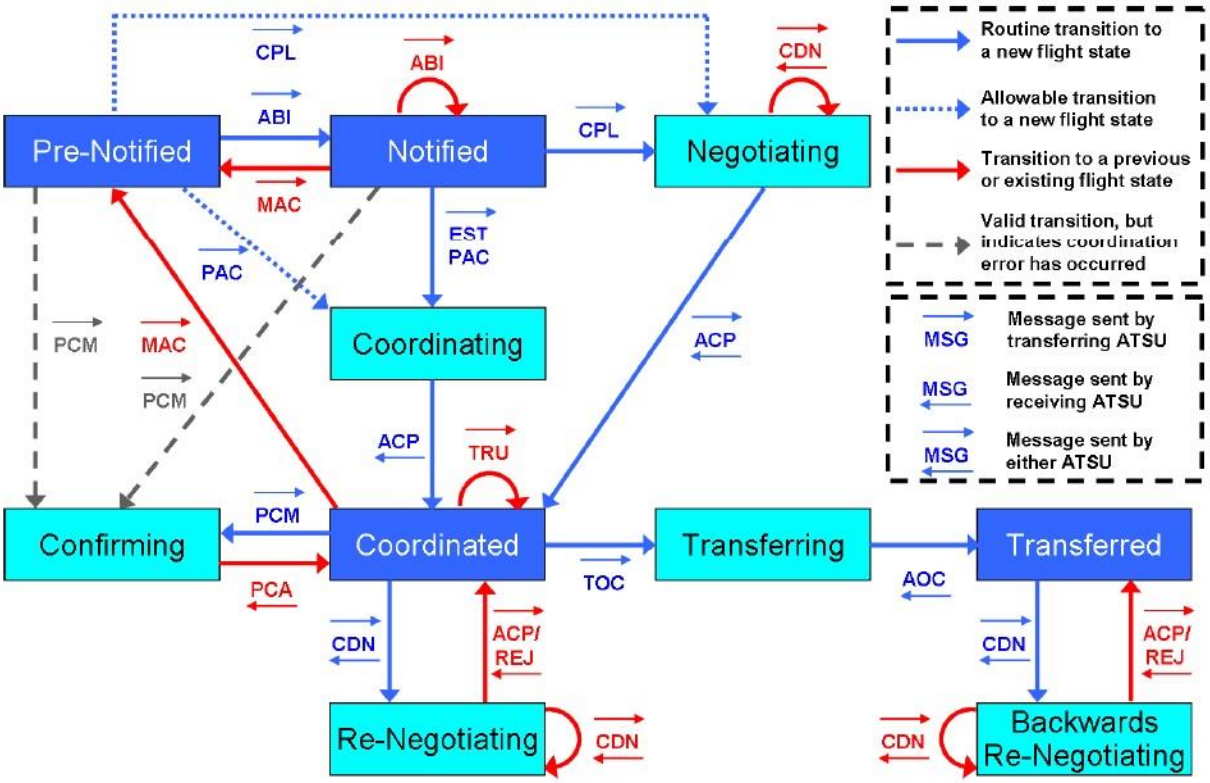
1. En la plantilla del FPL, el ATCO Planificador presionará el botón HISTORY. Se abrirá la ventana del Historial del FPL:





APÉNDICE 1

DIAGRAMA DE ESTADO DE COORDINACIÓN AIDC



APÉNDICE 2

SET DE MENSAJES AIDC – SISTEMA INDRA AIRCON 2100

MENSAJE	SIGNIFICADO
ABI	**Advanced Boundary Information**
	Información actualizada del FPL con los datos preliminares de Coordinación de la Transferencia.
CPL	**Current Flight Plan**
	Mensaje de Plan de Vuelo Actualizado
EST	**Coordination Estimate**
	Mensaje de Coordinación de las Condiciones de Transferencia (equivalente a la transferencia vía canal oral)
PAC	**Preliminary Activate**
	Mensaje de Coordinación de las Condiciones de Transferencia para vuelos muy cercanos a la frontera (aeronave en tierra)
MAC	**Cancellation of Notification or Coordination**
	Mensaje de Cancelación de la Coordinación previa
CDN	**Coordination Negotiation**
	Negociación de cambios en las Condiciones de Transferencia
ACP	**Acceptance**
	Aceptación de la Coordinación
REJ	**Rejection**
	Rechazo de la Coordinación
PCM	**Profile Confirmation Message**
	Confirmación de Condiciones de Transferencia para corregir cualquier variación de último minuto en los datos previamente coordinados.
PCA	**Profile Confirmation Acceptance**
	Aceptación de la Confirmación.
TRU	**Track Update**
	Enmiendas en la trayectoria, posición y condiciones coordinadas.
TOC	**Transfer of Control**
	Transferencia de Control (Handoff).
AOC	**Acceptance of Control**
	Aceptación de la Transferencia de Control (Aceptar Handoff).
EMG	**Emergency**
	Mensaje de texto para informar condiciones de emergencia o urgencia.
MIS	**Miscellaneous**
	Mensaje de texto libre para coordinaciones de diversa índole.
LAM	**Logical Acknowledgement Message**
	Acuse de recibo lógico por parte del sistema.
LRM	**Logical Rejection Message**
	Rechazo lógico por parte del sistema (Indica código de error).
ASM	**Application Status Monitor**
	Mensaje automático de la aplicación para verificar la interconexión.

APÉNDICE 3

ESTADOS DE COORDINACIÓN AIDC

ESTADO	SIGNIFICADO
PRNG	**Pre Negociación**
	Estado previo al inicio de coordinaciones AIDC. Solo se ha enviado el FPL.
NOTG	**Notificación**
	Envío del mensaje ABI.
CORG	**Coordinando**
	Envío del mensaje EST o PAC con los detalles de las Condiciones de Transferencia. (Equivalente a una transferencia vía canal oral).
NEGG	**Negociando**
	Envío de un mensaje CPL con los detalles de las Condiciones de Transferencia.
RNGG	**Renegociando**
	Envío de un mensaje CDN con cambios en las Condiciones de Transferencia (Cambio de FL, Hora o Punto de transferencia)
CORD	**Coordinado**
	Confirmación de que el Estado de coordinación del FPL se ha completado en forma exitosa, y las Condiciones de Transferencia han sido aceptadas por la FIR receptora.
CONF	**Confirmando**
	Envío de un mensaje PCM para confirmar cualquier variación en las Condiciones de Transferencia.
TRFG	**Transfiriendo**
	Envío de un mensaje TOC. (Equivalente a un Handoff).
TRFD	**Transferido**
	Aceptación del mensaje TOC mediante un AOC por parte de la FIR receptora. (Equivalente a la aceptación de un Handoff).
BRNG	**Renegociación Inversa**
	Envío de un mensaje CDN con cambios propuestos para un vuelo ya transferido, pero aún en el espacio aéreo del ACC Transferidor.

APÉNDICE 4

ESTADOS DE COMUNICACIÓN AIDC

ERROR	SIGNIFICADO
LMO	**LAM Time Out**
	Mensaje de Acuse de Recibo Lógico (LAM) del Sistema de la FIR Adyacente no recibido dentro del tiempo límite establecido.
LRM	**Logical Reject Message**
	Mensaje de Coordinación AIDC rechazado por el Sistema de la FIR Adyacente debido a que no puede ser procesado por diversos motivos. (Ver Apéndice 5).
MAN	**Manual Coordination**
	Mensaje que indica que la coordinación para ese vuelo se deberá realizar en forma manual (Canal Oral).
OTO	**Operation Time Out**
	Respuesta del Operador de la FIR Adyacente no recibida dentro del tiempo límite establecido.
RCV	**LAM Received**
	Mensaje que confirma que el sistema de la FIR adyacente ha recibido y procesado correctamente el mensaje de coordinación enviado.

APÉNDICE 5

LISTA DE ERRORES LRM

CÓDIGO	CAMPO	SIGNIFICADO
1	HEADER	INVALID SENDING UNIT
2	HEADER	INVALID RECEIVING UNIT
3	HEADER	INVALID TIME STAMP
4	HEADER	INVALID MESSAGE ID
5	HEADER	INVALID REFERENCE ID
6	7	INVALID AIRCRAFT ID
7	7	DUPLICATE AIRCRAFT ID
8	7	UNKNOWN FUNCTIONAL ADDRESS
9	7	INVALID SSR MODE
10	7	INVALID SSR CODE
11	8	INVALID FLIGHT RULES
12	8	INVALID FLIGHT TYPE
13	9	INVALID AIRCRAFT MODEL
14	9	INVALID WAKE TURBULENCE CATEGORY
15	10	INVALID CNS EQUIPMENT DESIGNATOR
16	10	INVALID SSR EQUIPMENT DESIGNATOR
17	13, 16, 17	INVALID AERODROME DESIGNATOR
18	13	INVALID DEPARTURE AERODROME
19	16	INVALID DESTINATION AERODROME
20	17	INVALID ARRIVAL AERODROME
21	13, 16, 17	EXPECTED TIME DESIGNATOR NOT FOUND
22	13, 16, 17	TIME DESIGNATOR PRESENT WHEN NOT EXPECTED
23	13, 14, 16, 17	INVALID TIME DESIGNATOR
24	13, 14, 16, 17	MISSING TIME DESIGNATOR
25	14	INVALID BOUNDARY POINT DESIGNATOR
26	14, 15	INVALID ENROUTE POINT
27	14, 15	INVALID LAT LON DESIGNATOR
28	14, 15	INVALID NAVAID FIX
29	14, 15	INVALID LEVEL DESIGNATOR
30	14, 15	MISSING LEVEL DESIGNATOR
31	14	INVALID SUPPLEMENTARY CROSSING DATA
32	14	INVALID SUPPLEMENTARY CROSSING LEVEL
33	14	MISSING SUPPLEMENTARY CROSSING LEVEL
34	14	INVALID CROSSING CONDITION
35	14	MISSING CROSSING CONDITION
36	15	INVALID SPEED/LEVEL DESIGNATOR
37	15	MISSING SPEED/LEVEL DESIGNATOR
38	15	INVALID SPEED DESIGNATOR
39	15	MISSING SPEED DESIGNATOR
40	15	INVALID ROUTE ELEMENT DESIGNATOR
41	15	INVALID ATS ROUTE SIGNIFICANT POINT DESIGNATOR
42	15	INVALID ATS ROUTE DESIGNATOR
43	15	INVALID SIGNIFICANT POINT DESIGNATOR
44	15	FLIGHT RULES INDICATOR DOES NOT FOLLOW SIGNIFICANT POINT
45	15	ADDITIONAL DATA FOLLOWS TRUNCATION INDICATOR
46	15	INCORRECT CRUISE CLIMB FORMAT

47	15	CONFLICTING DIRECTION
48	18	INVALID OTHER INFORMATION ELEMENT
49	19	INVALID SUPPLEMENTARY INFORMATION ELEMENT
50	22	INVALID AMENDMENT FIELD DATA
51		MISSING FIELD nn
52		MORE THAN ONE FIELD MISSING
53		MESSAGE LOGICALLY TOO LONG
54		SYNTAX ERROR IN FIELD nn
55		INVALID MESSAGE LENGTH
56		TDM ERROR
57		INVALID MESSAGE
58		MISSING PARENTHESIS
59		MESSAGE NOT APPLICABLE TO zzzz OAC
60	3	INVALID MESSAGE MNEMONIC (3 LETTER IDENTIFIER)
61	HEADER	INVALID CRC
62		UNDEFINED ERROR
63		MSG SEQUENCE ERROR. ABI IGNORED
64		MSG SEQUENCE ERROR. INITIAL COORDINATION NOT PERFORMED
65		MSG SEQUENGE ERROR. EXPECTING MSG xxx, RECEIVING MSG yyy
66	14	INVALID BLOCK LEVEL
67	14	INVALID OFF-TRACK CLEARANCE TYPE
68	14	INVALID OFF-TRACK DIRECTION
69	14	INVALID OFF-TRACK DISTANCE
70	14	INVALID MACH NUMBER QUALIFIER
71	14	INVALID MACH NUMBER
72	FAN-ADF	INVALID IDENTIFIER
73	FAN-ADF	INVALID SMI
74	FAN-ADF	INVALID AIRCRAFT ID IN FMH/ IDENTIFIER
75	FAN-ADF	INVALID REGISTRATION IN REG/ IDENTIFIER
76	FAN-ADF	INVALID AIRCRAFT ADDRESS IN CODE/ IDENTIFIER
77	FAN-ADF	INVALID LOCATION IN FPO/ IDENTIFIER
78	FAN-ADF	INVALID DATA LINK APPLICATION IN FCO/ IDENTIFIER
79	FAN-ADF	INVALID OR UNSUPPORTED CPDLC VERSION NUMBER
80	FAN-ADF	INVALID OR UNSUPPORTED ADS-C VERSION NUMBER
81	FAN-ADF	INVALID IDENTIFIER IN FAN MESSAGE
82	FCN-CSF	INVALID CPDLC CONNECTION STATUS
83	FCN-CSF	INVALID FREQUENCY IN FREQ/ IDENTIFIER
84	ADS-ADF	INVALID IDENTIFIER IN ADS MESSAGE
85	ADS-ADF	INVALID DATA IN ADS MESSAGE
86	TRU-TDF	INVALID IDENTIFIER IN TRU MESSAGE
87	TRU-TDF	INVALID HEADING IN HDG/ IDENTIFIER
88	TRU-TDF	INVALID POSITION IN DCT/ IDENTIFIER
89	TRU-TDF	INVALID OFF TRACK DEVIATION IN OTD/ IDENTIFIER
90	TRU-TDF	INVALID FLIGHT LEVEL IN CFL/ IDENTIFIER
91	TRU-TDF	INVALID SPEED IN SPD/ IDENTIFIER
92	TRU-TDF	INVALID FLIGHT LEVEL IN RFL/ IDENTIFIER
93	TRU-TDF	INVALID FLIGHT LEVEL IN PRL/ IDENTIFIER
94-256		RESERVED FOR FUTURE USE

APPENDIX D

(AIDC) GROUND-GROUND DATA INTERCONNECTION LEVEL REQUIREMENTS IN THE SAM REGION

ARGENTINA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels *				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
CORDOBA (AUT. INDRA AIRCON2100) (2007)	IQUIQUE	XI			X	Positive AIDC tests - March 2016 As a result of the tests, the transmission speed has to be incremented from 2400 to 9600 bit/sec AIDC foreseen to be operational at the end of the second semester of 2019.
	LA PAZ	XI			X	AIDC foreseen for period - 2019 -2020
	EZEIZA	XI			XI	AIDC in pre-operational phase since December 2015. Operational phase foreseen by the second semester of 2018
	MENDOZA	XI			X	AIDC pre-operational phase by the second semester of 2018
	RESISTENCIA	XI			X	AIDC pre-operational phase by the second semester of 2018
RESISTENCIA (AUT. INDRA AIRCON2100) (May 2016)	ASUNCION	XI			X	Positive AIDC tests were conducted in 2015 between Ezeiza and Asuncion. Tests between Resistencia and Asuncion were conducted in the end of 2016. AIDC foreseen to be operational by the first semester of 2019.
	CORDOBA	XI			X	AIDC pre-operational by the second semester of 2018
	CURITIBA	XI			X	AIDC foreseen by the first semester of 2019
	EZEIZA	XI			X	AIDC pre-operational by the second semester of 2018
	MONTEVIDEO	XI			X	AIDC foreseen by the first semester of 2019

EZEIZA (AUT. INDRA AIRCON2100) (2007)	COMODORO RIVADAVIA	XI			X	AIDC pre-operational by the second semester of 2018
	MENDOZA	XI			X	AIDC pre-operational by the second semester of 2018
	PUERTO MONTT	XI			X	AIDC by the first semester of 2019
	CORDOBA	XI			XI	AIDC in pre-operational phase since December 2015. Operational phase foreseen by the second semester of 2018
	RESISTENCIA	XI			X	AIDC pre-operational by the second semester of 2018
	JOHANNESBURG	XI			X	AIDC tests foreseen by the second semester of 2017
	MONTEVIDEO	XI			X	AIDC foreseen by the first semester of 2019
MENDOZA (AUT INDRA AIRCON2100) (May 2016)	EZEIZA	XI			X	AIDC pre-operational by the first semester of 2018
	SANTIAGO	XI			X	AIDC foreseen for 2019
	CORDOBA	XI			X	AIDC pre-operational by the second semester of 2018
COMODORO RIVADAVIA (AUT INDRA AIRCON2100) (June 2016)	EZEIZA	XI			X	AIDC pre-operational by the first semester of 2018
	PUNTA ARENAS	XI			X	AIDC by the end of the second semester of 2018
	PUERTO MONTT	XI			X	AIDC by the end of the second semester of 2018

BRAZIL						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
AMAZÓNICO (MANAUS) AUTO. SAGITARIO ATECH	BRASILIA	XI			XI	AIDC implemented June 2016
	BOGOTÁ	XI			X	AIDC operational foreseen by first semester 2018
	CAYENNE	XI			X	AIDC foreseen for period 2018-2019
	CURITIBA	XI			XI	AIDC implemented July 2016
	GEORGETOWN	XI			X	AIDC foreseen for period 2018-2019
	LA PAZ	XI			X	AIDC foreseen for period 2019-2020
	LIMA	XI			XI	AIDC in preoperational phase since 6 September 2018

	MAIQUETIA	XI	X		X	AIDC foreseen for period 2018-2019
	PARAMARIBO	XI			X	AIDC foreseen for period 2018-2019
	RECIFE	XI			X	AIDC implemented since 2 May 2016
	ATLÂNTICO	XI			X	Second semester 2018
BRASILIA AUTO. SAGITARIO ATECH	AMAZÔNICO	XI			XI	AIDC implemented June 2016
	CURITIBA	XI			XI	AIDC implemented July 2016
	RECIFE	XI			XI	AIDC implemented June 2016
CURITIBA AUTO. SAGITARIO ATECH	AMAZONICO	XI			XI	AIDC implemented July 2016
	ASUNCION	XI			X	AIDC foreseen second semester 2018
	BRASÍLIA	XI			Xi	AIDC implemented July 2016
	LA PAZ	XI			X	AIDC foreseen for period 2019-2020
	MONTEVIDEO	XI			X	AIDC foreseen for the first semester of 2018
	RECIFE	XI			XI	AIDC implemented July 2016
	RESISTÊNCIA	XI			X	AIDC foreseen by the first semester of 2018
	ATLÂNTICO	XI			XI	Implemented on the first quarter of 2018
RECIFE AUTO. SAGITARIO ATECH	AMAZÔNICO	XI			XI	AIDC Implemented on 2 May 2016
	BRASÍLIA	XI			XI	AIDC implemented June 2016
	CURITIBA	XI			XI	AIDC implemented July 2016
	ATLÂNTICO	XI			X	Implemented on the first quarter of 2018
ATLÁNTICO AUTO. SAGITARIO ATECH	AMAZÔNICO	XI			X	Second Semester 2018
	CURITIBA	XI			X	Implemented on the first quarter of 2018
	DAKAR	XI			X	AIDC TBD
	JOHANNESBURG	XI			X	AIDC TBD
	LUANDA	XI			X	AIDC TBD
	MONTEVIDEO	XI			X	AIDC foreseen for period 2018-2019
	RECIFE	XI			X	Implemented on the first quarter of 2018
	CAYENNE	XI			X	AIDC foreseen for period 2018-2019

BOLIVIA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
LA PAZ (MANUAL)	AMAZÔNICO	XI			X	AIDC foreseen for period 2019 -2020
	ASUNCION	XI			X	AIDC foreseen for period 2019 -2020
	CURITIBA	XI			X	AIDC foreseen for period 2019 -2020
	CORDOBA	XI			X	AIDC foreseen for period 2019 -2020
	LIMA	XI			X	AIDC foreseen for period 2019 -2020
	IQUIQUE	XI			X	AIDC foreseen for period 2019 -2020

CHILE						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
SANTIAGO (AUTO THALES TOPSKY)	IQUIQUE	XI			X	AIDC foreseen for period 2018-2019
	LIMA	XI			X	AIDC foreseen for period 2018-2019
	MENDOZA	XI			X	AIDC foreseen for period 2018-2019
	PUERTO MONTT	XI			X	AIDC foreseen for period 2018-2019
IQUIQUE (AUTO INDRA AIRCON 2100)	CORDOBA	XI			X	Positive AIDC tests - March 2016. Tests results indicate the requirement of increase transmission speed from 2400 to 9600 bit/sec. AIDC operational foreseen by the first semester of 2019
	LA PAZ	XI			X	AIDC foreseen for period 2019-2020
	LIMA	XI			XI	**Operational since 18 August 2018.**
PUERTO MONTT (INDRA AUTOMATED)	SANTIAGO	XI			X	AIDC foreseen for period 2018-2019
	PUNTA ARENAS	XI			X	AIDC operational since mid-2017
	EZEIZA	XI			X	AIDC by the first semester of 2019

	COMODORO RIVADAVIA	XI			X	AIDC by the second semester of 2018
PUNTA ARENAS (INDRA AUTOMATED)	PUERTO MONTT	XI			X	AIDC operational since mid-2018
	COMODORO RIVADAVIA	XI			X	AIDC by the second semester of 2019

COLOMBIA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
BOGOTÁ (AUTO INDRA AIRCON 2100)	AMAZÔNICO	XI			X	AIDC operational foreseen first semester 2018
	CENAMER	XI			X	AIDC foreseen for period 2018-2019
	GUAYAQUIL	XI			XI	Positive AIDC tests conducted AIDC in pre-operational phase (August 2015). Implementation foreseen first semester 2018.
	LIMA	XI			XI	Positive AIDC tests conducted. AIDC pre-operational (August 2015) Operational letter of agreement incorporating AIDC was signed on November 2016 Operational phase foreseen second semester 2018
	MAIQUETIA	XI			X	AIDC foreseen for period 2018-2019
	PANAMA	XI			X	Positive AIDC tests conducted. AIDC foreseen to be operational by first semester 2018.
	BARRANQUILLA	XI			XI	AIDC pre-operational (March 2016)
BARRANQUILLA (AUTO INDRA AIRCON 2100)	MAIQUETIA	XI			X	AIDC foreseen for period 2018-2019
	PANAMA	XI			X	Positive AIDC tests conducted. AIDC foreseen to be operational by first semester 2018.
	BOGOTA	XI			XI	AIDC pre-operational (March 2016)

	KINGSTON	XI			X	AIDC TBD
	CURAÇAO	XI			X	AIDC TBD
APP Rio Negro (AIRCON 2100)	PANAMA	XI			X	Tests on first semester 2018
APP Cali (AIRCON 2100)	PANAMA	XI			X	Tests on first semester 2018

ECUADOR						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
GUAYAQUIL AUTO INDRA AIRCON 2100	BOGOTA	XI			XI	Positive AIDC tests conducted. AIDC pre-operational (August 2015) implementation foreseen second semester 2018
	LIMA				XI	**Operational since 18 August 2018.**
	CENAMER	XI			X	Positive AIDC tests conducted. AIDC foreseen for period 2018-2019

FRENCH GUIANA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
CAYENNE AUTO ADACEL AIDC installed	AMAZÔNICO	XI			X	AIDC foreseen for period 2018-2019
	PARAMARIBO	XI			X	AIDC foreseen for period 2017-2019
	PIARCO	XI			X	AIDC foreseen for period 2018-2019
	DAKAR	XI			X	AIDC foreseen for period 2018-2019
	ATLANTICO	XI			X	AIDC foreseen for period 2018-2019

GUYANA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
GEORGETOWN AUTO INTELCAN AIDC not installed	AMAZONICO	XI			X	AIDC foreseen for period 2018-2019
	PIARCO	XI			X	AIDC foreseen for period 2018-2019
	MAIQUETIA	XI			X	AIDC foreseen for period 2018-2019
	PARAMARIBO	XI			X	AIDC foreseen for period 2018-2019

PANAMA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
PANAMA (AUTO THALES)	BOGOTA	XI			X	Still in pre-operational phase. It is required to coordinate letters of agreement based on AIDC. The operational phase is foreseen by the first quarter 2019
	BARRANQUILLA	XI			X	Still in pre-operational phase. It is required to coordinate letters of agreement based on AIDC. The operational phase is foreseen by the first quarter 2019
	CENAMER	XI			X	Positive AIDC tests have been performed under the AFTN network. The pre-operational phase will now be resumed under the AMHS network.
	APP CALI	XI			X	Tests on second semester 2019.
	APP RIO NEGRO	XI			X	Tests on second semester 2019.
	KINGSTON	XI			X	Waiting for Kingston Control to start with pre operational phase

PARAGUAY						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
ASUNCION AUTO AIRCON 2100 INDRA	CURITIBA	XI			X	AIDC foreseen for second semester 2019
	LA PAZ	XI			X	AIDC foreseen for period 2019-2020
	RESISTENCIA	XI			X	Positive AIDC tests conducted in 2015 between Ezeiza and Asuncion. Tests between Resistencia and Asuncion were conducted in late 2016. AIDC foreseen to be operational by the first semester 2019.

PERU						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
LIMA AUTO AIRCON 2100 INDRA	AMAZONICO	XI			X	AIDC foreseen to be operational by second semester 2018
	BOGOTA	XI			XI	Positive AIDC tests conducted. AIDC pre-operational phase (August 2015). Amendment to the operational agreement including the AIDC signed in November 2016. Operational phase foreseen second semester 2018
	SANTIAGO	XI			X	AIDC foreseen for period 2018-2019
	IQUIQUE	XI			XI	**Operational since 18 August 2018.**
	GUAYAQUIL	XI			XI	**Operational since 18 August 2018.**
	LA PAZ	XI			X	AIDC pending confirmation

SURINAME						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
PARAMARIBO (AUTO INTELCAN) AIDC not installed	AMAZÓNICO	XI			X	AIDC foreseen for period 2018-2019
	GEORGETOWN	XI			X	AIDC foreseen for period 2018-2019
	PIARCO	XI			X	AIDC foreseen for period 2018-2019
	CAYENNE	XI			X	AIDC foreseen for period 2018-2019

URUGUAY						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
MONTEVIDEO (AUTO INDRA AIRCON2100)	CURITIBA	XI			X	AIDC foreseen by period 2019-2020
	EZEIZA	XI			X	AIDC foreseen by the first semester 2019
	RESISTENCIA	XI			X	AIDC foreseen by first semester 2019
	ATLANTICO	XI			X	AIDC foreseen for period 2018-2019
	JOHANNESBURG	X			X	AIDC TBD O/G

VENEZUELA						
ACC	ACC ADJ	Flight plan				Comments
		Interconnection levels				
		1 4444 Manual	2 4444 Auto	3 (OLDI)	4 (AIDC)	
MAIQUETIA (AUTO ATECH X4000) AIDC not installed	AMAZONICO	XI	XI		X	AIDC foreseen for period 2018-2019
	BOGOTA	XI			X	AIDC foreseen for period 2018-2019
	BARRANQUILLA	XI			X	AIDC foreseen for period 2018-2019
	PIARCO	XI			X	AIDC TBD
	CAYENNE	XI			X	AIDC foreseen for period 2018-2019
	CURAZAO	XI			X	AIDC TBD
	SAN JUAN	XI			X	AIDC TBD

*** X PLANNED**
***XI IMPLEMENTED AND IN PRE-OPERATIONAL OR OPERATIONAL PHASE**

APPENDIX E

PLAN OF ACTIVITIES FOR THE IMPLEMENTATION OF THE AIDC INTERCONNECTION BETWEEN ADJACENTS ACCs

Activity	Start	End	Responsible	Status
1. **Establishment of initial activities for completing the technical implementation of AIDC**	**10/10/14**	**16/10/14**	**ICAO**	**Completed** The initial plan of activities for AIDC implementation is scheduled for 2015. The plan of activities contemplates the conduction of AIDC courses for air traffic controllers working at ACCs and the operational implementation of AIDC between adjacent ACCs. These activities will be conducted in Chile, Colombia, Ecuador and Peru. Interconnection tests between the Lima and Bogota ACCs were added to the list shown in paragraph 1.1.1.
1.1 Based on the results of AIDC tests conducted from February 2014 to June 2014, the technical documentation of the automated systems installed in the Region, and the SAM AIDC implementation guide, develop: 1.1.1 Plan of activities to complete technical feasibility tests for AIDC interconnection between: Santiago ACC - Lima ACC Guayaquil ACC - Lima ACC Bogota ACC - Guayaquil ACC 1.1.2 Contents of AIDC course for ATS controllers and programmers of AIDC automated system databases, to be conducted in Chile, Colombia, Ecuador and Peru.	10/10/14	16/10/14	ICAO	
2. Review of activities at the SAM/IG/14 meeting	**09/10/14**	**13/11/14**	**ICAO and SAM/IG group**	**Completed** The SAM/14 reviewed and approved the plan of activities for AIDC implementation
2.1 Submission of the plan of activities and contents of the AIDC course at the SAM/IG/14 meeting	09/10/14	13/11/14	ICAO	
2.2 Review and approval for submission at the Eighth Coordination Meeting of Project RLA/06/901	09/10/14	13/11/14	SAM/IG	

Activity	Start	End	Responsible	Status
3. Approval of activities by the RCC/8 meeting	**25/02/15**	**27/02/15**	**RLA/06/901 member States**	**Completed** The RCC/8 meeting held in Lima on 25-27 February 2015 approved the activities for initial implementation of AIDC interconnection in Chile, Colombia, Ecuador and Peru.
3.1 Submission of activities, with their respective cost, for approval.	25/02/15	27/02/15	RLA/06/901 member States	
4. Search and selection of experts	**24/11/14**	**28/01/15**	**ICAO**	**Completed** For the performance of the initial activities, three SAM experts with experience in database programming and operation of ACC automated systems were selected: **Rubén Silva of Argentina, Mauricio Ferrer of Colombia, and Jorge Merino of Peru**.
4.1 Search and selection of 4 experts from SAM States participating in Project RLA/06/901, with experience in the installation, operation and programming of AIDC databases, to perform the activities listed in item 1.	24/11/14	28/01/15	ICAO	
5. Missions to complete AIDC interconnection between States that started tests during the first semester of 2014	**06/04/15**	**01/05/15**	**3 automation experts ICAO**	**Completed** Missions were conducted for training purposes and to complete tests for AIDC interconnection and operation in Chile, Peru, Ecuador and Colombia.
5.1 Mission to Santiago de Chile	06/04/15	10/04/15	3 automation experts ICAO	**Completed** Implementation of AIDC activities at the Santiago ACC • AIDC practical course AIDC interconnection tests between: *Santiago ACC and Lima ACC*
5.1.1 Complete AIDC technical implementation between the Santiago and Lima ACCs	06/04/15	10/04/15	3 automation experts ICAO	**Completed** Two-way communication was established in the AIDC
5.1.2 Conduct AIDC course for ATS personnel of the Santiago	06/04/15	10/04/15		

Activity	Start	End	Responsible	Status
ACC				interconnection tests between the Thales Top sky system of the Santiago ACC and the INDRA Aircon 2100 of the Lima ACC. The operational tests did not have positive results due to the AIDC limitations in the Santiago ACC. The practical course on AIDC and database programming was conducted, providing training to 16 controllers of the Santiago ACC and 2 aeronautical technicians.
5.2 Mission to Lima:	13/04/15	17/04/15	3 automation experts	**Completed** Implementation of AIDC activities in the Lima ACC • AIDC practical course • AIDC interconnection tests between: *Lima ACC - Santiago ACC* *Lima ACC - Guayaquil ACC* *Lima ACC - Bogota ACC*
5.2.1 Conduct AIDC course for ATS personnel of the Lima ACC	13/04/15	17/04/15	3 Automation experts ICAO	**Completed** The practical course on AIDC and database programming was conducted, providing training to 44 controllers of the Lima ACC.
5.2.2 Complete AIDC tests between the Lima ACC and the Guayaquil ACC	13/04/15	17/04/15		**Completed** AIDC tests between the Lima and Guayaquil ACCs were successfully conducted.
5.2.3 Complete AIDC tests between the Lima ACC and the Bogota ACC	13/04/15	17/04/15		**Completed** AIDC tests between the Lima

Activity	Start	End	Responsible	Status
				and Bogota ACCs were successfully conducted.
5.3 Mission to Guayaquil	20/04/15	24/04/15	3 Automation experts of the SAM Region	**Completed** Implementation of AIDC activities at the Guayaquil ACC • Practical course on AIDC • AIDC interconnection tests and pre-operational implementation: Guayaquil ACC - Lima ACC Guayaquil ACC- Bogota ACC
5.3.1 Complete AIDC technical implementation between the Guayaquil ACC and the Lima ACC	20/04/15	24/04/15	3 automation experts of the SAM Region	**Completed** AIDC technical interconnection was completed, currently in the pre-operational phase.
5.3.2 Complete AIDC technical implementation between the Guayaquil ACC and the Bogota ACC	20/04/15	24/04/15		**Completed** AIDC technical interconnection was completed, currently in the pre-operational phase
5.3.3 Conduct AIDC course for ATS personnel of the Guayaquil ACC	20/04/15	24/04/15		**Completed** The practical course on AIDC and database programming was conducted, providing training to 31 controllers of the Guayaquil ACC.
5.4 ***Mission to Bogota***	**27/04/15**	**01/05/15**	**3 automation experts**	**Completed** Implementation of AIDC activities in the Bogota ACC • Practical course on AIDC • AIDC interconnection tests and pre-operational implementation:

Activity	Start	End	Responsible	Status
				Guayaquil ACC - Lima ACC *Guayaquil ACC - Bogota ACC*
5.4.1 Complete AIDC technical implementation between the Bogota ACC and the Guayaquil ACC	27/04/15	01/05/15	3 automation experts of the SAM Region	**Completed** The AIDC technical interconnection was completed, currently in pre-operational phase
5.4.2 Complete AIDC technical implementation between the Bogota ACC and the Lima ACC	27/04/15	01/05/15		**Completed** The AIDC technical interconnection was completed, currently in pre-operational phase
6. First meeting of the AIDC operational implementation working group during the SAMIG/15 meeting	**11/05/15**	**15/05/15**	**RLA/06/901 member States**	**Completed.** As a result of AIDC technical implementation, the SAM/IG/15 established a group of activities to migrate from the pre-operational phase to the operational between the ACC Bogota, Guayaquil and Lima. Additionally, the AIDC messages to be used were defined.
6.1 It is proposed that, as a matter of priority, the SAM/IG/15 meeting do the follow-up of AIDC implementation. Accordingly, the AIDC operational implementation working group will hold its first meeting.	11/05/15	15/05/15	RLA/06/901 member States	
7. AIDC operational implementation **ACC Guayaquil ACC Lima** **ACC Bogota ACC Guayaquil** **ACC Lima ACC Bogota** **ACC Lima ACC Iquique**	**18/05/15**	**31/12/18**	**Involved States**	**Since 18 August 2018 were established the following AIDC connections:** **ACC Guayaquil-ACC Lima and ACC Iquique-ACC Lima**
7.1 Definition of the parameters of the AIDC database for the to AID operational interconnection between Colombia, Ecuador and Peru	25/05/15	29/05/15	Involved States	**Completed.**
7.2 Amend letter of operational agreement to include the AIDC for the coordination between the ACC Lima with AAC Bogota, ACC Bogota with ACC Guayaquil and ACC Lima with ACC Guayaquil	15/06/15	30/06/18	Involved States	**Valid.** Letter of operational agreement between the ACC Guayaquil and

Activity	Start	End	Responsible	Status
				ACC Lima was amendment and signed. (Oct 2015). On Nov 2016, final review and sign of letter of operational agreement between ACC Lima and ACC Bogota was completed. Pending amendment of letter of agreement between ACC Bogota and ACC Guayaquil.
7.3 Teleconferences to coordinate and follow-up the migration from the AIDC pre-operational phase to the operational for Colombia, Ecuador and Peru	June 2014	Monthly Tele-conferences at the beginning of each month until end 2018 depending on the progress, telecon-ference will be conducted upon needs	Involved States ICAO	**Valid.** Teleconferences are being carried out on monthly basis since June 2014. On 2016 teleconferences were conducted on: 19 January 23 May 19 February 3 June 18 March 6 September On 2017 teleconferences were held on March 2, June 28, August 24 and December 14. On 2018 one teleconference was held on January 26 and on July.
7.4 Complete courses for the ACC Lima and Guayaquil, Bogotá ATS staff as well as staff ARO/AISe	18/05/15	30/12/17	Involved States	**Completed.**
7.5 Preoperational and operational Implementation of AIDC **Guayaquil ACC - Lima ACC** Bogota ACC - Guayaquil ACC Lima ACC - Bogota ACC Lima ACC – Santiago ACC* **Lima ACC – Iquique ACC**	18/05/15	31/12/17	States involved	**Valid.** Letter of operational agreement with corrections on AIDC between ACC Colombia, Ecuador, Panama and Peru were amended (October 2015).

Activity	Start	End	Responsible	Status
				Letter of operational agreement between AAC Lima and Guayaquil with the inclusion of AIDC was signed on 23 October 2015. Letter came into force on 31 March 2016. Establishing of a pre-operational period completing the ATS staff training. Operational implementation. AIDC between ACC Lima - ACC Guayaquil in operational phase from August 3, 2015, became operative on 31 March 2016. AIDC operations interrupted on September 2016 due to AIRCON 2100 system problems in Lima ACC. Automated system of Lima was completed by the end of 2017. The AIDC between the ACC Bogota and the ACC Lima and ACC Guayaquil is still in pre-operational phase since May, 2015. * The AIDC operational implementation between the ACC Lima and ACC Santiago has postponed in view of the delay in the modernization of the

Activity	Start	End	Responsible	Status
				ACC Santiago automated Center (2017-2019). **AIDC connections between Iquique ACC – Lima ACC and Guayaquil ACC – Lima ACC operational since 18 August 2018.**
8. Other AIDC implementations **Bogota ACC - Panama ACC** **Ezeiza ACC - Montevideo ACC** **Resistencia ACC - Asunción ACC** **Curitiba ACC – Resistencia ACC** **Iquique ACC – Lima ACC** **Cordoba ACC – Iquique ACC** **Amazonico ACC – Bogota ACC** **Amazonico ACC – Lima ACC** **Asuncion ACC – Curitiba ACC**	18/05/15	31/12/18	States involved	**AIDC connections between Iquique ACC – Lima ACC operational since 18 August 2018.**
8.1 Definition of parameters of the AIDC database for the operational interconnection of the AIDC		29/12/16	States involved	**Valid** Defined for AIDC between: Bogota ACC-Panama ACC, Iquique ACC-Cordoba ACC and Resistencia ACC-Asuncion ACC.
8.2 Amendment of letter of operational agreement to include the AIDC for coordination between ACCs.		30/06/18	States involved	**Valid**
8.3 Carry out teleconferences for coordination and follow-up to the migration from the AIDC pre-operational to operational phase		Monthly tele-conferences at the beginning of each month until	States involved ICAO	**Valid** Teleconferences conducted 19 January 23 May 19 February 3 June 18 March 6 September

Activity	Start	End	Responsible	Status
		the end of 2018 Depending on the progress tele-conferences will be conducted upon need		For 2017 teleconferences are foreseen for March, (made on 3 March) July, September and December. **Three teleconferences were carried out in 2018 (January, July and November).**
8.4 Practical courses addressed to the ATS AIS CNS personnel of the ACC involved, interconnection AIDC		30/11/16	States involved OACI	**Completed** AIDC Course (Panamá 22 -26 June) 2015 AIDC Course (Paraguay 28 November to 2 December 2016).
8.5 Conduction of AIDC interconnection test between adjacent ACCs		30/12/17	States involved	**Valid** Successful AIDC interconnection tests between Bogota and Panama. (June 2015). Tests will continue during 2017 in view of the improvement made in the automated system of Panama ACC. AIDC tests Iquique ACC and Lima ACC were successfully conducted on December 2015 and continued until the end of 2017. AIDC tests Iquique ACC and Cordoba ACC were made in

Activity	Start	End	Responsible	Status
				February 2016 with positive results but the ABI message. Tests will continue one end-2017 since Argentina reported that AIDC domestic operations will be completed first. AIDC tests Amazonico ACC and Lima ACC were conducted on the second semester of 2018 with problems with ABI messages at the beginning which were overcome by the Company Atech. Tests will continue on first semester 2018. AIDC tests Ezeiza ACC and Montevideo ACC (first semester 2018). AIDC tests Asuncion ACC and Resistencia ACC were made during the week of 28 November 2016 and will restart at the beginning of 2020. AIDC tests Curitiba ACC and Resistencia ACC (end of the second semester 2017). AIDC tests Curitiba ACC and Asuncion ACC (first semester 2017).

Activity	Start	End	Responsible	Status
				AIDC tests Bogota AAC and Amazonico ACC (First semester 2018)
8.6 Implantation of pre-operational and operational AIDC		31/12/17	States involved	**Valid** AIDC between Bogota ACC and Panama ACC is in pre-operational phase since October 2015. Operational phase foreseen by the end of the second semester 2019. AIDC between Ezeiza ACC and Montevideo ACC in pre-operational phase foreseen by June 2018 and in operational phase by the end of the second semester 2019. AIDC between Asuncion ACC and Resistencia ACC in pre-operational phase and operational by the end of first semester 2019. AIDC between Iquique ACC and Lima ACC will be in pre-operational phase on May 2018 and operational phase on the end of first semester 2018. AIDC between Iquique ACC and Cordoba ACC in pre-operational phase and will be on

Activity	Start	End	Responsible	Status
				operational phase by the end of first semester 2019. AIDC between Curitiba ACC and Resistencia ACC in pre-operational and operational phases by the first semester 2019. AIDC between Amazonico ACC and Lima pre-operational phase on second semester 2018. AIDC between Amazonico ACC and Bogota ACC foreseen operational phase by the end of first semester 2018. AIDC between Asunccion ACC and Curitiba ACC operation phase foreseen by second semester 2021.
9. Workshop/Seminars on implementation of ATM automation	**22/09/15**	**31/12/19**		
9.1 Workshop/Seminars on implementation of ATM automation	22/09/15	23/10/15		**Completed** NAM/CAR/SAM Workshop held in Panama from 22 to 25 September 2015. The implementation of interregional AIDC interconnections was analysed.
9.2 Workshops/Seminars on AIDC implementation		June 2019	**ICAO**	**Valid**.

Activity	Start	End	Responsible	Status
10. Second meeting of the AIDC operational implementation working group during SAMIG/16	**19/10/15**	**23/10/15**	**ICAO**	**Completed**
10.1 It is proposed, as a matter of priority, the SAM/IG/16 meeting do the follow-up of AIDC implementation. Accordingly, the second meeting of the AIDC operational implementation working group will be held.	19/10/15	23/10/15	ICAO	**Completed** Follow-up was made on the operational implementation and programming of activities for operational implementation in 2016.
11. **AIDC Implementation meetings 2018-2020**	**01/01/18**	**31/12/20**	**Involved States ICAO**	**Valid**
11.1 Implementation of remaining AIDC interconnections at inter-regional level (Chart CNS II-3 – Plan of ATS voice circuits of the CAR/SAM Air Navigation Regional Plan Volume II eANP) and 8 inter-regional distributed as follows: Colombia (Barranquilla-Kingston, Barranquilla-Curazao and Bogota-CENAMER), Ecuador (Guayaquil-CENAMER) and Venezuela (Maiquetia-Piarco, Josefa Camejo – Aruba and Maiquetia-San Juan).	01/01/17	31/12/19	Involved States ICAO	**Valid**
11.2 Inter-regional AIDC interconnections between SAM and AFI Regions: Argentina (1), Brazil (2), French Guiana (1) and Uruguay (1)	01/01/17	31/12/20	Involved States ICAO	**Valid**
12. **Introduction of FF ICE concept**	**18/04/17**	**31/12/19**		
12.1 Analysis of the application of B1-FICE Module in the Region: Increasing interoperability, efficiency and capability through FF ICE. First stage of application before exit.	18/04/18	31/12/2019	SAM Region States and ICAO	Valid
13. **Monitoring to the AIDC interconnection implementation**	**2015**	**2020**	**ICAO**	
13.1 **AIDC Implementation Meeting** ✓ First AIDC Implementation Meeting ✓ Second AIDC Implementation Meeting	March 2016	September 2020	ICAO	**Valid** AIDC/1 (Lima, Peru, 28-30 March 2016) AIDC/2 (Lima, Peru, 21-23

Activity	Start	End	Responsible	Status
✓ Third AIDC Implementation Meeting ✓ Fourth AIDC Implementation Meeting ✓ Fifth AIDC Implementation Meeting ✓ Sixth AIDC Implementation Meeting				September 2016) AIDC/3 (Lima, Peru, 24-26 April 2017) Approved by RCC/10 AIDC/4 (Lima, Peru, 16-20 April 2018) AIDC/5 (Lima, Peru, September 2019) AIDC/6 (Lima, Peru, September 2020)

APPENDIX F / APÉNDICE F

NATIONAL FOCAL POINTS IN SAM REGION / PUNTOS FOCALES NACIONALES EN REGIÓN SAM

IMPLEMENTATION OF INTERCONNECTION OF AUTOMATED SYSTEMS / IMPLANTACIÓN INTERCONEXIÓN SISTEMAS AUTOMATIZADOS

STATE/ ESTADO	ADMINISTRATION / ADMINISTRACIÓN	NAME/ NOMBRE	POST/ CARGO	TELEPHONE/ TELEFONO	E-MAIL
ARGENTINA	EANA	Javier Schenk	Gerente CNS EANA	Cel (54911) 5848 6936	Jschenk@eana.com.ar
		Osvaldo Oscar Godoy	Jefe ANS Subregional Ezeiza	(5411) 4480 2309 Cel (54911) 2883 6444	ogodoy@eana.com.ar
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APPENDIX G

RECOMMENDATIONS FORMULATES DURING THE MEETING OF IMPLEMENTATION OF AIDC IN THE NAM/CAR/SAM REGIONS (Lima, Peru, 16 to 20 April 2018) TO COMPLETE THE OPERATIONAL IMPLEMENTATION OF AIDC

RECOMMENDATION AIDC/1.- Increase efforts to complete AIDC operational implementation

That NAM/CAR/SAM States, taking into account the information provided by the GREPECAS GTE that shows the significant contribution of AIDC to the reduction of LHDs, increase their AIDC implementation efforts, aiming at the operational implementation of AIC systems. Likewise, that States, through their task forces, promote the exchange of lessons learned regarding AIDC implementation.

RECOMMENDATION AIDC/2.- Consider the recommendations of manufacturers and States regarding AIDC implementation

That NAM/CAR/SAM States examine and use as a reference the document containing the integrated recommendations made at the Meeting by Indra Systems, Thales, and ATECH, which is shown in Appendix D of the Meeting Report, as well as the weaknesses identified by the regional AIDC implementation working groups, with a view to expediting and coordinating the implementation of AIDC interconnections.

RECOMMENDATION AIDC/3.- List of AMHS staff

That the NAM/CAR/SAM States update the contact information of the AMHS technicians of their States/FIRs to have an updated version of the AMHS technical management contact list and that the ICAO NAM/CAR and SAM Offices ensure that this information is available on their WEB pages with the aim of obtaining an updated version to coordinate, as soon as possible, any necessary action with those centers with which messaging is exchanged and traffic is permanently monitored, establishing maximum time between consecutive messages processed, as well as how to check permanently reports of non-delivery reports (NDR) generated by messaging systems, mainly those that are not related to unknown addresses.

APPENDIX H

COMPARATIVE TABLE WITH ALL SAM REGION STATES

State (FL)	% of FIR Coverage Continental and Oceanic (Space-based ADS-B)	% of FIR Coverage Continental and Oceanic (SSR)	Space-based ADS-B (Annual Cost/km2 FIR)	SSR (Annual cost/(% of Coverage x Km2 FIR)	Terrestrial ADS-B (Annual cost/(% of Coverage x Km2 FIR)
Argentina (FL 100)	100	12,37	0,15	8,68	2,61
Argentina (FL 150)	100	15,27	0,15	7,04	2,11
Argentina (FL 250)	100	18,58	0,15	5,78	1,73
Bolivia (FL 100)	100	26,10	0,57	2,93	0,88
Bolivia (FL 150)	100	40,85	0,57	1,87	0,56
Bolivia (FL 250)	100	70,35	0,57	1,09	0,33
Brazil (FL 100)	100	27,86	0,53	4,25	1,27
Brazil (FL 150)	100	35,01	0,53	3,38	1,01
Brazil (FL 250)	100	46,26	0,53	2,56	0,77
Chile (FL 100)	100	8,96	0,20	19,48	5,85
Chile (FL 150)	100	11,66	0,20	14,97	4,49
Chile (FL 250)	100	17,55	0,20	9,95	2,98
Colombia (FL 100)	100	37,37	1,17	4,22	1,27
Colombia (FL 150)	100	49,33	1,17	3,20	0,96
Colombia (FL 250)	100	77,73	1,17	2,03	0,61
Ecuador (FL 100)	100	27,45	0,77	10,79	3,24
Ecuador (FL 150)	100	45,74	0,77	6,48	1,94
Ecuador (FL 250)	100	74,49	0,77	3,98	1,19
French Guiana (FL 100)	100	***ADS-B 11,67***	0,30		Nota b) 18,46

State (FL)	% of FIR Coverage Continental and Oceanic (Space-based ADS-B)	% of FIR Coverage Continental and Oceanic (SSR)	Space-based ADS-B (Annual Cost/km2 FIR)	SSR (Annual cost/(% of Coverage x Km2 FIR)	Terrestrial ADS-B (Annual cost/(% of Coverage x Km2 FIR)
French Guiana (FL 150)	100	***ADS-B 15,34***	0,30		Nota b) 14,05
French Guiana (FL 250)	100	***ADS-B 16,56***	0,30		Nota c) 13,01
Guyana (FL 100)	100	***ADS-B 91,86***	1,26		Nota c) 0,91
Guyana (FL 150)	100	***ADS-B 96,9***	1,26		Nota c) 0,86
Guyana (FL 250)	100	***ADS-B 100***	1,26		Nota b) 0,84
Panama (FL 100)	100	33,70	2,29	14,40	4,32
Panama (FL 150)	100	41,63	2,29	11,66	3,50
Panama (FL 250)	100	59,48	2,29	8,16	2,45
Paraguay (Fl 100)	100	***SSR- 30,87/ADS 92,61***	1,31	1,91	Nota d) 0,57
Paraguay (Fl 150)	100	***SSR - 40,39/ADS 99,5***	1,31	1,46	Nota d) 0,53
Paraguay (Fl 250)	100	***SSR - 69,21/ADS 100***	1,31	0,85	Nota d) 0,53
Peru (FL 100)	100	13,14	0,60	5,68	1,71
Peru (FL 150)	100	19,70	0,60	3,79	1,14
Peru (FL 250)	100	43,21	0,60	1,73	0,52
Surinam (Fl 100)	100		1,23		
Surinam (Fl 150)	100		1,23		
Surinam (Fl 250)	100		1,23		
Uruguay (Fl 100)	100	3,18	0,20	42,83	12,85

State (FL)	% of FIR Coverage Continental and Oceanic (Space-based ADS-B)	% of FIR Coverage Continental and Oceanic (SSR)	Space-based ADS-B (Annual Cost/km2 FIR)	SSR (Annual cost/(% of Coverage x Km2 FIR)	Terrestrial ADS-B (Annual cost/(% of Coverage x Km2 FIR)
Uruguay (Fl 150)	100	5,30	0,20	25,70	7,71
Uruguay (Fl 250)	100	7,43	0,20	18,33	5,50
Venezuela (FL 100)	100	48,87	1,18	2,68	0,80
Venezuela (FL 150)	100	65,23	1,18	2,01	0,60
Venezuela (FL 250)	100	83,64	1,18	1,57	0,47

Notes:

a) Para la mayoría de los países, se adoptó el número ficticio de estaciones de ADS-B terrestres que estarían con sus coordenadas de localización de instalación coincidentes donde están ubicados los SSR actuales.
b) Para Guayana Francesa solamente se consideró ADS-B terrestre (cinco sensores).
c) Para Guyana solamente se consideró ADS-B terrestre (cinco sensores).
d) Paraguay posee radares (dos) y ADS-B terrestre (seis). Por este motivo, los valores de Costo anual/(%Cobertura FIR x Km2 FIR) llevan en cuenta la cantidad real de cada sensor.
e) Para SSR y ADS-B Terrestre, las relaciones (Costo anual/(%Cobertura x Km2 FIR) pueden ser consideradas conservadoras con respecto a la adquisición de los equipos y por la aplicación del 20% por mantenimiento, operación, telecomunicaciones, costos con infraestructura y “spare-parts” en toda su vida útil.
f) Para los cálculos de SSR y ADS-B Terrestre, fue considerado el costo ficticio si los sensores SSR y ADS-B terrestre tuvieran cobertura del 100% en toda la FIR (oceánica y continental) de cada Estado.

APPENDIX I

(Spanish only)

Posición de IATA sobre ADS-B por satélite

- El ADS-B por satélite tiene un gran potencial para brindar servicios de vigilancia ATS, principalmente en espacios aéreos remotos y oceánicos. Sin embargo, todavía hay que solucionar el tema de la comunicación directa entre controlador y piloto, con miras a proporcionar separaciones similares a las utilizadas en el espacio aéreo continental (3-5 NM) a largo plazo.
- Todavía hay trabajo en curso dentro del Panel de Vigilancia de la OACI para definir el requisito de latencia de datos para los servicios de vigilancia ATS. Este es un trabajo que viene siendo realizado con pleno respaldo de la Comisión de Navegación Aérea de la OACI. Sin el requisito y los criterios de latencia de datos definidos, no es posible decir, a nivel de la OACI, si la REDDIG es capaz de soportar en enlace de datos ADS-B por satélite. Por lo tanto, el uso de la REDDIG deberá validarse una vez que el Panel de Vigilancia haya desarrollado y aprobado el requisito y los criterios de latencia.
- Es necesario desarrollar un Business Case robusto para justificar la implementación del ADS-B, sea terrestre o por satélite, como, por ejemplo, indicando si los ANSPs que implementarán el ADS-B por satélite irán retirar algunos de los radares basados en tierra. Se debería evitar inversiones y costos duplicados, que ocurriría caso los ANSPs decidan usar también ADS-B por satélite sin reducir su infraestructura de vigilancia existente, a menos que existan claros beneficios operacionales. En ese caso, se debería utilizar el mecanismo de consulta con los usuarios sobre tarifas, previstos en el Doc. 9082.
- Teniendo en cuenta que el servicio de ADS-B por Satélite actualmente puede ser considerado un monopolio, se recomendaría a los ANSPs que se verifique los costos asociados al sistema, con miras que los precios cobrados tengan relación directa con los costos, aplicándose las guías del Doc. 9082.
- Se recomendaría que los ANSPs verifiquen que las tarifas cobradas de forma diferenciada por espacio aéreo (oceánico, remoto, continental, etc.) podrían afectar la aplicación de las guías del Doc. 9082. Uno de los principios básicos del mencionado documento es que las tarifas deben ser relacionadas al costo. De esa manera, no se debería cobrar tarifas diferenciadas por espacio aéreo, con base a las tarifas cobradas por una tercera parte al ANSP, teniendo en cuenta que el costo es exactamente igual para proveer el servicio ADS-B por Satélite en cualquier espacio aéreo.
- Con relación a la duración del contrato entre ANSP y Aireon, se recomendaría a los ANSPs un máximo de 5 años, teniendo en cuenta que la tecnología puede variar rápidamente y que hay algunas informaciones que indican la posibilidad de que otro proveedor de ADS-B por Satélite ingrese en el mercado.
- Se recomienda a los Estados y ANSPs que consideren las limitaciones de la encuesta sobre capacidad CNS de las aeronaves, presentada por IATA, en la NE/15 de la SAM/IG/22, con miras a toma de decisión de implementación del ADS-B.

Agenda Item 6: Other business

6.1 Under this agenda item, the following papers were analysed:

a) WP/19 - *Acciones realizadas por EANA para optimizar la gestión del tránsito aéreo a través de la medición por indicadores* (presented by Argentina) (**Spanish only**);
b) WP/24 - *Necesidad de estructura normativa para la coexistencia de la ATM frente a una UTM emergente* (presented by Venezuela) (**Spanish only**);
c) IP/20 - *Plan de contingencias ATM de la región SAM* (presented by Argentina) (**Spanish only**); and
d) IP/24 - *Cooperación entre los países de la region para la resolución de problemas de integración de los sistemas automatizados y el intercambio de conocimientos y mejores prácticas* (presented by Brazil and Venezuela) (**Spanish only**).

6.2 With reference to the subjects reviewed during the Thirteenth Air Navigation Conference, Venezuela reviewed the utilization of remotely piloted aircraft, and handling of the "unmanned aircraft systems" (UAS) concept, where a broad range of possibilities exist and are undergoing trials world-wide.

6.3 The UAS systems market promotes the increase of drone operations at very low level (VLL) inside an airspace shared with other users, especially over urban areas, situation which increases the need for analysis and adoption of criterion for the reasonable, organized and systemic management of UAS traffic (UTM). It is expected that drones promote the development of business models for delivery of merchandize, particularly, online sales of pharmaceuticals, food, electronics and textiles, amongst others, as well as inspection activities, surveillance and recreation activities.

6.4 Argentina informed that when implementing its ATS Contingency Plan, which includes the activation of the simplified route network, longitudinal separation minimum has been simultaneously applied in all of its five FIRs, although only one is affected. This situation results in inconveniences in the FIRS that do not have limitations in ATS services, in view that the simplified route network is applied unnecessarily affecting air traffic efficiency. To this respect, Argentina is improving its ATS Contingency Plan, and suggested that other SAM States managing more than one FIR, with a similar situation in its airspace, consider the possibility of segregate the application of Contingency Plans in a more efficient manner.

6.5 The Meeting took note that Brazil and Venezuela are developing a technical cooperation process to achieve common objectives, in order to maintained safety in the Region and for the exchange of experiences in the handling and integration of automated systems. Likewise, academic training of Venezuelan professionals is pursued through specialized courses in air traffic control and ATS surveillance. It is expected that this idea of cooperation becomes extensive, in a short time, to all other States in the Region that wish to form part of the exchange of experiences and technical integration.