SAM/IG/4-WP/12
09/10/09

International Civil Aviation Organization
South American Regional Office

FOURTH WORKSHOP/MEETING OF THE SAM IMPLEMENTATION GROUP (SAM/IG/4)
REGIONAL PROJECT RLA/06/901

Lima, Peru, 19 to 23 October 2009

Agenda Item 4: Standards and procedures for performance-based navigation operations approval

Survey about aircrafts PBN capability in SAM Region

(Presented by the Technical Committee of the SRVSOP)

Summary

This working paper presents the results of the survey about PBN capability of the SAM Region aircraft fleet carried out during year 2009, besides presenting the draft consultation tool database generated.

References:

- Regional Project RLA/99/901
- SAM/IG/2 Report
- SAM/IG/3 Report

1. Background

1.1 During the SAM/IG/2 Workshop/Meeting, of the SAM Implementation Group (Lima, Peru, 3-7 November 2008) the proposal to develop a survey addressed to SAM Region States, where each aircraft can be identify by its registration versus its PBN capability. To carry out this survey, the Regional Safety Oversight Cooperation System (SRVSOP), as part of its supporting actions for the implementation of PBN in the Region, developed a survey form on the aircrafts PBN capability.

1.2 Le survey form was circulated among SAM Region States, with letter SAM/IG/3 LT 2/3A.5-SA058 dated 29 January 2009, in which information on Aircraft operating commercial flights with a maximum certified take off weight of more than 5 700 Kg, was requested by 20 March 2009.

1.3 The Third Workshop / Meeting of the SAM Implementation Group (SAM/IG/3) (Lima, Peru, 20 to 24 April 2009) agreed to revise the survey form to collect additional information including RNP AR APCH operations. It was also agreed to unify the dates to present results by 31 July 2009. On that date, States would forward the results corresponding to aircraft operating in:

- Aircraft operating commercial flights with a maximum certified take off weight of more than 5 700 Kg.
- Aircraft operating commercial flights with a maximum certified take off weight of equal or more than 5 700 Kg.
- General aviation.

1.4 In this regard for SAM Region States which were requested to complete the survey by letter LN 3/17.6.38 - SA5209 (04-05.09) as well as for those States that had already sent part of the information (as requested by letters LN 3/17.6.38 – SA5202 (04/05/09) and LN 3/17.6.38 – SA5222 (11/05/09)) the date for submit the information was set 31 July 2009.

2. Analysis

2.1 Regarding the progress of gathering information on PBN capacity of the fleet in the region, so far, information has been received from Argentina, Bolivia, Brazil, Colombia, Chile, Ecuador, Guyana, French Guyana and Peru on commercial aviation. **Appendix A** to this Working Paper presents the status of the progress to complete the survey information.

2.2 As it is known, according to the administrating procedure of the survey, a Focal Point has been nominated for each State, which responsibilities are to collect all the information for the survey, to complete the Excel database and finally send the information to ICAO SAM Regional Office.

2.3 In this context, it is necessary that Focal Points carry out the actions to forward the information about aircrafts PBN capability of their fleet to the ICAO SAM Regional Office.

2.4 In addition, taking into consideration that the survey is the initial step to generate a database of PBN capacity aircraft in the region, which would allow States of the region to plan orderly implementation of PBN; an Excel program has been developed to generate the required database and reports on it. **Appendix B** presents the data entry form, and reporting model PBN Capacity of the Region, based on information available at the Regional Office.

3. Action suggested

3.1 The Meeting is invited to:

a) Take note of the information contained in this working paper;

b) express opinion on the proposal of PNB capacity report; and

c) Request States to take the necessary actions to collect pending information.

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Response to the survey on SAM Region PBN capacity

Date: 28/09/2009

State	¿Response?	Comments
Argentina	YES	1. Aircraft affected in commercial aviation only. 2. In forms received the operator is not identified. 3. Missing information on general aviation with a maximum certified take off weight of more than 5 700 Kg only. 4. For general aviation with certified take off weight of less than 5700 Kg, it is reported that no information could be forwarded due to the short time provided.
Bolivia		1. Aircraft operating commercial flights with a maximum certified take off weight of more than 5 700 Kg only. 2. Mission information of commercial aviation with aircraft with take off weight of less than 5 700 Kg.
Brazil	YES	1. Aircraft with more than 5 700 Kg only. 2. Missing information about RNP AR APCH.
Colombia	YES	1. Commercial aviation only. The electronic delivery of data is required to facilitate its reading. 2. Missing information about RNP AR APCH..
Chile	YES	Commercial aviation only with aircrafts with a maximum certified take off weight of more than 5 700 Kg only.
Ecuador	YES	1. Commercial aviation only.
Guyana	YES	1. Commercial aviation only.
French Guyana	YES	1. Commercial aviation only. 2. Missing information about RNP AR APCH.
Panama		

State	¿Response?	Comments
Paraguay		
Perú	YES	1. Commercial aviation only with aircraft with a maximum certified take off weight of more than 5 700 Kg only. 2. Missing information about RNP AR APCH.
Uruguay		
Surinam		
Venezuela		

Appendix B

Instrucciones para el llenado de la Tabla / Instructions for filling out the Table

Estado/State Indique el nombre del Estado que reporta

1. **Explotador/Operator:** Complete el nombre del explotador, por ejemplo: CONDOR/Complete the name of the operator, for example: CONDOR.

2. **Aeronave/Aircraft:** En este punto se encuentran tres columnas que permiten identificar a la aeronave/At this point there are three columns which permit aircraft identification:

   - ► en la columna titulada "Matricula", indique la matrícula de la aeronave/In column titled "License", please indicate aircraft license..
   - ► en la columna titulada "Modelo", indique el modelo de la aeronave, por ejemplo B767-300./In column titled "Model" indicate the aircraft model, for example B767/300.
   - ► en la columna titulada "Fabricante", indique el nombre del fabricante./In column titled "Manufacturer" indicate the manufacturer name.
   - ► en la columna titulada "FL superior a 250", indique si la aeronave vuela por encima del FL 250./In column titled "FL above 250" indicate if the aircraft flight above FL 250.

3. **Capacidad RNAV:** marque con una X, según corresponda, si la aeronave dispone de capacidades RNAV con los valores de confinamiento señalados en las columnas, de acuerdo a lo indicado en el Airplane Flight Manual (AFM) o en el Pilot Operating Handbook (POH). Esta solo debe reflejar la capacidad demostrada de la aeronave y no necesariamente el que tenga una autorización operacional de su Administración./Mark with an X, as required, if aircraft has RNAV capacilities with confinement values shown in columns, as per indicated in Airplane Flight Manual (AFM) or in the Pilot Operating Handbook (POH). This should reflect only the aircraft demonstrated capacity and not necessarily the one having operational clearance of its administration.

RNAV Capacity: Notas/Notes:

- ► Si el AFM indica la capacidad RNP10, esta debe considerarse como válida en la opción RNAV 10./If AFM indicates RNP10 capacity, it should be considered as valid in option RNAV/10.
- ► Si el AFM indica la capacidad B-NAV, esta debe considerarse como válida en la opción RNAV 5./If AFM indicates B-NAV capacity, it should be considered as valid in option RNAV 5.

4. **Capacidad RNP:** marque con una X, según corresponda, si la aeronave dispone de capacidades RNP con los valores señalados en las columnas, de acuerdo a lo indicado en el Airplane Flight Manual (AFM) o en el Pilot Operating Handbook (POH). Esta solo debe reflejar la capacidad demostrada de la aeronave y no necesariamente el que tenga una autorización operacional de su Administración. /Mark with an X, as required, if aircraft has RNP capacilities with confinement values shown in columns, as per indicated in Airplane Flight Manual (AFM) or in the Pilot Operating Handbook (POH). This should reflect only the aircraft demonstrated capacity and not necessarily the one having operational clearance of its administration.

5. **Baro-VNAV:** marque con una X, según corresponda, si la aeronave dispone de capacidad Baro-VNAV, de acuerdo a lo indicado en el Airplane Flight Manual (AFM) o en el Pilot Operating Handbook (POH). Esta solo debe reflejar la capacidad demostrada de la aeronave y no necesariamente el que tenga una autorización operacional de su Administración. /Mark with an X if aircraft has BARO-VNAV capacity, as indicated in the Airplane Flight Manual (AFM) or in the Pilot Operating Handbook (POH). I should only reflect capacity demonstrated of the aircraft and not necessarily the one having an operational clearance by its administration.

6. **Sensores de Navegación/ Navigation sensors:** marque con una X, según corresponda, los sensores de navegación con que dispone la aeronave./Mark with an X, as required, the navigation sensors of the aircraft.

7. **GPS Primario/Primary GPS:** onda, si la aeronave dispone de equipos DPS single o dual, certificados como equipos de navegación primarios y que cumplen con las TSO C129A; C145A o C146A./Mark with an X as required, if the aircraft has DPS equipment, single or dual, certified as primary navigation equipment complyin

8. **IntegridadIntegrity:** marque con una X, según corresponda, si el sistema GNSS de la aeronave dispone de medios para asegurar la integridad de los señales de navegacion GPS (Vigilancia autónoma de la integridad en el receptor (RAIM) y de deteccion de fallas o exclusion (FDE). / Mark with an X, as required, if GNSS aicraft System has means to ensure integrity of GPS navigation signals. (Receptor Autonomous surveillance of receptor integrity (RAIM) and detection of failures or exclusion (FDE).

9. **FMS:** marque con una X, según corresponda, en caso la aeronave disponga de FMS o No./Mark with an X as required, in case the aircraft has FMS or No.

A continuación se describe un ejemplo de cómo llenar la tabla/Here follows an example of how to fill in the table:

Estado	1. Explotador : Operator:	2. Aeronave Aircraft					3. Capacidad RNAV Capacity RNAV (AFM)					4. Capacidad RNP Capacity RNP (AFM)					5. Baro-VNAV (AFM)	6. Sensores de Navegación Navigation Sensors					8. Integridad Integrity		9. FMS		
		Matricula Register																VOR/DME	DME/DME	INS o IRS	7. GPS Primario TSO C129A/C145A/C146A				No	Single	Dual
		Naciona-lidad	Matricula	Fabricante Manufacturer	Modelo Model	FL superior a 250	10 (RNP 10)	5	2	1	P-RNAV	4	2	1	RNP APCH	RNP AR APCH					Single	Dual	RAIM o AAIM	FDE			
Ecuador	CONDOR	N	9MEL	De Havilland	DHC-8	x	-	x	-	-	-	-	-	-	-	-	-	-	x	x	x		x	x	-	x	
Ecuador	CONDOR	HC	162	Airbus	A321	x	x	x	x	x	x	x	x	x	x	-	x	x	-	x	-	x	x	x	-	-	x

Ver Listado de Modelos / See models list

Fecha: Date

CAPACIDAD PBN DE LAS AERONAVES / PBN AIRCRAFT CAPACITY

		2. Aeronave / Aircraft						3. Capacidad RNAV / RNAV Capacity (AFM)					4. Capacidad RNP / RNP Capacity (AFM)						6. Sensores de Navegación / Navigation Sensors			7. GPS Primario TSO C129A/C145A/C146A		8. Integridad / Integrity		9. FMS		
Estado State	1. Explotador Operator	Nacionalidad	Matrícula Register	Fabricante Manufacturer	Modelo	Series	FL superior a 250	RNAV 10 (RNP 10)	RNAV 5	RNAV 2	RNAV 1	P-RNAV	RNP 4	RNP 2	RNP 1	RNP APCH	RNP AR APCH	5. Baro-VNAV (AFM)	VOR/ DME	DME/ DME	INS o IRS	GPS Primario Single	GPS Primario Dual	Integridad RAIM o AAIM	Integridad FDE	FMS No	FMS Single	FMS Dual
Argentina		LV	BFR	Cessna	208			SI	SI																			
Argentina		LV	BEM		400	A		SI	SI																			
Argentina		LV	BDH		412	EP			SI	SI		SI										SI						SI
Argentina		LV	BIB		560	XL		SI					SI															
Argentina		LV	BCS		560	XLS		SI		SI	SI												SI		SI			
Argentina		LV	ALJ	Boeing	747	475	SI	SI				SI															SI	SI
Argentina		LV	AXF	Boeing	747	475	SI	SI	SI				SI															
Argentina		LV	BBU	Boeing	747	475	SI	SI										SI										
Argentina		LV	BMR	Boeing	767	316ER	SI	SI		SI						SI												
Argentina		LV	BTE	Boeing	767	375ER	SI		SI			SI																
Argentina		LV	BRL	Boeing	A100		SI						SI		SI			SI										
Argentina		LV	BET	Boeing	A320	233	SI			SI																		
Argentina		LV	BFO	Boeing	A320	233	SI					SI	SI															
Argentina		LV	BFY	Boeing	A320	233	SI				SI																	

Survey report

3. Capacidad RNAV / RNAV Capacity (AFM)					
Respuestas / Replies	10 (RNP 10)	RNAV 5	RNAV 2	RNAV 1	P-RNAV
SI / YES	8	5	4	2	4
NO	481	484	485	487	485

4. Capacidad RNP RNP Capacity (AFM)					
Respuestas / Replies	RNP 4	RNP 2	RNP 1	RNP APCH	RNP AR APCH
SI / YES	4	0	1	1	0
NO	485	489	488	488	489

5. Baro-VNAV (AFM)	
Respuestas / Replies	
SI / YES	2
NO	487

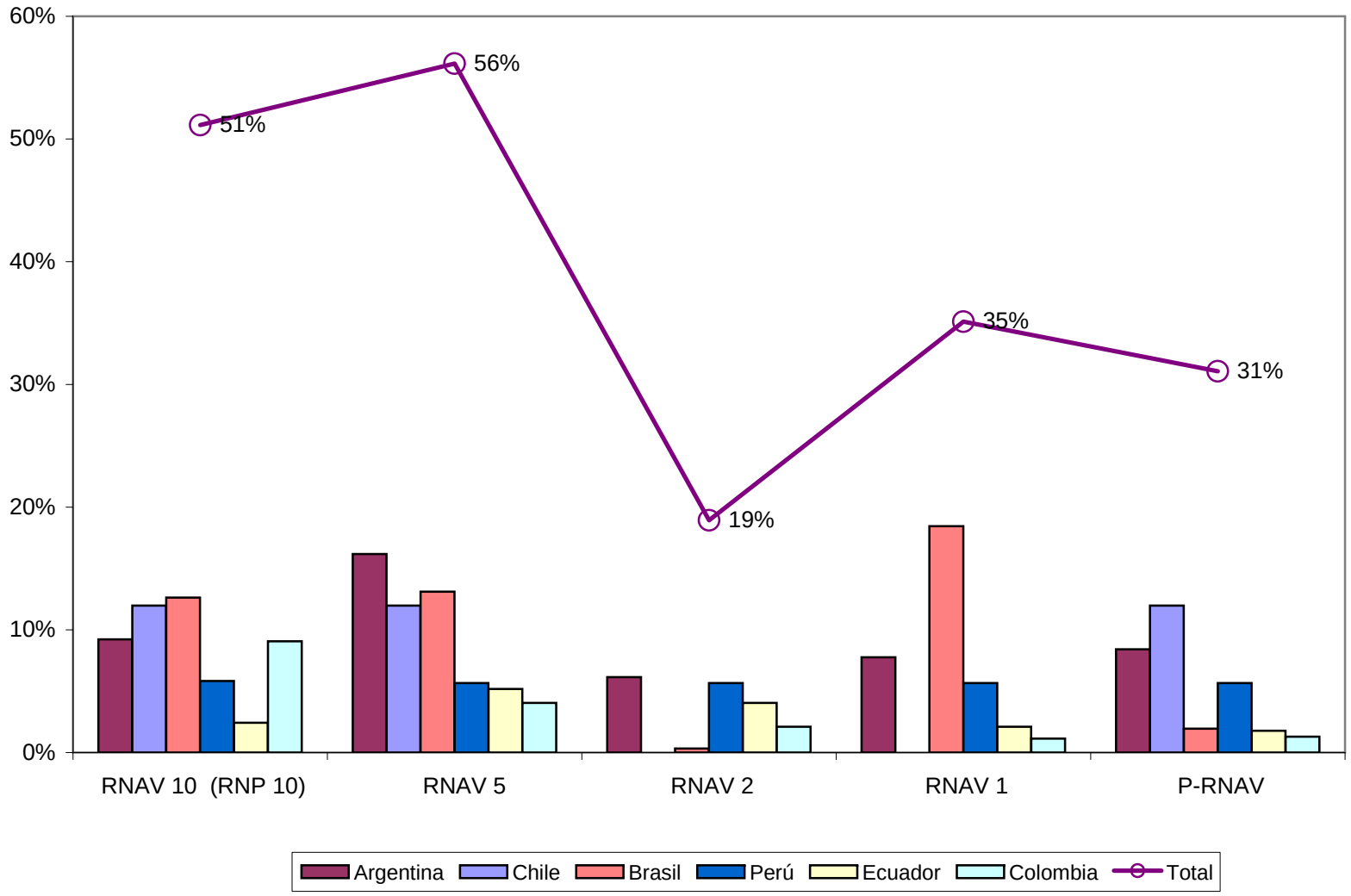
6. Sensores de Navegación / Navigation Sensors			
Respuestas / Replies	VOR/DME	DME/DME	INS o IRS
SI / YES	**0**	**0**	**0**
NO	**489**	**489**	**489**

7. GPS Primario TSO C129A/C145A/C146A		
Respuestas / Replies	Single	Dual
SI / YES	1	1
NO	488	488

8. Integridad / Integrity		
Respuestas / Replies	RAIM o AAIM	FDE
SI / YES	0	1
NO	489	488

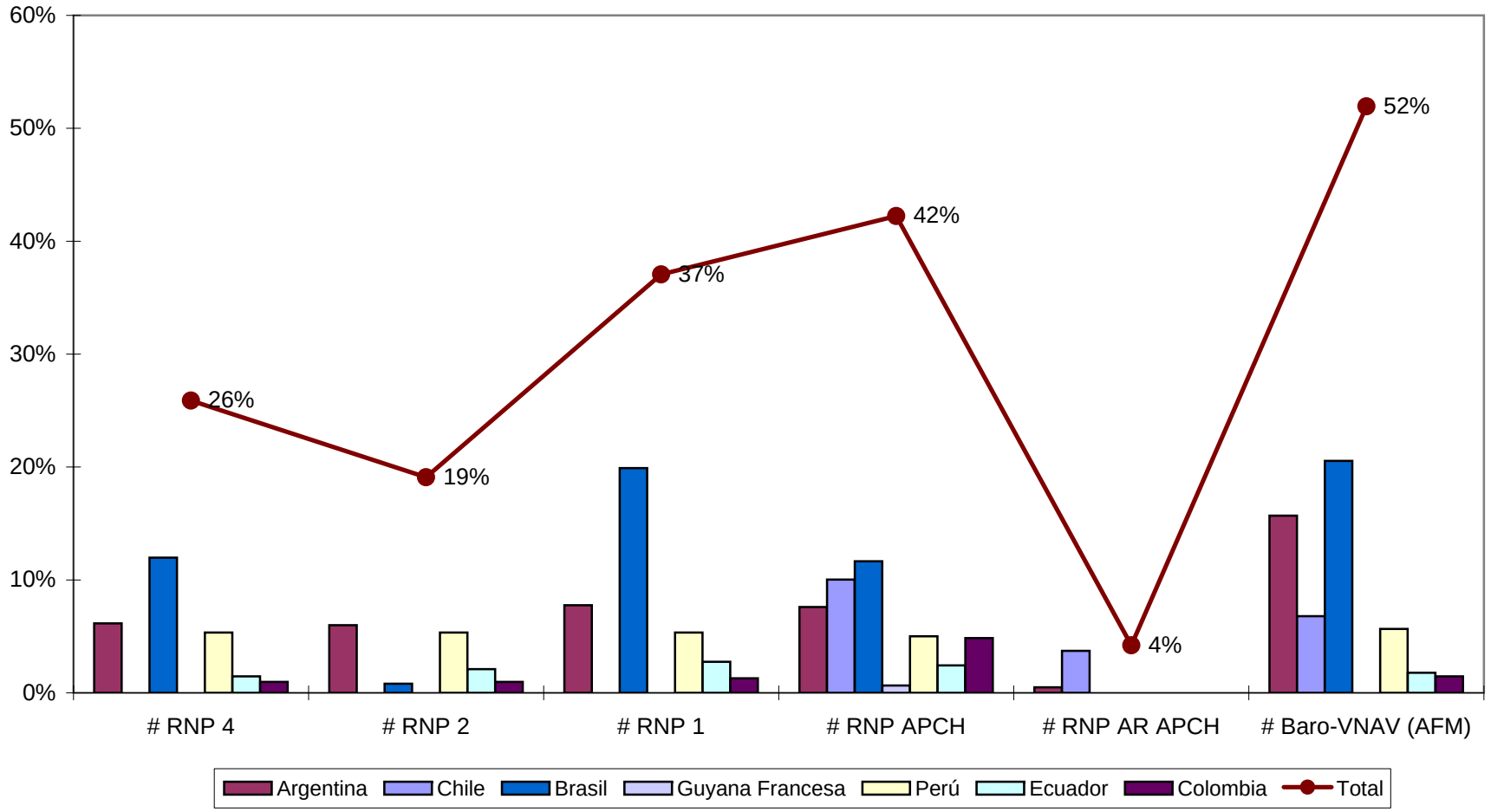
9. FMS			
Respuestas / Replies	No	Single	Dual
SI / YES	0	1	2
NO	489	489	487

RNAV Capacity in SAM Region



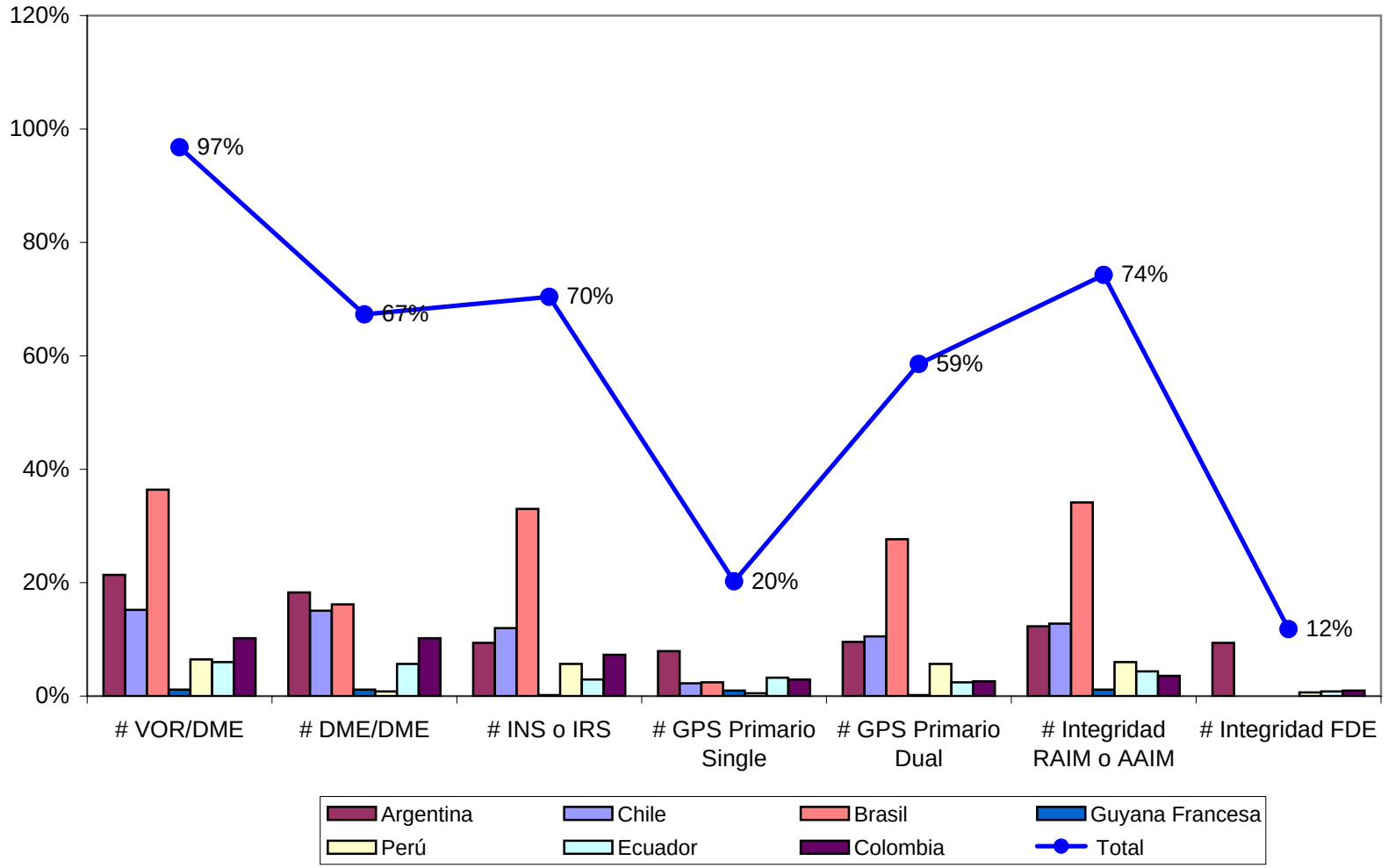
Note: The average is calculated based on all aircrafts flying over FL 250 of fleet reported in SAM Region.

RNP Capacity in SAM Region



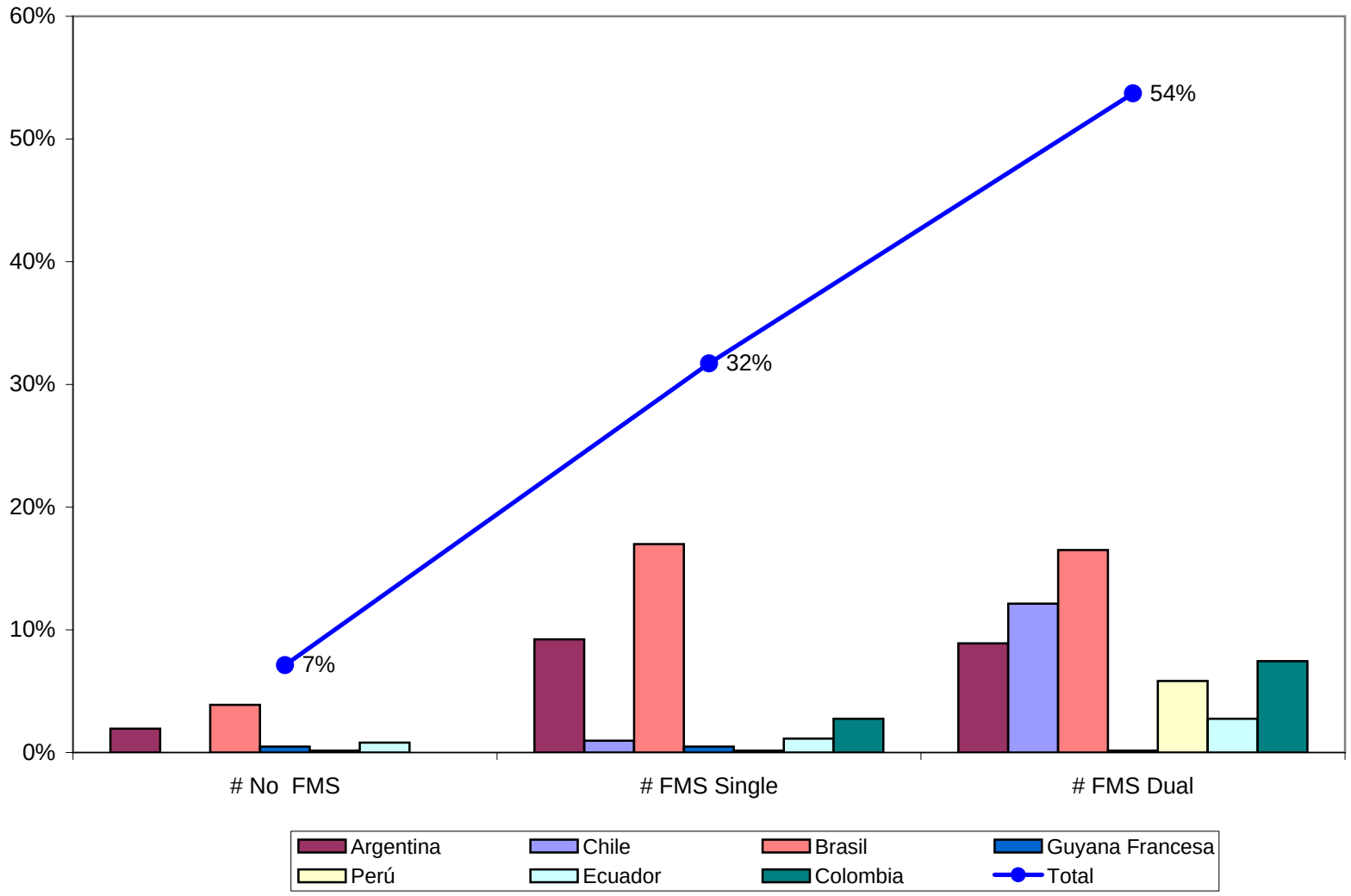
Note: The average is calculated based on all aircrafts flying over FL 250 of fleet reported in SAM Region.

Sensor Navigation distribution



Note: The average is calculated based on all aircrafts flying over FL 250 of fleet reported in SAM Region.

Report on FMS distribution



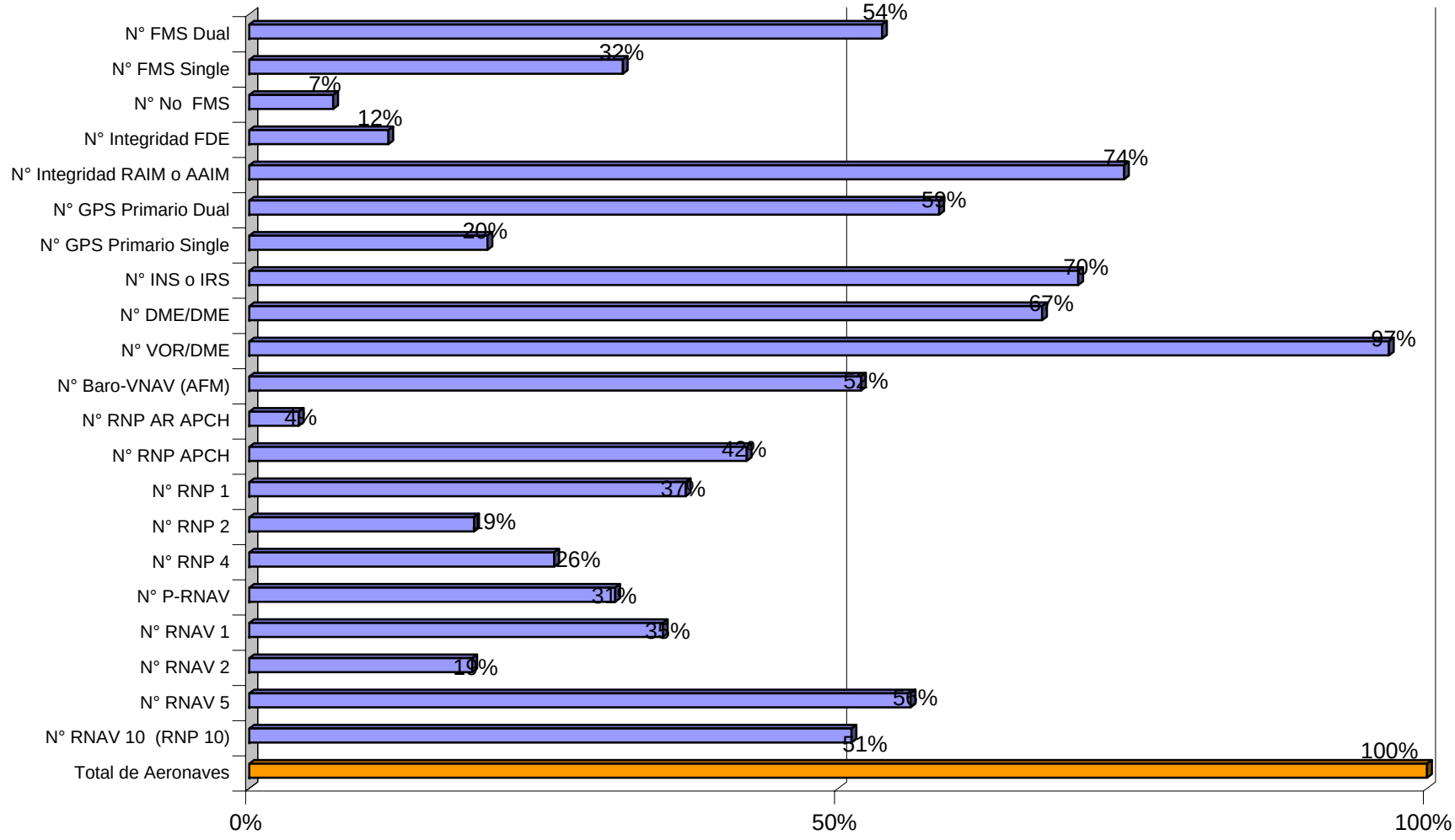
Note: The average is calculated based on all aircrafts flying over FL 250 of fleet reported in SAM Region.

Report on the fleet PBN Capacity

Estado / State	Chile
Explotador / Operator	(All)
FL encima FL250 / FL over FL250	(All)

	Matrícula Register		
Datos / Data	CC	N	Grand Total
Total de Aeronaves / AircarftsTotal	96	1	97
N° RNAV 10 (RNP 10)	73	1	74
N° RNAV 5	73	1	74
N° RNAV 2	-	-	-
N° RNAV 1	-	-	-
N° P-RNAV	73	1	74
N° RNP 4	-	-	-
N° RNP 2	-	-	-
N° RNP 1	-	-	-
N° RNP APCH	61	1	62
N° RNP AR APCH	23	-	23
N° Baro-VNAV (AFM)	41	1	42
N° VOR/DME	96	1	97
N° DME/DME	93	1	94
N° INS o IRS	73	1	74
N° GPS Primario Single	14	-	14
N° GPS Primario Dual	67	1	68
N° Integridad RAIM o AAIM	81	1	82
N° Integridad FDE	-	-	-
N° No FMS	-	-	-
N° FMS Single	7	-	7
N° FMS Dual	74	1	75

Distribution of PBN Capacity in SAM Region



Note: Only aircraft flying over FL 250 are considered in this report.
The average is calculated based on all aircrafts flying over FL 250 of fleet reported in SAM Region.