



**Cuestión 5 del
Orden del Día:**

Evaluación de los requisitos operacionales para determinar la implantación de mejoras de las capacidades de comunicaciones, navegación y vigilancia (CNS) para operaciones en ruta y área terminal

**SEGUIMIENTO A LA IMPLANTACION DEL SERVICIO DE PREDICCIÓN DE LA
DISPONIBILIDAD RAIM VIA WEB**

(Nota presentada por la Secretaría)

RESUMEN	
Esta nota de estudio presenta información sobre los avances en la implantación del servicio de predicción de la disponibilidad RAIM vía web.	
REFERENCIAS	
<ul style="list-style-type: none">• Informe del Cuarto Taller/Reunión del Grupo de Implantación SAM/IG/4 (Lima, Perú, 19- 23 de octubre de 2009);• Informe del Octavo Taller/Reunión del Grupo de Implantación SAM/IG/8 (Lima, Perú, 10-14 de octubre de 2011);• Informe del Noveno Taller /Reunión del Grupo de Implantación SAM/IG/9 (Lima, Perú, 14-18 de mayo de 2012);• Informe de la Quinta Reunión del Comité de Coordinación del Proyecto RLA/06/901 (RCC/05) (Lima, Perú, 28-30 de noviembre de 2011);• Informe de la Sexta Reunión del Comité de Coordinación del Proyecto RLA/06/901 (RCC/06) (Lima, Perú, 21-23 de noviembre de 2012); y• Licitación OACI ST-22501411 para la implantación del servicio de predicción de la disponibilidad RAIM (23 de agosto de 2013).	
Objetivos estratégicos de la OACI:	<i>A – Seguridad operacional C – Protección del medio ambiente y desarrollo sostenible del transporte aéreo</i>

1. Introducción

1.1 La reunión SAM/IG/4, al revisar la propuesta de revisión a la CA 91-001 – *Aprobación de aeronaves y operadores para operaciones RNAV 10 (RNP 10)*, manifestó lo siguiente:

- Los operadores no cuentan con un programa de predicción de disponibilidad FDE en ruta, que este aprobado y aplicable a la región SAM;
- Las autoridades no cuentan con las regulaciones que les permitan aprobar un programa de predicción de disponibilidad FDE;
- El programa FAA/VOLPE, no considera el espacio aéreo fuera de los Estados Unidos;
- El programa AUGUR (EUROCONTROL), a pesar que considera los aeropuertos y radioayudas de la región SAM, éste establece que los cálculos solo son válidos para la región ECAC; y

- e) Se reconoce la falencia de la región de contar con un programa de predicción de disponibilidad FDE en ruta, o los procedimientos de aprobación adecuados.

1.2 En virtud de lo anterior, la reunión formuló la Conclusión SAM/IG/5-5 - *Programa de predicción de disponibilidad FDE*, cuyo contenido se presenta como **Apéndice A** de esta nota de estudio.

1.3 La reunión SAM/IG/8, como seguimiento a la Conclusión SAM/IG/5-5 - *Programa de predicción de disponibilidad FDE*, analizó la propuesta de dos soluciones de predicción de la disponibilidad RAIM por parte de la industria, así como de los estudios iniciales realizadas por Colombia para extender la aplicación de la disponibilidad RAIM que tienen instalada a nivel nacional para toda la Región SAM.

1.4 La reunión SAM /IG/8 consideró, después de un amplio debate, que la Region requería de un servicio de predicción de disponibilidad RAIM para asegurar los procedimientos PBN en ruta, así como las aproximaciones de no precision, aproximaciones con guía vertical (APV) y área terminal para cada uno de los Estados de la Región.

1.5 Asimismo, la reunión, después de haber analizado la información presentada para la implantación de un servicio para la predicción de la disponibilidad RAIM, consideró que de las propuestas de la industria, la de la empresa DWI representaba la más apropiada para la Region y, en referencia a lo de Colombia, la reunión consideró que la Secretaría le solicitara que completara el estudio técnico-financiero para la predicción de la disponibilidad para el 15 de noviembre de 2011, con el fin de que la reunión RCC/5 del Proyecto Regional RLA/06/901 pudiera definir la mejor solución técnico-financiera, formulándose la Conclusión SAM/IG/8-3 - *Implantación de un servicio para la predicción de la disponibilidad RAIM/FDE en la Región SAM*, que se presenta como Apéndice A de esta nota de estudio.

1.6 Como seguimiento a la Conclusión SAM/IG/8, Colombia informó que no podría prestar una solución regional. A este respecto, la reunión RCC/5 del proyecto RLA/06/901 solicitó extender la solicitud de recepción de respuestas a la consulta realizada a los Estados en cuanto a su interés en participar en la solución regional propuesta a través del Proyecto RLA/06/901 y, de ser positiva la respuesta, se emprendería la preparación de las especificaciones técnicas del servicio de predicción de la disponibilidad RAIM.

1.7 En la reunión SAM/IG/9 se informó que todos los Estados de la Región SAM, salvo Guyana, habían respondido a una consulta de la OACI sobre la intención de participar en la adquisición del servicio de predicción de la disponibilidad RAIM a través del proyecto RLA/06/901 y, de las respuestas obtenidas, un solo Estado, Francia (Guyana Francesa), informó que el sistema que disponen puede darle el servicio de predicción.

1.8 Asimismo, durante la reunión SAM/IG/9 se presentó y analizó el documento de especificaciones técnicas para la implantación de un servicio de predicción de la disponibilidad RAIM. La reunión RCC/6 del Proyecto RLA/06/901 consideró conveniente la revisión de las especificaciones técnicas a través de una teleconferencia que se efectuó en febrero del 2013. Se introdujeron cambios en las especificaciones técnicas a raíz de los comentarios recibidos por Argentina, Colombia y Venezuela. El **Apéndice B** de esta nota de estudio presenta las especificaciones técnicas finales.

1.9 El documento de proyecto RLA/06/901 (Versión J) enmendado con la inclusión del servicio de predicción de la disponibilidad RAIM y firmado por el secretario general de la OACI fue enviado a todos los Estados miembros del RLA/06/901 el 27 de septiembre de 2013 a través de la carta SA5666 para su firma y envió a la Oficina regional SAM de la OACI el 16 de octubre de 2013.

2. **Análisis**

2.1 El proceso de licitación pública para la implantación del servicio de predicción del RAIM fue iniciado por la Oficina de Cooperación Técnica de Montreal el 23 de agosto de 2013 en base a las especificaciones técnicas finales indicadas en el Apéndice B. La evaluación de las ofertas fueron realizadas en la Oficina de la Cooperación técnica de la OACI en Montreal del 1 al 3 de octubre de 2013 por parte del Oficial CNS de la Oficina Regional SAM, representantes de Brasil y oficiales de la Oficina de la Cooperación Técnica de Montreal. Todos los Estados miembros del proyecto RLA/06/901 fueron invitados a participar a la evaluación (carta LN 3/24.2-SA5590 del 28 de agosto de 2013).

2.2 La evaluación de las ofertas se realizó a través de un criterio de evaluación preparado previo a la evaluación y a conocimiento de las empresas participantes al proceso, que se presenta como **Apéndice C** de esta nota de estudio.

2.3 Tres empresas presentaron ofertas al pliego de licitación, pero se evaluaron únicamente dos, en vista que una de éstas fue descartada en el proceso de evaluación por parte de la Oficina de Cooperación Técnica de la OACI por no cumplir con las normas de licitación.

2.4 Como producto de la evaluación técnica y comercial, se recomendó una empresa como ganadora. Durante la reunión SAM/IG/12 se presentarán los resultados de la evaluación con el fin de que los mismos sean avalados por la Reunión.

3. **Acción sugerida**

3.1 Se invita a la Reunión:

- a) tomar nota de la información presentada; y
- b) analizar los resultados de la evaluación que se presentarán en la Reunión con el fin de que sean avalados por la misma.

APÉNDICE A

Conclusión SAM/IG/5-5 Programa de predicción de disponibilidad FDE

Que:

Se avance en el estudio y aplicación de la herramienta AUGUR (EUROCONTROL) por parte de los Estados de la región;

Considerando que la herramienta AUGUR (EUROCONTROL), incorpora los Aeropuertos y Radioayudas de la Región SAM, se sugiere que a través de la Oficina Regional de OACI, se tome contacto con EUROCONTROL con el propósito de establecer la factibilidad de ampliar la validez del cálculo de predicción realizado con la herramienta AUGUR, para las diferentes etapas del vuelo, en la región SAM;

A través de la Oficina Regional de OACI, se establezca contacto con la FAA, a fin de recibir orientaciones sobre los procedimientos de aprobación de un programa de predicción de disponibilidad FDE y los procedimientos que utilizan sus operadores cuando realizan operaciones del tipo RNAV basadas en GNSS fuera del espacio aéreo de Estados Unidos; y


la Oficina Regional de OACI, evalúe la posibilidad de liderar un proceso de desarrollo de un programa de predicción de disponibilidad FDE para la región SAM para su utilización en todas las etapas del vuelo.

Conclusion SAM/IG/8-3 Implantación de un servicio para la predicción de la disponibilidad RAIM/FDE en la Región SAM

Que, con el fin de que la Región FDE SAM cuente con un servicio común para la determinación de la predicción de la disponibilidad de RAIM y FDE para soportar las operaciones en ruta, aproximaciones que no son de precisión, aproximaciones con guía vertical (APV), área terminal y aproximación PBN:

- a) la Quinta Reunión del Comité de Coordinación (RCC/5) del Proyecto Regional RLA/06/901 considere la adquisición de un servicio de predicción de la disponibilidad RAIM seleccionando entre las propuestas presentadas por la empresa DWI y Colombia; y
- b) la OACI analice la forma más apropiada para que los Estados no miembros del Proyecto Regional RLA/06/901 aporten la cuota correspondiente del servicio de predicción RAIM.

APENDICE B

	INTERNATIONAL CIVIL AVIATION ORGANIZATION TECHNICAL CO-OPERATION BUREAU TECHNICAL SPECIFICATION	THIS COLUMN TO BE COMPLETED BY TENDERER COMPLIANCE STATEMENT Tenderer must state below, against every item, <i>Compliance</i> or <i>Non Compliance</i> . Failure to complete and return this form may invalidate the bid.
ICAO SPECIFICATION CODE: 94-03-550 RLA/06/901 PR 21101102 24 MAY 2013		
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB		
<p style="text-align: center;"><i>It is strictly prohibited for tenderers to alter this document. Only the originator of the specification may provide amendments.</i></p>		SUPPLIER NAME:
SECTION A – INTENT AND STANDARDS		
<p>1. OBJECTIVE</p> <p>1.1 The International Civil Aviation Organization (ICAO), on behalf of the Governments of Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana (France), Guyana, Paraguay, Peru, Panama, Suriname, Uruguay and Venezuela <i>intends to procure, on a turnkey basis, the implementation of a SAM Regional RAIM (Receiver Autonomous Integrity Monitoring) prediction availability service for an initial period of four (4) years through a WEB page functioning the 24 hour per seven day a week (24/7) to support the PBN procedures en route, terminal and approach area.</i></p> <p>2. OBJECTIVE OF SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE (SRRPAS)</p> <p>2.1 In order to achieve this objective, the aeronautical authorities of the Region have agreed that the SRRPAS shall ensure:</p> <p>2.1.1 To provide users of an on-line status of the prediction availability of GPS RAIM the 24 hours/7 days a week (24/7) to support the PBN RNAV/RNP operations at Regional level and to each State of the SAM Region.</p> <p>2.1.2 To develop a web site for the SRRPAS.</p> <p>2.1.3 To be easily expandable to cover the availability of the RAIM prediction service in other constellations of satellite navigation systems (GALILEO, GLONASS, Beidou).</p> <p>2.1.4 To cover all regional airspace for RNAV/RNP operations for both Fault Detection (FD) and Fault Detection and Exclusion (FDE) capable receivers.</p>		

ICAO SPECIFICATION CODE: 94-03-550 RLA/06/901 PR 21101102 24 May 2013	Page 2 of 20
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB	COMPLIANCE STATEMENT

SECTION A – INTENT AND STANDARDS	
<p>3. SCOPE</p> <p>3.1 The Project contemplates that the Successful Bidder shall provide:</p> <p>a) SAM Regional RAIM Prediction Availability Service (FD and FDE capable receivers) for the following PBN/RNAV /RNP operations</p> <p style="margin-left: 40px;">En route</p> <p style="margin-left: 80px;">Oceanic and remote continental area: RNP 10, RNP 4, RNP 2, Advanced RNP</p> <p style="margin-left: 80px;">Continental area: RNAV 5, RNAV 2, RNAV 1, RNP 2, Advanced RNP, RNP 0.3</p> <p style="margin-left: 40px;">Terminal</p> <p style="margin-left: 80px;">RNAV 5, RNAV 2, RNAV 1, RNP 1, Advanced RNP, RNP 0.3</p> <p style="margin-left: 40px;">Approach</p> <p style="margin-left: 80px;">RNAV 1 (Initial, intermediate, missed approach segments)</p> <p style="margin-left: 80px;">RNP 1 (Initial, intermediate, missed approach segments)</p> <p style="margin-left: 80px;">RNP 0.3 (Initial, intermediate, missed approach segments)</p> <p style="margin-left: 80px;">Advanced RNP (all segments)</p> <p style="margin-left: 80px;">RNP APCH (all segments)</p> <p style="margin-left: 80px;">RNP AR APCH (Optional)</p> <p style="margin-left: 40px;">Departure</p> <p style="margin-left: 80px;">RNAV 2, RNAV 1, RNP 1, Advanced RNP, RNP 0.3</p> <p>b) Provision of database of waypoints within SAM airspace SRRPAS website design.</p> <p>c) The develop of a WEB page for he SRRPAS</p> <p>d) To maintain and manage the WEB page for the SRRPAS</p> <p>e) The SRRPAS application shall be hosted on an dual application server with a database back- end providing highly available file storage facilities</p> <p>4. BASIC TECHNICAL CHARACTERISTICS</p> <p>4.1 The hardware shall consist of two servers, one for the redundant primary and mirror (2 in total) See Figure 1 for SRRPAS architecture:</p>	

ICAO SPECIFICATION CODE: 94-03-550 RLA/06/901 PR 21101102 24 May 2013	Page 3 of 20
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB	COMPLIANCE STATEMENT

SECTION A – INTENT AND STANDARDS

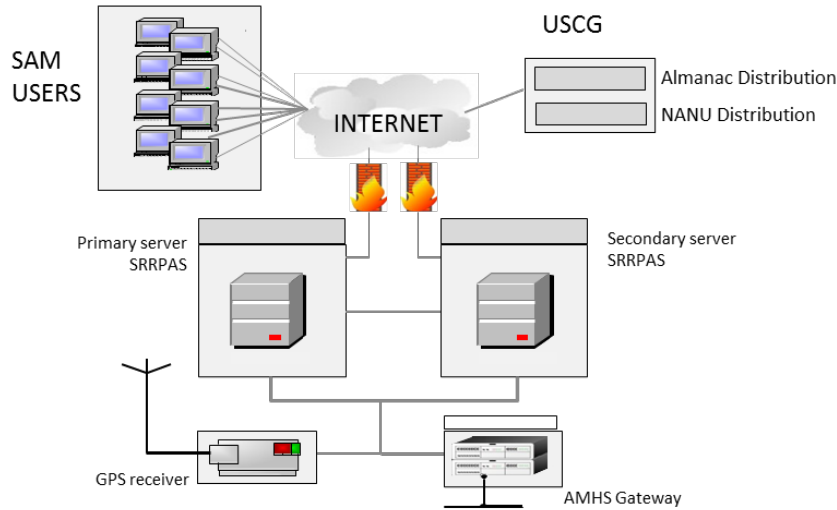


Figure 1 SRRPAS Architecture

5. GENERAL CONSIDERATIONS

- 5.1 The Successful Bidder shall be responsible for the implementation of a SRRPAS, a design of a WEB page, acquisition, installation, hosting and commissioning of the required equipment and services, with all the accessories and facilities and to maintain and manage the SRRPAS.
- 5.2 The system shall be installed , hosted and operated on the place of the bid winner installation and deployed across two geographically dispersed servers, at two different Data Centres, offering 24/7 service with a 99.5% availability.

6. RULES AND STANDARDS

- 6.1 All designs, materials, manufacturing techniques and workmanship shall be in accordance with the highest accepted international standards.
- 6.2 Where applicable, the system shall fully comply with or exceed the requirements of the following documents (latest edition plus any related amendments):
 - a) the standards and recommended practices of the International Civil Aviation Organization (ICAO) contained in the Annexes, as well as the provisions of its manuals, documents and circulars concerning aeronautical telecommunications, the ATN, CNS/ATM systems, and air traffic services. The Successful Bidder is responsible for complying also with the new standards, amendments and recommendations issued during the implementation of the project;

ICAO SPECIFICATION CODE: 94-03-550 RLA/06/901 PR 21101102 24 May 2013	Page 4 of 20
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB	COMPLIANCE STATEMENT

SECTION A – INTENT AND STANDARDS	
<p>b) those applied by public carriers in each State; and c) the ISO 9000 certification in terms of its methods and lines of production.</p> <p>6.3 If at the time of the publication of this document the specific rules and standards mentioned in any of the other Sections have been revoked, superseded or updated, the new rules or standards shall be deemed as applicable.</p> <p>7. ALTERNATIVES</p> <p>7.1 Bidders are invited to bid for any alternative that, in their opinion, meets, or exceeds the requirements of, this specification. Any such alternative or variation shall be fully and clearly defined and substantiated so as to easily determine such equivalence or superiority.</p> <p>8. BIDDER’S EXPERIENCE</p> <p>8.1 The Bidder shall demonstrate broad experience in the RAIM Prediction Availability Service implementation The Bidder shall include a list of customers to whom it has supplied the same service during the last five (5) years. The list shall contain the names, addresses and references of customers that can be contacted.</p> <p>8.2 The Bidder shall submit at least three (3) letters of reference with the contact names of different customers with similar projects in different locations to enable verification of the level of compliance of the services previously provided. ICAO or the AAA may contact such customers to check the accuracy of the information submitted.</p> <p>8.3 The Bidder shall demonstrate that the level of quality of its personnel is commensurate to the service to be supplied, presenting also, the certification of each specialist to enable him for each task to be developed to provide the service in this specification.</p> <p>8.4 The service provider shall be a leading company worldwide, with an experience proven and recognised in the international markets.</p> <p>9. BIDDER’S DOCUMENTATION</p> <p>9.1 <i>Statement of compliance: all bids shall be accompanied by a Statement of Compliance, in the form of a copy of the specifications, indicating in the right column whether it Complies (C) or Does not Comply (NC). If the bid states that it complies, any reference, indication, comment or subsequent note to the contrary shall not release the Bidder from the responsibility for the compliance stated.</i></p>	

ICAO SPECIFICATION CODE: 94-03-550 RLA/06/901 PR 21101102 24 May 2013	Page 5 of 20
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB	COMPLIANCE STATEMENT

SECTION A – INTENT AND STANDARDS	
<p>The Bidder shall make reference to the statement of compliance, indicating what section of its documentation substantiates such statement. Failure to provide such definitive indication with respect to any requirement can invalidate its bid.</p> <p>9.2 The Bidder shall submit its bid in Spanish and English, in two (2) hard copies and one (1) electronic copy. See Section D, Technical Documentation for further details. The official language of the tender will be English.</p> <p>9.3 Each Bidder shall submit the appropriate technical documentation containing data sheets, performance data, drawings, illustrations, pictures, etc., of the system being offered to enable full and detailed assessment of the bidder as a whole, in accordance with that stated in Section C. The financial bid shall provide detailed costs of the services required in this technical specification.</p> <p>9.4 The proposal shall include documentation on operational <i>commands, and other information that the Bidder may deem</i> appropriate.</p> <p>9.5 The Bidder shall submit, together with its bid, a timetable of major activities to be carried out concerning the design, manufacturing, provision, Inspection, installation, and commissioning (see other details in Section E).</p> <p>9.6 Additionally, the Bidder shall submit the available operational manuals (as described in Section D) as part of the proposal.</p>	

ICAO SPECIFICATION CODE: 94-03-550 RLA/06/901 PR 21101102 24 May 2013	Page 6 of 20
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB	COMPLIANCE STATEMENT

SECTION B – GENERAL REQUIREMENTS	
<p>1. REQUIREMENTS</p> <p>1.1 General guidelines</p> <p>1.1.1 The Bidder shall provide the organizational chart of the company and resumes of its technical staff involved in the tasks provided for in the provision of the services (management and technical).</p> <p>1.1.2 The Bidder shall prepare a project timetable for the implementation of the SRRPA</p> <p>1.1.3 The Successful Bidder shall be fully responsible for the design, selection of components and materials, and installation techniques, to ensure total integration and full compatibility between the main components and all auxiliary units.</p> <p>1.1.4 Within forty-five (45) days following the signing of the contract, the Successful Bidder shall submit for the approval of ICAO a detailed System Design Document (SDD) for the implementation of the SRPP</p> <p>1.1.5 The Successful Bidder shall appoint properly qualified personnel in sufficient number to perform the work within the proposed timeframes.</p> <p>1.1.6 The Successful Bidder shall prepare and submit Inspection tests for approval, and shall conduct the performance tests.</p> <p>1.1.7 The Successful Bidder shall prepare and submit the Final Acceptance Test (PSAT) protocols for approval.</p> <p>1.1.8 The Successful Bidder shall be responsible for host maintain and manage the SRRAPS</p> <p>1.1.9 The Successful Bidder shall submit the operation manual.</p> <p>1.2 Bidder’s responsibilities</p> <p>1.2.1 The Bidder shall assume full responsibility for the following issues:</p> <p style="margin-left: 40px;">a) Project proposal, organisation and distribution of all works.</p> <p style="margin-left: 40px;">b) Any deviation from the specifications must be corrected at its own expense.</p>	

<p>ICAO SPECIFICATION CODE: 94-03-550 RLA/06/901 PR 21101102 24 May 2013</p>	<p>Page 7 of 20</p>
<p>TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB</p>	<p>COMPLIANCE STATEMENT</p>

<p>SECTION C – TECHNICAL REQUIREMENTS</p>	
<p>1. INTRODUCTION</p> <p>1.1 SRRPS OVERVIEW</p> <p>General Features</p> <p>1.1.1 SRRPAS will be developed such that User can access up to date information about the GPS Satellite constellation and calculated RAIM unavailability pertinent to their operations.</p> <p>1.1.2 SRRPAS shall make information available to Users over the Internet and shall ensure that the most up to date GPS Satellite constellation data available is used as the basis for RAIM calculations and constellation status reports. The System will use a variety of information sources to collate the best available GPS constellation data. Information shall be made available both graphically and in a textual form.</p> <p>1.1.3 SRRPAS shall be configured such that it is resilient and will provide 99.5% availability. The System shall be deployed in a mirrored configuration with two independent and geographically distributed server installations. The two server installations shall be synchronised to ensure that continuity is preserved regardless of the server used by the User. The SRRPAS software will be designed such that the switch between the primary site and the mirror site in the event of a failure occurs automatically, without human input.</p> <p>1.1.4 SRRPAS shall ensure that the User is made aware of the provenance and source of the constellation data used by the tools. The System will ensure that the Tools use a consistent constellation data set by means of the Constellation Mediator system function.</p> <p>1.1.5 The System shall maintain calculation audit logs that capture the following information:</p> <p>Calculation parameters and results. Data and time of the calculation.</p> <p>1.1.6 In addition the System shall ensure that data provided to Users is logged for audit purposes. At a minimum, the system will record sufficient information to allow the User to be identified and for the information provided to the User to be recreated.</p> <p>1.1.7 The System shall be designed to enable it to be easily expanded to provide an integrity prediction capability for Galileo, GLONASS, Beidou and future navigation systems.</p>	

ICAO SPECIFICATION CODE: 94-03-550 RLA/06/901 PR 21101102 24 May 2013	Page 8 of 20
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB	COMPLIANCE STATEMENT

SECTION C – TECHNICAL REQUIREMENTS	
<p>2. GPS RAIM PREDICTION SERVICE TECHNICAL APPROACH</p> <p>2.1 SRRPAS shall be a web-based tool with access for SAM regional customers. The information in the web site must be presented in English, Spanish and Portuguese. The main URL and mirror URL shall be defined in conjunction with ICAO on behalf of the SAM States.</p> <p>2.2 The following sections define the proposed tools and functions within SRRPAS.</p> <p>2.2.1 GPS Status Tool</p> <p>2.2.1.1 The GPS Status Tool shall allow the view of the GPS Satellite constellation based on the latest almanac and NANUs (Notice Advisory to Navigation Users) issued by the US Coast Guard.</p> <p>2.2.1.2 The GPS Status Tool shall present the number of operational satellites in the GPS constellation based on the information current at the time of the request to inform users whether or not there are sufficient satellites to meet the minimum requirements for PBN/RNAV/RNP operations shown in Section A, paragraph 3.1 a). Also the almanac used and NANUs that may affect the satellite availability during the period of time requested, shall be displayed.</p> <p>2.2.1.3 The GPS Status Tool shall be configured to provide the status of the GPS constellation for a 72 hour period calculated from the midnight previous to the time at which the status request was made (times are in UTC).</p> <p>2.2.2 Terminal/Approach Tool</p> <p>2.2.2.1 The Terminal/Approach Tool shall use algorithms to calculate the predicted RAIM availability for a 72 hour period for specific Aerodromes. The algorithms shall be used in Terminal mode addressing the RAIM requirements for GNSS receivers operating in Terminal operations ($\pm 1\text{NM}$) in Approach mode addressing the RAIM requirements for GNSS receivers operating in Approach operations ($\pm 0.3\text{NM}$), and RNP AR APCH (optional). Both the Fault Detection (FD) and Fault Detection and Exclusion (FDE) algorithms should be provided, with FD set as the default.</p>	

<p>ICAO SPECIFICATION CODE: 94-03-550 RLA/06/901 PR 21101102 24 May 2013</p>	<p>Page 9 of 20</p>
<p>TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB</p>	<p>COMPLIANCE STATEMENT</p>

<p>SECTION C – TECHNICAL REQUIREMENTS</p>	
<p>2.2.2.2 The Terminal/Approach Tool shall provide a graphical output and a tabular output each of which shall display the predicted RAIM outages over the scenario period for each of the selected aerodromes.</p> <p>2.2.2.3 The Terminal/Approach Tool shall be configured to return the status of the GPS constellation for a 72 hour period calculated from the midnight previous to the time at which the status request was made (times are in UTC).</p> <p>2.2.2.4 The Terminal/Approach Tool should allow up to 10 aerodromes to be specified. Aerodromes are selected by entering their ICAO identifier.</p> <p>2.2.2.5 The Terminal/Approach Tool shall calculate the predicted RAIM availability at the Aerodrome Reference Point (ARP) for baro (pressure altitude) aided and non-baro aided GNSS user equipment at 1 minute intervals throughout the scenario time. The sample time is taken to be the mid-point of a 1 minute period. Therefore a RAIM outage detected at a single sample time will have a duration of 1 minute starting 30 seconds prior to the sample time and ending 30 seconds after the sample time.</p> <p>2.2.3 Visibility Tool</p> <p>2.2.3.1 The SRRPAS has to calculate the location of the GPS satellites relative to a fixed receiver position for a given time duration.</p> <p>2.2.3.2 The Visibility Tool shall provide the following output options:</p> <ul style="list-style-type: none"> a) Graphical sky plot representation of the visible satellites. b) Tabular representation of the visible satellites. (A table of azimuth and elevation values and the visibility status for each satellite at each sample time in the scenario is displayed, azimuth and elevation are displayed in decimal degrees, all satellites shall be included regardless of visibility and “health”. c) Visibility Tool shall require user-configurable parameters as inputs, like: <ul style="list-style-type: none"> - Receiver Position - Mask angle - Scenario duration - Number of samples required to calculate the satellite visibility - UTC date and time - Etc. 	

ICAO SPECIFICATION CODE: 94-03-550 RLA/06/901 PR 21101102 24 May 2013	Page 10 of 20
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB	COMPLIANCE STATEMENT

SECTION C – TECHNICAL REQUIREMENTS	
<p>2.2.4 Route Tool</p> <p>2.2.4.1 The Route Tool shall calculate the predicted RAIM availability for points along a defined route using either the RAIM algorithm in En-Route mode or the Terminal mode.</p> <p>2.2.4.2 A route shall be defined by a series of waypoints selected, or input, by the user. The tool shall maintain a list of current en-route waypoints and nav aids in the South American Region area which shall be selected by ICAO identifier. The tool shall provide to the user the possibility to define custom waypoints by entering an identifier, State, latitude and longitude</p> <p>2.2.4.3 The system must contain a database of waypoints inside South American Region airspace and easily configured by the user.</p> <p>2.2.4.4 The defined route and the results of the RAIM check shall be able to be saved and to be reviewed for the session.</p> <p>2.2.4.5 The User has the capability to select other angles.</p> <p>2.2.4.6 Both the Fault Detection (FD) and Fault Detection and Exclusion (FDE) algorithms shall be provided.</p> <p>2.2.4.7 The tool has to calculate the anticipated RAIM availability for points spaced at one minute intervals along the route, based upon the Time Offset values entered, and displays any anticipated RAIM outages that equal or exceed 5 minutes (User configurable).</p> <p>2.2.4.8 The Route Tool has to provide a graphical output and a tabular output each displaying the predicted RAIM outages over the scenario period. Both displays have also to show the anticipated outages if the start time is delayed, or brought forward, by 5, 10 or 15 minutes.</p>	
<p>3. SRRPAS HOSTING AND OPERATIONAL FACTORS</p> <p>3.1 SRRPAS shall be managed and operated by the successful bidder and shall be deployed across two geographically dispersed servers, at two different Data Centres, offering 24/7 service with a minimum availability of 99.5%. (See Figure 1 for SRRPAS architecture).</p> <p>3.2 SRRPAS application shall be hosted on an application server with a database back- end providing highly available file storage facilities.</p>	

<p>ICAO SPECIFICATION CODE: 94-03-550 RLA/06/901 PR 21101102 24 May 2013</p>	<p>Page 11 of 20</p>
<p>TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB</p>	<p>COMPLIANCE STATEMENT</p>

<p>SECTION C – TECHNICAL REQUIREMENTS</p>	
<p>3.3 The server shall be fault-tolerant and shall include support for hot-swapping of essential hardware such as disks and power supplies.</p> <p>3.4 The hardware shall consist of two servers, one for the redundant primary and mirror (2 in total) with the following minimum specification:</p> <ul style="list-style-type: none"> a) Redundant Pair of firewalling Devices. b) Redundant Pair of Hardware Load Balancers balancing traffic at layer 4, 100Mbit access switch ports with 1Gbps trunks between distribution, aggregation and core switching layers. c) Multiple upstream internet providers shall be provided. d) Servers provided with the following minimum configuration that will be update during the implementation planning phase of the project (Processor (Quad 2.0Ghz) – 4Gb Ram – 2x 72Gb SAS 10k Disks in Raid 1). <p>3.5 IP security</p> <p>3.5.1 SRRPAS server infrastructure shall be protected by a dual firewall system. The internal network clusters shall be hosted on a private network segment with a private address range – not directly accessible from outside the firewall. Only web traffic, email traffic and management traffic shall be permitted through the firewall.</p> <p>3.5.2 SRRPAS shall be patched with software security updates (OS, Database, etc.) as they become available.</p> <p>3.5.3 Local physical security measures shall be implemented.</p> <p>3.6 Constellation Data Mediator</p> <p>3.6.1 SRRPAS shall maintain an up to date record of the GPS satellite constellation as well as scheduled changes to the constellation in order to ensure that the System calculations are based on the best available data.</p> <p>3.6.2 The System shall obtain constellation data and constellation updates from a number of sources, as follows:</p> <ul style="list-style-type: none"> a) United States Coast Guard (USCG). b) Almanac. c) Unscheduled outages/changes (NANU). d) AFTN/AMHS (as a future option). e) Unscheduled outages/changes (NOTAM). 	

<i>ICAO SPECIFICATION CODE:</i> 94-03-550 RLA/06/901 PR 21101102 24 May 2013	Page 12 of 20
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB	COMPLIANCE STATEMENT

SECTION C – TECHNICAL REQUIREMENTS	
<p>3.6.3 The constellation data mediator subsystem will provide the system with the best available picture of the constellation for the calculation time periods supported by the Tools.</p> <p>3.6.4 The constellation data mediator subsystem shall also carry out the recalculation of static data in response to a constellation change to ensure that RAIM outage predictions are current and reliable.</p> <p>3.6.5 The Constellation Data Mediator subsystem will be written to be resilient to errors in the data feeds from the external data sources. SRRPA will not update reference constellation data until it is verified as good with respect to format validity, range checking.</p> <p>3.6.6 By using multiple data sources, GRPS will be able to use the best data available if one or more of the data sources is not functioning correctly. SRRPA will allow customisation of audit logging and notifications to system administrators based on errors detected in the source data (availability or content) to allow timely manual override of default behaviour and investigation of the issue if necessary.</p> <p>3.6.7 The topographic data source of the application should come from a sufficiently reliable source.</p> <p>3.7 SRRPAS Helpdesk</p> <p>3.7.1 The bid winner should respond to queries related to SRRPAS and its operation via the SRRPAS Helpdesk, contactable via an Email address to be specified.</p> <p>3.7.2 The bid winner shall assist in resolving issues at application level, specifically:</p> <ol style="list-style-type: none"> a) To support the quality of the GPS RAIM predictions, b) Monitoring and validation of the US Notice Advisory to NAVSTAR Users (NANU) Service and GPS NOTAMs. <p>3.8 Bid Optional requirements</p> <p>3.8.1 The bidder shall submit as optional within the bid, the following:</p> <ol style="list-style-type: none"> a) Implementation in the menu functions, the generation of PDOP/ GDOP both graphical and numerical to have the option of generating research processes within states that require it. b) Removal of artificial obstacles in the SAM terminal which will host the simulation in the approach phase, allowing a more accurate GPS RAIM simulation. 	

<i>ICAO SPECIFICATION CODE:</i> 94-03-550 RLA/06/901 PR 21101102 24 May 2013	Page 13 of 20
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB	COMPLIANCE STATEMENT

SECTION D – SPARE PARTS, ACCESSORIES, TEST EQUIPMENT & TECHNICAL DOCUMENTATION	
<p>1. TECHNICAL DOCUMENTATION</p> <p>1.1 The bid winner will supply an operational manual with the description of all the function of the SRRAP in soft-copy, in the English and Spanish language.</p>	

ICAO SPECIFICATION CODE: 94-03-550 RLA/06/901 PR 21101102 24 May 2013	Page 14 of 20
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB	COMPLIANCE STATEMENT

SECTION E – SERVICES, TESTS AND ACCEPTANCE	
<p>1. DATA CENTRE INSPECTION</p> <p>1.1 The tenderer undertakes to submit for AAA/ICAO’s approval at least forty-five (45) days prior to the scheduled commencement of the inspection, a Data-centre Inspection Plan and Procedures. ICAO shall notify the tenderer of its decision within thirty (30) days thereafter, and after an agreement has been reached, the plan/procedures shall form part of the eventual contract. Any changes in the plan/procedures initiated by the tenderer will be without cost to AAA/ICAO and subject to AAA/ICAO’s approval.</p> <p>1.2 The Data Centre Inspection includes the inspection of the hardware and software of the system that provide the SRRPAS. The software include the functionality of the SRRPAS, the WEB page of the service for the SAM Region and the SAM database.</p> <p>1.3 All results of the data centre inspection shall be duly recorded and shall be signed by the tenderer’s representative and AAA/ICAO representatives.</p> <p>1.4 All observations agreed on and discrepancies noted during the Data Centre Inspection are to be corrected by the tenderer.</p> <p>1.5 The tenderer shall arrange for a maximum of (2) inspections, to run consecutively for the facilities.</p> <p>1.6 ICAO’s appointed representative(s) together with AAA’s representative(s) shall be entitled to enter the facilities of the tenderer at reasonable times during the normal working hours to witness the work in progress.</p> <p>1.7 The Inspection shall be conducted in the presence of ICAO’s appointed representative and representatives from AAA whose names shall be advised to the tenderer at least three weeks prior to the commencement of tests. Following the satisfactory completion of the tests, ICAO shall sign and issue a Inspection Certificate. It has been considered that three people will participate in the Inspection, one on behalf of ICAO and the remaining two on behalf of the AAA.</p> <p>1.8 The costs of stay and passages from the three persons will be included in the offer of the bidder. It has been considered a minimum of three days (total) for the Inspections.</p>	

<i>ICAO SPECIFICATION CODE:</i> 94-03-550 RLA/06/901 PR 21101102 24 May 2013	Page 15 of 20
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB	COMPLIANCE STATEMENT

SECTION E – SERVICES, TESTS AND ACCEPTANCE	
<p>1.9 If ICAO’s appointed representative does not issue and sign the Inspection Certificate, he shall immediately notify the tenderer in writing with proper reference to any tests in the approved Test schedule or to any part of the Specifications which the equipment has failed to meet. It is agreed between the parties that minor failures, which do not adversely affect the performance or operation of the equipment for the purpose intended and subsequently subject to modification by the tenderer at no extra cost, shall not be considered as items preventing Acceptance.</p> <p>1.10 With respect to ICAO’s reason for non-acceptance, the tenderer shall give notice to ICAO stating how it intends to rectify in order that ICAO may repeat the tests that not initially comply and also the tests in respect of those parts affected by the rectification. The tenderer shall bear all costs associated with the re-testing (i.e. travel, accommodation and subsistence costs for ICAO’s/AAA’s representative(s) re-participation).</p> <p>1.11 In the event of ICAO or AAA’s representatives failing to be present at the time and place appointed by the tenderer for the Factory Acceptance Tests, the tenderer may proceed with the tests which shall be deemed to have been made in the presence of ICAO and AAA’s representatives and the tenderer shall sign the Factory Acceptance Certificate for corresponding purposes which shall have the same meaning and value as if it had been signed by ICAO. A copy of the test results must be submitted to ICAO for review prior to shipment.</p> <p>2. TRAINING</p> <p>2.1 General aspects</p> <p>2.1.1 The Bidder shall include in its proposal a two-day operational training on the SRRPAS. The training will be carried out on-line.</p> <p>3. INSTALLATION</p> <p>3.1 Nil.</p>	

<p>ICAO SPECIFICATION CODE: 94-03-550 RLA/06/901 PR 21101102 24 May 2013</p>	<p>Page 16 of 20</p>
<p>TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB</p>	<p>COMPLIANCE STATEMENT</p>

<p>SECTION E – SERVICES, TESTS AND ACCEPTANCE</p>	
<p>4. SITE ACCEPTANCE TESTS AND START-UP</p> <p>4.1 The SAT shall be conducted in three(3) phases as follows:</p> <ul style="list-style-type: none"> a) Provisional Site Acceptance Test (PSAT) b) Operational Readiness Demonstration (ORD) phase (30 days) c) Final Site Acceptance Test (FSAT) <p>4.2 The contractor shall provide written test plans and procedures, in Spanish language (If the language normally used by the Successful Bidder is other than Spanish, a set of documents shall be delivered in English) for the PSAT and FSAT. Copies of the detailed test plan and procedures are to be provided to ICAO/AAAs for approval not less than 30 days prior to the conduct of the tests. The SAT shall be witnessed by AAA/ICAO representatives.</p> <p>4.2.1 Note that the Successful Bidder shall introduce the comments, and corrections suggested by ICAO/AAAs and shall re-submit such documents for approval, at no additional cost for ICAO/AAA.</p> <p>4.2.2 Any delays in the execution of the contract resulting from the non-approval of the aforementioned plans and procedures shall be attributable to the Successful Bidder and shall not give the right to extensions in the execution timeframes established in the contract.</p> <p>4.3 The test plans and procedures shall contain at least the following</p> <ul style="list-style-type: none"> a) Detailed test timetable, by day b) Test sites and schedules c) List of participants on behalf of the Successful Bidder d) Purpose of the test e) General description of the SRRAP to be tested. f) Description of test procedures and steps g) Lists/tables with expected results h) Complete operational manuals of the equipment to be tested <p>4.4 The successful bidder shall demonstrate at PSAT phase, using mutually agreed upon test procedures, that all the equipment provided within this project is compliant to the technical specification and requirements. All deficiencies identified at the PSAT phase shall be corrected by the successful bidder prior to the FSAT phase.</p>	

<i>ICAO SPECIFICATION CODE:</i> 94-03-550 RLA/06/901 PR 21101102 24 May 2013	Page 17 of 20
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB	COMPLIANCE STATEMENT

SECTION E – SERVICES, TESTS AND ACCEPTANCE	
<p>4.5 PSAT tests shall be conducted for the service operation , covering at least the following aspects:</p> <ul style="list-style-type: none">a) Connectivity to the WEB pageb) Functionality of all the parts of the SARRPS described in Section C part 2c) Verify the content and quality of the data base of location and waypoint of the SAM Regiond) Documentation <p>4.6 There shall be a 30 day period between the PSAT and FSAT phases. During this period of 30 days, the AAA personnel shall be operating the system normally in order to identify any defects, adjustments, , etc. which shall be corrected by the successful bidder prior to the FSAT</p> <p>4.7 When all the deficiencies identified during the PSAT and all abnormal situations identified during the 30 days operational readiness test phase are corrected, then the FSAT can take place.</p> <p>4.8 The contractor shall provide the test equipment required for the SAT (if any).</p> <p>4.9 All results of the SAT shall be duly recorded and shall be signed by the contractor. These results shall form the basis for the installation acceptance and for station records.</p> <p>4.10 During acceptance (PSAT, ORD and SAT), the Project Office may include additional testing, as necessary, in order to ensure the correct operation of the supply of the website. These tests shall be automatically included as a supplement to the official test programme.</p> <p>Start-up</p> <p>4.11 The start-up of the service will commence upon approval of PSAT. The Successful Bidder will start the provision of the SRRPAS for the 24 hours a day, 7 days a week (24x7). The service will be in a preoperational phase for of 30 day period</p>	

ICAO SPECIFICATION CODE: 94-03-550 RLA/06/901 PR 21101102 24 May 2013	Page 18 of 20
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB	COMPLIANCE STATEMENT

SECTION E – SERVICES, TESTS AND ACCEPTANCE	
<p>5. GUARANTEES / PERFORMANCE OF THE SERVICES</p> <p>5.1 The Successful Bidder shall maintain the quality of the service during the term of the contract, 24 hours per day, 7 days a week (24x7).</p> <p>5.2 The Successful Bidder shall provide access to a support centre to handle queries about the functionality of the service.</p> <p>5.2.1 In the event of unavailability of the service, a user may contact this centre via an email or phone call to report the event. In this act, the Successful Bidder must provide the relevant claim number for its use in the discount calculation referred in this section, as well as send an email to the user and to the ICAO SAM Regional Office</p> <p>5.2.2 Once the claim has been solved, the Successful Bidder will send an email to the ICAO monitoring bureau, and to every user who made the complaint, informing the solution and indicating the time it was settled and the number of claim.</p> <p>5.2.3 The time between the start of the contingency registered in the number of claim and its end, registered in the e-mail sent by the Successful Bidder, is the corresponding to T_i = "total time of unavailability" mentioned below. In case that a month registers several contingencies, the T_i will account for the total unavailability time.</p> <p>5.3 Preventive maintenance should be performed during the period of the services, without prejudice to the service operation, and must be communicated with a minimum of 10 (ten) business days via fax or e-mail.</p> <p>5.4 The Successful Bidder shall provide to ICAO at the time of the commencement of the contract, the list of the persons in charge for the service provision in hierarchical order.</p> <p>Discounts due to outage</p> <p>5.5 The Successful Bidder shall provide a discount for the disruption in the prediction services if the required availability in these specifications is not met (99.5%).</p>	

ICAO SPECIFICATION CODE: 94-03-550 RLA/06/901 PR 21101102 24 May 2013	Page 19 of 20
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB	COMPLIANCE STATEMENT

SECTION E – SERVICES, TESTS AND ACCEPTANCE				
<p>5.6</p>	<p>If the responsible of the failure is the Successful Bidder, penalties will be applied consisting in the reduction in the payment of the cost of the service, according to the following scheme:</p> <table border="1" data-bbox="162 611 1107 919"> <tr> <td data-bbox="162 611 365 919"> $I = \frac{T_i \times P}{T_o}$ </td> <td data-bbox="365 611 1107 919"> <p>Where:</p> <p>I = monthly discount in USD, relative to the service in fault.</p> <p>T_o = operation period (01 month), in minutes.</p> <p>T_i = total time of unavailability of the service , occurred during the considered operation period (01 month), in minutes.</p> <p>P = monthly price of the Contract in USD.</p> </td> </tr> </table>	$I = \frac{T_i \times P}{T_o}$	<p>Where:</p> <p>I = monthly discount in USD, relative to the service in fault.</p> <p>T_o = operation period (01 month), in minutes.</p> <p>T_i = total time of unavailability of the service , occurred during the considered operation period (01 month), in minutes.</p> <p>P = monthly price of the Contract in USD.</p>	
$I = \frac{T_i \times P}{T_o}$	<p>Where:</p> <p>I = monthly discount in USD, relative to the service in fault.</p> <p>T_o = operation period (01 month), in minutes.</p> <p>T_i = total time of unavailability of the service , occurred during the considered operation period (01 month), in minutes.</p> <p>P = monthly price of the Contract in USD.</p>			
<p>5.7</p> <p>5.8</p> <p>5.9</p> <p>5.10</p>	<p>The tenderer shall also warrant that all services delivered under an eventual contract shall perform in accordance with and conform to all specifications, descriptions, and other requirements included in the offer and shall be without defects in materials, workmanship and design. Failing to accomplish these performance criteria, the tenderer must modify/add and/or exchange the inadequate equipment and/or software, if necessary, to provide the specified functions.</p> <p>Approval or acceptance of the tenderer’s designs or acceptance of the system shall not prejudice ICAO/AAA’s rights under this Article.</p> <p>The rights under this Article shall be enforceable by the AAAs and ICAO respectively.</p> <p>ICAO’s and AAA’s rights under this Article are not exclusive and any other rights provided in this Contract or by Law are reserved.</p>			

<i>ICAO SPECIFICATION CODE:</i> 94-03-550 RLA/06/901 PR 21101102 24 May 2013	Page 20 of 20
TITLE: SAM REGIONAL RAIM PREDICTION AVAILABILITY SERVICE VIA WEB	COMPLIANCE STATEMENT

GLOSSARY OF ACRONYMS

For purposes of this document, the following acronyms will apply:

AAA	Aeronautic Administrations Authorities
AFTN	Aeronautical fixed telecommunication network
AMHS	Air Traffic Services Message Handling Services
Beidou	Global Navigation Satellite System (GNSS) developed in China
FD	Fault Detection
FDE	Fault Detection and Exclusion
FSAT	Final Acceptance Test in the Site
GALILEO	Global Navigation Satellite System developed the European Union (EU)
GDOP	Geometric Dilution of Precision
GLONASS	Global Navigation Satellite System of Russia
GPS	Global Positioning System
IP	Internet Protocol
PBN	Performance-based Navigation
PDOP	Positional Dilution of Precision
PSAT	Provisional in site Acceptation Test
NANU	NAVSTAR Users Advertisement Service
RAIM	Receiver Autonomous Integrity Monitoring
RNAV	Area Navigation
RNP	Required Navigation Performance
RNP APCH	Required Navigation Performance in Approach
RNP AR APCH	RNP Authorization Required Approach
SRRPAS	SAM Regional RAIM Prediction Availability Service
URL	Uniform Resource Locator
USCG	United States Coast Guard
UTC	Universal Time Coordinated

APENDICE C

EVALUATION METHOD - SERVICES (Field Projects + Regular Program)

Evaluation of SERVICES is done on a BEST VALUE FOR MONEY basis.

Criteria	Method
Formal / Corporate	PASS/ FAIL
Technical	Points (as per below table)

Step	Preparation of Evaluation Template (prior to Sealed Tender process):		
1	Finalize the Terms of Reference (TOR). Include an itemized list of services for which the tenderer shall provide prices.		
2	Customize the Formal and Technical criteria with keywords of the major criteria from the TOR; insert additional lines as needed. The criteria must refer to the appropriate paragraph in the TOR. Determine the maximum score achievable for each criteria, based on its relevance for the evaluation. Technical criteria shall account for 60% and Price for 40% of the evaluation.		
3	Adjust the Evaluation Summary by listing the services in the Technical Evaluation that shall be evaluated (as per itemized list of Step 1).		
Step	Evaluation (after Sealed Tender has closed):		
1	Prepare one Evaluation - Proposal Tab for each proposal received.		
2	Fill in the Formal Criteria and Corporate Eligibility Criteria (PASS/FAIL). If all criteria are answered with "PASS", the supplier is eligible for evaluation of Technical Criteria. If not all criteria are answered with "PASS", the supplier is disqualified.		
3	Evaluate the Technical Criteria (POINTS) for all suppliers which pass Step 2. Assign the percentage of points received for each criteria as per below table.		
Step	Evaluation Summary:		
1	Suppliers who reach ≥ 70% of points in the technical evaluation are eligible for commercial consideration. Acceptable suppliers: Fill in the prices and calculate the commercial score with formula $P = y (\mu/z)$; the lowest proposal gets maximum score.		
2	Contract award will be recommended to the company with highest combined score (technical + commercial points).		
Evaluated Criteria	Supporting Evidences	Scoring Scale	Example with max. score of 10
Excellent	Excellent evidence of ability to support and exceed contract requirements	100%	10
Good	Good evidence of ability to support and exceed contract requirements	90%	9
Satisfactory	Satisfactory evidence of ability to support contract requirements	70%	7
Poor	Marginally acceptable or weak evidence of ability to support contract requirement	40%	4
Very Poor	Lack of evidence to demonstrate ability to comply with contract requirements	10%	1
Not Submitted	Information has not been submitted or is unacceptable	0%	0

TECHNICAL EVALUATION - SERVICES

Evaluator name:

Sealed Tender/ RFQ:

Tenderer:

Date of evaluation:

FORMAL CRITERIA

Attachment I of Tender Docs.	Description	PASS/ FAIL	Comments
	Attachment II "Terms of Reference" completed (Field Projects only)		
	Commercial Offer submitted		
	Detailed Technical proposal submitted		
	Schedule of implementation submitted		
	Supplier provided Financial information		
	Three (3) References provided		
	Proposal submitted before the closing date		
	Offer meets Validity period		
	Supplier Eligibility Declaration signed		

CORPORATE ELIGIBILITY CRITERIA

No.	Description	PASS/ FAIL	Comments
	Corporate Experience and Capability		
	Provided proof of relevant years of experience as requested in Tender Documents		
	List of similar projects acceptable, as requested in Tender Documents		
	Customer references acceptable, as requested in Tender Documents		

TECHNICAL EVALUATION - SERVICES

Evaluator name:
 Sealed Tender/ RFQ:
 Tenderer:
 Date of evaluation:

		Corporate Standards and Policies		
		Company is ISO 9001:2000 certified or equivalent Quality Assurance System		
		Financial Standing		
		Total price of the proposal is ≤30% of the Company's Annual Revenue		
		Quick Ratio [(Cash + Accounts Receivable)/ Current Liabilities] ≥ 1		

TECHNICAL CRITERIA

No.	Section No.	Description	Max. Points	Scoring %: 100% = Excellent 90% = Good 70% = Satisfactory 40% = Poor 10% = Very poor 0% = Not submitted	Points received [Points x %]	Comments
SECTION A - INTENT AND STANDARDS						
A	4	BASIC TECHNICAL CHARACTERISTICS	10			
A	5	GENERAL CONSIDERATIONS	10			
A	6	RULES AND STANDARDS	10			
A	7	ALTERNATIVES	10			
A	8	BIDDER'S EXPERIENCE	150			
A	9	BIDDER'S DOCUMENTATION	10			
		Subtotal	200		0	
SECTION B -GENERAL REQUIREMENTS						
B	1.1.1	The bidder provide the organizational chart	10			
B	1.1.2	The bidder prepare a project timetable	10			
B	1.1.3	The Successful Bidder shall be fully responsible for the design, selection of components and materials, and installation techniques	20			
B	1.1.5	The Successful Bidder shall appoint properly qualified personnel in sufficient number	20			

TECHNICAL EVALUATION - SERVICES

Evaluator name:

Sealed Tender/ RFQ:

Tenderer:

Date of evaluation:

B	1.1.6	The Successful Bidder shall prepare and submit Inspection tests	5	
B	1.1.7	The Successful Bidder shall prepare and submit the Final Acceptance Test (PSAT)	5	
B	1.1.8	The Successful Bidder shall be responsible for host maintain and manage the SRRAPS	50	
B	1.1.9	The Successful Bidder shall submit operation manual	20	
B	1..2.1	The Bidder shall assume full responsibility for the following issues: a) Project proposal, organisation and distribution of all works.	10	
Subtotal			150	0

SECTION C - TECHNICAL REQUIREMENTS

C	1.1.1 to 1.1.7	General Features system	50	
C	2.1	SRRPAS shall be a web-based tool with access for SAM regional customers. The information in the web site must be presented in English, Spanish and Portuguese. The main URL and mirror URL shall be defined in conjunction with ICAO on behalf of the SAM Member States.	60	
C	2.2.1.1 to 2.2.1.3	GPS Status Tool	40	
C	2.2.2.1 to 2.2.2.5	Terminal/Approach tool	40	
C	2.2.3.1 and 2.2.3.2	Visibility tool	40	
C	2.2.4.1 to 2.2.4.8	Route tool	40	
C	3.1	SRRPAS shall be managed and operated by the successful bidder and shall be deployed across two geographically dispersed servers, at two different Data Centres, offering 24/7 service with a minimum availability of 99.5%	40	
C	3.2	SRRPAS application shall be hosted on an application server with a database back- end providing highly available file storage facilities	40	

TECHNICAL EVALUATION - SERVICES

Evaluator name:

Sealed Tender/ RFQ:

Tenderer:

Date of evaluation:

C	3.3	The server shall be fault-tolerant and shall include support for hot-swapping of essential hardware such as disks and power supplies.	20	
C	3.4	Hardware SRRPAS	20	
C	3.5.1 to 3.5.3	IP security	30	
C	3.6.1 to 3.6.6	Constellation data mediator	40	
C	3.7.1 and 3.7.2	SRRPAS Helpdesk	40	
C	3.8	Bid Optional requirements		
Subtotal			500	0

SECTION D – SPARE PART, TOOLS, ACCESSORIES, TEST EQUIPMENT AND TECHNICAL DOCUMENTATION

D	1.1	The bid winner will supply an operational manual with the description of all the function of the SRRAP.	30	
Subtotal			30	0

SECTION E – SERVICES, TESTS, AND ACCEPTANCE

E	1	INSPECTION TESTING	10	
E	2	TRAINING	30	
E	3	INSTALLATION	20	
E	4	SITE ACCEPTANCE TESTS AND START-UP (PSAT, FSAT)	10	
E	5	GUARANTEES / PERFORMANCE OF THE SERVICES	50	
Subtotal			120	0

Total punctuation (Sum of max punctuation A+B+C+D+E)	1000	0
---	-------------	----------

EVALUATION SUMMARY - SERVICES

Evaluator name:

Sealed Tender/ RFQ:

Date of evaluation:

Contract award will be recommended to the company with highest combined score (technical + commercial points).

TECHNICAL EVALUATION	Max. Score	Proposal 1	Proposal 2	Proposal 3
Formal Criteria: Supplier has met all Formal Criteria (PASS/FAIL)?				
Corporate eligibility criteria: Supplier has met all CEC (PASS/FAIL)?				
Technical Criteria 1 - Section A: Sub-Total of points received:	200			
Technical Criteria 2 - Section B: Sub-Total of points received:	150			
Technical Criteria 3 - Section C: Sub-Total of points received:	500			
Technical Criteria 4 - Section D: Sub-Total of points received:	30			
Technical Criteria 5 - Personnel E: Sub-Total of points received:	120			
Total technical points (proposals reaching ≥70% of Max. Score are eligible for commercial evaluation)	1000	0	0	0
COMMERCIAL EVALUATION	Max. Score	Proposal 1	Proposal 2	Proposal 3
Meets threshold >70% of Technical Evaluation?		YES/NO	YES/NO	YES/NO
Price of proposal without taxes: (Field Projects: Price includes all applicable local taxes)				
Price Score (P= y (μ/z); lowest proposal gets max. points)	1000			
Combined Score (0.6xTechnical Score + 0.4xCommercial Score):		0	0	0

For calculation of the price score, use this formula: **P = y (μ/z)**

P = points for the commercial proposal being evaluated
y = maximum number of points for the commercial proposal
μ = price of the lowest priced proposal
z = price of the proposal being evaluated

In this methodology (Cumulative Analysis), the maximum number of points assigned to the commercial proposal is allocated to the lowest price proposal, technically compliant.
All other price proposals receive points in inverse proportion.