Global Aviation Safety Oversight System (GASOS)

Concept of Operations

Issue 3 – 12 September 2019
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1. Introduction

In response to growing aviation safety oversight challenges experienced globally, ICAO is proposing to establish the Global Aviation Safety Oversight System (GASOS) within the framework of the Global Aviation Safety Plan (GASP). GASOS is designed as a voluntary standardized-assessment and recognition mechanism for safety oversight organizations (SOOs) and Accident Investigation Organizations (AIOs). For the initial phase of GASOS a SOO is defined as a Regional Safety Oversight Organization (RSOO) or any other intergovernmental regional or subregional aviation safety oversight body that supports a State or group of States in carrying out their safety functions and activities. Similarly, an AIO is an intergovernmental regional accident and incident investigation organization (RAIO).

The Forum on RSOOs for Global Aviation Safety held in Swaziland from 22 to 24 March 2017, supported the proposed ICAO Global Strategy and Action Plan for the improvement of RSOOs and the Establishment of a Global System for Provision of Safety Oversight\(^1\), and of which one of the key objectives is the establishment of GASOS. GASOS promotes advice (level 1) or assistance (level 2) in the conduct of safety functions and activities to States being provided by ICAO recognized SOOs/AIOs, while maintaining the States’ obligations and responsibilities for safety oversight and accident and incident investigation under the Convention on International Civil Aviation (Chicago Convention).

Using a methodology derived from the ICAO Universal Safety Oversight Audit Programme Continuous Monitoring Approach (USOAP CMA), GASOS is designed to assess and recognize a SOO’s/AIO’s qualifications and capabilities to perform certain safety oversight, safety management and accident investigation functions that assist States in fulfilling their responsibilities.

To minimize risks associated with the implementation of this new programme a phased approach will be employed by ICAO. The first phase will be limited to conducting assessments and recognizing the qualifications of only RSOOs and RAIOs performing advisory services (Levels 1) and/or providing operational assistance (Level 2), with the focus on strengthening RSOOs/RAIOs in order to better support their member States.

Additional phases of GASOS may incorporate the assessment and recognition of an individual State to advise or assist another State in carrying out their safety functions and activities and in the conduct of its safety management responsibilities. Future phases may also include full delegation (Level 3) of functions and activities. Chapter 3 contains additional information on the levels of functions and activities.

This concept of operations outlines what GASOS is expected to be, its primary objectives, the main underlying principles, as well as the description of foreseen responsibilities, processes, and boundaries and interfaces.

\(^1\) Global strategy and action plan for the improvement of Regional Safety Oversight Organizations (RSOOs) and the establishment of global system for the provision of safety oversight - ICAO
2. Current Situation and Justification for Changes

2.1 Description of the Current Safety Oversight and Accident Investigation

States have extensive safety oversight and accident investigation responsibilities under the provisions of the Chicago Convention and its Annexes. Today many States already rely on regional mechanisms, such as RSOOs, COSCAPs and RAIOs that advise or assist the State in carrying out certain safety functions. In some instances these regional mechanisms are given the authority by the State to perform certain safety or accident investigation functions on behalf of the State.

2.2 Justification for Change

Safety is the top priority, and through the efforts and collaborative work of States, industry, international organizations and other stakeholders, the global aviation accident rate in recent years has remained low and stable. However, the aviation industry is changing and becoming more complex; new technologies are emerging and air traffic is forecast to double over the next fifteen years. Some States are not able to fulfil all their aviation safety oversight obligations effectively. Whereas it is expected that RSOOs and other regional mechanisms would provide tangible improvements, some of those organizations face specific challenges that do not allow them to deliver the expected results. The gap between the insufficient development of State safety oversight capabilities and the constant evolution of the industry will increase and may negatively impact the safety of aviation. States need effective, reliable alternatives for carrying out their safety responsibilities in order to close this gap.

2.3 Required Changes

Changes are required to assist States in improving their safety oversight and accident and incident investigation performance. The main changes proposed under GASOS are to assess an SOO’s/AIO’s qualification and capabilities to advise (level 1) or assist (level 2) States in performing certain safety functions for or on behalf of a State and to recognize those qualifications and capabilities. Furthermore, GASOS will provide incentives to States to request the provision of functions from or delegate to those SOOs/AIOs that have been ICAO recognized. GASOS is the means to implement those changes, based also on the assumptions described below.

2.4 Assumptions

The following assumptions are to be considered for GASOS:

Assumption 1: States have a national or regional legal framework that allows the State to request the provision of functions or delegate functions to a SOO or AIO. Implementation of this assumption (through legal measures) is the responsibility of each State.

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2 See also RSOO evaluation report, ICAO, November 2017.
Assumption 2: There is an interest of some States to have access to recognized SOOs/AIOs that can provide advice and assistance in carrying out safety functions, and there is an interest for SOOs/AIOs to have their qualifications recognized with a view to offer advice or assistance to States\(^3\).

Assumption 3: GASOS will have to be approved by Council and endorsed by the Assembly before any full scale operational implementation. Submittal of the GASOS proposal to States is planned at the 40th ICAO Assembly in September 2019.

3. GASOS overview

3.1 Objective

The main objective of GASOS is to strengthen State safety oversight, accident and incident investigation and safety management capabilities by:

- Strengthening existing SOOs/AIOs to make them more effective and efficient in supporting States; and
- Promoting the provision of safety functions, as needed, by States to qualified and capable SOOs/AIOs that have been assessed and recognized by ICAO.

3.2 Guiding Principles and Considerations

i. States maintain responsibility for safety oversight, accident investigation and safety management under the Chicago Convention and its Annexes.

ii. GASOS is a voluntary programme and, in principle, is open to all SOOs/AIOs. The first phase of GASOS as previously mentioned will be limited to RSOOs, RAIOs, or any other intergovernmental regional or subregional aviation safety oversight body that supports a State or group of States in carrying out their safety functions and activities. The application of an SOO/AIO to be recognized through GASOS is a voluntary decision of the organization. The use of recognized SOOs/AIOs by States is also voluntary.

iii. GASOS is an integral part of the ICAO strategy for reinforcing RSOOs, and should be seen by RSOOs and RAIOs as a means to support their reinforcement and recognition at a global level, for providing safety oversight, accident investigation and safety management functions for States.

iv. States are responsible for deciding whether or not they want to receive advice or assistance (Levels 1 and 2) on the performance of certain safety functions or delegate (Level 3) them to fulfill their safety responsibilities. In such cases, the State should:

- decide which safety functions they require advice or assistance or may wish to delegate; and
- obtain assurance that the SOO’s/AIO’s capability remains valid in the context of State specific needs, and properly oversee the functions it has delegated to its satisfaction.

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\(^3\) This assumption was verified in accordance with the two surveys conducted by ICAO and as articulated in the GASOS business case.
v. GASOS is based on a proven and credible methodology for the initial assessment and monitoring of a SOO’s/AIO’s qualifications and capabilities that is derived from the USOAP CMA methodology.

vi. The GASOS assessment criteria will be maintained to be closely consistent with relevant USOAP-CMA PQs.

vii. Consistency with high level GASP objectives, goals and targets will be maintained through the GASOS assessment methodology and assessment criteria.

viii. Similarly, the assessment and monitoring of a SOO’s/AIO’s qualifications and capabilities will be performed by recognized competent personnel as described in chapter 3.

ix. GASOS aims at driving efficiency in the monitoring of a SOO’s and AIO’s capabilities to provide a safety function and/or activity (Levels 1 and 2) or perform a delegated function (Level 3). Therefore, use of safety information from other monitoring activities will be required.
   ▪ In the case of a SOO/AIO applying for assessment and recognition under GASOS, the initial GASOS assessment may take into account recent USOAP-CMA outcomes to inform the GASOS assessment.
   ▪ In turn, the USOAP-CMA activities on States that are served with functions and/or activities by GASOS recognized SOOs/AOIs will be informed by GASOS assessments.
   ▪ Whenever and wherever possible, a duplication of activities will be avoided.

x. Since GASOS is intended to contribute to the GASP long term strategic objective of achieving worldwide high safety oversight capabilities, it will be based on a principle of a high-level of technical capability.

xi. The GASOS programme will be managed by ICAO on a cost recovery basis, i.e. without seeking to make profits. Any unutilized revenue would be ring-fenced within the programme. Funding and technical resources mobilized from voluntary contributions by States, International Organizations and Industry is also a consideration.

xii. The GASOS programme is based on the principle of transparency and will make its documentation related to its processes available to stakeholders and to the public to the extent possible. However, by precedent voluntary ICAO programmes remain confidential and therefore the reports generated from the voluntary GASOS assessments will remain confidential between ICAO and the SOO/AIO being assessed.

xiii. GASOS will be governed by a steering/oversight committee comprised of three (3) groups

   a. Group 1: States or organizations of chief importance in aviation safety oversight with their own international oversight program;
   
   b. Group 2: States or Organizations not otherwise included but which make the largest contribution to the provision of aviation safety oversight through technical assistance; and
c. States or Organizations not otherwise included whose designation will ensure that all major geographic areas of the world are represented.

xiv. The GASOS programme is also seen as contributing to the United Nations Sustainable Development Goals, in particular Goal 9 – Industry, Innovation and Infrastructure.

### 3.3 GASOS Description

#### 3.3.1 Components of the system

GASOS is a tool to assess, recognize, and monitor the qualifications and capabilities of SOOs/AIOs to perform certain safety functions, as defined in the scope of recognition. As a result ICAO will publish and maintain a directory of ICAO GASOS recognized SOOs/AIOs, including the scope of recognition (safety functions) for use by States seeking advice or assistance in conducting such functions or wanting to delegate them.

#### 3.3.2 GASOS will be composed of the following actors, key activities and main outputs (*elements directly interfacing with GASOS but not strictly part of it are shown in italics*):

<table>
<thead>
<tr>
<th>Actors</th>
<th>Key Activities</th>
<th>Main Outputs</th>
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| ICAO                       | GASOS methodologies and processes  
Assessment, Recognition and Monitoring of SOOs/AIOs  
Development of GASOS related guidance | List of safety functions (GASOS functions)  
GASOS assessment criteria and mapping with corresponding USOAP PQs  
GASOS Directory  
SOO/AIO Recognition  
ICAO GASOS Manual  
Roster of ICAO qualified GASOS Assessors  
ICAO Manual 9734 Part B updated  
RAIO Manual 9956 update |
| SOOs/AIOs (already recognized) | Maintain capability demonstration  
*Perform safety functions on behalf of States* | GASOS Annual Activity Questionnaire |
| SOOs/AIOs (applying for recognition) | Capability demonstration  
*Perform safety functions on behalf of States* | Self-assessment check-lists |
| States                     | Access the GASOS Directory                                                   |                                                                              |
A summarized visual representation of GASOS is further provided below:

![GASOS Visual Representation](image)

**Figure 1: GASOS Visual Representation**

### 3.3.2 Levels of GASOS Safety Functions and Activities

A State may seek advice or assistance on the performance of certain safety functions or delegate the functions and activities to fulfill their safety responsibilities (safety oversight, safety management or accident investigation functions). For the purposes of GASOS this is divided into three levels, which correspond roughly to different levels of authority or legal empowerment:

- **Level 1**: Advisory functions
- **Level 2**: Operational assistance functions
- **Level 3**: Delegated functions

Examples of functions in the three levels are given in the glossary (Appendix B). The comprehensive GASOS List of Functions is maintained as a separate document (“GASOS List of Functions”) and will be part of the GASOS Electronic Management System (GASOS EMS).
3.3.3 The GASOS Electronic Management System (EMS)

The GASOS EMS will be comprised of modules that capture the entire workflow of GASOS activities aimed at streamlining the GASOS processes. The primary modules of the GASOS EMS include:

- Application module – encapsulates the entire business process and work flow from start to finish of an SOO/AIO applying for assessment and recognition by GASOS.

- Assessment module – encapsulates the entire business process and work flow from start to finish of the SOO/AIO being assessed by GASOS.

- Directory module – contains public information on recognized SOOs/AIOs, including details on the scope of recognition/Level in terms of safety functions.

- Continuous Monitoring module – encapsulates the entire business process and work flow from start to finish of the continuous assessment of SOOs and AIOs, including an annual GASOS activity questionnaire.

- Assessor module - manages the roster of assessors and planning of assessments for GASOS.

3.3.4 GASOS Assessors

In order to conduct GASOS assessments, it is necessary for ICAO to establish a cadre of technical experts (hereafter referred to as assessors) with the appropriate experience in auditing and expertise in the needed safety areas required for the assessments. GASOS assessors will follow similar principles as the USOAP programme auditors (reference Doc 9735).

ICAO recognizes that in order to build the necessary cadre of technical experts, it will need to rely heavily on States to provide such experts along with oversight by ICAO.
ICAO is proposing the following requirements and acknowledges that the number of assessors needed is dependent upon the number of assessments conducted each year.

| GASOS Programme Assessment Coordinator | ICAO personnel responsible for overseeing the assessment process, including coordinating the assessors.  
Oversee team leaders to ensure no conflicts of interest exist in the State or Region where the GASOS assessment is being conducted. |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standards Officers/SMEs Area Coordinators | ICAO subject matter experts with USOAP experience where necessary and have received GASOS training.  
Review GASOS reports and ensure that assessments are being conducted without bias or conflict of interest. |
| Team Leads | ICAO staff that are active USOAP auditors or ICAO GASOS assessors that have been appropriately trained and meet the below requirements.  
Proof of fluency in English, both spoken and written.  
Completed USOAP CBT portion in regards to their subject area of expertise.  
Must have completed SMS CBT.  
Recurrent checks (every 3 years) and feedback given to ICAO by the area coordinators. |
| Assessors | Minimum of 7 years of experience as a subject matter expert in their technical field, including 3 years of international auditing experience with a minimum of 2 audits per year.  
Must have completed USOAP CBT (generic portion and their technical area(s)), SMS CBT, USOAP or GASOS interview and GASOS training.  
If already approved as a USOAP auditor (including interview and OJT), it will be necessary to only complete GASOS training.  
Proof of fluency in English, both spoken and written.  
Recurrent checks and feedback given to ICAO by the team leads. |

4 A full GASOS assessment covering each area would require 1 team lead and 6 assessors. The maximum time allotted for an on-site assessment is 5 days in total plus additional days for preparation and corrective action plan review.
3.4 Responsibilities

3.4.1 Responsibilities of ICAO

ICAO is responsible for establishing and operating GASOS, i.e. for the permanent deployment of dedicated resources and activities that will enable the establishment and functioning of GASOS. ICAO is responsible for implementing processes for:

- Maintaining the GASOS assessment criteria, with the objective to maintain consistency with the USOAP PQs, to the extent possible;
- Conducting the initial assessment of the SOOs/AIOs, monitoring the recognized SOOs/AIOs, and conducting any follow-on assessment/reassessment, as necessary;
- Maintaining the GASOS Directory of recognized SOOs/AIOs;
- Maintaining required supporting electronic tools;
- Implementing an independent quality management system for the GASOS programme; and
- Creating, documenting, and maintaining the appropriate processes and procedures that support a quality management system.

Before undertaking a GASOS assessment and recognition, ICAO is responsible for ensuring that any required formal agreement between the SOO/AIO and ICAO is concluded.

3.4.2 Responsibilities of SOOs/AIOs

SOOs/AIOs applying to ICAO for assessment and recognition under GASOS are responsible for:

- Designating an accountable head of the SOO/AIO;
- Designating a technical focal point for all GASOS assessment and monitoring activities;
- Defining their intended scope of assessment and recognition;
- Conducting a self-assessment;
- Providing all of the necessary documentation and evidence required to apply for assessment and recognition; and
- Demonstrating their qualifications and capabilities to ICAO.

Recognized SOOs/AIOs are responsible for:

- Ensuring their qualification and capability demonstration is valid, also in the context of State specific aspects such as language, knowledge of national aviation regulations and specificities of their national aviation activity;
- Maintaining data and reporting to ICAO their activities, including an annual report; and
- Providing information to ICAO upon request.
3.4.3 Responsibilities of States

States that seek advice or assistance in conducting safety functions or delegate safety functions to an SOO/AIO remain responsible for ensuring that their safety obligations are properly discharged.

States are responsible for making decisions pertaining to the type of assistance they may need, whether they only require advice or assistance in conducting safety functions or actually delegate functions; to which organization(s); for which functions; and in particular for ensuring that there is full clarity in the description of work and authority levels for the provisions of functions being conducted. For example, States are responsible for ensuring that their accident investigations are conducted by an AIO that is independent from a SOOs and other entities that could interfere with the conduct or objectivity of an investigation.

States are responsible for overseeing the provision of functions be conducted by the SOO/AIO, as appropriate to ensure they meet the needs of the State. Accordingly, States are responsible for ensuring that efficient technical coordination mechanisms are in place between the CAA and the SOO/AIO, and also between SOOs/AIOs if more than one SOO/AIO is engaged by the State. For Level 2 functions and activities where the State CAA retains the final approving authority, it is expected that the CAA retains the capability to review the report or equivalent outcomes in order to make the necessary approval decisions.

3.5 Impact on ICAO provisions

This section provides an overview of which adaptations are considered necessary to the ICAO regulatory and guidance framework.

The ICAO Legal Affairs and External Relations Bureau (LEB) conducted a legal analysis of GASOS with the advice and support of an external ad hoc legal advisory group. As a result of the legal analysis, ICAO determined that GASOS is compatible with the Chicago Convention and with mitigation measures in place would not likely create a significant new liability for ICAO for the first phase of GASOS.

On top of the guidance material provided for Level 1 and 2, new guidance provisions for Level 3 are needed in two main areas:

- SOOs/AOIs that are applying for recognition or maintaining their recognition: New provisions in the ICAO GASOS Manual describing in more detail the GASOS processes, documents the recognition assessment criteria and also the respective tasks and responsibilities of ICAO and SOOs/AIOs related to the GASOS processes and methodologies.
- State delegation mechanisms - Such guidance addresses in particular the following aspects:
  - definition of the scope for Level 3 delegations,
  - compatibility with the national legal framework,
  - how national specific aspects (such as regulations or related aviation activity) are being addressed,
  - the level of monitoring that the State should exercise itself on the SOO/AIO,
- interface and coordination aspects between SOO(s)/AIO(s) and the State’s CAA, etc., and
- remaining technical State responsibilities.

4. High level description of GASOS processes

4.1 Initial recognition of an SOO/AIO

4.1.1 Description of stages

The initial recognition of an SOO/AIO takes place in four phases as described below.

**Stage 1: Application and pre-assessment**

An SOO/AIO may voluntarily submit an application for assessment and recognition, using an on-line application form. The application will include preliminary information on the organization, including supporting documentation, the intended scope of assessment and recognition, and the safety functions already performed by the SOO/AIO, if applicable.

ICAO will then perform a pre-assessment of the application package in order to determine the SOO’s/AIO’s eligibility. The applicant will be informed by ICAO if the application requires more information or if it is approved to move forward or rejected. If the scope of the application covers multiple technical areas, ICAO may consider applying a modular approach to the assessment (with multiple assessment teams and keeping the possibility to phase the recognition steps). Once the application is approved to move forward, ICAO will send the SOO/AIO the necessary information to begin the next stage.

**Stage 2: Self-assessment and preparation of the on-site assessment**

The SOO/AIO will provide a self-assessment to demonstrate its qualifications and capabilities against the applicable assessment criteria, along with relevant supporting documents as appropriate. After review of the self-assessment, ICAO will establish an assessment team and initiate the preparation of the on-site assessment.

The assessment team will be composed of qualified GASOS assessors (see paragraph 3.3.4). The size and composition of the team will be determined depending on the SOO/AIO size and intended scope of assessment and recognition. The team will prepare an on-site assessment plan based on the results of the self-assessment, documentation/evidence provided by the SOO/AIO with their application, and the level of recognition sought.

**Stage 3: The on-site assessment**

The assessment team, under the leadership of a team leader, will establish an on-site assessment plan that will define in detail the scope and planning of the on-site activity. The on-site assessment methodology

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5 Eligibility is determined by applying the definition of an SOO/AIO (cf. Appendix 2). Additionally, the applicant must be able to demonstrate that it is able to carry out the proposed safety functions at either Level 1, 2, or 3.
will be derived from the *Universal Safety Oversight Audit Programme Continuous Monitoring Manual* (Doc 9735), Fourth Edition (chapter 7, refers). GASOS assessments may use the information derived from the USOAP CMA in cases where a SOO/AIO has been subject to a recent USOAP CMA activity that may be relevant to the intended scope of assessment and recognition.

The assessment team will conduct the on-site assessment, collect evidence, complete an assessment check-list and identify potential findings and observations. This material will be used to verify that a SOO/AIO meets certain qualifications and has demonstrated its capability against a set of standardized assessment criteria. The assessment team will inform the SOO/AIO of any identified findings that require corrective actions.

In cases where a SOO/AIO applies for an assessment and recognition for the provision of functions at Level 2 or Level 3 without having organizational experience of actually performing such functions, the assessment will consider also the experience available with individual technical personnel of the SOO/AIO, as well as other aspects such as training, processes and procedures. Additional mitigations may be considered in the frame of the monitoring of the SOO/AIO.

**Stage 4: Recognition**

During the final stage, a Corrective Action Plan (CAP) will be initiated for any identified findings that resulted from the GASOS assessment and the applicant will update its qualification and capability demonstration accordingly.

The assessment team will prepare its draft assessment report that will provide a summary of the assessment activities and their outcomes. The SOO/AIO will have an opportunity to comment on the draft report and list of findings before it is finalized.

Assuming any findings have been sufficiently addressed and a satisfactory internal ICAO peer review of the assessment report has been conducted, a GASOS recognition certificate will be issued to the SOO/AIO, including the scope of recognition. The GASOS directory will be updated accordingly.

As this overall process may have the potential to generate conflicts of technical opinion between the SOO/AIO and ICAO, procedures for resolution of conflict and for contested decisions will be needed.

**4.1.2 Methodology for establishing the applicable assessment criteria**

The generic assessment criteria are identical for each applicant SOO/AIO and therefore will be applied to every applicant. Each applicant may select different safety functions for which it seeks recognition, which are mapped to the GASOS list of safety functions, therefore the specific assessment criteria may differ between applicants depending on the scope of recognition sought.

ICAO will make publically available both the generic and specific assessment criteria. These assessment criteria have been derived, adapted and will continue to be maintained and aligned with the most current USOAP CMA PQs. The correspondence between GASOS assessment criteria and USOAP CMA PQs will be maintained by ICAO (so-called “mapping”).
4.1.3 Timeline for SOO/AIO Recognition under GASOS

The timeline for the recognition process is dependent upon the availability of resources, and reactivity/responsiveness and performance of both the SOO/AIO and ICAO. Generally, ICAO proposes the times outlined below.

![Timeline Diagram](Image)

4.2 Changes to the scope of recognition of an SOO/AIO

If an SOO/AIO seeks a change to the scope of recognition, it must apply for a change to its recognition. The process steps, methodologies and timeline are similar to the case of an initial recognition process, adapted to the extent and nature of the change. In particular, the decision whether a new on-site assessment is needed will be linked to the significance of the change in recognition.

4.3 Monitoring and re-assessment of an SOO/AIO

Monitoring of a recognized SOO/AIO may be achieved through a combination of activities performed both by the recognized SOO/AIO, the States that are receiving functions or activities from the recognized SOO/AIO, and other ICAO Programmes. Information collected will be entered into the SOOs/AIOs risk profile in support of the GASOS monitoring activity.

4.3.1 SOO/AIO tasks for monitoring

The SOO/AIO shall:

- On a yearly basis, provide updated information to ICAO on its activities through completing a GASOS Annual Activity Questionnaire.
- Answer, if requested to do so, Mandatory Information Requests (MIR) submitted by ICAO.
- Maintain an updated Corrective Action Plan (CAP) (for the follow-up of findings).

Failure to submit this information in a timely manner may result in suspension or revocation of the SOO’s/AIO’s GASOS recognition.
4.3.2 States tasks for monitoring

A State that is receiving functions or activities from a GASOS recognized SOO/AOI may:

- Provide to ICAO through the online feedback tool information on the functions and activities being received from the GASOS recognized SOO/AIO.

4.3.3 ICAO tasks for monitoring

ICAO shall perform monitoring activities which may include the following:

- Off-site review of the documentary evidence submitted regularly by the SOO/AIO
- Updating the SOO/AIO risk profile
- Mandatory Information Request (MIR): e.g. to confirm certain elements of the capability demonstration, or to gather evidence after a change in the applicable assessment criteria, or when deteriorating safety performance is observed in States for which the SOO is active, or following feedback from States that are receiving the functions or activities of the SOO/AIO.
- Analysis, prioritization and planning of re-assessment activities.

ICAO will define and prioritize its re-assessment activities using the following information inputs:

- The SOO/AIO Safety Risk Profile: based on the size of the SOO’s/AIO’s activity and associated aviation activity, the safety performance of the States for which the SOO/AIO is active;
- Date of last on-site assessment activity;
- The importance of the changes affecting the SOO’s/AIO’s qualifications and capability demonstration since the last on-site assessment (changes in the organization or in its level of activity, or in the applicable assessment criteria);
- Feedback from States which are receiving the functions or activities of the SOO/AIO; and
- Any other relevant information.

4.3.3 Re-assessment of the SOO/AIO

A standard interval for re-assessment is expected to be on average every 3 years. A decision to re-assess an SOO/AIO will be made using a risk-based approach as an outcome of the ICAO monitoring activities. For example, if the recognized SOO/AIO reports a significant reduction in its resources or the State that is receiving the functions or activities reports that the SOO/AIO is underperforming then ICAO may require an additional assessment of that recognized SOO/AIO prior to the 3 year interval.

If any findings are identified during a re-assessment the SOO/AIO must correct those findings within the timeframes specified in the CAP and agreed to by ICAO. If findings are not corrected within the specified timeframes, or if any serious deficiencies are identified, ICAO may suspend, limit or revoke the SOO/AIO recognition.
4.4 Surrender, limitation, suspension or revocation of an SOO recognition

4.4.1 Surrender

A recognized SOO/AIO may decide to surrender its recognition, e.g. if it does not intend to provide functions or activities any longer to States (notwithstanding any permanent regional cooperation framework) or if it is no longer interested in maintaining ICAO recognition while continuing to provide services. At which time, the SOO/AIO must notify those States for which they are providing functions and activities and make a declaration in writing to ICAO identifying the States that they provide services to and that those States have been notified that the SOO/AIO is no longer recognized by ICAO.

4.4.2 Limitation, suspension or revocation

ICAO may decide to limit, suspend or revoke the recognition of an SOO/AIO for the following reasons:

- Where serious deficiencies are found in the capability demonstration of the SOO/AIO;
- Where findings have been identified during monitoring or re-assessment of the SOO/AIO and the findings are not corrected within the specified timeframes of the CAP;

4.5 Maintaining GASOS Methodologies and Processes

Under the ICAO GASOS programme, there is a need for ICAO to develop, publish and maintain the methodological and process elements needed for assessment and monitoring, as described above. These elements will be included as part of the GASOS electronic management system.

5. Boundaries and Interfaces

5.1 Boundaries

5.1.1 Technical scope boundaries

The technical scope of the assessment and recognition can include:

- Safety oversight functions as described in ICAO document 9734 part A (Safety Oversight Manual);
- State specific safety management functions as described in the Safety Management Manual (such as safety data collection and analysis, safety risk management or safety promotion); and
- Accident and incident investigation functions as described in Annex 13.

GASOS also includes safety functions related to the oversight of RPAS operations.

5.1.2 Functional scope boundaries

GASOS functionally includes the ICAO GASOS programme and all activities performed by SOOs/AIOs in order to obtain and maintain their recognition. It does not encompass the provision of functions themselves, i.e. the decision making, selection, implementation and/or monitoring processes put in place by States or groups of States to receive advice or assistance in the conduct of or delegate certain safety
functions to SOOs/AIOs. However, the need to develop further guidance for States on these mechanisms is acknowledged.

5.2 Interfaces

5.2.1 Interface with a State’s Safety Oversight System

States may call upon the services of ICAO recognized SOOs/AIOs to discharge certain safety functions or to receive support in performing them. The GASOS Directory will be a source of information for States, where they can find a list of SOOs/AIOs that have been determined to be qualified and capable of providing specified functions at levels 1, 2, or 3 as and when appropriate.

5.2.2 Interface with USOAP CMA

USOAP CMA and GASOS will be separate ICAO programmes that may share some commonalities (e.g. methodologies and tools), but there are a number of fundamental differences:

- USOAP CMA monitors States’ safety oversight, accident investigation and/or safety management responsibilities; GASOS assesses and recognizes an SOO’s/AIO’s qualifications and capability to perform certain safety functions that assist State’s in fulfilling their safety oversight, accident investigation and/or safety management responsibilities.
- USOAP CMA is mandatory for States; GASOS assessments are voluntary for SOOs/AIOs.

GASOS assessments may use the information derived from the USOAP CMA in cases where a SOO/AIO has been subject to a recent USOAP CMA activity that may be relevant to the intended scope of assessment and recognition.

5.2.3 Interface with Civil Aviation Safety Inspectors (CASI)

A complementary initiative is the development of an ICAO recognition scheme for Civil Aviation Safety Inspectors (CASI database). Both CASI and GASOS projects are closely coordinated, in particular in regards to the harmonization of terminologies. Each project will have nevertheless its own set of documentation.

5.2.4 Interface with the RSOO Cooperative Platform

RSOOs are an essential component of global aviation safety and as such, ICAO has undertaken a number of initiatives as part of a strategy to strengthen RSOOs, such as the establishment of the RSOO Cooperative Platform (RSOO-CP). The RSOO-CP aims to bring RSOOs together to exchange best practices, share and collaborate on the development of manuals and checklists, and cooperate on providing technical assistance.

GASOS is a tool to help strengthen the capability of RSOOs to assist States in fulfilling their safety oversight responsibilities. As a result, GASOS is an integral part of the ICAO strategy for reinforcing RSOOs, therefore, the RSOO-CP and GASOS initiatives are closely coordinated.
6. Preliminary Impact Analysis

The preliminary impact analysis below provides an analysis of how GASOS is expected to impact the main stakeholders, in terms of benefits and challenges, assuming that GASOS is implemented and operated as expected.

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Expected benefits</th>
<th>Expected challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>States</td>
<td>States will have access to a directory of competent SOOs/AIOs as an alternative to having all safety functions implemented in-house with the required staffing and systems. States will have the flexibility to choose and combine providers of functions and services from different recognized SOOs/AIOs. States will be able to increase their safety oversight and accident investigation capabilities when calling upon the provisions of functions provided by recognized SOOs/AIOs. An increase of effective implementation of safety oversight can be expected, nationally, regionally and globally. States with strong safety oversight capabilities and spare resources can seek assessment and recognition for certain functions and be called upon by other States and SOOs/AIOs for certain safety functions.</td>
<td>States have to make decisions related to the provision of functions they seek to receive and implement them from a legal, contractual, financial and operational point of view. They will have to decide upon any additional requirements (such as proficiency with language or national aviation requirements). States will have to ensure that those technical responsibilities for the provision of functions and activities are clearly defined and that the necessary technical coordination is taking place between the CAA and the SOO(s)/AIO(s).</td>
</tr>
<tr>
<td>RSOOs</td>
<td>RSOOs are encouraged to undergo a GASOS assessment for those functions that they perform on behalf of States, thereby increasing their visibility and credibility. The assessment and recognition process is expected to further help strengthen RSOOs (through the recognition activities themselves and the associated improvement incentives) and to contribute to conducting more functions and activities for the States.</td>
<td>Some RSOOs may have to significantly reinforce their capabilities or have their framework reconsidered, in order to achieve recognition for Level 2 and Level 3 functions.</td>
</tr>
<tr>
<td>Other SOOs/AIOs</td>
<td>Other SOOs/AIOs have access to a recognition system that can help them in providing additional functions and activities.</td>
<td></td>
</tr>
</tbody>
</table>

GASOS Concept of Operations – Issue 3
| **ICAO** | Safety monitoring of States by USOAP and GASOS assessments may enrich both programmes. Synergies may be explored in the long term. Global increase in effective implementation of safety oversight and overall harmonization. | ICAO needs to establish, operate and evolve GASOS and its programme, including related methodologies, processes, tools, guidance and staffing needs. |
| **Aviation System** | Aviation industry and passengers are expected to benefit from increased overall safety levels resulting from increased safety oversight capabilities on a global level. | |
### APPENDIX A: Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIO</td>
<td>Accident Investigation Organization</td>
</tr>
<tr>
<td>AOC</td>
<td>Air Operator Certificate</td>
</tr>
<tr>
<td>CAA</td>
<td>Civil Aviation Authority</td>
</tr>
<tr>
<td>CAP</td>
<td>Corrective Action Plan/Process</td>
</tr>
<tr>
<td>CASI</td>
<td>Civil Aviation Safety Inspector</td>
</tr>
<tr>
<td>GASOS</td>
<td>Global Aviation Safety Oversight System</td>
</tr>
<tr>
<td>GASP</td>
<td>Global Aviation Safety Plan</td>
</tr>
<tr>
<td>MIR</td>
<td>Mandatory Information Request</td>
</tr>
<tr>
<td>PQ</td>
<td>Protocol Question</td>
</tr>
<tr>
<td>RAIO</td>
<td>Regional Accident Investigation Organization</td>
</tr>
<tr>
<td>RSOO</td>
<td>Regional Safety Oversight Organization</td>
</tr>
<tr>
<td>SARPs</td>
<td>Standards and Recommended Practices</td>
</tr>
<tr>
<td>SME</td>
<td>Subject Matter Expert</td>
</tr>
<tr>
<td>SOO</td>
<td>Safety Oversight Organization</td>
</tr>
<tr>
<td>SSP</td>
<td>State Safety Programme</td>
</tr>
<tr>
<td>USOAP CMA</td>
<td>Universal Safety Oversight Audit Programme Continuous Monitoring Approach</td>
</tr>
</tbody>
</table>
APPENDIX B: Glossary

**Accident Investigation Organizations (AIOs):** An organization which is either a (State) accident investigation authority, or a regional accident investigation organization (RAIO), or another type of organization which performs or intends to perform accident investigation functions on behalf of States, in the context of ICAO Annex 13. Independence is required between AIO and SOO functions.

**Civil Aviation Safety Inspector (CASI):** A qualified person authorized by a State or a Safety Oversight Organization to carry out safety oversight activities for civil aviation. *(Source: ICAO Doc 10070 - Manual on the Competencies of Civil Aviation Safety Inspectors)*

**Levels of a Safety functions and activities:** A State may request a provision of safety functions (safety oversight, safety management or accident investigation functions) at three different levels.

**Level 1:** Advisory functions:
- Advise on developing aviation safety legislation or regulations for transposition into national or regional regulations system in a given area
- Assist in the identification and notification of differences to SARPs
- Advise on the development of manuals, checklists and other guidance material
- Coordinate a pool of inspectors or experts
- Provide expert advisory services in any area of safety oversight, state safety management or safety investigation

**Level 2:** Operational assistance functions: In addition to the safety functions and activities conducted at Level 1 this includes performing an actual function or activity but under the authority of the State.
- Develop a full set of aviation safety legislation and/or regulations in a given area, for adoption by States, which may include the responsibility for the maintenance of this regulatory set
- Deliver training for civil aviation safety inspectors or experts
- Conduct inspections or full technical investigations aiming at supporting the decision to issue, maintain, amend or revoke a certificate, license or approval
- Conduct surveillance activities, identification of safety deficiencies, recommendations for corrective actions (without enforcement powers)
- Conduct parts of safety investigations (under Annex 13)
- Conduct State specific safety management activities such as: establishment of a safety data collection and processing system (SDCPS), safety data analysis, hazard identification and development of risk mitigation strategies, SPI development and safety promotion.

**Level 3:** Delegation – In addition to the safety functions conducted at Levels 1 and 2, Level 3 includes the actual empowerment to issue, amend or revoke licenses, certificates, authorizations and approvals; issue or amend regulations; or conduct accident and incident investigations.
- Draft aviation safety regulations and make them effective
- Conduct full Annex 13 safety investigations, including issuance of the investigation report and associated safety recommendations

**Global Aviation Safety Oversight system (GASOS):** GASOS is a system:
- To assess, recognize and monitor the qualifications and capabilities of a Safety Oversight Organization (SOO) or Accident and Incident Investigation Organization (AIO) to perform safety functions and activities, as defined in the scope of recognition, and
To publish information on ICAO recognized SOOs/AIOs in a directory for use by States seeking assistance in carrying out their safety responsibilities.

**ICAO GASOS programme:** The ICAO GASOS programme is the set of policies, activities and resources that are deployed/developed by ICAO to enable the establishment and continuous functioning of GASOS.

**GASOS Directory:** an ICAO-maintained repository of information on recognized SOOs/AIOs, including details on their scope of recognition.

**Recognition of an SOO/AIO, scope of Recognition:** the recognition of an SOO/AIO is a decision by ICAO that the SOO/AIO has been found to be qualified and capable of performing certain safety functions and activities as defined in the scope of recognition. The scope of recognition includes a list of GASOS functions and activities that can be further determined according to “qualifiers” such as the types of personnel, product categories, aviation operations or aviation services to which those functions and activities relate.

Some qualifiers may be explicitly included in the approved scope of recognition (and therefore require a change to the scope of recognition), others may be accepted as being directly declared and updated by the SOO/AIO (for example a list of aircraft types).

**Regional Safety Oversight Organization:** the term “RSOO” covers, in a general sense, a number of legal forms and institutional structures that range from highly formalized international intergovernmental organizations, such as the European Aviation Safety Agency (EASA) and the Pacific Aviation Safety Office (PASO), to less institutionalized projects established under the ICAO Cooperative Development of Operational Safety and Continuing Airworthiness Programme (COSCAP).

(Source: ICAO Doc 9734 part B – The Establishment and Management of a Regional Safety Oversight Organization)

**Responsibility/accountability:** the state of being responsible for an undertaking, person, thing or action and for which an organization or individual or both are liable to be called to account. An ICAO Contracting State and its respective civil aviation authority are ultimately responsible for the implementation of ICAO SARPs within their State. A State may either perform these obligations or, through mutual agreement, have another organization perform these functions; however, the State retains the responsibility under its duties of sovereignty.

(Source: ICAO Doc 9734 part B – The Establishment and Management of a Regional Safety Oversight Organization)

**Safety function (or GASOS function):** in the context of GASOS, safety functions or GASOS functions are the set of functions that can be part of the GASOS scope of recognition of a SOO/AIO. They are defined in such a way to represent the range of all safety management responsibilities a State has under ICAO Convention and its Annexes and include 3 types of functions:

- Safety oversight functions
- (State specific) Safety management functions
- Accident investigation functions

A distinction is made between primary and secondary functions. A primary function is an overarching safety oversight, safety management or accident investigation function. For example, a primary safety function would be directly related to the issuance or maintaining of a certificate, license or approvals issued to service providers, individuals or products. A secondary safety function would be related to either specific approvals in the frame of a higher level approval / primary function (e.g. EDT0 versus
AOC) or correspond to specific areas of expertise that are needed in the frame of a higher level approval/primary function

(State specific) Safety management function: those are functions required under Annex 19 which are neither oversight functions nor accident investigation functions. They include, for example, collection and analysis of safety information, hazard identification and safety risk assessment, State safety performance, and safety promotion.

Safety management system (SMS): A systematic approach to managing safety, including the necessary organizational structures, accountability, responsibilities, policies and procedures.

Safety oversight: A function performed by a State to ensure that individuals and organizations performing an aviation activity comply with safety-related national laws and regulations.

Safety Oversight Organization (SOO): An SOO is a State CAA, an RSOO, or any other international, regional or sub-regional aviation safety oversight body that carries out safety functions on behalf of a State or group of States but excludes private organizations.
APPENDIX C: Reference Documents

ICAO Resolution A39-14 on Regional cooperation and assistance to resolve safety deficiencies, establishing priorities and setting measurable targets


ICAO Document 10070 – Manual on the Competencies of Civil Aviation Safety Inspectors

Forum on Regional Safety Oversight Organizations (RSOOs) for Global Aviation Safety, 22-24 March 2017, Ezulwini, Swaziland – Report

Global strategy and action plan for the improvement of Regional Safety Oversight Organizations (RSOOs) and the establishment of global system for the provision of safety oversight - ICAO

Report on the ICAO evaluation of Regional Safety Oversight Organizations, November 2017


GASOS – List of Functions – Draft June 2018
APPENDIX D: GASOS Process Charts

GASOS Initial Recognition and Changes to the Scope of Recognition of a Safety Oversight Organisation (SOO)

<table>
<thead>
<tr>
<th>Safety Oversight Organisation (SOO)</th>
<th>ICAO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application for GASOS Recognition or Change to Scope of Recognition</td>
<td>Application review and preliminary assessment</td>
</tr>
<tr>
<td>Inform SOO decision &amp; reasons</td>
<td>Review satisfactory?</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Complete and submit self-assessment</td>
<td>Send SOO self-assessment</td>
</tr>
<tr>
<td></td>
<td>On-site assessment planning and preparation</td>
</tr>
<tr>
<td></td>
<td>Conduct on-site assessment</td>
</tr>
<tr>
<td></td>
<td>Assessment Report</td>
</tr>
<tr>
<td>Corrective Action Plan Management</td>
<td>Assessment satisfactory?</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Issue or Update GASOS Recognition Certificate</td>
<td>Update GASOS Directory</td>
</tr>
</tbody>
</table>
## APPENDIX E: Governance Matrix

<table>
<thead>
<tr>
<th>No.</th>
<th>Issue Description</th>
<th>Solutions</th>
</tr>
</thead>
</table>
| 1   | WP/078 3.1: State to dedicate resources and expertise to ensure the SOO is adequately performing its functions as formalised in the delegation instrument.  
WP/078 3.2: Further work should be undertaken to develop arrangements to support smaller States to satisfy themselves regarding the performance of a SOO, such as expert assistance from larger States or ICAO. | It is the responsibility of the State to monitor and oversee outsourced functions and activities to a SOO/AIO.  
Options for States with difficulties for managing the monitoring and oversight include but are not limited to:  
• peer monitoring provided by Member States,  
• development of performance indicators by Member States for monitoring of the SOO/AIO;  
• participate in training (i.e. TRAINAIR Plus); and  
• request assistance from TCB, ICAO Regional Offices, States or regional partnership mechanisms.  
ICAO will collect and publish information from States on best practices, including from the above list, for monitoring RSOOs. This information will be contained on ICAO websites, guidance material (Doc. 9734 B, Chp. 6, GASP Roadmap) and the GASOS Manual.  
SOOs/AIOs should be transparent and provide to States how they comply with 9734 B (i.e. 6.1).  
ICAO to review and consider to be included in GEN protocol questions (i.e. how do you share information with your member States on how you comply with 9734 B?)  
ICAO will request RSOOs through the RSOO CP to share examples or best practices (i.e. a survey to RSOOs) of performance indicators. Alternatively, a separate survey can be sent to States to request similar information but from the State perspective. |
<p>| 2   | WP/078 3.3: Under GASOS, a State will receive a Universal Safety Oversight Audit Programme (USOAP) credit for the functions delegated to a recognised SOO. However, there is little detail about whether non-compliance by a SOO will impact upon a State’s USOAP score. | It has been determined that States will not receive USOAP credit for a GASOS assessment. |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Issue Description</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>WP/078 3.4: <em>ICAO should provide guidance and measures to assist States to move efficiently and effectively to another SOO. Measures to preserve a State’s USOAP score in these circumstances should also be considered, such as providing an appropriate time period of grace to allow for a State to transition to an alternate SOO.</em></td>
<td>The choice of using, choosing or creating an SOO is the decision of the State. States are ultimately responsible for their safety oversight responsibilities. Furthermore, as GASOS has been re-scoped to only include RSOOs, RAIOs and their member States, this point is no longer relevant. Please see item 2 above and 4 below about the USOAP credit.</td>
</tr>
<tr>
<td>4</td>
<td>WP/078 3.5: <em>The ability to manage potential conflicts of interest within an organisation that is being held accountable for the USOAP scores of their client States, but also in those SOOs that are conducting technical or certification functions also should be given further consideration. It will be necessary to develop measures and guidance material to assess governance arrangements of SOOs on their ability to manage and prevent any potential conflicts of interests.</em></td>
<td>The issue of USOAP credit has been removed from the GASOS programme, making this moot. The manual will provide examples on how States may contract with SOOs/AIOs. Please refer to the ICAO legal analysis of GASOS regarding conflict of interest.</td>
</tr>
</tbody>
</table>
| 5   | Management of disputes between State’s and SOOs/AIOs and WP/124: One could also foresee that ICAO might find itself accountable for the performance of any organization they have recognized, which may become problematic if there are issues between the SOO and the State. This means there must be a continuous exchange of data related to the effectiveness of the GASOS recognized organization, and any safety concerns that may arise, so that immediate action can be taken to suspend activities. This includes information from other States who are using the same SOO or are impacted by their work. It is not clear how ICAO will leverage the data it needs in this regard. | Under the GASOS programme, a mechanism is being established for a continuous monitoring process, which includes direct feedback from member States, as well as the SOO/AIO. ICAO may decide to reassess, limit, suspend or revoke the recognition of an SOO/AIO for the following reasons:  
- Where serious deficiencies are found in the capability demonstration of the SOO/AIO; and  
- Where findings have been identified during monitoring or re-assessment of the SOO/AIO and the findings are not corrected within the specified timeframes of the CAP. |
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APPENDIX G: Cost Benefit Analysis

GLOBAL AVIATION SAFETY OVERSIGHT SYSTEM (GASOS)

COST-BENEFIT ANALYSIS

12 September 2019
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1. Executive Summary

1.1 The responsibility for aviation safety oversight lies with States under the provisions of the Chicago Convention. Some States however are currently not able to fulfill all their aviation safety oversight obligations adequately. As a result, ICAO has encouraged States to come together on regional levels through Regional Safety Oversight Organizations (RSOOs) including Cooperative Development of Operational Safety and Continuing Airworthiness Programme (COSCAPs) to pool their limited resources in order to implement their safety oversight more effectively.

1.2 For over a decade, ICAO has been providing support and guidance to the establishment and strengthening of RSOOs. However, even with the establishment of RSOOs and COSCAPs, States still have difficulty implementing their safety oversight responsibilities. As a result, in order to provide assistance to RSOOs and their member States, ICAO has proposed to establish the Global Aviation Safety Oversight System (GASOS). GASOS is a voluntary, standardized assessment and recognition mechanism for safety oversight organizations (SOOs) and accident investigation organizations (AIOs) that facilitates the provision of safety functions and activities and ultimately strengthens State safety oversight capabilities. GASOS will strengthen a State’s safety oversight, safety management and accident investigation capabilities by facilitating the provision of safety functions and activities, where needed, for States by capable and qualified SOOs and AIOs.

1.3 The 13th Air Navigation Conference held in October 2018, in Montreal, Canada, noted the need to conduct a Cost-Benefit Analysis (CBA) of GASOS before presenting GASOS at the 40th ICAO Assembly in 2019. Thus, the purpose of this document is to provide information on the results of the CBA undertaken to identify and quantify the costs and benefits for SOOs and States.

1.4 The CBA has confirmed positive results for States being members of a regional safety oversight organization capable to provide certain safety functions and activities. From the data herein, there is a positive benefit/cost ratio of between 2.0 to 3.29 depending on different SOOs, therefore showing the viability and positive benefit of the relationship. Furthermore, with the completion of a successful GASOS assessment, States may expand their activities with the SOO, further strengthening their safety oversight capability and ultimately improving their Effective Implementation (EI) level. With the increase of EI, it is envisioned that air traffic volume will increase with a positive impact on Gross Domestic Product (GDP).

1.5 Further to the 5th meeting of the GASOS Study Group (SG) held 2-4 July 2019, the SG members acknowledged the difficulty of building a CBA due to the limited data available. It was agreed that ICAO would work with RSOOs to gather data and information regarding costs and benefits as the GASOS programme moves forward. ICAO will request RSOOs to share any information and costs associated with their preparations and participation in GASOS. This information will then be used to update the CBA as required.

---

6 Definition of SOO from A/40 WP on GASOS: An SOO is an RSOO or any other intergovernmental regional or sub-regional aviation safety oversight body that supports a State or group of States in carrying out their safety functions and activities.

7 ATB study (1% increase in EI → 0.18% increase in air traffic → GDP increase)
2. **Background**

2.1 After nearly two decades of USOAP assessments, many States continue to struggle to comply with international aviation safety standards because they lack the required resources and technical capacity. To address this issue, ICAO has promoted regional collaborative mechanisms, including the establishment of RSOOs which—although varied in terms of structure, level of integration, and/or delegation of authority—essentially pool the efforts of their individual members into a regional entity. RSOOs can be an effective mechanism for enhancing safety and strengthening the safety oversight capabilities of their member States. Despite the actions taken and the assistance provided to resolve the deficiencies identified through such regional organizations, many States are still unable to comply with ICAO SARPs.

2.2 Recommendation 3/1 of the Second High-Level Safety Conference and Assembly Resolution A39-14 encourage the strengthening and furtherance of regional aviation safety, and safety oversight mechanisms, including RSOOs. As a result, to further support and assist States in meeting their safety oversight functions, ICAO has developed the Global Aviation Safety Oversight System (GASOS).

2.3 Since March 2017, ICAO has been developing GASOS with the goal of launching the system in early 2020. ICAO, along with the GASOS Study Group of Experts, composed of members from States and other stakeholders, has completed the planning work and documented the necessary processes and procedures to meet this goal. Furthermore, ICAO has conducted one pilot assessment of a State CAA and three RSOOs, which have been instrumental for testing and enhancing the GASOS assessment mechanisms.

2.4 To further support the work and promote the feasibility of GASOS, ICAO completed two surveys (April 2018 and November 2018). The target audience of the first survey was limited to 33 organizations comprised of RSOOs, GASOS Study Group Members and other potential GASOS stakeholders. Fifteen organizations (7 RSOOs, 6 CAAs, and 2 international organizations/stakeholders) responded to the first survey and the results showed that 89% of respondents would be interested in being assessed under GASOS and 100% of respondents perceived value in being part of the GASOS programme. The second survey had a larger and more diverse audience and was answered by 64 organizations, including 46 State CAAs, eight RSOOs and ten AIOs. The results of the survey demonstrated support for GASOS: 67% responded that they would be interested in being assessed and recognized under GASOS; 38% responded that they would be ready for recognition at the launch of GASOS in early 2020; and 46% of respondent States indicated that they would be willing to delegate safety functions to ICAO recognized SOOs or AIOs. As a result of the two surveys, ICAO received feedback from 11 out of the 15 regional safety oversight organizations (RSOOs and COSCAPs) showing positive support for GASOS, including their participation in the GASOS programme.

2.5 Taking into consideration that presently there are 15 regional safety oversight organizations (including RSOOs and COSCAPs) globally, regional safety oversight organizations are working with approximately 160 ICAO Member States to assist them effectively implement their safety
oversight responsibilities. However, these organizations and States are still facing challenges. This is evident as the average global EI rate remains at approximately 68%. The below tables provide the EI average regionally and per RSOO.

<table>
<thead>
<tr>
<th>Regions</th>
<th>Average of EI</th>
</tr>
</thead>
<tbody>
<tr>
<td>WACAF</td>
<td>54.06%</td>
</tr>
<tr>
<td>ESAF</td>
<td>52.86%</td>
</tr>
<tr>
<td>APAC</td>
<td>63.51%</td>
</tr>
<tr>
<td>NACC</td>
<td>71.7%</td>
</tr>
<tr>
<td>MID</td>
<td>75.23%</td>
</tr>
<tr>
<td>EUR/NAT</td>
<td>77.16%</td>
</tr>
<tr>
<td>SAM</td>
<td>79.93%</td>
</tr>
<tr>
<td><strong>Global Average EI</strong></td>
<td><strong>68.22%</strong></td>
</tr>
<tr>
<td><strong>Total States</strong></td>
<td><strong>185</strong></td>
</tr>
</tbody>
</table>

*Table 1: USOAP Safety EI Score in ICAO Regions (June 2019)*

<table>
<thead>
<tr>
<th>RSOO</th>
<th>Average EI 2009</th>
<th>Average EI 2019</th>
<th>Increase (pp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAMAC</td>
<td>31.86%</td>
<td>55.10%</td>
<td>23.24</td>
</tr>
<tr>
<td>ACSA</td>
<td>69.87%</td>
<td>86.19%</td>
<td>16.32</td>
</tr>
<tr>
<td>ASSA-AC</td>
<td>18.19%</td>
<td>44.93%</td>
<td>26.74</td>
</tr>
<tr>
<td>BAGASOO</td>
<td>53.40%</td>
<td>49.93%</td>
<td>-3.47</td>
</tr>
<tr>
<td>CASSOA</td>
<td>48.11%</td>
<td>61.14%</td>
<td>13.03</td>
</tr>
<tr>
<td>CASSOS</td>
<td>51.28%</td>
<td>56.76%</td>
<td>5.48</td>
</tr>
<tr>
<td>COSCAP-NA</td>
<td>87.65%</td>
<td>88.33%</td>
<td>0.68</td>
</tr>
<tr>
<td>COSCAP-SA</td>
<td>47.36%</td>
<td>72.91%</td>
<td>25.55</td>
</tr>
<tr>
<td>COSCAP-SEA</td>
<td>65.37%</td>
<td>67.00%</td>
<td>1.63</td>
</tr>
<tr>
<td>COSCAP-UEMOA</td>
<td>38.77%</td>
<td>64.66%</td>
<td>25.89</td>
</tr>
<tr>
<td>EASA</td>
<td>77.51%</td>
<td>83.02%</td>
<td>5.51</td>
</tr>
<tr>
<td>IAC</td>
<td>68.95%</td>
<td>66.89%</td>
<td>-2.06</td>
</tr>
<tr>
<td>iSASO</td>
<td>37.64%</td>
<td>56.95%</td>
<td>19.31</td>
</tr>
<tr>
<td>PASO</td>
<td>53.38%</td>
<td>50.13%</td>
<td>-3.25</td>
</tr>
<tr>
<td>SRVSOP</td>
<td>71.60%</td>
<td>83.40%</td>
<td>11.80</td>
</tr>
<tr>
<td><strong>Benchmark:</strong></td>
<td><strong>World</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Average EI</strong></td>
<td><strong>59.25%</strong></td>
<td><strong>68.22%</strong></td>
<td><strong>8.97</strong></td>
</tr>
</tbody>
</table>

*Table 2: Shows the evolution of average EI of States, members of RSOOs and COSCAPs between 2009 and 2019, compared with the corresponding figures for all ICAO States (world benchmark). (source: iSTARS June 2019)*

2.6 ICAO has developed GASOS as a tool to assess, recognize, and monitor the qualifications and capabilities of SOOs/AIOs (RSOOs and RAIOs) to perform certain safety functions, as defined in the GASOS scope of recognition (safety functions and levels). As a result, ICAO will publish and maintain a directory of SOOs/AIOs that have successfully completed a GASOS assessment, including their scope of recognition (safety functions and activities) for use by their
member States who may wish to request the provision of additional functions and activities from that GASOs recognized SOO/AIO.

2.7 The main objective of GASOS is to strengthen State safety oversight, accident and incident investigation and safety management capabilities by:

a) assessing existing SOOs and AIOs to make them more effective and efficient in supporting States; and

b) facilitating the provision of safety functions and activities, where needed, for States by capable and qualified SOOs and AIOs.

2.8 The expected benefits of GASOS include:

a) increased safety oversight capabilities for States by facilitating the provision of safety functions and activities, where appropriate, by recognized SOOs and AIOs;

b) the empowerment and strengthening of RSOOs and other existing regional mechanisms in effectively carrying out safety functions and activities; and

c) increased overall safety performance resulting from improved safety oversight and safety management capabilities on a global scale.

3. Introduction

3.1 Problem statement

3.1.1 Under the provisions of the Chicago Convention and its annexes, States have extensive safety oversight responsibilities. Today many States already rely on regional organizations, such as RSOOs and Regional Accident and Incident Investigation Organizations (RAIOs) to perform certain safety functions and activities.

3.1.2 Through the efforts and collaborative work of States, industry, international organizations and other stakeholders, the global aviation accident rate in recent years has remained low and stable. However, the aviation industry is changing and becoming more complex; new technologies are emerging and air traffic is forecast to double over the next fifteen years. Some States are not able to fulfil all their aviation safety oversight obligations effectively. The gap between the insufficient development of State safety oversight capabilities and the constant evolution of the industry will increase and may negatively impact aviation safety. States need effective, reliable and flexible alternatives to develop capacity for all safety functions in order to close this gap.
3.1.3 Whereas it is expected that RSOOs, RAIOs and other regional or sub-regional organizations would provide tangible improvements, many of them face specific challenges that do not enable them to deliver the expected results. The strengthening of safety oversight capability can be achieved through GASOS by facilitating the provision of safety functions and activities to capable and qualified SOOs and also by reinforcing existing SOOs/AIOs. This can be achieved by conducting objective and standardized assessments to determine if an SOO/AIO is qualified to carry out these functions or activities. GASOS may increase confidence of States to call upon these qualified SOOs/AIOs to perform specific safety functions and activities.

4. Objective

4.1 In response to recommendation 6.1.3/1 of the AN-Conf/13, ICAO has undertaken this CBA in order to evaluate the costs and benefits for SOOs to participate in GASOS. In order to complete this CBA, it was necessary to determine a GASOS assessment and recognition fee schedule to use as an example of costs for an SOO to participate in the GASOS assessment process. Furthermore, as GASOS is not currently being implemented, it was necessary to make various assumptions, which are noted below in 6.1. As the GASOS programme is implemented, ICAO will request RSOOs and States to provide additional information and data in order to update the CBA, as required.

5. Base case (do-nothing option)

5.1 The base case scenario is that, in the absence of GASOS recognition of SOOs by ICAO, it would be necessary for either the member States to maintain or increase the necessary resources in order to implement their safety oversight obligations on their own in a context of traffic growth and new technological challenges or try to achieve the same outcomes using SOOs that are not subject to any objective external evaluation.
6. **Assumptions**

6.1 The assumptions below are considered the baseline criteria in carrying out the cost-benefit analysis.

**Assumption 1:** Information was provided by different regional organizations to show the costs and benefits of implementation by an individual State vs. regional cooperative activities.

**Assumption 2:** Accident and Incident Investigation Organizations (AIOs), including Regional Accident and Incident Investigation Organizations (RAIOs) are also to be assessed and recognized under GASOS, however, no data was made available with regard to their costs and benefits. It is assumed that RAIOs will achieve the same economies of scale as in the case of RSOOs by pooling very specialized resources. Therefore, only SOOs will be mentioned further in this document; certain benefits will nevertheless be applicable also to AIOs.

**Assumption 3:** In the absence of an SOO, a member State would have to achieve the same outcomes on their own or from the open market. Thus, the benefit for States amounts to the savings that the SOO provides each member State for performing a defined set of functions or activities in order to meet safety oversight requirements.

**Assumption 4:** By using a GASOS assessed and recognized SOO, it is expected that member States’ effective implementation will increase in the areas where the SOO has successfully completed a GASOS assessment. Furthermore, it may also lead to the growth of air traffic volume and bring economic benefit, including more job opportunities.

**Assumption 5:** Known and quantifiable benefits of regional cooperation in the form of existing COSCAPs and/or RSOOs (now referred to as SOOs) already exist, such as the sharing of technical experts, harmonization of regulations, etc. 8).

**Assumption 6:** GASOS assessments, recognition and continuous monitoring will strengthen the capability of SOOs, which may encourage member States to request additional safety functions to be performed by the SOOs.

**Assumption 7:** GASOS ‘market base’ for the initial phase is limited to 15 existing SOOs.

7. **Data Background and Analytical Approach of existing Soos (rsoos/coscaps)**

7.1 Benefit Cost Ratio (BCR) is an indicator used in a cost-benefit analysis that attempts to summarize the overall value for money of a project. A BCR takes into account the amount of

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monetary gain realized by performing a project versus the amount it costs to execute the project. The higher the BCR, the better the investment. The general rule is that if the benefit is higher than the cost the project, it is a good investment.

7.2 As mentioned above, the results of a CBA can be represented by the BCR as an indicator of a project’s worth. If the BCR>1.0, it means the benefits exceed the costs, and the project should be allowed to proceed, vice versa, when BCR=1.0, the project may proceed, but with little viability. It also means the higher the BCR, the more worthwhile the project.

7.3 There is currently no data to show the costs and benefits to States and SOOs in regards to GASOS, as the GASOS programme is not currently in place. Therefore in order to determine a baseline of costs and benefits of SOOs, ICAO has collected data from 2 existing SOOs (SRVSOP and COSCAP-SA). This data shows the costs for States to implement their safety oversight obligations on their own, as well as under an SOO. The difference between the two is the net benefit of the SOO. From that baseline, further assumptions were made regarding the impact of the GASOS programme on States and SOOs, including the link between increase in EI, which may lead to increase in traffic, as well as GDP. Further information regarding this can be found at 9.3.

7.4 The cost-benefit analysis was based on existing studies regarding the costs and benefits of States as members of an SOO. It is assumed that with GASOS, the benefits will be further amplified for States. Additionally, as it is difficult to quantify some aviation benefits (i.e. political will, trust, harmonization and standardization of laws and regulations) the CBA is further supported with a cost-effectiveness analysis (CEA) for GASOS.

7.5 Existing or estimated benefits of SOOs for States

7.5.1 The following case studies are based on information provided by SRVSOP and COSCAP-SA (2018). Additional information was considered taking into consideration reports on EASA (2015, 2016), as well as State information provided by Costa Rica. The ultimate result of these case studies and the additional information shows that there are significant benefits for States to join SOOs.

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9 SRVSOP, Latin American Regional Safety Oversight Cooperation System, was formed by 12 Member States: Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, Ecuador, Panama, Paraguay, Peru, Uruguay, and Venezuela.
10 COSCAP-SA, Cooperative Development of Operational Safety and Continuing Airworthiness Programme, was formed by 7 Member States: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka.
11 When benefits cannot be expressed in monetary values in a meaningful way, a cost-effectiveness analysis (CEA) should be carried out to assist in making effective decisions. A CEA calculates cost-effectiveness ratios of different alternative policy options and then compares the resulting ratios so that the most efficient option is chosen. In a sense, a CEA ensures technical efficiency in the process of achieving a desired outcome. Source: Government of Canada https://www.tbs-sct.gc.ca/trap-parfA/analys/analys-eng.pdf
13 Feasibility Study Examining the Case for COSCAP-SA’s Development into a Regional Safety Oversight Organisation (RSO).
7.6 Case Study of SRVSOP

7.6.1 In 2009, SRVSOP completed a CBA of the services provided to its member States from 2001 to 2008. The purpose of the analysis was to advise the CAAs of the benefits of belonging to a regional organization. The quantitative results of the analysis revealed savings for member States during this period of US$13.7 million dollars.

7.6.2 Due to the level of success of working on a regional level, in 2015 it was agreed to incorporate new sets of regulations in the areas of Aerodromes and Ground Aids (AGA), Air Navigation Services (ANS) and Dangerous Goods. By increasing the scope of work under SRVSOP, it was envisioned that there would be an increase in the development of air transport in the region. Therefore, the 2009 CBA report was updated in 2015 in order to present the benefits brought by the increased scope of activity, as well as to justify the increase of State contributions to SRVSOP.

7.6.3 According to the summary of the SRVSOP CBA report (2001-2015), without SRVSOP, its member States would have had to achieve the same result on their own or through the utilization of services on the market. For example, if the SRVSOP did not provide technical assistance or training events, the alternative for States would have been to obtain it in the open market or to develop it at their own cost. The difference between the market price and the State contribution to SRVSOP amounts to the benefit of each product.

7.6.4 The report shows that the benefit obtained from the use of SRVSOP over a period of 15 years between 2001 and 2015 is over USD $35 million; resulting in the benefit-cost ratio of 3.24 (see Appendix 2, Table 1). As the benefit-cost ratio is greater than 1, this demonstrates that the project is viable and cost effective, therefore it is worth proceeding. It is important to note that this analysis does not consider new products that are currently being provided by SRVSOP, such as the Ramp Safety Inspections Data Exchange Program (IDISR), the dangerous goods programme and the certification of training centers. As a result, the benefits that have been quantified above are undervalued.

7.6.5 Additionally, the costs and benefits data reported to ICAO by SRVSOP has been used in the ICAO Cost Benefit Application that has been developed by the Air Transport Bureau (ATB). The results of the application (Appendix 3 refers) indicates that the net benefits from the SRVSOP for the period between 2020 and 2034 at present value (NPV) are estimated at USD $11,681,673, which translates to an average net benefit of USD $970,000 for each SRVSOP Member State. The internal rate of return for the project is estimated at 48% which is a significant spread from the discount rate of 9%. The spread indicates that even if the benefits, as reported to ICAO by the SRVSOP are taken at a more conservative levels, the net present value (NPV) will continue to be positive (see Appendix 3).
7.6.6 The below table provides additional information for SRVSOP regarding the costs and benefits as undertaken without a project (situation in which States must individually develop or purchase services in the market), versus with a project (services provided by SRVSOP)\(^\text{15}\).

<table>
<thead>
<tr>
<th>WITHOUT A PROJECT</th>
<th>WITH A PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training: The State must cover the following relevant costs per person:</td>
<td>Training: Consider as a State cost the cost of the time spent by the person in the training course.</td>
</tr>
<tr>
<td>- Daily per diem cost</td>
<td></td>
</tr>
<tr>
<td>- Daily course cost</td>
<td></td>
</tr>
<tr>
<td>Assistance to the States: The State must cover the professional fees of the international experts, amounting to USD $6,500 per expert, per week. (Approximate reference value of ICAO TCB).</td>
<td>Assistance to the States: Consider the cost of the assistance provided by the System’s experts.</td>
</tr>
<tr>
<td>Production of LARs: Each State must cover the relevant cost of having a team of professionals and of the equipment, systems and infrastructure, which has been valued at an average of USD $ 60,000 per LAR for a 5-year period.</td>
<td>Production of LARs: Consider the cost of the assistance of System experts, the preparation of the documentation and the general expenses involved in attending meetings, panels and courses.</td>
</tr>
<tr>
<td>Certification of AMOs: Each State must commission at least two airworthiness inspectors to certify each maintenance shop in each country, with a commission cost per MO.</td>
<td>Certification of AMOs: Consider the cost of the activities involved in the certification and oversight of maintenance organizations.</td>
</tr>
</tbody>
</table>

7.6.7 The report\(^\text{16}\) concludes by noting the following:

- Since its creation, SRVSOP has produced sizeable savings in costs for its member States;
- Training, assistance to the States, multinational activities, implementation, seminars and other activities that without the System would not have been performed or whose cost would have been prohibitive for most of the States, continue to be performed; and
- The roster of top-level aeronautical professionals with training and experience standardized at the regional level continues to grow.

7.7 Case Study of COSCAP-SA

7.7.1 The purpose of the CBA that was conducted on behalf of COSCAP-SA was to assist decision-makers by providing them with information regarding the benefits of sharing resources and achieving economies of scale in areas where individual member States require assistance. The basic assumption was that in the absence of the COSCAP, the member States would have to achieve the same outcomes on their own or through obtaining services from the market. The report noted that total contributions of the member States during Phase I and II (1999-2008) amounted to USD $1.6 million, whereas it was estimated that they received USD $6.7 million in measurable savings. The overall net benefit for Phases I and II amounts to USD $5.1 million, which means the general benefit/cost ratio is 4.32. More specific information regarding the costs


\(^{16}\) Report on the Update to the Cost-Benefit Analysis of the Regional Safety Oversight Cooperation System (2015), page 6
for each member State for specific services versus their contributions to COSCAP-SA and the overall cost benefit ratio can be found in Appendix 2, Table 2.

7.7.2 The report further notes that with the continued development of COSCAP-SA, the benefits to its member States in phase IV (2018) amounted to USD $1.44 million with the total contributions of USD $0.71 million, the benefit/cost ratio thus resulting in 2.0. This means that the member States in COSCAP-SA were able to save twice the amount of the contributions. The report goes on to further note that there are services/activities that are not possible to put a reasonable monetary valuation on, as a result, the “qualitative benefits” are of far greater value. The table below provides additional information on these qualitative benefits.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Savings for COSCAP-SA</th>
<th>Qualitative Valuation</th>
</tr>
</thead>
</table>
| Meetings, conferences and documentation      | Not measurable         | • Opportunity for aviation leaders to share common concerns, pursue common solutions and share resources  
                                             |                         | • COSCAP-SA developed and maintains manuals and guidance material for the member States       |
| Courses, Seminars and Workshops              | USD $1 million         | • COSCAP-SA provides training to its member States                                       |
| Audit Training and Preparations              | USD $90,000            | • Some States are already above the global average, but not all states have achieved this. |
| Technical Assistance                         | USD $350,000           | • Difficult to directly measure the benefits, but can be counted in terms of improved career opportunities and the foundation for building even stronger regional cooperative programmes |

7.8 Additional Information from EASA Report

7.8.1 The benefits of EASA and a common European aviation safety system were identified in a 2015 study by ECORYS and are as follows:

- Safety benefit due to increased safety standards:
- Industry gain and promotion of the common market due to centralization of certification:
- Efficiency gain due to centralization of certification: and
- Simplified regulatory process.

7.8.2 The report found that even though it was necessary to make revisions to the European aviation safety regulatory system and to increase the associated budgets for implementation

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17 Information derived from Feasibility Study Examining the Case for COSCAP-SA’s Development into a Regional Safety Oversight Organisation (RSOO), page 104

purposes, the benefits for member States, industry and passengers significantly outweighed the costs.

7.8.3 This was further quantified in an assessment of the cost that would be borne if EASA had not existed:

<table>
<thead>
<tr>
<th>Scenario 1: common regulatory framework, no EASA</th>
<th>Scenario 2: no common regulatory framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>The NAAs in three countries (DE, FR, UK) would probably take on most of the EASA tasks and would need to expand their capacity. We have assumed that there would be a 10% increase in net costs compared with the current EASA costs.</td>
<td>Instead of the current cost to industry of EUR 91 million for EASA certification and other services (2015), the cost could increase threefold to at least EUR 300 million to the aviation industry if it was necessary to certify products via at least three NAAs.</td>
</tr>
</tbody>
</table>


7.9 Additional information provided by Costa Rica in respect of ACSA

7.9.1 Even though ICAO was not provided with a full study of the costs and benefits to member States of ACSA, the DGAC of Costa Rica provided an example of the costs and benefits they have experienced under ACSA. In 2018, the DGAC requested specific assistance from ACSA that resulted in a total cost of USD $26,667 (plus ACSA membership and travel expenses for technical experts). The DGAC advised that the estimated costs of the activities that would have been purchased on the open market if there was no ACSA was USD $2,000,000.

7.9.2 These figures lead to a calculation of an extremely high benefit/cost ratio, therefore they have been taken with caution. Nevertheless, the case of DGAC Costa Rica and ACSA provides a good case of a State belonging to an RSOO having a perception of a very high return on investment.

8. Costs to SOOs for GASOS recognition

8.1 The above-mentioned cases show the benefit/cost ratio of the SOOs within the range of 2.0 (*COSCAP-SA for Phase IV*) and 3.29 (*EASA*). Using this as a baseline, it is necessary to take into consideration costs for ICAO to conduct the assessments and monitoring of SOOs. As a result, it is necessary for ICAO to charge fees in order to recover costs for the service of conducting an assessment of an SOO and the subsequent work related to GASOS recognition and monitoring. An SOO that requests a GASOS assessment will be responsible for such fees and are the major costs to be considered as part of the CBA.

8.2 Taking into consideration that ICAO operates other cost-recovery programmes with similar recognition and assessment processes (i.e. TRAINAIR PLUS (training centres), Aviation English Language Test Service (AELTS – aviation English language tests) and currently under development specifically requested USOAP audits/activities, it has been necessary to evaluate and review these programmes in order to develop a fee structure for GASOS. Costs derived from the

initial 3 GASOS pilot assessments of RSOOs, plus a review of other ICAO programmes has resulted in the development of a fee structure to support the GASOS activities.

8.3 The initial fee structure to be established to support GASOS assessment, recognition and continuous monitoring is estimated to have a range of USD $30,000 to USD $50,000 per 3 year cycle, plus travel fees to conduct the assessment. The overall fees will be contingent upon the number of technical areas to be assessed, recognized and monitored. Additionally, the costs to individual member States, if any, will be dependent on several factors, including, but not limited to: the number of member States in the regional safety oversight organization and the financial arrangements for supporting that organization. In general terms, it can be assumed that the range of costs per individual member State could range from USD $3,000 to USD $8,000 plus shared travel expenses per 3 year cycle.

8.4 It is envisioned that as the programme is implemented and evolves, that the fee structure will need to be updated. This initial fee structure though will be used as an estimate in order to measure costs vs. benefits for States.

8.5 Study Group members at the 5th GASOS SG meeting, also noted the need to take into consideration costs borne by the RSOO in their preparations for the conduct of a GASOS assessment, as well as to develop and implement their corrective action plan, if required. As a result, it was recommended that with the launch of GASOS, ICAO considers requesting information from RSOOs regarding any costs that may be required for them to prepare for the assessment, develop and implement the action plan, and the sustainability of their GASOS recognition.

8.6 As a result of the recommendation from the 5th GASOS SG meeting, ICAO approached the RSOOs that received pilot assessments and requested that they consider sharing information regarding any costs associated with their preparations and development and implementation of their action plans. At the time of this revised CBA, ICAO had received preliminary estimates from ACSA regarding costs associated with the development and implementation of their CAP. ACSA has estimated that the required work was 428 hours for a total cost of $17,120 (plus travel and subsistence costs) for the development and implementation of the CAP.

9. Cost-Effectiveness Analysis

9.1 Cost-benefit analysis has a well-established methodology and is used to evaluate infrastructure projects for economic impact. However, CBA has not yet reached the same level of maturity in assessing the benefits and costs of aviation safety oversight projects on the regional and global levels. Some aspects, such as “the benefits of harmonization and standardization of regulations” cannot be measured as a monetary value. In this case, an alternative approach, known as a cost-effectiveness analysis (CEA) should be considered in the decision-making process. Some unmeasurable benefits that can be considered for GASOS are included but not limited to those listed below.
9.2 **Long-run average cost-effectiveness**

9.2.1 SOOs provide a mechanism to allow States to share their technical resources in order to enhance safety oversight in its member States. States with different sized aviation systems, as well as human and financial resources are able to come together on a regional level to utilize technical personnel to support and enhance their oversight capabilities.

9.2.2 GASOS is a standardized tool to assess, recognize, and monitor the qualifications and capabilities of SOOs. The assessment is an objective method of identifying potential findings and observations of the SOOs, which the SOO would need to correct; eventually this will lead to an improvement of the effectiveness of such SOOs. Therefore GASOS will have a multiplier effect on the existing benefits of regional mechanisms. In addition, this will have other non-quantifiable outcomes, such as increased political will which may result in the increase in both human and financial resources in order to further strengthen and enhance the SOOs. Under GASOS, it is envisioned that member States will request the provision of additional tasks and functions from these organizations in order to conduct the necessary safety oversight.

9.3 **Safer and more efficient air transportation**

9.3.1 The regional and global economic benefit is also a very important factor to be considered. Improved member State and SOOs safety oversight ability under the GASOS programme may lead to the increase of USOAP EI of States and may thus trigger the growth of air traffic volume\(^{20}\), which may ultimately result in the increase of GDP and job opportunities in that region.

9.3.2 ICAO has modelled the impacts on the air traffic volume and GDP of a State by improving its EI score (%). The econometric model, projects that for every 1% improvement in the EI score, the air traffic volume expressed in number of departures will increase by 0.18% depending on the level of the State’s EI vis-a-vis the region, its economic maturity and the current contribution of aviation to GDP.

9.4 **Harmonization of regulations and procedures**

9.4.1 Additionally, a significant benefit for SOOs that may be a result of the GASOS programme is the support for the harmonization of the regulations within regions, thus strengthening and improving the capability of an SOO, which is an unmeasurable benefit. After SOOs are recognized by ICAO under the GASOS programme, they can be more active and efficient and will facilitate the harmonization of safety requirements. This will also help to reduce the cost of development of regulations and facilitate compliance by State regulators, air operators, and other players in that region. Additionally, the strengthening of the SOO will stimulate the development of the aviation market in the region by facilitating the provision of services and enabling the mobility of aviation personnel. The value of uniformity of regulations and procedures not only is a key ICAO goal, but also is recognized to improve the regional and global safety oversight ability in the aviation community.

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\(^{20}\) Assumed that 1% of the USOAP EI growth will increase by 0.18% of air traffic volume. Source: ICAO/ATB (2018)
10. Conclusion

10.1 In order to support the request from States at the ANConf/13, ICAO has undertaken a CBA to provide information to States and SOOs regarding the benefits of the ICAO GASOS programme. ICAO conducted a CBA based on data provided by SOOs in order to look at some of the quantifiable benefits. ICAO has further supported the CBA by including information of a CEA (non-quantifiable benefits). There are already existing, quantifiable benefits of cooperation in the form of established SOOs, and it is expected that GASOS will help to enhance and further expand those benefits with a benefit-cost ratio within the range from 2.0 to 3.29. Many of the benefits to be derived from SOOs and GASOS-recognized SOOs is not quantifiable (i.e. political will, harmonization of laws and regulations, etc.), as shown in the cost-effective analysis above, however they may be significant positive outcomes of the programme.

10.2 As shown above in section 8, it will be necessary for SOOs to pay fees in order to be assessed, recognized and monitored under the GASOS programme. These fees will enable ICAO to recover the costs of the GASOS assessment and recognition process. In terms of both quantifiable and unquantifiable benefits, the costs for SOOs in regards to the GASOS programme will be offset and are minimal, taking into account that by default the SOOs will be assessed every 3 years. Therefore the annual cost per Member State is minor. The GASOS programme will enable the strengthening of SOOs, in order to make them more effective and efficient in supporting their Member States. By strengthening SOOs and improving the safety oversight capacity of their Member States, the overall benefits of GASOS will expand beyond States and regions and will ultimately enhance safety oversight on a global level.
APPENDIX 1

6.1 Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACSA</td>
<td>Central American Agency of Aviation Safety</td>
</tr>
<tr>
<td>ANC</td>
<td>Air Navigation Commission</td>
</tr>
<tr>
<td>BCR</td>
<td>Benefit-Cost Ratio</td>
</tr>
<tr>
<td>CAA</td>
<td>Civil Aviation Authority</td>
</tr>
<tr>
<td>CEA</td>
<td>Cost-Effective Analysis</td>
</tr>
<tr>
<td>CBA</td>
<td>Cost-Benefit Analysis</td>
</tr>
<tr>
<td>COSCAP-SA</td>
<td>Cooperative Development of Operational Safety and Continuing Airworthiness Programme- South Asia</td>
</tr>
<tr>
<td>EASA</td>
<td>European Union Aviation Safety Agency</td>
</tr>
<tr>
<td>EI</td>
<td>Effective Implementation</td>
</tr>
<tr>
<td>GASOS</td>
<td>Global Aviation Safety Oversight System</td>
</tr>
<tr>
<td>GASP</td>
<td>Global Aviation Safety Plan</td>
</tr>
<tr>
<td>LAR</td>
<td>Latin American Regulations</td>
</tr>
<tr>
<td>NPV</td>
<td>Net Present Value</td>
</tr>
<tr>
<td>PV</td>
<td>Present Value</td>
</tr>
<tr>
<td>RAIO</td>
<td>Regional Accident and Incident Investigation Organization</td>
</tr>
<tr>
<td>RSOO</td>
<td>Regional Safety Oversight Organization</td>
</tr>
<tr>
<td>SOO</td>
<td>Safety Oversight Organization</td>
</tr>
<tr>
<td>SRVSOP</td>
<td>Latin American Regional Safety Oversight Cooperation System</td>
</tr>
<tr>
<td>TA+OJT</td>
<td>Technical Assistance + On-Job Training</td>
</tr>
<tr>
<td>USOAP CMA</td>
<td>Universal Safety Oversight Audit Program Continuous Monitoring Approach</td>
</tr>
</tbody>
</table>
APPENDIX 2

6.2 Cost-Benefit Analysis Report for States with RSOOS

Cost-Benefit Analysis Report Summary of States for SRVSOP

<table>
<thead>
<tr>
<th>Products</th>
<th>Cost without the SRVSOP</th>
<th>Cost with the SRVSOP</th>
<th>Net Benefit</th>
<th>Net Benefit/Cost Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training</td>
<td>7,027,874</td>
<td>2,604,389</td>
<td>4,423,485</td>
<td>1.70</td>
</tr>
<tr>
<td>Assistance to the States</td>
<td>700,000</td>
<td>369,009</td>
<td>330,991</td>
<td>0.90</td>
</tr>
<tr>
<td>Production of LARs</td>
<td>36,737,333</td>
<td>7,565,212</td>
<td>29,172,121</td>
<td>3.86</td>
</tr>
<tr>
<td>Certification of AMOs</td>
<td>1,967,030</td>
<td>424,120</td>
<td>1,542,900</td>
<td>3.64</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>46,432,237</strong></td>
<td><strong>10,962,730</strong></td>
<td><strong>35,469,497</strong></td>
<td><strong>3.24</strong></td>
</tr>
</tbody>
</table>

Table 1: Summary of CBA in SRVSOP 2001-2015\(^1\) (US Dollars)

Cost-Benefit Analysis Report Summary of States for COSCAP-SA

<table>
<thead>
<tr>
<th>Member State</th>
<th>Benefit</th>
<th>Cost</th>
<th>Net Benefits</th>
<th>Benefit/ Cost Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Training</td>
<td>Manuals</td>
<td>Regulations</td>
<td>TA+OJT</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>416.5</td>
<td>150.0</td>
<td>48.0</td>
<td>58.8</td>
</tr>
<tr>
<td>Bhutan</td>
<td>161.3</td>
<td>150.0</td>
<td>48.0</td>
<td>32.2</td>
</tr>
<tr>
<td>India</td>
<td>1709.8</td>
<td>150.0</td>
<td>48.0</td>
<td>80.0</td>
</tr>
<tr>
<td>Maldives</td>
<td>355.1</td>
<td>150.0</td>
<td>48.0</td>
<td>71.7</td>
</tr>
<tr>
<td>Nepal</td>
<td>796.0</td>
<td>150.0</td>
<td>48.0</td>
<td>77.6</td>
</tr>
<tr>
<td>Pakistan</td>
<td>895.7</td>
<td>150.0</td>
<td>48.0</td>
<td>40.8</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>486.9</td>
<td>150.0</td>
<td>48.0</td>
<td>140.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4821.3</td>
<td>1050.0</td>
<td>336.0</td>
<td>501.5</td>
</tr>
</tbody>
</table>

Table 2: Summary of CBA in COSCAP-SA to Nov 2008\(^2\) (Thousands of US Dollars)

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\(^1\) Source: Report on the update to the cost-benefit analysis of the regional safety oversight cooperation system, page 5.

\(^2\) Source: Feasibility Study Examining the Case for COSCAP-SA’s Development into a Regional Safety Oversight Organisation (RSOO), Page 93
APPENDIX 3

6.3 Cost-Benefit Analysis Report for SRVSOP

Above information provided as a result of ATB CBA Tool (June 2019)

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