 <p>SOUTH AFRICAN CIVIL AVIATION AUTHORITY</p>	<p>REPUBLIC OF SOUTH AFRICA CIVIL AVIATION AUTHORITY</p>	<p>SACAA Private Bag X 73 Halfway House 1685</p>
<p>Tel: (011) 545-1000 Fax: (011) 545-1466 E-Mail: mail@caa.co.za</p>	<p>GENERAL NOTICE # AEP-2017/001</p>	<p>Issue date: 02 August 2017</p>

GENERAL NOTICE TO AIR TRANSPORT OPERATORS ENGAGED IN INTERNATIONAL OPERATIONS (AVIATION ENVIRONMENTAL PROTECTION)

ICAO CARBON OFFSETTING AND REDUCTION SCHEME FOR INTERNATIONAL AVIATION (CORSA)

1. Applicability

This General Notice is applicable to all air transport operators engaged in international operations.

2. Purpose of this General Notice

This General Notice aims to share information with the air transport operators engaged in international aviation on the Carbon Offsetting and Reduction Scheme for International Aviation (CORSA). The notice outlines the CORSA:

- design elements;
- implementation aspects;
- work being done on the development of Standards and Recommended Practices (SARPs); and guidance material for its implementation.

3. Regulatory Reference

- *To be updated- ICAO SARPs on CORSA will be finalized by mid-2018.*

4. CORSA overview

4.1. History behind the development of a global Market Based Measure (MBM)

At the 38th Session (A38) of the International Civil Aviation Organisation (ICAO) Assembly in 2013, it was unanimously decided that a global MBM must be developed for international aviation (Resolution A38-18, paragraph 18). The ICAO Council was asked to make a recommendation on a global MBM scheme that would address key design elements and the mechanisms for its implementation from 2020. The results of the work on the MBM scheme were to be reported for decision at the 39th Session of the ICAO Assembly (A39).

Prior to the A39, the ICAO Committee on Aviation Environmental Protection (CAEP) undertook a range of seminars and workshops on the global MBM. The CAEP Global MBM Technical Task Force (GMTF) Work Group held eight meetings on the design elements of the global MBM. The

Council also established an Environmental Advisory Group (EAG) that conducted 15 meetings between March 2014 and January 2016. A historic agreement was reached during the ICAO 39th Assembly in October 2016 on the CORSIA and Resolution A39-3¹ was adopted.

4.2. What is the CORSIA?



Source: ICAO

- The first global MBM scheme for any industry sector;
- One element of the 4 basket of measures to achieve ICAO’s global aspirational goal of Carbon Neutral Growth from 2020 (CNG 2020); and
- One of the measures to be included in States’ Action Plans on how they will limit or reduce Carbon Dioxide (CO₂) emissions.

Table 1: Facts about CORSIA

5. Key design features of the CORSIA

5.1. Phased implementation

The implementation will be in 3 phases as follows:

- Pilot Phase- 2021-2023;
- 1st Phase- 2024-2026; and
- 2nd Phase 2027-2035.

Participation in the Pilot and 1 st phases is voluntary.	
Participation in the 2 nd phase is compulsory for all States:	
i. With an individual share of international activities in RTK ² s in the year 2018 above 0.5% of total RTKs; and	
ii. That are part of the list of States that account for 90% of total RTKs when sorted from the highest to the lowest amount of individual RTKs.	
<p>Inclusions</p> <ul style="list-style-type: none"> • For the 2nd phase, all States with an individual share of international aviation activities in year 2018 above 0.5% of total activities or whose cumulative share reaches 90% of total activities, are included. 	<p>Exemptions</p> <ul style="list-style-type: none"> • Least Developed Countries (LDCs); • Small Islands Developing States (SIDS); and • Landlocked Developing Countries (LLDCs). <p><i>Note: a list of these States can be found at http://unohrls.org/. These exempted States are also encouraged to voluntarily participate in the CORSIA.</i></p>

Table 2: Phased implementation

As of 29 June 2017, 71 States had volunteered to participate in the CORSIA from its outset. African States that have volunteered are Burkina Faso, Gabon, Kenya, Nigeria and Zambia. The Republic of South Africa (RSA) currently has an RTK of 0.53% thus it will participate in the CORSIA in 2027 during the 2nd phase.

¹ Resolution A39-3: Consolidated statement of continuing ICAO policies and practices related to environmental protection- Global Market-based Measure (MBM) scheme (https://www.icao.int/environmental-protection/Documents/Resolution_A39_3.pdf)

² Revenue Tonne Kilometers

5.2. Emissions coverage- Route based approach

The CORSIA shall apply to all international aircraft operators on the same routes between States (route-based approach) as shown in the figure below:

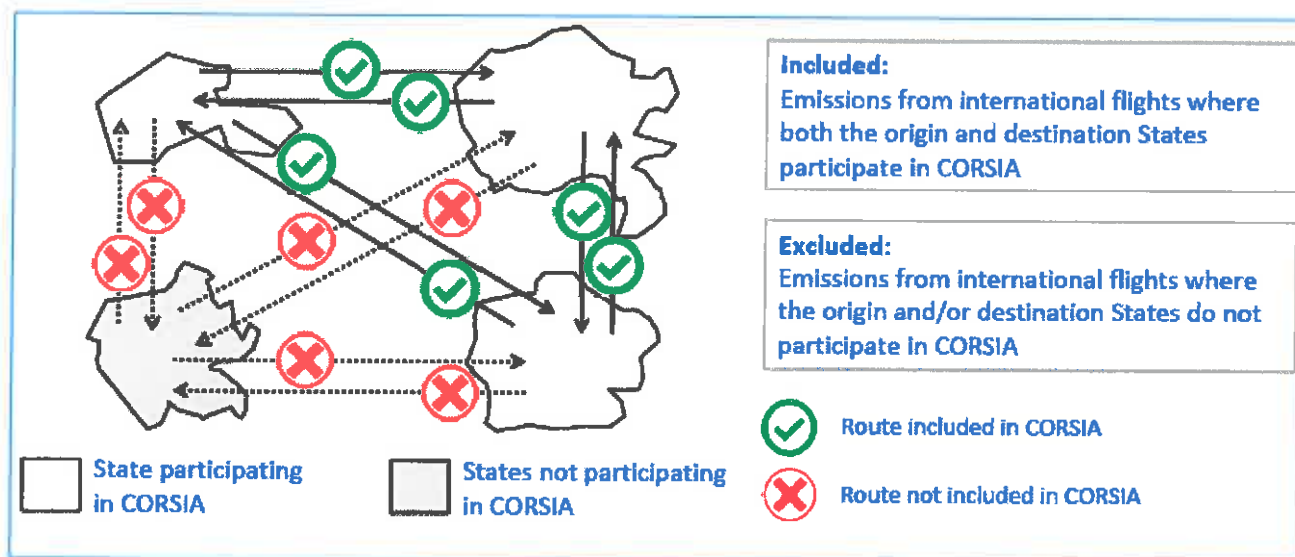


Figure 1: CORSIA route-based approach. Source: ICAO

5.3. New Entrants

New entrants³ are exempted from the CORSIA for the first 3 years or until the year that their annual emissions exceed 0.1% of total 2020 emissions, whichever occurs first.

5.4. Technical Exemptions

CORSIA does not apply to low levels of international aviation activity. The following are aircraft operators that are outside the CORSIA scope:

- operators emitting less than 10,000 metric tonnes of CO₂⁴ emissions from international aviation per year;
- aircraft with less than 5,700kg of MTOM⁵; or
- humanitarian, medical and firefighting operations.

5.5. Offsetting Requirements

What is C offsetting?

A **carbon offset** is a reduction in emissions of carbon dioxide or greenhouse gases made in one industry or location in order to compensate for or to offset an emission made elsewhere.

- Emissions in one sector or location are offset by reducing emissions in a different sector or location i.e. you can compensate for your own emissions by paying somebody else to make an equivalent greenhouse gas saving. [E.g. investment in renewable energy projects- wind farms, solar etc.
- The standard measurement used is one tonne of CO₂, or CO₂ equivalent (CO₂e), and this equates to one emission unit or credit
- These emission units can be bought, sold or traded.

³ A new entrant is defined as any aircraft operator that commences an aviation activity falling within the scope of the scheme on or after its entry into force and whose activity is not in whole or in part a continuation of an aviation activity previously performed by another aircraft operator.

⁴ Carbon Dioxide

⁵ Maximum Take Off Mass

(i) How much will the whole sector need to offset?

The average of total emissions covered by CORSIA between 2019 and 2020 will be used as the baseline for the sector-wide emissions.

$$\text{Sectoral Baseline (SE}_B\text{)} = \frac{(2019+2020)\text{emissions}}{2} \quad \text{Equation 1}$$

The amount of emissions to be offset for a sector in any given year (y), from 2021, will be the difference between the baseline emissions and the emissions in the given year (y):

$$\text{Sector – wide offsetting requirements in a given year } y \text{ (SE}_y\text{)} = \text{Emissions in Year } y - \text{SE}_B \quad \text{Equation 2}$$

Note: The sectoral baseline will be recalculated when routes included in the CORSIA change e.g. when new States volunteer to participate.

$$\text{Sectoral growth factor in a given year } y \text{ (from 2021)} = \frac{(\text{SE}_y - \text{SE}_B)}{\text{SE}_y} \quad \text{Equation 3}$$

The quantity of an operator's offsetting requirements in a given year y (OR_y) will be calculated based on the sectoral growth and/or individual growth as:

$OR_y = \text{Operator's annual Emissions in given year } y \text{ (OE}_y\text{)} \times \text{Sectoral Growth Factor in year } y$

$$OR_y = OE_y \times \left(\frac{SE_y - SE_B}{SE_y} \right) \quad \text{Equation 4}$$

For the Pilot (2021-2023), 1st Phase (2024-2026) and the 2nd Phase (2027-2029), the growth factor only takes into account the sectoral growth i.e. 100% Sectoral and 0% Individual requirement.

Note: For the Pilot phase, each State can choose OE_y either the operator's emissions:

- in a given year (i.e. 2021, 2022 and 2023); or
- covered in 2020.

Thus Equation 4 above will be used from 2021-2029 to calculate the quantity of an operator's offsetting requirements. From 2030, the growth factor will change every year taking into account both the sectoral and the individual operator's emissions growth and will be applied as follows:

- From 2030-2032, at least 20% Individual and 80% Sectoral;
- From 2033-2035, at least 70% Individual and 30% Sectoral

The quantity of an operator's offsetting requirements in a given year y (OR_y) from 2030 will be calculated based on the sectoral growth and individual growth as shown in Figure 2:

- From 2030 to 2032: Maximum 80% Sectoral Approach + At least 20% Individual Approach*

$$OR_y = \leq 0.8 \times \left[OE_y \times \frac{(SE_y - SE_B)}{SE_y} \right] + \geq 0.2 \times \left[OE_y \times \frac{(OE_y - OE_B)}{OE_y} \right]$$

Operator's Requirements in year y (from 2030)

Share of Sectoral Approach

Share of Individual Approach

Operator's Requirements in year y (from 2030) with Sectoral Approach

Operator's Requirements in year y (from 2030) with Individual Approach

- From 2033 to 2035: Maximum 30% Sectoral Approach + At least 70% Individual Approach*

$$OR_y = \leq 0.3 \times \left[OE_y \times \frac{(SE_y - SE_B)}{SE_y} \right] + \geq 0.7 \times \left[OE_y \times \frac{(OE_y - OE_B)}{OE_y} \right]$$

Operator's Requirements in year y (from 2033)

* The Council will recommend to the Assembly in 2028 whether and to what extent to adjust the percentages

Figure 2: Dynamic Approach—the shares of Sectoral/Individual Approaches change over time. Source: ICAO

These offsetting requirements are summarized in Figure 3.



Figure 3: Offsetting requirements

(ii) How does an operator meet its offsetting requirements under CORSIA?

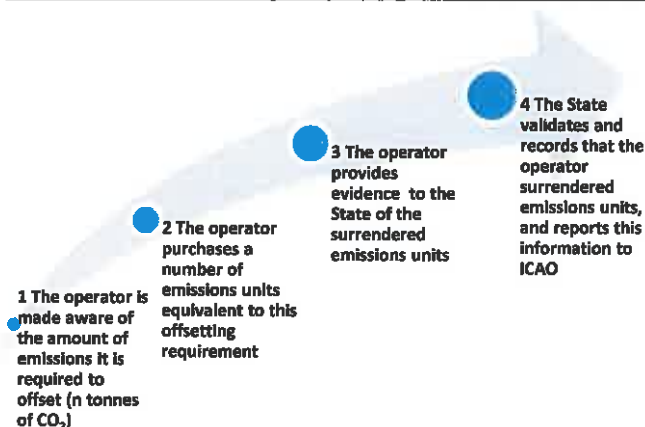


Figure 4: How an operator meets offsetting requirements

5.6. Review Mechanism

The CORSIA will be reviewed every three years starting from 2022.

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	
Phases	Pilot Phase (voluntary, 3 years)			First Phase (voluntary, 3 years)			Second Phase (all non-annexed States, 5 years)									
Compliance cycles	Cycle 1 (3 years)			Cycle 2 (3 years)			Cycle 3 (3 years)			Cycle 4 (3 years)			Cycle 5 (3 years)			
Periodic reviews Assemblies	Review 1 A41			Review 2 A42			Review 3 A43			Review 4 A44			Special	Review 5 A45		

Figure 5: Review mechanism

The ICAO Council will consider whether it is necessary to make adjustments to the next phase or compliance cycle of the scheme. A special review will be done by the end of 2032 on termination of the scheme, its extension or any other improvements of the scheme beyond 2035.

6. CORSIA MRV System

6.1. Overview of MRV Procedures

The ICAO Council, with technical contribution of CAEP, will develop the SARPs and related guidance material for the implementation of the Monitoring, Reporting and Verification (MRV) system under the CORSIA. These are expected to be adopted by the Council in 2018. Member States whose aircraft operators undertake international flights are to develop the necessary arrangements for implementing the MRV SARPs from 1 January 2019. Calculation of CO₂ emissions will be based on fuel burn:

1 tonne of fuel burn = 3.16 tonnes of CO₂ emissions

Equation 5

6.2. Expected roles and responsibilities in the MRV process

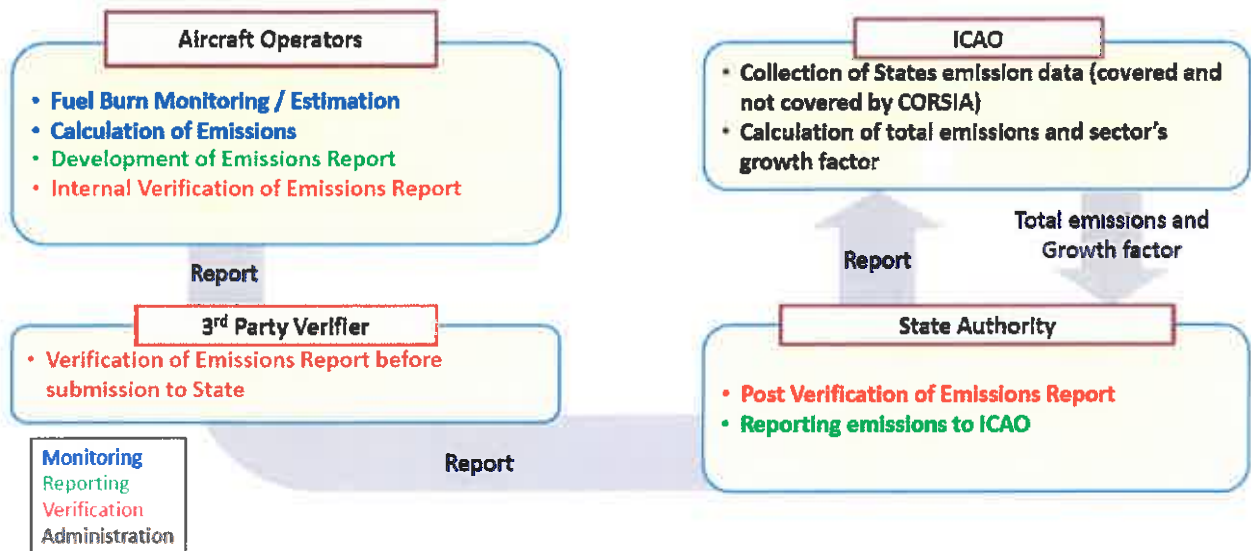


Figure 6: expected roles in the MRV System

7. Emissions Units and Registries

7.1. What are emissions units and how are they generated?

Emissions Units are a way of reducing greenhouse gases produced by polluters.

Greenhouse gases (GHGs)

These are gases that trap/absorb heat in the atmosphere- thus keeping the planet warmer than it should be. Examples of GHGs are carbon dioxide (CO₂); water vapour; methane (CH₄); nitrous oxide (NO₂); Ozone, etc. Each GHG persist for a different length of time in the atmosphere.

Carbon dioxide equivalent (CO₂ eq or CO₂ e)

A quantity that describes, for a given mixture and amount of greenhouse gas, the amount of CO₂ that would have the same global warming potential (GWP), when measured over a specified timescale (generally, 100 years). CO₂ e describes the different greenhouse gases in a common unit. It is measured in metric tonnes of CO₂. E.g. another greenhouse gas such as 1kg of CH₄ will have the same effect as 25kg of CO₂ so it has a CO₂ eq of 25.

Global Warming Potential (GWP)

The amount of warming a gas causes over a given period of time (normally 100 years). CO₂ has the value of 1, and the GWP for all other GHGs is the number of times more warming they cause compared to CO₂. E.g. 1kg of methane causes 25 times more warming over a 100 year period compared to 1kg of CO₂, and so methane as a 100-year GWP of 25.

1 emission unit is equivalent to 1 tonne of CO₂

7.2. Examples of sources for Emissions Units

- UNFCCC Clean Development Mechanism (CDM);
 - Biogas Plants for 3000 households in Uttarakhand, India (rural setting);
 - Community reforestation in Esteli, San Juan de Limay, Nicaragua

7.3. Carbon markets- *what are they and what are their features?*

Carbon markets are created from the trading of carbon emission allowances to encourage or help countries or organisations to limit their CO₂ emissions. Emissions reduction projects generate emissions units that are sold in carbon markets on a per tonne basis.

Carbon market features: *Supply, Demand, Price*

Based on Feb 2017 information, one offset credit was approximately USD 0.30-0.51

7.4. Eligibility of emissions units under the CORSIA

Aircraft operators shall meet their offsetting requirements by purchasing and surrendering eligible emissions units. ICAO Resolution A39-3 requests that a Technical Advisory Body be established to make recommendations to the Council regarding the evaluation of programmes (and potential project types) that generate eligible emission units.

CAEP 10 th meeting : Some of recommendations for Eligibility Criteria	
Offsetting Programmes should meet a range of elements covering the need for:	Offsetting Units
Clear methodologies and protocols	Based on a realistic and credible baseline
Identification and tracking	Quantified, monitored, reported and verified
Legal nature and transfer of units	Clear and transparent chain of custody
Transparency and public participation provisions	Only counted once towards a mitigation obligation
Sustainable development criteria	Assess and mitigate against potential increase in emissions elsewhere
Avoidance of double counting, issuance and claiming	Do not net harm

Figure 7: Eligibility criteria

7.5. Registries

These are generally electronic databases to record and track verified emissions data and/or emissions units, in order to assess compliance with relevant scheme. A39-3 requires the following registries to be established:

- A consolidated central registry under the auspices of ICAO; and
- Member States establish their own registries or group registries established by groups of States, or arrange for participation in other registries.

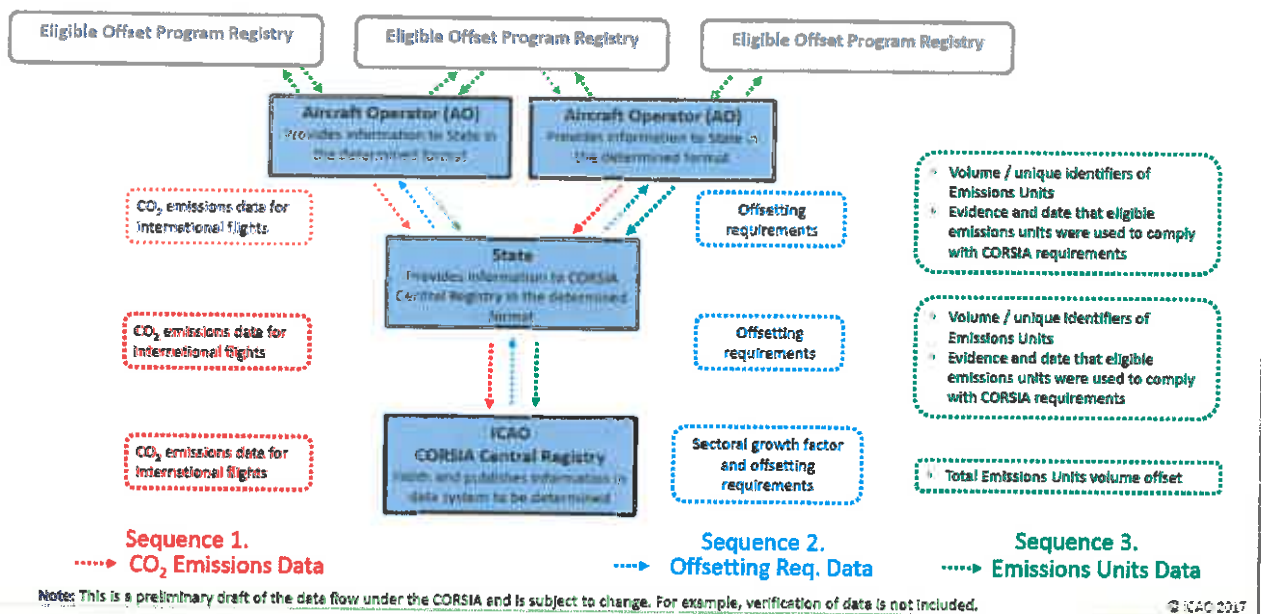


Figure 8: Draft of the CORSIA Registry System Data Flow

8. Capacity building needs and next steps

8.1. What preparations are being made for CORSIA implementation

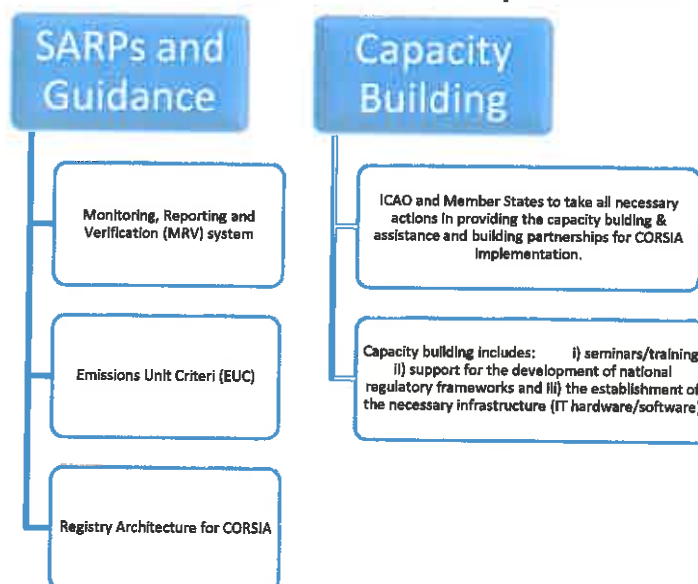


Figure 9: ICAO CORSIA Preparations

8.2. CORSIA SARPs and Guidance Development Timeline

Annex A contains the timeline set by ICAO on the development of the CORSIA SARPs and guidance material.

9. What does this mean for RSA

- i. The SACAA will develop CORSIA MRV Regulations and the necessary guidance material by end of 2018;
- ii. Industry workshops will be done to raise awareness of CORSIA SARPs and guidance material;
- iii. CORSIA MRV system will be implemented in RSA (*RSA international airlines will start sending their data to the State*) as from 1 January 2019;and
- iv. International operators will be required to implement CORSIA and offset their emissions as from 2027.

10. References

ICAO Resolution A39-3

11. Effective date:

This notification is effective from the date of issue as indicated on the first page.

12. Queries

Any queries regarding this notification should be sent to the Aviation Environmental Compliance Department within the Aviation Infrastructure Division, on environment@caa.co.za.

AVIATION ENVIRONMENTAL PROTECTION		
	CHINGA MAZHETESE	2 AUGUST 2017
SIGNATURE OF SPECIALIST: ENVIRONMENTAL PROTECTION	NAME IN BLOCK LETTERS	DATE
	GAWIE BESTBIER	2 AUGUST 2017
SIGNATURE OF EXECUTIVE: AVIATION INFRASTRUCTURE	NAME IN BLOCK LETTERS	DATE

Annex A: Timeline



CORSIA SARPs and Guidance Development Timeline

