

INTERNATIONAL CIVIL AVIATION ORGANIZATION

A United Nations Specialized Agency

USOAP Continuous Monitoring Approach (CMA) Workshop

Module 2 Overview of the USOAP CMA





The objective of this module is to provide an updated overview of the USOAP CMA methodology.

Outline



- 1) Monitoring and Oversight (MO)
- 2) Critical Elements (CEs) of a State's Safety Oversight System
- 3) USOAP CMA Audit Areas and Protocol Questions (PQs)
- 4) USOAP CMA Components
 - a) Collection of Safety Information
 - b) Determination of State Safety Risk Profile
 - c) Prioritization and Conduct of USOAP CMA activities
 - d) Update of Effective Implementation (EI) and Status of Significant Safety Concerns (SSCs)
- 5) Annex 19 Safety Management
- 6) USOAP CMA Computer-Based Training (CBT)
- 7) Report on USOAP CMA Results: Jan 2013 Dec 2015



Monitoring and Oversight (MO)



Monitoring & Oversight (MO)









Continuous Monitoring (Online Framework)

Planning and Scheduling

On-site Activities



Off-site Activities



Reports, Analyses and Working Papers



Training and Workshops



Critical Elements of a State's Safety Oversight System

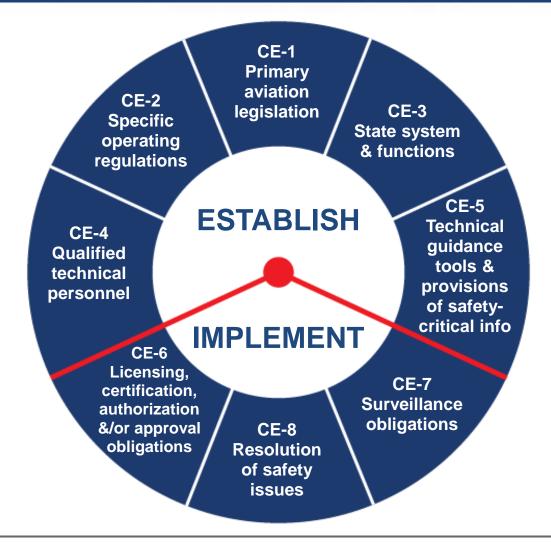


ICAO carries out audits and other monitoring activities to determine the safety oversight capabilities of its Member States by:

- Assessing their effective implementation of the 8 CEs in 8 audit areas (i.e. LEG, ORG, PEL, OPS, AIR, AIG, ANS and AGA) through Protocol Questions (PQs); and
- Verifying the status of the Member States' implementation of:
 - Safety-related ICAO Standards and Recommended Practices (SARPs);
 - Associated procedures; and
 - Guidance material.

Critical Elements (CEs)







CE-1: Primary aviation legislation

- The State shall promulgate a comprehensive and effective aviation law, consistent with the size and complexity of the State's aviation activity and with the requirements contained in the Convention on International Civil Aviation, that enables the State to regulate civil aviation and enforce regulations through the relevant authorities or agencies established for that purpose.
- The aviation law shall provide personnel performing safety oversight functions access to the aircraft, operations, facilities, personnel and associated records, as applicable, of service providers.



CE-2: Specific operating regulations

 The State shall promulgate regulations to address, at a minimum, national requirements emanating from the primary aviation legislation, for standardized operational procedures, products, services, equipment and infrastructures in conformity with the Annexes to the Convention on International Civil Aviation.



CE-3: State system and functions

- The State shall establish relevant authorities or agencies, as appropriate, supported by sufficient and qualified personnel and provided with adequate financial resources. Each State authority or agency shall have stated safety functions and objectives to fulfill its safety management responsibilities.
- The State shall ensure that inspectors are provided with guidance that addresses ethics, personal conduct and the avoidance of actual or perceived conflicts of interest in the performance of official duties.



CE-4: Qualified technical personnel

- The State shall establish minimum qualification requirements for the technical personnel performing safety oversight functions and provide for appropriate initial and recurrent training to maintain and enhance their competence at the desired level.
- The State shall implement a system for the maintenance of training records.



CE-5: Technical guidance, tools and provision of safety-critical information

- The State shall provide appropriate facilities, comprehensive and up-to-date technical guidance material and procedures, safety critical information, tools and equipment, and transportation means, as applicable, to the technical personnel to enable them to perform their safety oversight functions effectively and in accordance with established procedures in a standardized manner.
- The State shall provide technical guidance to the aviation industry on the implementation of relevant regulations.



CE-6: Licensing, certification, authorization and/or approval obligations

 The State shall implement documented processes and procedures to ensure that personnel and organizations performing an aviation activity meet the established requirements before they are allowed to exercise the privileges of a license, certificate, authorization and/or approval to conduct the relevant aviation activity.



CE-7: Surveillance obligations

 The State shall implement documented surveillance processes, by defining and planning inspections, audits, and monitoring activities on a continuous basis, to proactively assure that aviation license, certificate, authorization and/or approval holders continue to meet the established requirements. This includes the surveillance of personnel designated by the Authority to perform safety oversight functions on its behalf.



CE-8: Resolution of safety issues

- The State shall use a documented process to take appropriate corrective actions, up to and including enforcement measures, to resolve identified safety issues.
- The State shall ensure that identified safety issues are resolved in a timely manner through a system which monitors and records progress, including actions taken by service providers in resolving such issues.



The definitions of the eight CEs of a state's safety oversight system are found in Annex 19, Appendix 1.

Guidance on the eight CEs is provided in the Safety Oversight Manual, Part A — The Establishment of a State's Safety Oversight System (Doc 9734).

Note. — Doc 9734 Part A is to be amended to reflect Amendment 1 of Annex 19 and due for publication in July 2017.

As of January 2013, safety oversight information is available on the ICAO public website: URL: http://www.icao.int/safety/pages/usoap-results.aspx 1999 2000 2003 2004 2005 2006 2007 1997 1998 2001 2002 2008 2009 2010 2011 2012 2013+ ICAO / Safety / Safety Audit Information Global Plans Safety Audit Information Global Aviation Safety Plan (GASP) IC Safety Priorities SSCs published This information has been updated and relocated from the ICAO Flight Safety Information Exchange Runway Safety (FSIX) website. You can use the search box to find a State and then compare the result of its last on the USOAP re Controlled Flight Into Terrain (CFIT) USOAP CMA activity with the global average or any other State on the list. The Effective

STATES **CMA** online Implementation (EI) of each Audit Area is rated from 0% to 100%, with 0% being "Not Implemented" Loss of Control-Inflight 10 [*i*] (LOC-I) framework and 100% being "Fully Implemented". The El score represents the percentage of satisfactory USOAP **Global Flight Tracking** protocol questions applicable for a given State. 1997: Voluntary Assessn SARPs and PANS For developers, the EI scores can also be accessed via the iSTARS API Data Service. **Proposed layout** Standardization **Fully Confidential (Annex** Implementation Please note: A significant safety concern (SSC) does not necessarily indicate a particular safety of the SSCs for deficiency in the air navigation service providers, airlines (air operators), aircraft or aerodrome; Safety Implementation the public to but, rather, indicates that the State is not providing sufficient safety oversight to ensure the Safety Fund (SAFE) de receive State effective implementation of applicable ICAO Standards. Full technical details of the ICAO Aviation Safety Implementation findings have been made available to the State to guide rectification, as well as to all ICAO 1999: U feedback Assistance Partnership Member States to facilitate any actions that they may consider necessary to ensure safety. The (ASIAP) State has undertaken to regularly report progress on this matter to ICAO. Read more to all Sta Next Generation of Aviation Professionals (NGAP) Other links related to USOAP CMA: RASGs and PIRGs **IMPLEMENT** SA · Video on Youtube (2 min) on The Launch of CMA COSCAPs / RSOOs / PUBLIC CMA Interactive Presentations in all ICAO languages> RAIOs · Frequently Asked Questions (FAQs) on CMA Safety Management Performance Based CMA Forum Navigation (PBN) CAPSCA 2014 Guidance Material 100 Assess and Measure 90 R Unresolved SSCs Global average ent ISTARS 80 Aerodromes: 56.719 70 API Data Service to be made 60 sent Regional Performance 50 available to the Dashboards 40 public in format Safety Information 30 Monitoring Services 20 and conditions (SIMS) II USOAP 10 Safety Report approved by with Map Builder sadding contraction under contraction production recording the sadding the sad Council Compliance and 45% of Verification USOAP CMA Safety Audit Information



USOAP CMA Audit Areas and Protocol Questions (PQs)

USOAP CMA Audit Areas



Primary aviation legislation and civil aviation regulations (LEG)

Civil aviation organization (ORG)

Personnel licensing and training (PEL) Annexes 1 and 19 Aircraft operations (OPS) Annexes 6, 9, 18, 19 and PANS-OPS

Airworthiness of aircraft (AIR) Annexes 6, 7, 8, 16 and 19

Aircraft accident and incident investigation (AIG) Annexes 13 and 19

Air navigation services (ANS) Annexes 2, 3, 4, 5, 10, 11, 12, 15, 19 and PANS-ATM Aerodromes and ground aids (AGA) Annexes 14 and 19

Protocol Questions (PQs)



- Primary tool used to assess States' safety oversight capabilities, for each CE.
- Enable standardization in the conduct of USOAP CMA activities.
- Percentage of "Satisfactory" PQs is reflected in the El.
- Evidence-based approach:
 - Show me.
 - Lack of evidence or lack of sufficient evidence = PQ status will or remains N/S.
 - N/S PQ generates a finding and since 2014, each finding is PQ-specific.

PQ — Example



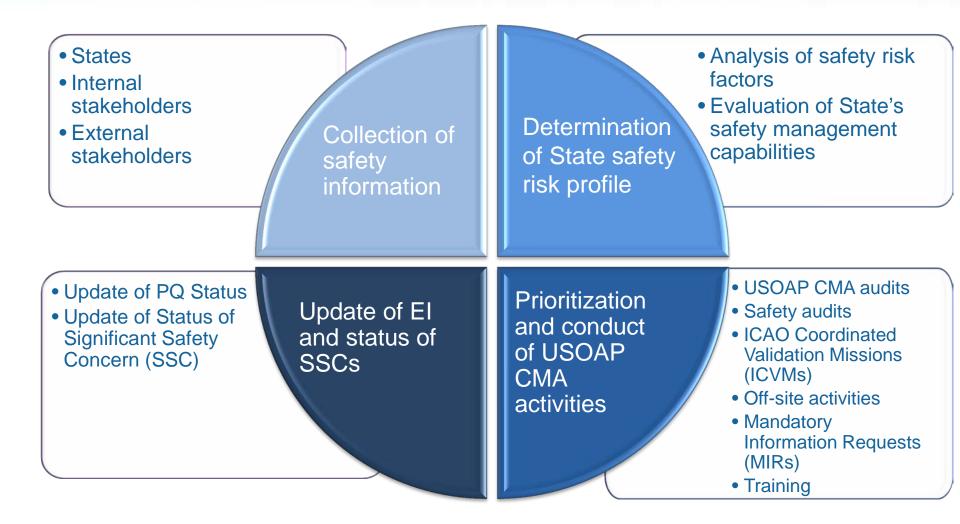
PQ No.	Protocol Question	Guidance for Review of Evidence	ICAO References	CE
4.129	Has the State promulgated regulations for AOC applicants to establish procedures to ensure that the flight manual is updated by implementing changes made mandatory or approved by the State of Registry?	 a) relevant State regulations; b) applicable certification process; and c) operations inspectors' procedures. 	Part I, Att. E Part III, Att. assoc	CE-2 Imber ciated h PQ
4.103	Is the organ applicant re a) duties, r clearly define b) functionar tasks and miles or reporting are clearly delineated and duly documented?	applicant. 3) Verify that the safety management, quality assurance management and emergency management systems have been:	STD A6 ICAO ferences GM Doc 8335 Part II, C2 Part III, C5	CE-6
		a) established; b) documented; and c) implemented.		



USOAP CMA Components

USOAP CMA Components





USOAP CMA Components





Collection of Safety Information



States provide:

- 1) State Aviation Activity Questionnaire (SAAQ);
- 2) Compliance Checklists (CCs) on the Electronic Filing of Differences (EFOD) system;
- 3) Self-assessment; and
- 4) Updated Corrective Action Plans (CAPs).



Internal stakeholders include:

- 1) ICAO Secretariat Bureaus/Sections; and
- 2) Regional Offices (ROs).



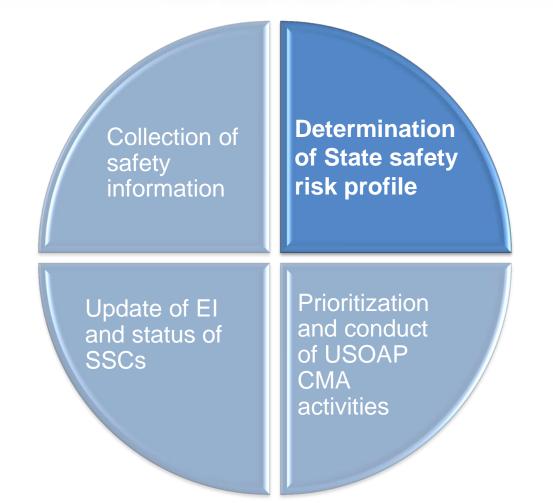
External stakeholders include:

- 1) State civil aviation authorities (e.g. FAA);
- 2) Regional Safety Oversight Organizations (RSOOs) (e.g. EASA); and
- 3) International organizations (e.g. IATA).

Note.— Some of these organizations conduct audit activities that generate information used as indicators for the USOAP CMA.

USOAP CMA Components



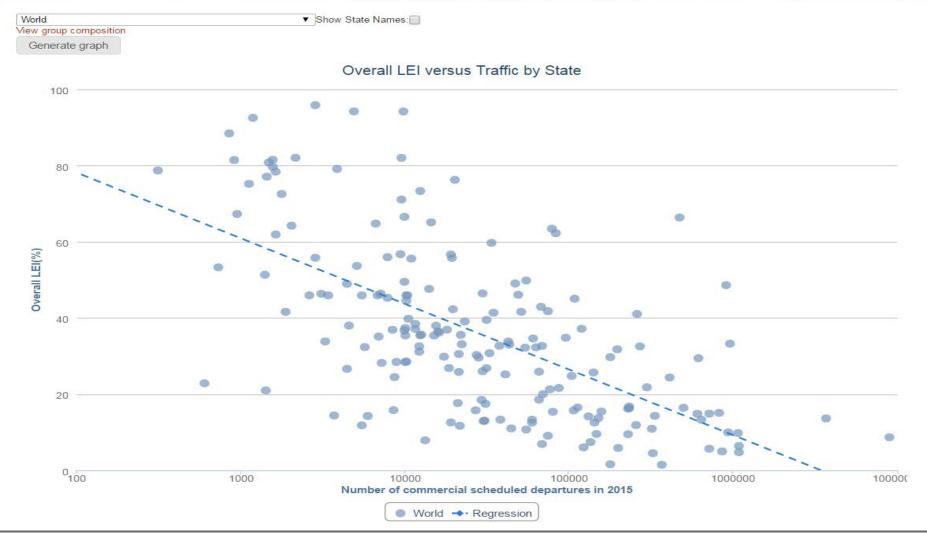


Main Factors for Determining State Safety Risk Profile



- a) EI (determined through previous USOAP CMA activity);
- b) Existence of SSC(s);
- c) Level of aviation activities in the State for each audit area;
- d) Projected growth of air traffic and aviation activities;
- e) State's capability to submit CAPs acceptable to ICAO;
- f) Level of progress made by State in implementing CAPs;
- g) Major changes in organizational structure of State's CAA;
- h) Ongoing or planned assistance projects;
- i) State's progress in achieving GASP objective on safety management;
- j) Air navigation deficiencies; and
- k) Regional Office (RO) mission reports.

First Review: LEI versus Traffic



OAC

Other iSTARs Applications Used





integrated Safety Trend Analysis and Reporting System

MY APPS | CATALOGUE | GROUP MANAGER | SPACE-EXCHANGE | WORKSHOP | NEWS | MY ACCOUNT | CONTACT US | PROFILE

Safety Margins

Risk-based prioritization for operations, air navigation and support functions

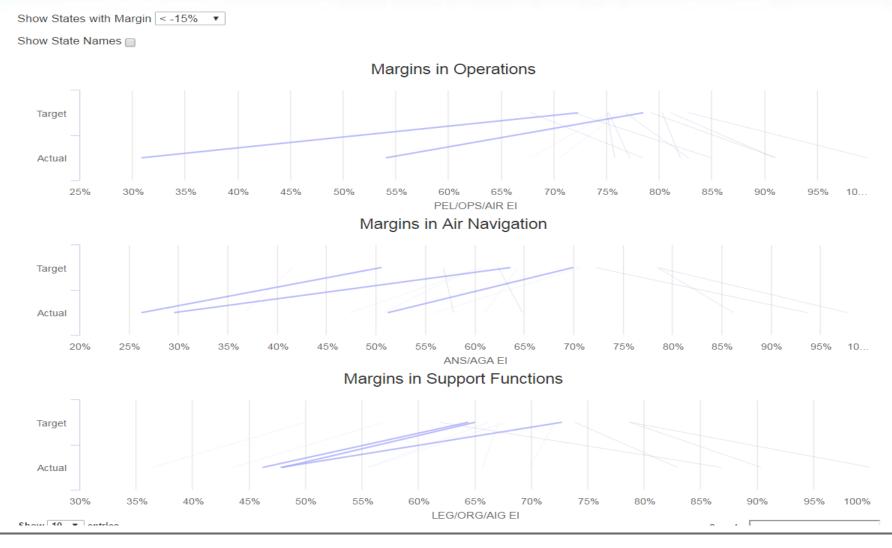
The below application allows to perform a risk-based prioritizes of operational, air navigation and support related USOAP areas.

In each of the 3 functional areas, a State is given a target effective implementation score which is calculated based on a global linear regression of traffic versus effective implementation of all ICAO Member States. A State with a positive safety margin would be considered to have sufficient regulatory controls in place to cover its existing traffic volume. A State with a negative safety margin would be considered to have an insufficient oversight system taking into consideration its traffic volume.

The operational safety margins are calculated taking into consideration only flights performed by carriers from the State, whereas the other margins are calculated using all departures from the State.

Safety margins are best used in conjunction with the Solution Center which provides solutions for the various USOAP areas.

Indicators from "Safety Margins" App



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USOAP CMA Components





Prioritization and Conduct of USOAP CMA Activities



MO prioritizes CMA activities in States based on:

- a) State's safety risk profile;
- b) Approved MO budget; and
- c) Available MO resources.

Criteria Used to Select a State for:



CMA Audit	ICVM	
State's safety risk profile		
Information submitted by State through PQ self-assessment		
Recommendations from RO or ANB sections		
Information shared by recognized international organizations		
Regional balance		
Date of last audit	State's readiness (via reported progress in CAP implementation)	
Significant changes in any audit area within State's civil aviation system	State's progress in resolving identified SSCs	

Criteria Used to Select a State for an *Off-Site Validation Activity*:



- State has PQ findings associated with eligible PQs (most of the PQs from CEs 1 to 5);
- 2) About 75% of State's corresponding CAPs, for the audit area considered, meet the following three conditions:
 - a) CAPs fully address the corresponding PQ findings;
 - b) CAPs are reported by the State as fully implemented; and
 - c) The State has submitted all relevant evidence for the corresponding PQs through the OLF; and
- 3) Information submitted by State through PQ self-assessment.

Conduct of USOAP CMA Activities — *Scope*



Factors determining scope	ICVM	CMA Audit
Level of aviation activity in the State	✓	✓
Any changes to the State's system		✓
Acceptability of CAPs	✓	
Level of progress reported by the State in CAP implementation	✓	
State's self-assessment, including submitted evidence	✓	✓
Request by State (cost-recovery activity)	✓	✓
Availability of resources	✓	✓

Conduct of USOAP CMA Activities — *Duration and Team Composition*



Factors determining duration and team composition	ICVM	CMA Audit
Scope	✓	✓
Complexity of the State's system	✓	✓
Number of Not-Satisfactory PQs to be addressed	✓	
Other factors, such as State's official language	✓	✓

Off-Site Validation Activity



- The objective is to validate CAPs implemented by a State without conducting an on-site activity, i.e. an audit or ICVM.
- This activity is conducted at ICAO HQ.
- To qualify for an off-site validation activity, CAPs should address most of the PQ findings associated with CEs 1 to 5 (collectively known as "establishment" CEs).
- Will be considered only if these three criteria are met:
 - 1) CAPs fully address PQ findings;
 - 2) Most CAPs are fully implemented; and
 - 3) Relevant evidence uploaded by the State on the OLF.

Six Criteria for a Good CAP ("RCDSRC")



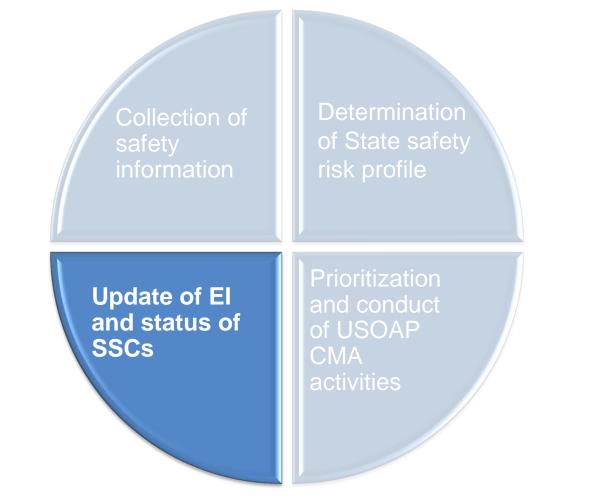
- 1) Relevant: CAP addresses the *issues* and *requirements* related to the finding and corresponding PQ and CE.
- Comprehensive: CAP is *complete* and includes *all elements* or *aspects* associated with the finding.
- Detailed: CAP outlines implementation process using step-by-step approach.
- **4) Specific**: CAP identifies *who will do what, when* and in coordination with other entities, if applicable.
- 5) Realistic: In terms of *contents* and *implementation timelines*.
- 6) Consistent: In relation to *other CAPs* and with the *State's self-assessment*.



- CAPs related to the majority of PQ findings associated with CEs 6, 7 and 8 (collectively known as the "implementation" CEs) do not qualify for an off-site validation activity.
- Such CAPs must be assessed and validated through an on-site activity.

USOAP CMA Components









El calculation:

Overall EI (%) = $\frac{\text{Number of Satisfactory PQs}}{\text{Total Number of Applicable PQs}} \times 100$





- The validation of collected safety information enables ICAO to continuously update a State's EI.
- State's EI is reported on the Online Framework (OLF) and on iSTARS 3.0, i.e. SPACE.

PQ Amendment



- MO revises and updates PQs on a periodic basis to:
 - a) reflect the latest changes in ICAO provisions, and
 - b) harmonize and improve PQ references and content.
- Revision of PQs incorporates inputs from:
 - a) States,
 - b) ICAO ANB,
 - c) ICAO ROs,
 - d) USOAP mission team members, and
 - e) external stakeholders.

2016 Edition of the PQs



- The 2016 edition of the PQs was posted in November 2016 in the "CMA Library" on the OLF.
 (See EB 2016/70, 30 November 2016.)
- The Library copy for each audit area includes an Introduction, Guidelines and Summary of Amendments.



• The 2016 edition is applicable for all USOAP CMA activities starting after 1 June 2017.



 In most cases, a MIR is issued by MO when concerns are raised by internal/external stakeholders regarding a State's safety oversight capabilities.



A MIR may also be issued in the following cases:

- a) Important information is missing in relation to the State's SAAQ, CCs and/or PQ self-assessment;
- A State has not provided initial or amended CAPs as needed;
- c) A significant change is observed in the State's organization;
- d) Information is needed in addition to an ICAO RO visit; or
- e) Information collected during a USOAP CMA activity is incomplete or insufficient.





• States are *required* to respond to a MIR using the "MIR Module" of the OLF.



PQ Status Change



- Status of PQs may be changed through the validation process conducted by MO based on:
 - CAPs or other information received from States, supported by appropriate evidence; and
 - Information received from ICAO ROs, recognized organizations and other stakeholders.
- Status of PQs may also change based on information received from States in response to MIRs.

Off-Site vs On-Site Activity



With the new online monitoring activities, MO may review and validate, off-site, some PQs related to CE-1 to CE-5.

However, validation of PQs related to CE-6, CE-7 and CE-8 will typically require an on-site activity.

Significant Safety Concerns (SSCs)



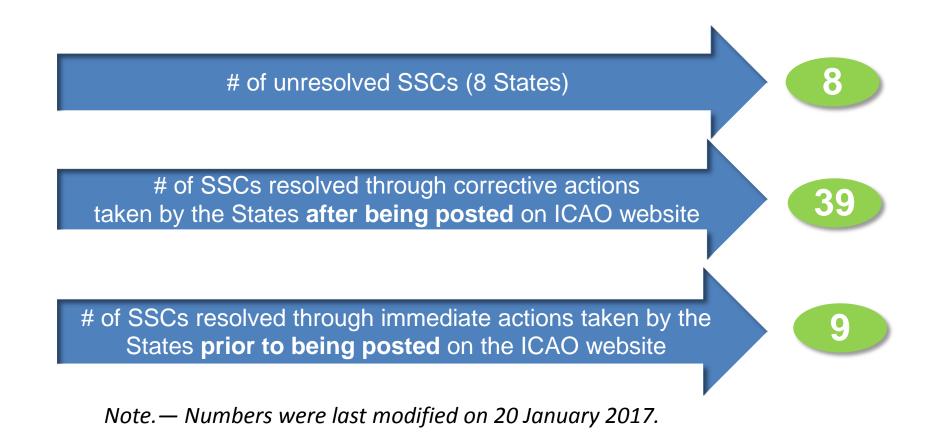
Definition of an SSC

"An SSC occurs when the audited State allows the holder of an authorization or approval to exercise the privileges attached to it, although the minimum requirements established by the State and by the Standards set forth in the Annexes to the Chicago Convention are not met, resulting in an immediate safety risk to international civil aviation."

Reference: EB 2010/7 dated 19 February 2010







SSC Mechanism: Identification



Continuous monitoring process

Ongoing monitoring of evidence and information collected from the State and other sources

USOAP CMA on-site activity

Evidence collected points to an SSC

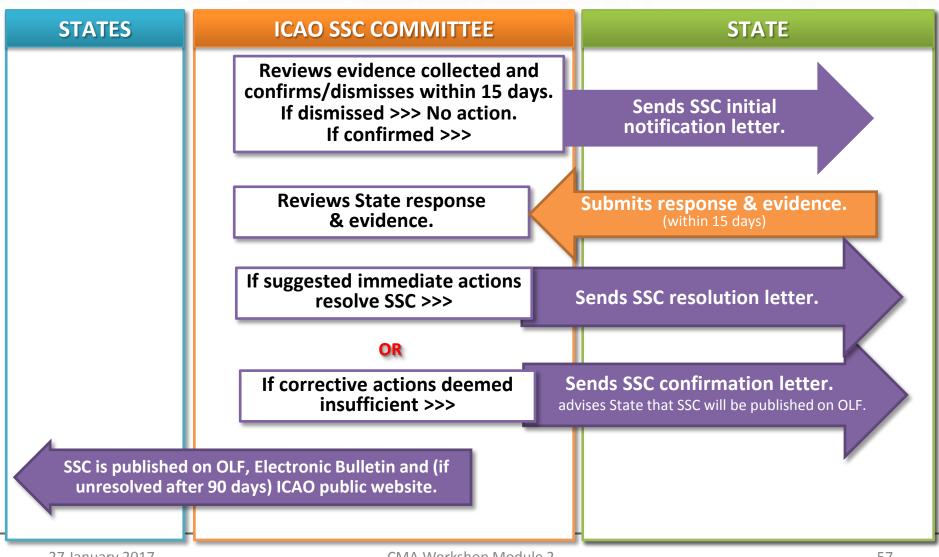
- Team leader brings it to the attention of the State as soon as it is discovered.
- State may initiate corrective actions immediately.
- Team leader provides all relevant information to C/OAS.

Preliminary SSC is identified

ICAO SSC Committee is convened to validate

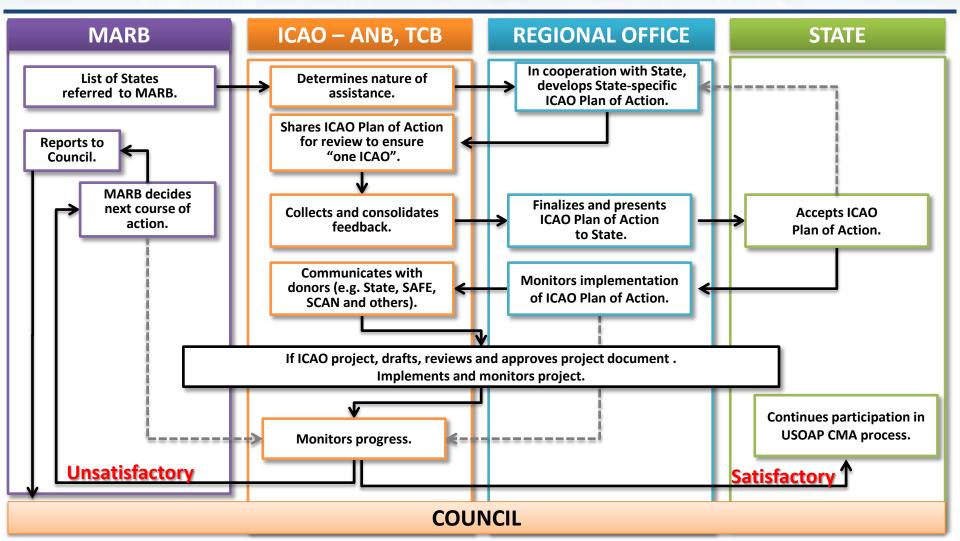
SSC Mechanism: Notification





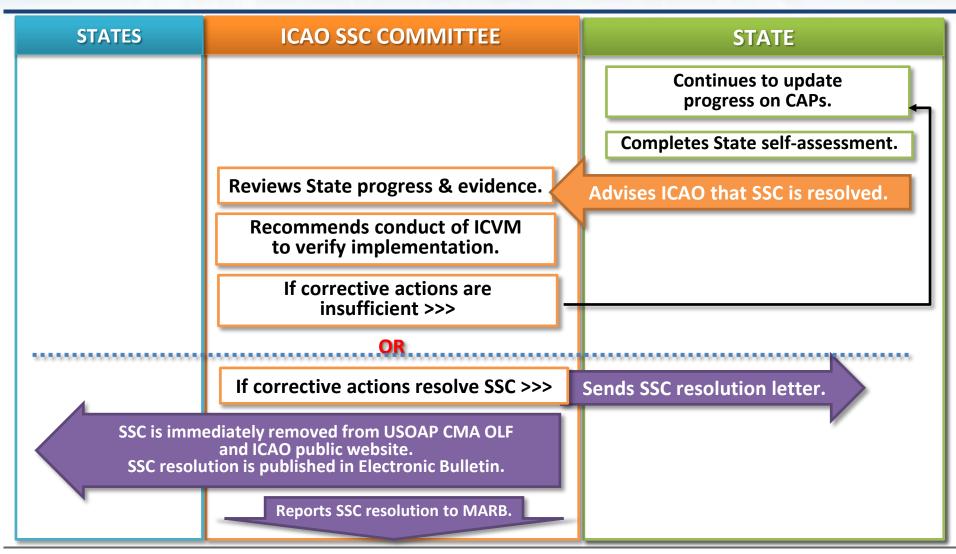
SSC Mechanism: ICAO Plan of Action





SSC Mechanism: Resolution







Annex 19 — Safety Management

SSP Roll-Out under USOAP CMA: *Initial Timelines*



EB 2014/61, issued on 22 October 2014:

- announced the publication by ICAO of "new PQs on safety management (SM)".
- informed Member States of the USOAP audit of the implementation of the ICAO SM provisions.
- indicated that audit of the new SM-related PQs would commence in States with an EI of over 60% in January 2016.
- States with an EI of over 60% would have one year, until the end of 2015, to complete their self-assessments of the new SM-related PQs.
- The applicability and relevance of the PQs would be reviewed and, if necessary, amended annually.





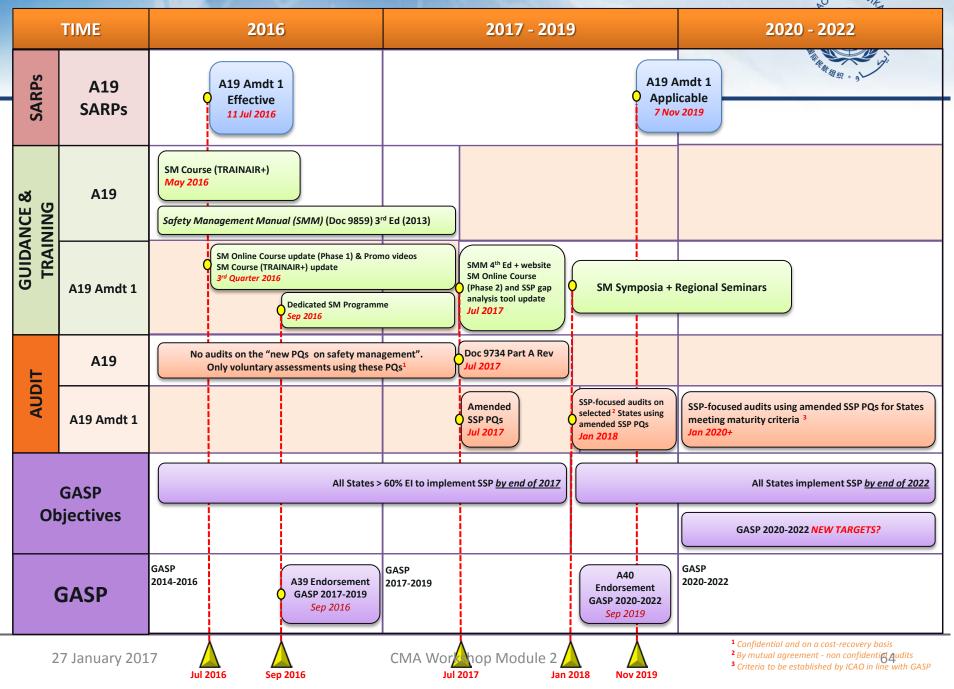
- EB 2015/56 published by ICAO on 4 Dec 2015:
 - The launch of the USOAP CMA audits of the new SM-related PQs is postponed to January 2018.
 - States are required to continue to complete their self-assessment of the new SM-related PQs on the OLF.
 - ICAO will perform a few assessments of the implementation of the new SM-related PQs, in selected volunteer States, throughout 2016.





- EB 2016/63 published by ICAO on 1 Nov 2016:
 - In July 2017: amended SSP-related PQs to be published to reflect Amdt 1 of Annex 19, 4th ed. of Doc 9859 and lessons learned to date.
 - Select States to be approached by ICAO for audits including the amended SSP-related PQs in 2018 and 2019 on a voluntary but non-confidential basis.
 - Starting 2020: ICAO will perform audits using the amended SSP-related PQs on the States which will meet the criteria to be established by ICAO, in line with the GASP.
 - States with an El of over 60% are requested to complete their self-assessments of the new SSP-related PQs, once these are published in July 2017.

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- Effective SSP implementation is a gradual process, requiring time to mature fully.
- Factors that affect the time required to establish an SSP include:
 - the complexity of the air transportation system; and
 - the maturity level of the aviation safety oversight capabilities of the State.
- Similarly, the monitoring by ICAO of States' SM implementation will be a gradual process.



USOAP CMA CBT



As per EB 2011/44, the computer-based training (CBT) was launched to:

- Provide participants with a thorough understanding of the USOAP CMA methodologies and the essential knowledge required to participate in USOAP CMA activities; and
- Serve as an opportunity for States to enhance the competencies of their aviation safety personnel in the areas addressed by USOAP CMA.





- Per Assembly Resolution A37-5, States and recognized organizations are called upon to nominate experts for secondment to ICAO on a long- or short-term basis to support USOAP CMA.
- For State-nominated experts who meet stated qualifications and experience criteria for the various audit areas (per *SL AN19/34-15/35*, 13 May 2015), ICAO will waive their CBT fees.
- More information available at:

https://www.icao.int/safety/CMAForum/Pages/USOAPCMA-CBT.aspx.



REPORT ON USOAP CMA ACTIVITIES & RESULTS: Jan 2013 – Dec 2015

USOAP CMA Report: Jan 13 – Dec 15



- Covers the period from 1 January 2013 (launch of the USOAP CMA) to 31 December 2015.
- Based on data collected through USOAP CMA and stored in the CMA OLF and iSTARS SPACE.
- Contains statistical data on USOAP activities and results (EIs) globally and by "Region" (ICAO RO accreditation areas).
- Also highlights issues identified in the 8 audit areas where El is still low and where more efforts at global, regional and national levels are needed.
- Now available in the "CMA Library" on the OLF at <u>https://www.icao.int/usoap</u> and on the ICAO public website <u>http://www.icao.int</u>.



States' Main Obligations



As per the USOAP CMA MOU and by using the OLF, States shall, in particular:

- Continuously update their SAAQ and CCs/EFOD;
- Continuously update their CAPs and PQ status (self-assessment), providing all related evidence; and
- Reply promptly to MIRs sent by ICAO.

Review



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