INTERNATIONAL CIVIL AVIATION ORGANIZATION

EIGHTH MEETING OF THE STEERING COMMITTEE OF THE REGIONAL AVIATION SAFETY GROUP FOR AFRICA-INDIAN OCEAN (RASC/8).

From 29 to 30 August 2022.

Agenda Item 1: Establishment and implementation of an effective State safety oversight training system: challenges and way forward.

(Presented by the Secretariat)

SUMMARY
This paper outlines a framework for the establishment and implementation of an effective State safety oversight training system, highlights the challenges and proposes a way forward.
REFERENCE(S): Doc 9734 — *Safety Oversight Manual,* Part A — *The Establishment and Management of a State's Safety Oversight System* (3rd edition, 2017) Doc 10070 — *Manual on the Competencies of Civil Aviation Safety Inspectors* Doc 9379 — *Manual of Procedures for Establishment and Management of a State's Personnel Licensing System* (3rd edition, 2020) Doc 8335 — *Manual of Procedures for Operations Inspection, Certification and Continued Surveillance* (5th edition, 2010) Doc 9760 — *Airworthiness Manual* (4th edition, 2020) Doc 9683 — *Human Factors Training Manual* (Amdt. 2, 1st edition, 1998) Doc 9756 — *Manual of Aircraft Accident and Incident Investigation* Doc 9962 — *Manual on Accident and Incident Investigation Policies and Procedures* (2nd edition, 2019) Cir 298-AN/172 — *Training Guidelines for Aircraft Accident Investigators* (June 2003) Cir 315-AN/179 — *Hazards at Aircraft Accident Sites* (2008) Doc 10068 — *Manual on the development of a Regulatory Framework for Instrument Flight Procedure Design Service* (1st edition, 2018) Doc 9774 — *Manual on Certification of Aerodromes* (1st edition, 2001) USOAP CMA 2020 Protocol Questions — ORG, PEL, OPS, AIG, ANS, AGA
Related ICAO Strategic Objective(s): This working paper relates to the Safety Strategic Objective.

1. INTRODUCTION:

1.1   Information available to ICAO shows that several Member States continue to experience difficulties in carrying out their safety oversight responsibilities effectively due to inadequate training systems, insufficient resource allocation, both human and financial and/or lack of or inadequate political will, etc. Addressing these issues is therefore necessary to foster improvement of Critical Element 4 on qualified technical personnel of the State safety oversight system.

State Safety Oversight System

1.2   The eight Critical Elements (CEs) of a State Safety Oversight (SSO) system are essentially the safety defense tools needed for the effective and sustainable implementation of a safety-related policy and associated procedures. The effective implementation (EI) of the CEs by States is an indication of a State's capability for safety oversight.

1.3   Furthermore, the CEs of a State safety oversight system cover the whole spectrum of civil aviation safety areas, including primary aviation legislation and specific operating regulations (LEG); civil aviation organization (ORG); personnel licensing and training (PEL); aircraft operations (OPS); airworthiness of aircraft (AIR); aircraft accident and incident investigation (AIG); air navigation services (ANS); and aerodromes and ground aids (AGA).

1.4   To ensure continuous monitoring, the USOAP CMA activities through the Protocol Questions (PQs) are primary tools for assessing the level of effective implementation of the oversight system. The PQs include evaluation of State safety oversight training systems. The results of the ICAO USOAP assessments indicate a general lack of effective implementation of the CEs of a State safety oversight system in the RASG-AFI region and further accentuated in the area of establishment of effective training systems.

1.5   Within the RASG-AFI region, the average EI in CE-4 is one of the lowest EIs of CEs of the SSO system, as shown in the chart below.

USOAP Results by Area and Critical Element

4 areas and 4 critical elements are above the target of 60% EI.

2.   DISCUSSION:

2.1   An effective Training system is critical for an effective State safety oversight system. States are required to establish minimum qualification requirements for the technical personnel performing safety-related functions and the provision of appropriate initial and recurrent training to maintain and enhance their competence at the desired level. States shall also implement a system for the maintenance of training records for technical personnel.

2.2   The tasks and activities involved in aviation safety oversight include a wide range of audits, inspections, evaluations, analyses and other interventions. Effective implementation of these tasks requires the intervention of sufficiently qualified and experienced technical personnel.

2.3   States should also establish clear and specific entry level minimum competencies, qualifications and experience for technical personnel as well as those who perform tasks and functions on behalf of the CAA. The established competencies, qualifications and experience should, to the extent possible, ideally match the qualifications of those personnel within entities under the oversight of the State.

2.4   The State authorities also need to provide the necessary resources, including financial, for the implementation of the required training, to ensure that technical personnel maintain their competency through an established a robust training system. This system should be based on a documented training policy established and signed at the management level of the State authorities.

2.5   The training policy should commit to provide all necessary training to all technical personnel in all areas, including initial training (induction and basic training), on-the-job training, recurrent training and specialized or advanced training. Furthermore, the training policy should require the establishment of a training programme and training plan for each technical staff member.

2.6   A training programme should be developed for technical staff positions and include all the training required to acquire and maintain the necessary competencies and minimum content for each type of training. Periodic training plan should be developed based on the approved training programme and the training plan should include specified timeframes and the training priorities.

2.7   Technical personnel should satisfactorily complete On-the-Job Training (OJT) before being assigned safety oversight-related tasks and responsibilities and this should be provided by designated experienced senior technical staff in the subject area or task and should follow a structured process, such as observing, working under supervision, competence assessment and authorization, etc.

2.8   Technical personnel should only be authorized to perform tasks after having been qualified, assessed and formally authorized and the State authorities should establish and implement a system for the maintenance of training records for their technical personnel.

2.9   Specific USOAP PQs to assess States' training systems have been established and the PQs hierarchy and details are illustrated under **Appendix A**. The results of the USOAP assessments and the EI scores for the RASG-AFI region are illustrated under **Appendix-B**

Challenges and a Way Forward

2.10   It is evident from the information highlighted in the Appendices that the RASG-AFI region faces significant challenges in terms of the establishment and maintenance of an effective safety oversight system in general and CE-4 in particular

2.11   Consequently, as a way forward, it is essential that:

a)   States together with stakeholders and partners implement strategies and mechanisms to improve CE-4 by discharging their safety oversight obligations, including establishing and implementing an

effective training system;
b) ICAO continues to include a training component in developing and providing implementation support to States through implementation packages (iPacks) and other assistance activities; and
c) Aviation stakeholders, including donors and partners, extend training assistance and support to States through scholarships, fellowships, and other programmes.

3.   ACTION BY THE MEETING:

3.1.   The meeting is invited to recommend that the RASG-AFI:

a) urge States to discharge their safety oversight obligations, including the establishment and implementation of an effective training system.
b) urge ICAO to continue to include a training component in developing and providing implementation support to States through implementation packages (iPacks) and other assistance activities; and
c) request aviation stakeholders, including donors and partners, to extend training assistance and support to States through scholarships, fellows,hips and other programmes.

Appendix A: Specific ICAO USOAP PQs to assess States' training systems

Initial qualification and experience requirements for technical personnel

1   Does each safety oversight entity/investigation authority have an active role in the selection and recruitment of sufficiently qualified and experienced technical personnel? (PQ 2.101)

Guidance for Review of Evidence

a.   That competency, qualifications and experience requirements are established
b.   Active participation of the respective safety oversight entity/investigation authority, if applicable, in the recruitment and the selection of prospective personnel.

2   Has each safety oversight entity/investigation authority established a training policy for technical personnel? (PQ 2.105)

Guidance for Review of Evidence

a.   A documented training policy is established and signed at the management level.
b.   Training policy commits to providing all necessary training to all technical personnel in all areas, including:
1)   initial (e.g. induction and basic training);
2)   on-the-job training (OJT);
3)   recurrent training; and
4)   specialized/advanced training.
c.   The training policy should require the establishment of a training programme for each technical staff position and training plans for each technical staff member.

3   Has the State established appropriate minimum qualification and experience requirements for all technical personnel, including:

a.   personnel licensing staff (PQ 3.111);
b.   examiners who prepare questions or assess examinations (PQ 3.505)
c.   flight and practical examiners (PQ 3.607)
d.   flight operations inspectors (PQ 4.033);
e.   dangerous goods inspectors (PQ 4.033);
f.   airworthiness inspectors (PQ 5.031);
g.   airworthiness engineers (PQ 5.471);
h.   aircraft accident investigators (PQ 6.119);
i.   all ANS inspectorate personnel (PQ 7.060); including:
1)   ATS inspectors;
2)   flight procedures inspectors;
3)   AIS inspectors;
4)   CNS inspectors;
5)   MET inspectors;
6)   SAR inspectors; and
j.   aerodrome regulatory authority (PQ 8.049).

Guidance for Review of Evidence

a.   Established qualification and experience requirements
b.   Minimum qualifications and experience include:
1)   specified number of years in air transport operations,
2)   at least as qualified as the personnel to be inspected or supervised, and
3)   experience compatible with the activities authorized to certify or supervise.
4)   relevant knowledge, background and appropriate experience
5)   aeronautical licences, certificates or academic degrees commensurate with their job responsibilities; and
6)   operational and technical work experience compatible with the relevant activities.
7)   recurrent training rules for flight and practical examiners.

8) conditions for renewal of designated flight and practical examiners.
9) supervision done by the Licensing Authority.

4   If the State delegates its duties to other divisions, other State bodies, regional organizations, private agencies or individuals, have requirements for competency been established for all domains, including for:

a.   licensing staff (PQ NA)
b.   designated examiners for flight and cabin crew checks (PQ 4.039);
c.   airworthiness inspection (PQ 5.037);
d.   engineering evaluations (PQ 5.477);
e.   all ANS inspectorate personnel (PQ NA); including
1)   ATS inspectors;
2)   flight procedures inspectors;
3)   AIS inspectors;
4)   CNS inspectors;
5)   MET inspectors;
6)   SAR inspectors; and
f.   aerodrome regulatory authority technical personnel (PQ 8.049)?

Guidance for Review of Evidence

Appropriate minimum requirements have been established for each delegated authority, including:
a.   competence;
b.   qualifications; and
c.   experience.

5   Does the State ensure that all personnel meet the established minimum qualification and experience requirements for all domains, including:

a.   licensing staff (PQ 3.112);
b.   airworthiness inspectors (PQ 5.032);
c.   airworthiness engineers (PQ 5.472);
d.   aircraft accident investigators (PQ 6.119);
e.   all ANS inspectorate personnel (PQ NA), including:
1)   ATS inspectors;
2)   flight procedures inspectors;
3)   AIS inspectors;
4)   CNS inspectors;
5)   MET inspectors;
6)   SAR inspectors; and
f.   aerodrome regulatory authority technical personnel (PQ 8.042)?

Guidance for Review of Evidence

Proper maintenance of comprehensive and accurate recruitment files consistent with and in compliance with the established requirements.

Establishment and Implementation of Formal Training Programmes, Plans and Record Keeping Systems

6   Has the State established a formal training programme that details the type of training that should be provided to all technical personnel for all domains, including:

a.   personnel licensing inspectorate staff and other technical personnel (PQ 3.113);
b.   operations inspectors and dangerous goods inspectors (PQ 4.051);
c.   airworthiness inspectors (PQ 5.047);

d.   airworthiness engineers (PQ 5.485);

e.   aircraft accident investigators (PQ 6.123);

f.   ANS inspectorate personnel, including
1) ATS inspectors (PQ 7.065)
2) flight procedures inspectors? (PQ 7.211)
3) AIS inspectors (PQ 7.277)
4) CNS inspectors (PQ 7.381)
5) MET inspectors (PQ 7.425)
6) SAR inspectors (PQ 7.495)

g.   aerodrome regulatory and inspectorate staff? (PQ 8.051)

Guidance for Review of Evidence

a.   Contents of training programme , including:
1) each job (inspectorate staff and other technical personnel), and
2) all activities (i.e. issuance of all licences, medical, training organizations approval).

b.   Types of training, including:
1) initial,
2) on-the-job,
3) recurrent, and
4) specialized training, with timelines to be provided, as applicable.

c.   Minimum duration for each type of training.

d.   Specialized training specified for all domains, including:
1) OPS Inspectorate:
   - ➢ Aircraft type rating;
   - ➢ Air operator certification;
   - ➢ Continued Surveillance activities;
   - ➢ Approval of Flight Simulation Training Devices (FSTDs);
   - ➢ Human factors;
   - ➢ Specific operational approvals (i.e. EDTO, RVSM, CAT II/III, EFB, PBN);
   - ➢ Safety Assessment of Foreign Aircraft (SAFA).

2) AIR Inspectorate:
   - ➢ Air operator certification
   - ➢ Reliability monitoring
   - ➢ Non-destructive testing
   - ➢ Avionics
   - ➢ Human factors
   - ➢ Specific operational approvals (i.e. EDTO, RVSM, CAT II/III, RNP)
   - ➢ Aircraft type knowledge
   - ➢ Ramp inspection methods

3) AIR Engineering:
   - ➢ Avionics
   - ➢ Propulsion systems
   - ➢ Structures
   - ➢ General aviation aircraft
   - ➢ Helicopters
   - ➢ Flight testing
   - ➢ Human factors
   - ➢ Quality systems
   - ➢ Modifications and repairs
   - ➢ MRB and MSG3

> ➢ System safety assessment.

4) AIG

5) ANS
  - ➢ MET Safety Oversight assessment process
  - ➢ Quality management system for meteorological services
  - ➢ Assessment of hazardous phenomena at aerodromes
  - ➢ Aeronautical meteorological competency standards
  - ➢ Establishment of MET authorities and responsibilities
  - ➢ Human factors

6) AGA:
  - ➢ Aerodrome operations
  - ➢ RFF
  - ➢ Wildlife management
  - ➢ Assessment of physical characteristics and electrical systems
  - ➢ Obstacle control
  - ➢ Assessment and reporting of runway surface conditions
  - ➢ Aeronautical studies/risk assessments
  - ➢ Enforcement
  - ➢ Signs, Markings and Lighting

7   Has the State implemented a training programme, including a periodic training plan, which details and prioritizes the type of training to be provided during the established period for all technical personnel for all domains, including:

a. personnel licensing inspectorate staff (PQ 3.115,);
b. flight operations inspection organization technical personnel (PQ 4.053);
c. airworthiness inspectors (PQ 5.051);
d. airworthiness engineers (PQ 5.489);
e. investigation authority aircraft accident investigators (PQ 6.125);
f. all ANS inspectorate personnel, including:
    1) ATS inspectors (7.069)
    2) flight procedures inspectors (PQ 7.215)
    3) AIS inspectors (PQ 7.281)
    4) CNS inspectors (PQ 7.385)
    5) MET inspectors (PQ 7.429)
    6) SAR inspectors (PQ 7.499); and
g. aerodrome regulatory authority (PQ 8.053, 8.055)

Guidance for Review of Evidence

a. Existence of training plan for each inspectorate staff and other technical personnel.
b. Existence of comprehensive training files.
c. Type and frequency of training is successfully completed and sufficient for technical personnel to acquire/maintain the required level of knowledge, skills and qualifications.
d. Availability of schedule for implementing the training programme
e. Training plan includes:
    1) details of the type of training;
    2) training priorities;
    3) timeframe of the plan;
    4) There is a requirement for OJT; and

       5) OJT is provided by an experienced, senior inspector.

f. Training programme and plan for investigation authority includes initial and recurrent training related to safety at the accident site.

8   Has the State established a system to maintain the training records period for all technical personnel for all domains, including:

a. personnel licensing staff (PQ 3.119,)
b. flight operations inspection organization and the entities responsible for the transport of dangerous goods by air (PQ 4.059)
c. Airworthiness Inspection (PQ 5.055)
d. Airworthiness Engineering (PQ 5.493)
e. Aircraft accident investigation authority (PQ 6.129)
f. ANS inspectorate (7.073), including:
      1) ATS inspectors;
      2) flight procedures inspectors;
      3) AIS inspectors;
      4) CNS inspectors;
      5) MET inspectors;
      6) SAR inspectors; and
g. aerodrome regulatory authority (PQ 8.057)

Guidance for Review of Evidence

a. requirements, procedures and instructions for the establishment and maintenance of training records.
b. the system in place complies with system description.
c. training records are systematically retained.
d. training records on OJT include details on the training activities performed

Appendix – B

Figure - 1

USOAP Results by Area and Critical Element

4 areas and 4 critical elements are above the target of 60% EI.
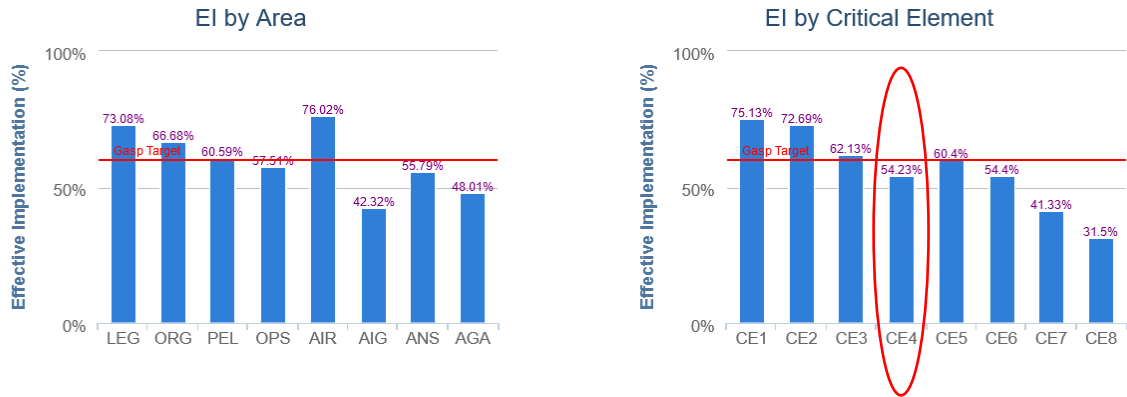
An analysis of the ICAO USOAP results related to CE-4 in RASG-AFI States shows main deficiencies in the establishment of the minimum qualification and experience criteria for examiners; and the development and appropriate implementation of training plans as shown in Figure-2 below.

Figure – 2

CE-4 Status by Implementation Requirement
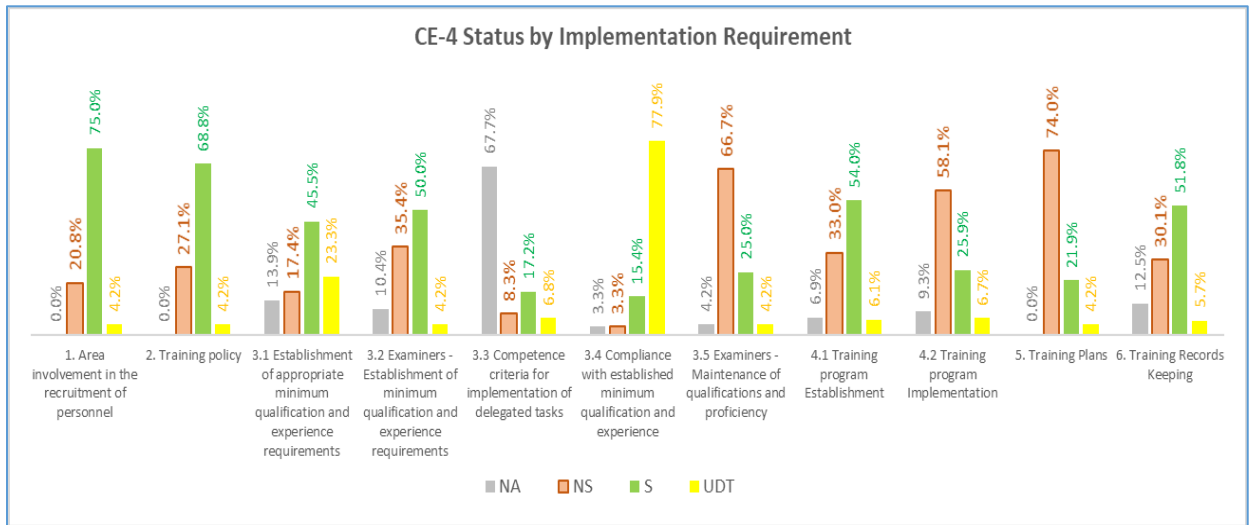
Aircraft accident investigation is the weakest area with respect to CE-4 implementation. However, the other areas except AIR present significant deficiencies with regards to staff training. See Figure-3 below.

Figure – 3

RASG-AFI CE-4 Status by Area
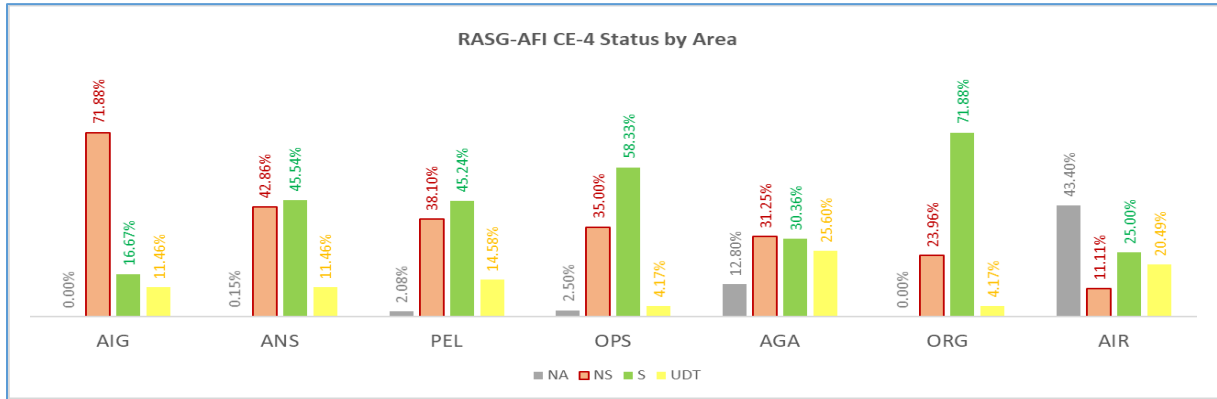
USOAP-CMA CE-4 implementation Status for RASG-AFI States

Figure- 4: USOAP-CMA Critical Element four (CE-4) level of implementation

RASG-AFI States CE-4 %EI vs %EI
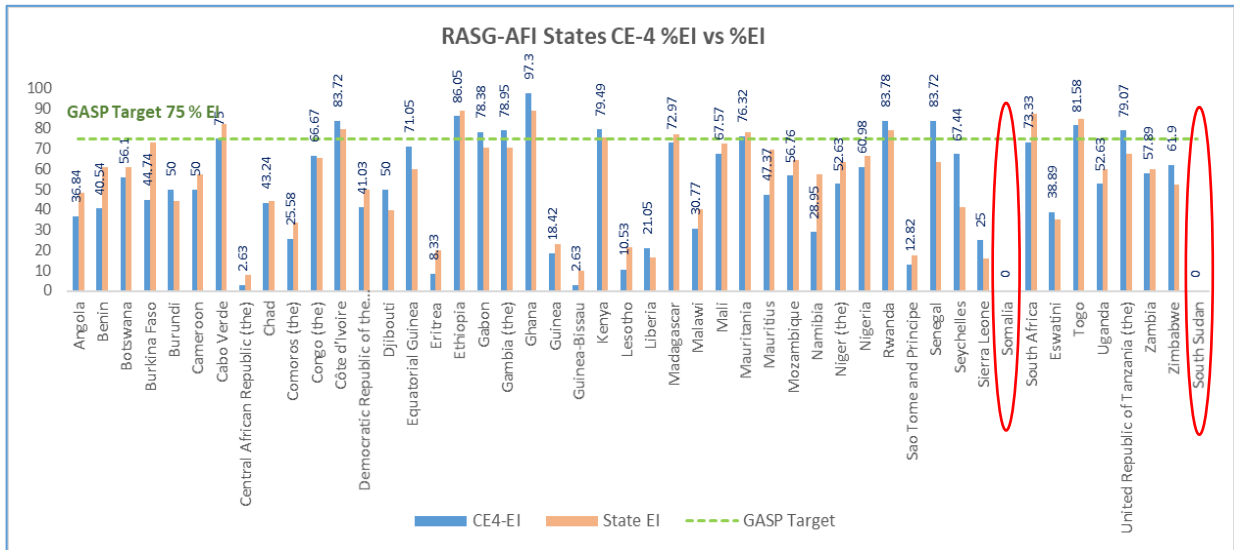
- The level of effective implementation (%EI) in the RASG-AFI Region is 55.35%, which is 20% lower than GASP target of 75%EI for 2022.
- In the RASG-AFI, 36 (75%) States have CE-4 %EI below the target of 75% and 28 (58%) States have %EI below the CE-4 global average of 59.71%.
- States with CE-4 below 60% EI tend to have State %EI below 60%.
- There was no USOAP-CMA activity for Somalia and South Sudan.

Figure- 5: USOAP- CMA Results by Critical Element (CE) and Area
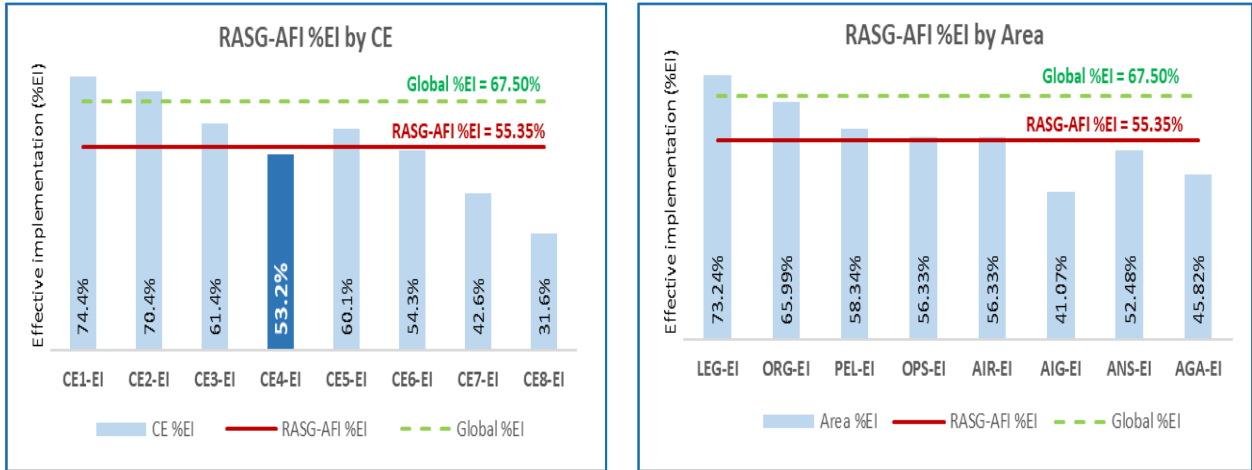
- The average level of implementation for CE-4 in the region is 53.24%EI, which is below the CE-4 global average of 59.71%.
- In the region, six USOAP-CMA CEs and seven areas have %EI below the global average of 67.50%. The CEs 4,6,7 and 8 and the areas of AIG, ANS and AGA have lowest %EIs
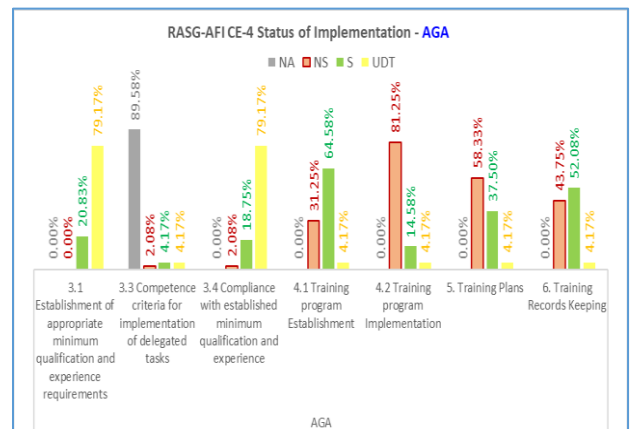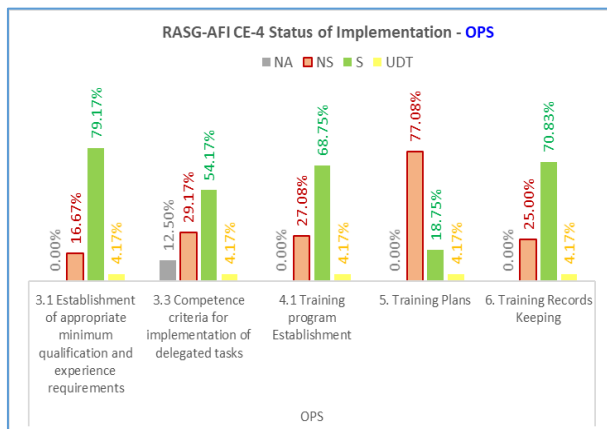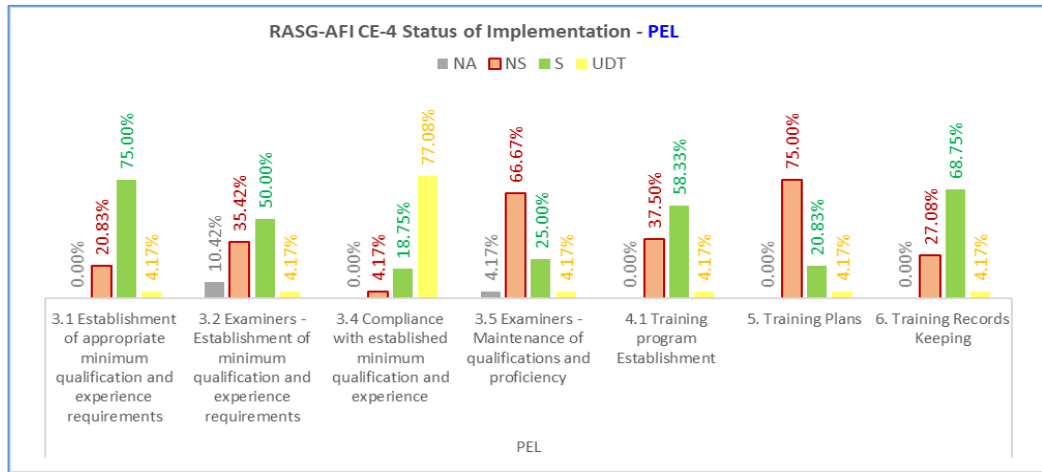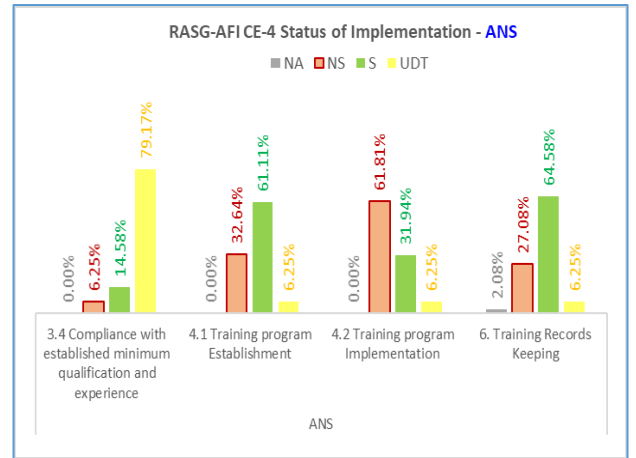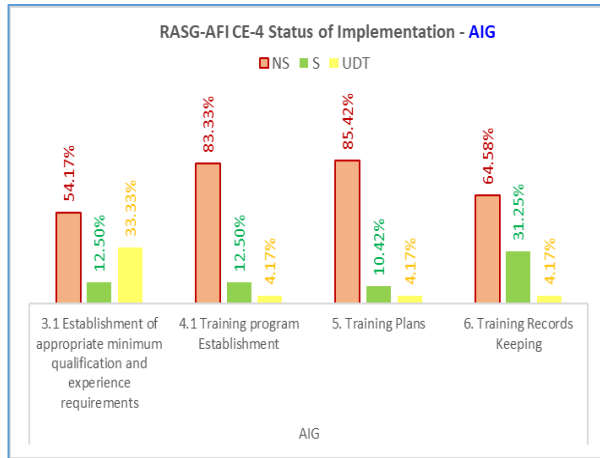
Figure- 6: USOAP-CMA CE-4 PQs and associated Implementation Requirements
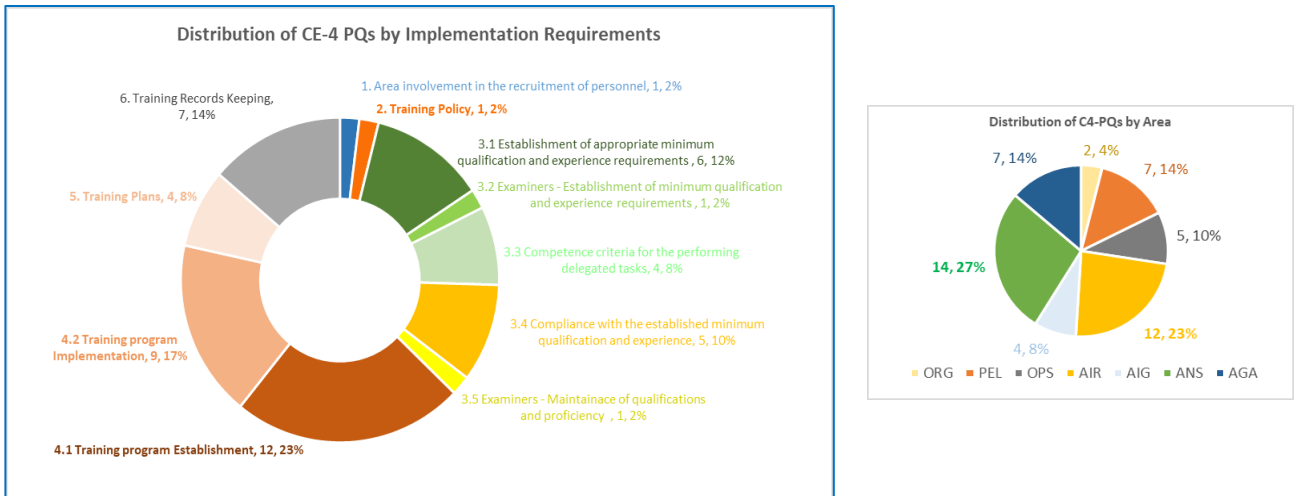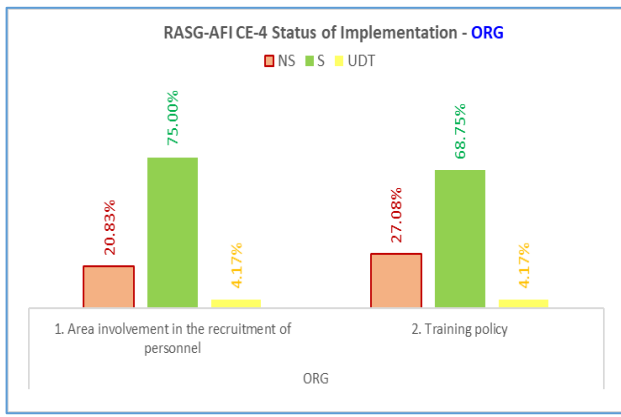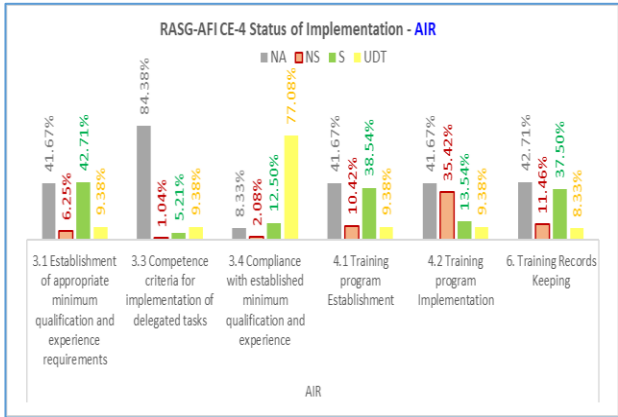

- The USOAP-CMA have 51 Protocol Questions to evaluate the CE-4 level of implementation related to qualified technical personnel.
- From the 51CE-4 PQs, the areas of ANS, AIR, PEL, OPS and AGA have the highest number of PQ, therefore with greater contribution in the overall results for CE-4.
- For each area the requirements with greater impact are those related to establishment and implementation of minimum qualification requirements for the personnel, training program and training plans

Figure- 7: RASG-AFI CE-4 PQs Status by Implementation by Area

- The details of on the implementation requirements for each USOAP- CMA is provide below.

RASG-AFI CE-4 Status of Implementation - AIR

RASG-AFI CE-4 Status of Implementation - ORG

-- END--