European Aviation Safety Agency

Position Paper

on the compliance of
EASA system and EU-OPS with ICAO Annex 6
safety management systems (SMS)
standards and recommended practices for air operators.

Date: 20 December 2007

1. Purpose

The objective of this paper is to evaluate the compliance of the EASA system and EU-OPS with ICAO Annex 6 standards and recommended practices concerning safety management systems (SMS) for air operators as required by ICAO per 1 January 2009.

2. References

For the purpose of this paper the relevant paragraphs of ICAO Annex 6 and EU-OPS are respectively paragraph 3.2 and OPS 1.037.[1] EU-OPS paragraph OPS 1.037 will be analysed to identify its compliance with this ICAO Annex 6 paragraph.[2]

3. Background

3.1 ICAO differentiates between state safety programme and safety management systems for organisations. In ICAO document 9859 (Safety Management Manual) the safety programme and safety management systems are described as follows:

- A safety programme is an integrated set of regulations and activities aimed at improving safety.

- A safety management system is an organised approach to managing safety, including the necessary organisational structures, accountabilities, policies and procedures.

3.2 Amendment 30 of ICAO Annex 6 requires organisations (air operators and maintenance organisations) to establish a safety management system that as a minimum:

a) identifies safety hazards;

b) ensures that remedial action necessary to maintain an acceptable level of safety is implemented;

c) provides for continuous monitoring and regular assessment of the safety level achieved; and

d) aims to make continuous improvement to the overall level of safety.

In addition organisations shall establish an appropriate management structure, assigning responsibilities and accountabilities, and allocating appropriate resources, consistent with the organisation's stated safety objectives. It also requires real commitment to safety on the part of senior management. Personnel shall fully understand their responsibilities and know what to report, to whom and when. Senior management shall review not only the financial performance of the organisation, but also the safety performance. In order to stimulate reporting by their personnel, the organisations must promote the just culture so that reporters are not exposed to unjust blame.

[1] Annex III to Regulation (EC) No. 3922/91 on the harmonisation of technical requirements and administrative procedures in the field of civil aviation will be effective on 16 July 2008.
[2] Amendment 30 to ICAO Annex published on 23 November 2006. See **Annex 1** to this position paper for the text of ICAO Annex 6 paragraph 3.2 and **Annex 2** for the text of EU-OPS paragraph OPS 1.037.

3.3 To comply with paragraph 3.2 above an organisation shall establish and maintain an SMS containing the following 4 components and corresponding elements[3]:

1. Safety policy and objectives.
    a. Management commitment and responsibilities
    b. Safety accountabilities of managers
    c. Appointment of key safety personnel
    d. SMS implementation plan
    e. Coordination of emergency response planning
    f. Documentation

2. Safety risk management.
    a. Hazard identification process
    b. Risk assessment and mitigation process

3. Safety assurance.
    a. Safety performance monitoring and measurement
    b. The management of change
    c. Continuous improvement of the SMS

4. Safety promotion.
    a. Training and education
    b. Safety communication

3.4 EU-OPS contain in paragraph OPS 1.037 an accident prevention and flight safety programme which consists of the following items:

1. Programmes to achieve and maintain risk awareness by all persons involved in operations; and

2. An occurrence reporting scheme to enable the collation and assessment of relevant incident and accident reports in order to identify adverse trends or to address deficiencies in the interests of flight safety. The scheme shall protect the identity of the reporter and include the possibility that reports may be submitted anonymously; and

3. Evaluation of relevant information relating to accidents and incidents and the promulgation of related information, but not the attribution of blame; and

4. A flight data monitoring programme for those aeroplanes in excess of 27 000 kg MCTOM. Flight Data Monitoring (FDM) is the pro-active use of digital flight data from routine operations to improve aviation safety. The flight data monitoring programme shall be non-punitive and contain adequate safeguards to protect the source(s) of the data; and

5. The appointment of a person accountable for managing the programme.

3.5 EU-OPS also defines that:

1. Proposals for corrective action resulting from the accident prevention and flight safety programme shall be the responsibility of the person accountable for managing the programme.

2. The effectiveness of changes resulting from proposals for corrective action identified by the accident and flight safety programme shall be monitored by the Quality Manager.

[3] ICAO Doc.9829 – AN/460 – Safety Management Manual – Chapter 5.

4. Comparison of ICAO Annex 6 paragraph 3.2 with EASA system and EU-OPS paragraph OPS 1.037.

4.1. ICAO and EASA system

- According to 3.2.1: States shall establish a safety programme in order to achieve an acceptable level of safety in the operation of aircraft.

>> *Response*: Consistent with ICAO Doc. 9859, the EASA system comprises an integrated set of regulations and activities aimed at improving safety:[4]

a. *Regulations*: The EASA system is built on Regulation (EC) No. 1592/2002, which establishes at legislative level the safety objectives to be met by means of essential requirements; these requirements have been designed to mitigate any probable risk linked to civil aviation activities within the scope of the EASA system. These mitigating means are further detailed in appropriate implementing regulations, acceptable means of compliance, certification specifications and guidance material.

b. *Rulemaking:* The Agency is required through the rulemaking process to develop and amend regulations in order to maintain and continuously improve the safety level. It could receive external input from stakeholders as well as data on the aviation system, accidents, incidents and occurrences collected and analysed by safety analyses and research team of the Agency. This process is supported by safety analysis, research and involvement of the industry through the European Strategic Safety Initiative; ESSI is an aviation safety regulator-industry partnership in Europe, further enhancement of safety is foreseen through analysis of safety data, coordination with safety initiatives worldwide, and the implementation of cost effective action plans.[5]

c. *Standardisation:* The Agency conducts standardisation inspections of National Aviation Authorities in the domains of the implementing rules that are within the remit of the Agency, to provide for an effective and harmonised implementation of the EASA regulations.

d. *Certification and oversight:* Competent authorities, including the Agency itself and National Aviation Authorities must ensure continued compliance with the regulations through initial compliance check with the certification requirements and continuous oversight checking.

- According to 3.2.2: The acceptable level of safety to be achieved shall be established by the State(s) concerned.

>> *Response*: The acceptable level of safety is a political decision to be taken by the legislator. The definition of quantified key performance indicators, and targets to be met, although complicated is not an impossible task. However, it is doubtful indeed that legislators will accept such quantification because as long as the rate would be respected, some could argue that there is no need for action even with accidents occurring. Such is the reason why, as explained here above, the Community legislator has decided to set its objectives by adopting essential requirements as an integral part

[4] See also Article 2 of the EASA Basic Regulation, Regulation (EC) No. 1592/2002.
[5] More info on the European Strategic Safety Initiative (ESSI), see http://www.easa.europa.eu/essi/

of the Basic Regulation. When doing so the legislator had in mind a broad objective that could be summarised in few words, such:

- One accident involving public is an accident too much, or
- Reduce the rate of accidents and the fatality risk, irrespective of the volume of air traffic within Europe, for aviation safety worldwide.

Trying to define the acceptable level of safety by other means might be incompatible with the legislative framework accepted by all EASA Member States.[6]

The Agency by developing and amending regulations, as well as monitoring their impact aims for a continued maintenance of the acceptable level of safety and where necessary improvement thereof.

- According to 3.2.4: From 1 January 2009, States shall require, as part of their safety programme, that an operator implement a safety management system acceptable to the State of the Operator that, as a minimum:

a) identifies safety hazards;

b) ensures that remedial action necessary to maintain an acceptable level of safety is implemented;

c) provides for continuous monitoring and regular assessment of the safety level achieved; and

d) aims to make continuous improvement to the overall level of safety.

>> *Response*: EU-OPS 1.037 paragraph (a) requires the establishment and maintenance of an accident prevention and flight safety programme in order to improve aviation safety. It does not require explicitly the definition of an acceptable level of safety and a continuous monitoring thereof by the operator which are key elements of a SMS. It also can be considered that the requirements of EU-OPS are reactive rather than pro-active. The SMS seems require indeed that the operator evaluates all potential risks related to its activities and mitigates them by anticipation. Only identifying risks and address them when they happen does probably not fulfil the intent of the SMS.

- According to 3.2.5: A safety management system shall clearly define lines of safety accountability throughout the operator's organisation, including a direct accountability for safety on the part of senior management.[7]

>> *Response*: EU-OPS 1.037 (a)(5) requires the appointment of a person accountable for managing the programme, but EU-OPS 1.037 in specific terms does not require the definition of lines of safety accountability throughout the operator's organisation and the senior management commitment. It moreover seems to imply a sharing of roles between the person in charge with corrective action and the one responsible for evaluating its effectiveness; this may not be the intent of the SMS. This problem may be reduced when the accident prevention and flight safety programme is integrated into the quality system as allowed by EU-OPS 1.037.

[6] This point was one of the drivers for the Agency choice of a conventional approach to UAV certification instead of safety target approach.
[7] Guidance on safety management systems is contained in the Safety Management Manual (SMM) (Doc 9859).

- According to 3.2.7: An operator of an aeroplane of a maximum certificated take-off mass in excess of 27 000 kg shall establish and maintain a flight data analysis programme as part of its safety management system.[8]

>> *Response*: This point is covered by EU-OPS 1.037 paragraph (a)(4), for pro-active use of the digital data from routine operations to improve aviation safety. This is in compliance with pro-active character of managing safety in SMS.

- According to 3.2.8: A flight data analysis programme shall be non-punitive and contain adequate safeguards to protect the source(s) of the data.[9]

>> *Response*: covered by EU-OPS 1.037 paragraph (a)(5), which requires that the flight data monitoring programme shall be non-punitive and contain adequate safeguards to protect the source(s) of the data. This will be further strengthened by the extended Basic Regulation, which include similar wording.

- According to 3.2.9: An operator shall establish a flight safety documents system, for the use and guidance of operational personnel, as part of its safety management system.

>> *Response*: EU-OPS 1.037 paragraph (a)(3), requires that data shall be evaluated and promulgated. EU-OPS is therefore in compliance with the ICAO standard.

4.2. The table below provides a quick overview of the equivalence status of EASA system and EU-OPS 1.037 in relation to ICAO Annex 6 paragraph 3.2.

ICAO Annex 6	**EASA system**	**Gap**	**Corrective action or Remarks**
3.2.1	Article 2 EASA Basic Regulation EC No. 1592/2002	None.	EASA system contains the elements of the ICAO State Safety Programme. Further enhancement to be achieved by creating a safety Programme at Community level containing a description of the EASA system and complemented by EASA and national programme describing their organisation and means to implement the EASA system.

[8] An operator may contract the operation of a flight data analysis programme to another party while retaining overall responsibility for the maintenance of such a programme.

[9] Guidance on flight data analysis programmes is contained in the Safety Management Manual (SMM) (Doc 9859). Legal guidance for the protection of information from safety data collection and processing systems is contained in Annex 13, Attachment E.

ICAO Annex 6	EASA system	Gap	Corrective action or Remarks
3.2.2	Article 2 EASA Basic Regulation EC No. 1592/2002	Definition of acceptable level of safety.	Although the acceptable level of safety has not been formally specified by the Community legislator when adopting the Basic Regulation, its intention is reflected in the essential requirements. Compliance with ICAO requirement can probably be achieved by expressing in words such political intentions.
3.2.4	EU-OPS 1.037 (a)	EU-OPS 1.037 (a) does not require the definition of an acceptable level of safety and a continuous monitoring thereof. It does not address future risks which may not be fully inline with the intent of ICAO standard.	To complement the provisions of EU-OPS the future EASA implementing rules on air operations to include the items mentioned in ICAO Annex 6 paragraph 3.2.4.
3.2.5	EU-OPS 1.037 (a)(5)	EU-OPS 1.037 does not specifically require the definition of lines of accountability throughout the operator's organisation and the senior management commitment. It also indicates a sharing of roles between various managers that may not be appropriate.	To complement the provisions of EU-OPS the future EASA implementing rules on air operations to include the items mentioned in ICAO Annex 6 paragraph 3.2.4. The implementing rules will contain the definition of lines of safety accountability throughout the operator's organisation and the senior management commitment.
3.2.7	EU-OPS 1.037 (a)(4)	None.	None.
3.2.8	EU-OPS 1.037 (a)(5)	None.	None

ICAO Annex 6	EASA system	Gap	Corrective action or Remarks
3.2.9	EU-OPS 1.037 (a)(3)	None	None

n/a. = not applicable

5. Conclusion

5.1 Out of the comparison and gap analysis performed in paragraph 4 of this paper the following could be concluded:

- EASA system contains the elements of the ICAO State Safety Programme.[10] Further enhancement will be achieved by creating a safety programme at Community level specified in a clearly identifiable way the acceptable level of safety and containing a description of the EASA system and complemented by EASA and national programmes describing their organisation and means to implement the EASA system.

- EASA and National Aviation Authorities will cooperate in designing the Community Safety Programme.

- The major principles of ICAO Annex paragraph 3.2, like data collection, monitoring of safety performance, evaluation of data, providing data to personnel, anonymous reporting and pro-active attitude towards the improvement of aviation safety are included in EU-OPS 1.037.

- Member States by applying EU-OPS are making a positive move towards the implementation of an SMS, however for the full implementation of an SMS additional effort is required from organisations.

- To improve the EU-OPS compatibility with the SMS concept for organisations laid down in ICAO Annex 6 paragraph 3.2, the following should be included in the EASA implementing rules on SMS in addition to the existing EU-OPS provisions:

  - Management commitment and responsibility.
  - Hazard identification process.
  - Preventive risk assessment and mitigation process.
  - Safety promotion and communication.

The EASA system in the future should take into account the feasibility of imposing all the SMS elements, as described in paragraph 3.3 of this paper, to all organisations.

[10] For the elements covered in the EASA system, see paragraph 4.1 of this paper.

Indeed, the Basic Regulations mandates that EASA takes special care in relation to the impact of the regulatory system on small and medium-enterprises when developing implementing rules.

5.2 Full compliance will be assured when the EASA system is extended to cover air operations and the necessary implementing rules, including the implementing rules on SMS, are be in place; this is planned to happen in due time to meet the ICAO implementation date of 1 January 2009.

5.3 An intermediate solution would be to elaborate a common position towards ICAO containing a gap analysis based on this paper, which the Agency and Member States could provide to ICAO during USOAP audits, as well as on-going corrective actions to comply in due time.

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Annex 1

ICAO Annex 6 - Standard Practices and Recommendations

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3.2 Safety management

3.2.1 States shall establish a safety programme in order to achieve an acceptable level of safety in the operation of aircraft.

3.2.2 The acceptable level of safety to be achieved shall be established by the State(s) concerned.[11]

3.2.3 Recommendation. States should require, as part of their safety programme, that an operator implement a safety management system acceptable to the State of the Operator that, as a minimum:

a) identifies safety hazards;

b) ensures that remedial action necessary to maintain an acceptable level of safety is implemented;

c) provides for continuous monitoring and regular assessment of the safety level achieved; and

d) aims to make continuous improvement to the overall level of safety.

3.2.4 From 1 January 2009, States shall require, as part of their safety programme, that an operator implement a safety management system acceptable to the State of the Operator that, as a minimum:

a) identifies safety hazards;

b) ensures that remedial action necessary to maintain an acceptable level of safety is implemented;

c) provides for continuous monitoring and regular assessment of the safety level achieved; and

d) aims to make continuous improvement to the overall level of safety.

3.2.5 A safety management system shall clearly define lines of safety accountability throughout the operator's organization, including a direct accountability for safety on the part of senior management.[12]

[11] Guidance on safety programmes is contained in the Safety Management Manual (SMM) (Doc 9859), and the definition of acceptable levels of safety is contained in Attachment E to Annex 11.
[12] Guidance on safety management systems is contained in the Safety Management Manual (SMM) (Doc 9859).

3.2.6 Recommendation. An operator of an aeroplane of a certificated take-off mass in excess of 20 000 kg should establish and maintain a flight data analysis programme as part of its safety management system.

3.2.7 An operator of an aeroplane of a maximum certificated take-off mass in excess of 27 000 kg shall establish and maintain a flight data analysis programme as part of its safety management system.[13]

3.2.8 A flight data analysis programme shall be non-punitive and contain adequate safeguards to protect the source(s) of the data.[14]

3.2.9 An operator shall establish a flight safety documents system, for the use and guidance of operational personnel, as part of its safety management system.[15]

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> end.

[13] An operator may contract the operation of a flight data analysis programme to another party while retaining overall responsibility for the maintenance of such a programme.
[14] Guidance on flight data analysis programmes is contained in the Safety Management Manual (SMM) (Doc 9859). Legal guidance for the protection of information from safety data collection and processing systems is contained in Annex 13, Attachment E.
[15] Guidance on the development and organization of a flight safety documents system is provided in Attachment H.

Annex 2

EU - OPS

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OPS 1.037 Accident prevention and flight safety programme[16]

(a) An operator shall establish and maintain an accident prevention and flight safety programme, which may be integrated with the Quality System, including:

(1) Programmes to achieve and maintain risk awareness by all persons involved in operations; and

(2) An occurrence reporting scheme to enable the collation and assessment of relevant incident and accident reports in order to identify adverse trends or to address deficiencies in the interests of flight safety. The scheme shall protect the identity of the reporter and include the possibility that reports may be submitted anonymously; and

(3) Evaluation of relevant information relating to accidents and incidents and the promulgation of related information, but not the attribution of blame; and

(4) A flight data monitoring programme for those aeroplanes in excess of 27 000 kg MCTOM. Flight Data Monitoring (FDM) is the pro-active use of digital flight data from routine operations to improve aviation safety. The flight data monitoring programme shall be non-punitive and contain adequate safeguards to protect the source(s) of the data; and

(5) The appointment of a person accountable for managing the programme.

(b) Proposals for corrective action resulting from the accident prevention and flight safety programme shall be the responsibility of the person accountable for managing the programme.

(c) The effectiveness of changes resulting from proposals for corrective action identified by the accident and flight safety programme shall be monitored by the Quality Manager.

> end.

[16] Annex III to Regulation (EC) No. 3922/91 on the harmonisation of technical requirements and administrative procedures in the field of civil aviation will be effective on 16 July 2008.

Annex 3

REGULATION (EC) No 1592/2002 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 15 July 2002 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency

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Article 2

Objectives

1. The principal objective of this Regulation is to establish and maintain a high uniform level of civil aviation safety in Europe.

2. Additional objectives are, in the fields covered by this Regulation, as follows:

(a) to ensure a high uniform level of environmental protection;

(b) to facilitate the free movement of goods, persons and services;

(c) to promote cost-efficiency in the regulatory and certification processes and to avoid duplication at national and
European level;

(d) to assist Member States in fulfilling their obligations under the Chicago Convention, by providing a basis for a
common interpretation and uniform implementation of its provisions, and by ensuring that its provisions are duly
taken into account in this Regulation and in the rules drawn up for its implementation;

(e) to promote Community views regarding civil aviation safety standards and rules throughout the world by establishing appropriate cooperation with third countries and international organisations.

3. The means of achieving the objectives set out in paragraphs 1 and 2 shall be:

(a) the preparation, adoption and uniform application of all necessary acts;

(b) the recognition, without additional requirements, of certificates, licences, approvals or other documents granted to products, personnel and organisations in accordance with this Regulation and its implementing rules;

(c) the establishment of an independent European Aviation Safety Agency;

(d) the uniform implementation of all necessary acts by the national aviation authorities and the Agency within their respective areas of responsibility.