

Doc 9968



Report on Environmental Management System (EMS) Practices in the Aviation Sector

Approved by the Secretary General
and published under his authority

First Edition — 2012

International Civil Aviation Organization

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AMENDMENTS

Amendments are announced in the supplements to the *Catalogue of ICAO Publications*; the Catalogue and its supplements are available on the ICAO website at www.icao.int. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

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EXECUTIVE SUMMARY

Pressure on the aviation industry to balance increasing global demands in air travel with environmental protection is at an all time high. Therefore, an effective approach to sustain operations and meet future environmental requirements is critical. The International Civil Aviation Organization's (ICAO's) Committee on Aviation Environmental Protection (CAEP) is the international forum of expertise for the study and development of proposals to minimize the impact of aviation on the environment.

At the seventh meeting of CAEP (CAEP/7) in February 2007, the Land Use Planning and Noise Management Task Group (TG) was asked to deliver a report at the eighth meeting of CAEP (CAEP/8) in February 2010 on the use of environmental management systems (EMSs) and, as appropriate, make recommendations on how the committee could promote the use of EMS within the aviation system. In response, the TG developed an industry questionnaire to learn more about the application and potential value of EMS to aviation organizations. The questionnaire and accompanying State letter were distributed worldwide by Member States and international representative organizations in May 2008. Approximately 326 organizations responded to the questionnaire and were categorized into five different sectors, including air navigation services providers (ANSPs), airlines, airports, manufacturers and other aviation organizations. After validating the data, information from 233 responses formed the basis of this report to CAEP/8 and supported the development of recommendations.

Approximately 50 per cent of questionnaire respondents (117) applied EMS standards or guidelines, with the majority having an ISO 14001:2004 certified EMS in place. The remaining 116 respondents had other environmental programmes with many of the same principles and practices that are required as part of a formal EMS. For those organizations with an EMS, 82 per cent had additional management systems—approximately 51 per cent of these additional systems were integrated or coordinated with the organization's EMS. Over the past ten years, EMS implementation has been relatively consistent in the aviation industry. Respondents indicated that 6 to 12 months on average were needed to successfully develop and implement an EMS. Approximately 71 per cent had assistance with EMS implementation from a consulting or contracting firm.

Regardless of whether the respondent organization had an EMS, measuring environmental performance was important for ensuring compliance. On average, the majority of respondents communicated environmental performance through a corporate social responsibility (CSR) report or through their organization's website. Seventy-nine respondent organizations without an EMS plan to implement one in the future. Their most common reason for not implementing an EMS was unfamiliarity with EMS approaches, and as a result, they requested aviation industry specific EMS implementation guidance.

The information provided by respondents formed the basis of two recommendations which focused on increasing awareness of EMS principles and best practices in the aviation sector and establishing practical guidance to assist those organizations that choose to use EMS to enhance their management of environmental issues. Awareness and guidance materials should integrate existing ICAO environmental tools, guidelines and manuals. Where possible, they should encourage organizations to support higher-level ICAO environmental objectives, consider the collaborative nature of the aviation industry, and account for variance in operation type (i.e. sector type) and the level of EMS maturity at the organization.

Recommendations

Disseminate report information. Within the first year of the CAEP/9 cycle, ICAO should make the information contained in this report publicly available. A report should be distributed specifically to CAEP States and observers and to all survey respondents.

Develop EMS guidance. Stand-alone EMS guidance should be developed for the end of the CAEP/9 cycle to assist organizations to determine how EMS elements and principles can be used to enhance the way they manage environmental issues, and provide practical guidance on how these EMS elements and principles can be implemented/integrated into existing management systems and business processes.

ACRONYMS

ACI	Airports Council International
ANSP	Air navigation services provider
CAEP	Committee on Aviation Environmental Protection
CSR	Corporate social responsibility
CANSO	Civil Air Navigation Services Organisation
EMAS	Eco-management audit scheme
EMS	Environmental management system
FAA	Federal Aviation Administration
IATA	International Air Transport Association
ICCAIA	International Coordinating Council of Aerospace Industries Associations
ISO	International Organization for Standardization
O&M	Operation and maintenance
SMS	Safety management system
TG	Task group
QMS	Quality management system

Abbreviation

USD	United States dollar
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Chapter 1

INTRODUCTION

1.1 BACKGROUND

1.1.1 Global demand for air travel is estimated to increase significantly in the future. While the benefits of this growth will be substantial, it is likely to be accompanied by an increase in aviation-related environmental impacts. Local air quality, ambient noise levels, water quality, energy use and climate change are some of the most prominent impacts of concern. Pressure on the aviation industry to balance increasing demand with environmental protection is at an all-time high. Therefore, an effective approach to sustain operations and meet future environmental requirements is critical. Identifying the significant environmental impacts of aviation and effectively managing these impacts efficiently through the use of technology, procedures and policy is likely to play an important role in the sustainable growth of the aviation industry.

ICAO and the environment

1.1.2 ICAO is a specialized agency of the United Nations created in 1944 to promote the safe and orderly development of global air transport. ICAO's work on the environment focuses primarily on those problems that benefit most from a common and coordinated approach on a worldwide basis, namely, aircraft noise and engine emissions. The following environmental goals have been established by ICAO:

- a) limit or reduce the number of people affected by significant aircraft noise;
- b) limit or reduce the adverse impact of aviation emissions on local air quality; and
- c) limit or reduce the impact of aviation greenhouse gas emissions on the global climate.

1.1.3 ICAO's Committee on Aviation Environmental Protection (CAEP) is the international forum of expertise for the study and development of proposals to minimize the impact of aviation on the environment. Its membership consists of experts from ICAO Member States and observer organizations, including intergovernmental and non-governmental organizations representing the aviation industry and environmental interests. CAEP is responsible for conducting studies and recommending measures to minimize and reduce aviation's impact on the environment, and for maintaining certification Standards for aircraft noise and aircraft engine emissions. Recommendations made by CAEP are reviewed and adopted by the ICAO Council. The Council reports to the ICAO Assembly where the main policies on aviation environmental protection are defined and translated into Assembly Resolutions.

1.1.4 Since its creation in 1983, the role of CAEP has progressively expanded from one of setting basic standards to the development of broad policy measures, such as the balanced approach to limit or reduce the impact of aircraft noise, and the creation of market-based measures to handle noise and emissions charges and emissions trading. In order to achieve a greater understanding of the environmental impacts of aviation, CAEP encourages research through the collection, generation, analysis, harmonization, exchange, and dissemination of information related to aviation environmental issues. CAEP's work often results in published reports, guidance material, and/or specific studies.

CAEP/8 EMS task

1.1.5 An environmental management system (EMS) provides a methodology and framework to systemically identify and cost-effectively manage significant environmental aspects of aviation organizations' operations and have proven effective across a wide range of organizations, including airports, air carriers, manufacturers and government agencies. As a result, international recognition of the potential value of EMS as a tool to help aviation organizations manage their environmental issues is increasing. ICAO wanted to further understand the application of EMS by aviation organizations, encourage implementation to help them overcome environmental challenges and better use environmental opportunities.

1.1.6 At the seventh meeting of CAEP (CAEP/7) in February 2007, the Land Use Planning and Noise Management Task Group (TG) was asked to deliver a report to the eighth meeting of CAEP (CAEP/8) in February 2010 providing information on the use of EMS and, as appropriate, make recommendations on how the committee could promote the use of EMS within the aviation system. In response, the TG formed an ad hoc working group to perform the task and proposed a questionnaire to gather information for the report. The United States Federal Aviation Administration (FAA) agreed to lead the effort, and an ad hoc working group was formed with representatives from Transport Canada, Italy, International Coordinating Council of Aerospace Industries Associations (ICCAIA), International Air Transport Association (IATA) and Airports Council International (ACI).

1.1.7 The CAEP/8 EMS task was to:

- a) deliver a report providing information on the use of EMS among airports, airlines and air navigation providers in order to give a base of understanding in the aviation sector; and
- b) based on the report, as appropriate, make recommendations on how the committee could promote the use of EMS within the aviation sector.

1.2 METHODOLOGY

1.2.1 The TG developed an industry questionnaire based widely on input from members of the working group to gain an understanding of environmental management practices in the aviation sector. This questionnaire was divided into eight sections that sought to understand the responding organizations and their environmental management practices by inquiring about the following:

- a) environmental management drivers;
- b) approach to environmental management;
- c) performance monitoring and communication methods;
- d) resources required for implementation and maintenance; and
- e) lessons learned.

1.2.2 The questionnaire and accompanying State letter were approved by the ICAO Secretary General on 16 May 2008 and distributed worldwide by Member States and *international representative organizations. Approximately 326 organizations responded to the questionnaire over a six-month period.

1.2.3 Following validation, individual sector data were forwarded to the appropriate international representative organization so a summary analysis could be conducted to characterize the respondents in a given sector. After the response data were validated and characterized, data from the remaining 233 responses were analysed and formed the basis of the report to CAEP/8.

1.3 QUESTIONNAIRE DATA

1.3.1 As a result of the number and range of organizations from different States that responded to the questionnaire, variation in the data exists. Common inconsistencies included the submission of partially completed surveys; multiple different responses from the same organization; and responses to both question sets, i.e. those for organizations with an EMS and those for organizations without an EMS. It was critical that the data be as consistent as possible for a strong informative analysis. Therefore, the TG developed resolutions on how common inconsistencies should be addressed prior to analysis as follows:

- a) delete those responses from the data set that provided no information on the organization's environmental management practices;
- b) delete those responses from the data set that were duplicate;
- c) request clarification from international representative organizations for responses that were from the same organization but not duplicate;
- d) review data specifically by sector to see what can be done about inconsistent financial figures;
- e) request clarification from the international representative organizations or respondents for those responses that claimed they do not apply EMS standards/guidelines, but completed both sets of questionnaires, i.e. those for organizations with an EMS and those without one;
- f) delete the completed data set from organizations without an EMS that claimed to have one and who completed the question set for organizations with an EMS;
- g) change the organization's response to the question regarding whether or not they had an EMS to reflect the question set that they answered; and
- h) delete those responses from the data set that did not provide sufficient information on the organization to validate an accurate response.

1.3.2 Of the 326 responses received, approximately 93 were not considered for analysis as a result of the agreed upon resolutions. The remaining 233 responses formed the basis of the report to CAEP/8 and supported the development of recommendations.

* Four sectors, namely, air navigation services providers (ANSPs), airports, airlines and manufacturers, participated in the survey through their relevant representative associations, e.g. Civil Air Navigation Services Organisation (CANSO), ACI, IATA and ICCAIA. Throughout the document, "international representative organizations" will be used to refer to the group.

1.3.3 In addition to variation in the data, it should be noted that the questionnaire respondents did not make up a random sample. The questionnaire and State letter that was distributed to international representative organizations and States encouraged the participation of all organizations in the aviation sector. However, since participation was voluntary, those organizations who responded were more likely to have an environmental programme in place. As a result, the sample of respondents is not representative of the aviation industry as a whole.

1.4 INTRODUCTION TO EMS

1.4.1 As one of the most environmentally friendly forms of transportation, aviation organizations are increasingly using an EMS among other approaches to meet their environmental challenges. A formal definition of EMS, developed by Transport Canada, is as follows:

... A systematic approach for organizations to bring environmental considerations into decision-making and day-to-day operations. It also establishes a system for tracking, evaluating and communicating environmental performance. An EMS helps ensure that major environmental risks and liabilities are identified, minimized and managed. ...

1.4.2 Formal EMSs emerged in the early 1990s to provide organizations with a proactive, systematic approach for managing the potential environmental consequences of their operations. Such systems have been widely adopted by industry and government and have been effective at improving an organization's regulatory compliance and environmental performance. Although several recognized EMS frameworks exist, most are based on the International Organization for Standardization's (ISO's) ISO 14001:2004 EMS standard, illustrated in Figure 1-1. The elements contained in this figure are described as follows:

- a) **Environmental policy.** The organization establishes an environmental policy which provides an overarching vision and framework for environmental management at the organization;
- b) **Planning.** The organization identifies how its operations might harm the environment and develops objectives, targets and programmes to reduce this harm;
- c) **Implementation and operation.** The organization implements the systemic measures to control operations and reduce environmental impacts across all levels and functions of its operations;
- d) **Checking.** The organization assesses its environmental performance and the effectiveness of its management system elements;
- e) **Management review.** Based on its assessment of the implemented systemic measures, the organization undertakes actions to make system adjustments and promote continual improvement. EMS continually moves through this cycle, fine-tuning the management of those operations that harm the environment. This "continual improvement cycle" is a fundamental characteristic of EMS; it allows the system to adapt to the dynamic nature of the organization's operations and external conditions; and
- f) **Continual improvement.** It is the process by which the organization refines its EMS and improves its environmental performance based on feedback that is received through monitoring and assessment processes.

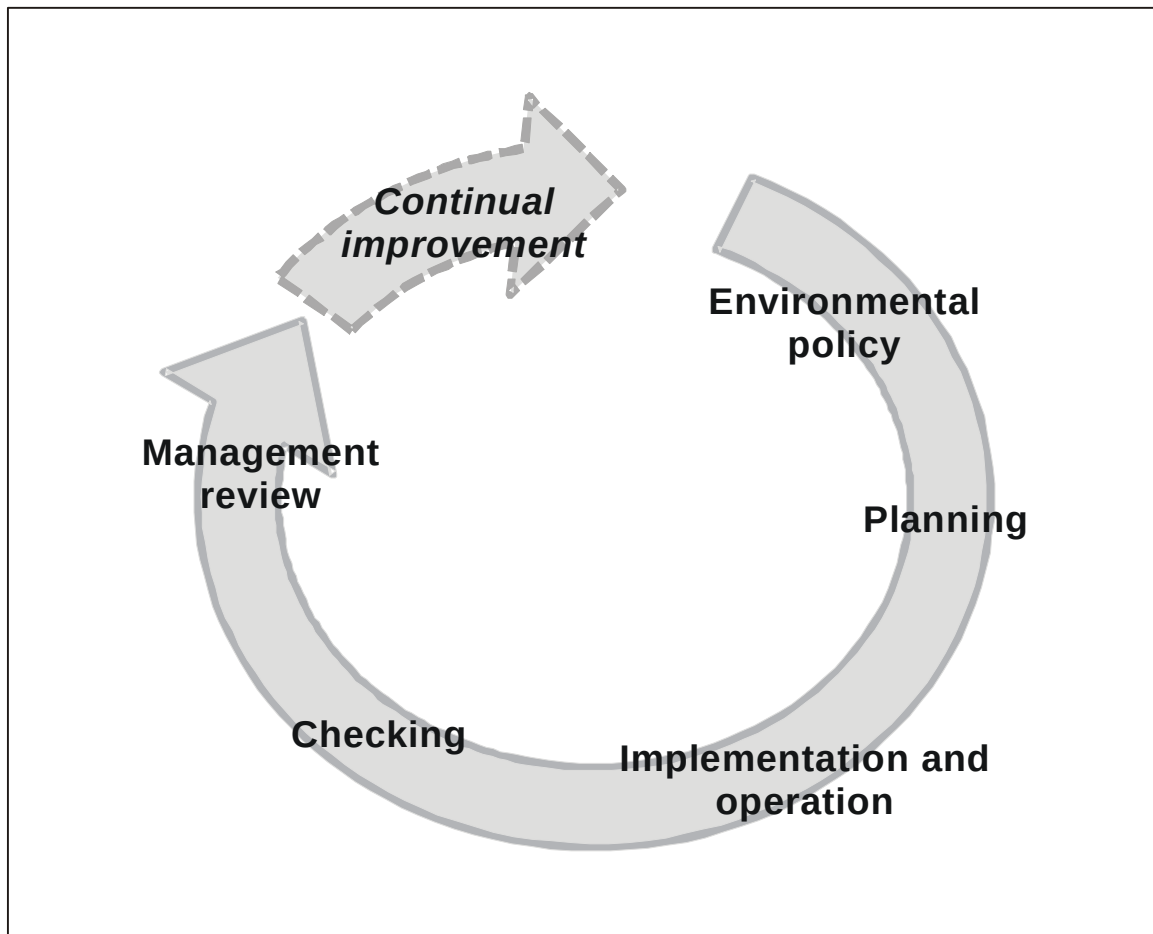


Figure 1-1. ISO 14001:2004 Framework

Chapter 2

QUESTIONNAIRE PARTICIPATION

2.1 INTRODUCTION

As mentioned in Chapter 1, questionnaires were disseminated worldwide to Member States and a wide range of stakeholders within the aviation industry. A total of 326 responses were received over a six-month period, and following validation, 233 of these formed the basis of this report. This chapter discusses and analyses the breakdown of these responses by industry sector and geographic location (see Table 2-1 and Figure 2-1).

2.2 SECTOR CHARACTERIZATION

2.2.1 Individual sector response data were forwarded to international representative organizations for completion of a summary analysis for that sector. These analyses contained statistical data specific to the respondents and offered insight into the industry as a whole, and illustrated their geographic location by sector.

Note.— The total number of respondents for each sector was out of 233.

Airlines

2.2.2 Eighty respondents were from passenger, cargo or passenger and cargo airlines. These “airline” respondents transported an estimated 1.1 billion passengers and 55 billion ton kilometers of cargo in 2008, representing approximately 67 per cent of total system-wide scheduled passengers and 33 per cent of total system-wide scheduled cargo carried by IATA member airlines in that year. Of the 80 airline respondents, 57 (or 71 per cent) were IATA members.

ANSPs

2.2.3 Twenty-four respondents were from air navigation and air traffic services providers. Eighteen of the 24 “ANSP” respondents were members of CANSO. Together, CANSO respondents moved an estimated 57 370 000 aircraft per year.

Airports

2.2.4 Ninety-six respondents were from airport companies, airport authorities, and government and city departments that operated one or more airports. These “airport” respondents operated 231 airports that had an annual passenger throughput of approximately 1.15 billion.

2.2.5 The 96 airport respondents represented approximately 17 per cent of ACI's 597 member organizations, and 5.7 per cent of the 1 680 airports in ACI. In terms of passenger numbers, the 96 responses covered almost a quarter of the 4.8 billion passengers handled at ACI member airports annually.