

**MANAGING AIRFIELD BIRD HAZARDS USING AN ENVIRONMENTAL
MANAGEMENT SYSTEM**

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Abstract

An Environmental Management System (EMS) provides organizations of all types, sizes and missions with a dynamic and flexible means to manage their obligations more effectively. The International Organization for Standardization, ISO 14001, defines an EMS as "that part of the overall management system which includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy." Implementation will be completed when the EMS becomes part of an organization's standard management practice.

The EMS approach has been embraced by the private sector, including some major airlines and some airport operators. Some of the activities to reduce bird hazards at airfields (e.g., pesticide application, habitat management, depredation) would seem to fit quite well within the purview of environmental protection. The EMS may offer new opportunities for the bird hazard control program to integrate its activities and to achieve desired results. Case studies are presented to demonstrate the advantages of an EMS to manage bird hazards on airfields.

Key words: hazard management, organization, legal issues, standards, public relations

1. Introduction

An Environmental management system (EMS) is a systematic approach for ensuring that an organization meets its environmental goals through repeatable and consistent control of its operations. Implementation of an EMS demands a commitment to continuous improvement in an organization's environmental performance. In use, an EMS becomes a set of procedures that allows an organization to assess the environmental impacts of its activities and develop appropriate mechanisms to manage them, thus providing many benefits such as improved efficiency, higher productivity, reduced life-cycle product costs, enhanced regulatory compliance, and improved public relations. The objective is to integrate the EMS into an organization's standard business approach, thus promoting planning and accountability.

Many airports worldwide have implemented an EMS. Some of these cover all operations within the fence line of the airport, others cover specific activities or operations. Airports with active EMS initiatives include: (Boston) Logan, Portland, Miami, Vancouver, Montreal, Brussels, Lyon, Madrid, Newcastle, Luton, Dublin, Melbourne, Miami, Geneva, Hamburg, and Oslo. Several U.S. military installations are using an EMS to reduce their environmental impacts including Eglin AFB, Florida, Sheppard AFB, Texas, and Warner-Robbins AFB, Georgia.

The following benefits of EMS implementation were reported by participants from the three Environmental Management System Initiatives for Government Entities sponsored by the Global Environmental and Technology Foundation (<http://www.peercenter.net/>):

- Operational efficiency and consistency, including improved compliance
- Resource savings (both natural and monetary)
- Improved environmental awareness, involvement and competency throughout the organization
- Better communication about environmental issues inside and outside the organization
- Better relationships with regulators
- Potential for improved bond rating and reduced insurance premiums
- Environmental efficiencies

Because an EMS focuses on management practices that may have an environmental impact, it is particularly applicable to bird hazard control activities on airfields. Bird control activities, by definition, will impact the natural environment by altering habitat, causing noise, dispensing chemicals, and sometimes killing birds or other animals. Effective bird hazard management will also serve to prevent pollution (creation of waste and use of resources) by preventing aircraft mishaps. More and more airfield operators and aircraft operators—civilian and military—are beginning to implement an EMS. This will provide unique opportunities to integrate bird management activities as a part of the organizational EMS.

2. Environmental Management Systems

Various voluntary standards for managing environmental matters have been adopted over the last twenty years by various industry groups and governments. The International Organization for Standardization (ISO) 14001, "Environmental Management Systems—Specification with guidance for use" (1996) has been implemented by industry and governmental agencies, worldwide. The British Standards Institution developed British Standard 7750 (BS 7750) and first published it in 1992. BS 7750 provided the basis for the

development of ISO 14001. The European Commission of the European Union introduced the Eco-Management and Audit Regulation in 1990 which also included the Eco-Management and Audit Scheme (EMAS). This paper will focus only on the elements described in ISO 14001; though other EMS systems may have equal applicability to bird management activities at airfields.

The ISO 14001 standard includes five elements: policy, planning, implementation and operation, checking and corrective action, and management review. Attachment 1 provides a summary of ISO 14001 requirements specifications. Attachment 2 lists some helpful Internet websites on ISO 14001.

2.1 Policy

An essential step of a successful EMS is to obtain top management support in the form of a written policy statement. The policy statement is the cornerstone of the EMS. The policy must commit the organization on key issues, such as prevention of environmental impacts, continuous improvement, and compliance with relevant regulations and legislation. This policy will provide the foundation for subsequent EMS activities. The policy should be communicated throughout the organization and to the public so that all employees and stakeholders are aware of the management commitment to environmental protection and to the organizational benefits it provides. An EMS can provide benefits to a variety of organizational activities indirectly related to environmental matters such as safety or security.

The most meaningful policy is one that will be implemented, so it should be the result of the organizational business strategy. The policy must provide the framework and means for setting and reviewing environmental targets and objectives and should take into account past, present and future issues relating to environmental management. Environmental objectives are the overall goals set by the organization; environmental targets are the detailed (quantified) performance requirements necessary to achieve the objectives. The mnemonic, S-M-A-R-T, is helpful when defining objectives and targets: specific, measurable, agreed-upon, reasonable, time-bound (from EMS training manual, Quality Management International, Inc., 1996). Documentation of performance is essential for the EMS.

2.2 Planning

By identifying activities that may adversely impact the environment, the organization sets in motion the planning necessary to avoid these unfavorable interactions. Managerial programs are developed to achieve established goals and targets related to reducing these interactions or improve compliance. Many organizations have existing planning and management systems that can fit well into an EMS context. An EMS provides a systematic means for integrating environmental issues into all management actions, thereby strengthening the organizational planning.

2.3 Implementation and operation

The organization achieves its environmental objectives and targets through implementation of its environmental programs. An EMS is a framework to focus the organization on achieving continuous improvement in its environmental performance as it conducts its operations. The organization begins implementation by defining roles and responsibilities, developing programs for training and awareness, establishing avenues – both within and outside the organization – for communication, maintaining documentation, and planning for emergency response. Linking the EMS to organizational priorities is essential to success.

2.4 Checking and corrective action

A responsible organization wants to achieve its business objectives and will measure its performance in achieving its targets and objectives with regards to its activities, operations, and compliance. The organization must establish a records management program to identify and maintain important environmental records. EMS audits periodically assess the performance of the EMS and provide information to management. The EMS must specifically define how non-conformance with its self-prescribed goals will be handled.

2.5 Management review

Top management must periodically review its organization's EMS and address needed changes. Improved efficiencies and cost-effectiveness in managing environmental activities are good short-term indicators that the EMS is operating properly. Over time, environmental performance should show improvement.

3. Environmental aspects and impacts for bird control activities

As the EMS policy is being developed, the organization should evaluate its existing environmental programs through a process termed "gap analysis". This involves determining where there are gaps between current operating systems and specifications of the EMS. For example, a gap analysis would focus on those organizational elements that pertain to the missions, conditions, activities and procedures at an airfield. The results of the gap analysis will show the organization where additional procedures were needed to take control of and manage its environmental interactions.

It may be useful to apply the gap analysis process for bird control activities that would occur at an airfield. The gap analysis would address the following specific elements for each activity with an environmental interaction:

3.1 Environmental aspects

The Organization would identify the environmental aspects of its activities, products or services that it exercises control over to determine those which have significant impacts on the environment. These aspects are considered in setting its environmental objectives. This means that each activity involved in bird control would be identified and evaluated separately for the potential interaction with the environment. Depending on the criteria used by the airport to determine its significant environmental aspects, bird control activities may or may not be deemed significant to the organization. Some airports have determined that bird control activities are significant. For example, Athens International Airport has integrated bird hazard control into its EMS. Athens has also developed an objective that seeks to raise awareness of bird hazard control issues among third parties. Its target is to prepare and publish four leaflets to inform third parties of bird hazard issues (http://www.athensairport-2001.gr/en/general_information/environment/EMS/images/report2002.pdf).

3.2 Environmental impact

The environmental impacts of specific activities are considered when setting environmental objectives or performance targets. Impacts are usually considered adverse; although, some could conceivably benefit the environment or public health. Environmental impacts can be adverse as in the case of a fuel spill or could be beneficial as in the case of effective bird strike abatement. They can also be either direct impacts associated with the organization's

own activities, products and services, e.g., land management, noise emissions or can be indirect impacts (purchase of materials and components with adverse environmental impacts or with the poor environmental performance of suppliers or contractors).

3.3 Applicable regulatory requirements

Does the organization have a procedure to track laws and regulations relating to its activities, including those relating to bird control? Diverse statutory and regulatory authority would pertain to the safe operation of aircraft at an airport. A fully functioning EMS enables an organization to effectively identify all legal and regulatory requirements that are applicable to its activities. When an organization gains a thorough understanding of its environmental footprint, its ability to track applicable legal requirements is enhanced. Ecological requirements could have implications for bird hazard management programs at some airports.

Several of the airports that have implemented an EMS have committed to work closely with local communities and environmental organizations to manage bird and animal hazards. An example is Melbourne Airport (Australia), which has issues with kangaroos and other wildlife.

3.4 Internal criteria

How does the organization provide operational guidance for environmental activities where no other external standards exist? This would relate to the existing guidance for bird hazard management and planning (i.e., airfield bird hazard reduction plan). The absence of external standards need not be a barrier to developing operational procedures. Procedures do not need to be overly complex, but should cover the basics to enable the organization to gain operational control over its activities that impact the environment.

Implementation of an EMS causes senior management to actively consider the environmental impacts of airport operations. In developing a policy and a series of environmental programs, management is not restricted to legal requirements. The opportunity exists to extend environmental stewardship beyond legal requirements. The development of internal criteria for stewardship is a management decision, based on many factors such as environmental objectives, cost, public relations, regulatory oversight and image.

3.5 Next steps

After the gap analysis is completed, the organization would use the results to either “fine-tune” the targets and objectives relating to the deficiencies identified or use the opportunity to establish new ones. It may have to better integrate activities across the organizational structure and strategies. It is particularly important to involve stakeholders during the early stages of policy.

3.6 Bird hazard management as part of an EMS

An EMS can help address issues related to bird hazards near airfields. The EMS for the City of San Diego (California) West Miramar Solid Waste Facility is responsible for on-site bird control. Bird control is a requirement of the City’s landfill lease from the U.S. Navy (http://genesis.sannet.gov/esd_ems/lfill_sop.jsp#bio). It is necessary to keep the bird population to a minimum due to the landfill’s proximity to the Marine Corps Air Station, Miramar as well as to maintain proper sanitation at the landfill. The Biological Services section uses shotguns to scare off birds flying over the vicinity of the landfill.

Current bird management activities for hazards away from the airfield environment would not have an environmental impact unless the bird strike prevention activities (e.g., bird avoidance) fail and a mishap occurs.)

It is beneficial to see how the aspect and impact analysis elements of an EMS may be applied to a typical airfield bird control activity: chemicals that are applied to reduce bird populations on the airfield, either by aversion, removal of food source (e.g., worms or insects), or by directly poisoning the birds. The environmental aspect is the release of a chemical into the environment. One environmental impact of using chemicals to control birds – or other animals – is the potential that the chemical will be transported off-the-airfield in quantities that are toxic. The environmental impact for each specific chemical would be different, depending on significance of the toxicity, risk of uncontrolled release and potential mitigation. For instance, does the government have laws relating to chemical application where that application would be out-of-compliance? The internal (or operational controls) might limit the application of a chemical to repel birds to a low application rate during the wet season to reduce the runoff potential to local bodies of water and possible contamination of non-target species. Similar environmental impact analysis could be performed with any airfield bird control method or design plan.

4. Summary

An EMS can provide the necessary integration to highlight bird control activities as they relate to the environmental objectives and targets of the business of flying. An indirect benefit would be the identification of additional resources to ensure the bird control activities have adequate funding for equipment and supplies and have adequate, trained personnel. By using the airport's existing bird hazard management planning documents, the bird control program should be easily incorporated into an EMS.

Implementation of an EMS provides an excellent opportunity to fully document all activities that could significantly impact the environment, or at least those activities which the organization has determined are significant to its business. The documentation requirements of an EMS could be useful in providing evidence of "due diligence" in bird control activities, should a birdstrike mishap actually occur. This may reduce an airport operator's liability and could help reduce insurance rates. This potential benefit of an EMS to bird hazard control activities requires further investigation.

An EMS can provide valuable insights and integration of many different, seemingly unrelated activities. Usually, management approaches problems by creating boundaries around issues such as environment, safety, and quality. Though an integrated management system may require more initial planning and coordination, it may be more cost-effective in terms of long-term pay back when direct (cost-savings) and indirect benefits (public relations; efficiencies) are considered. An integrated management system that considers safety, environment, and quality (customer-based) issues may be the next logical step to address bird hazards at airfields. Once implemented, any single process change would show continual improvements in all three areas.

From the safety perspective, impacts on the environment from bird control operations would be considered secondary to the impacts from a catastrophic bird strike mishap. An EMS can be useful when addressing issues relating to land use practices near the airports that attract birds.

Perhaps the most important benefit of an EMS may be its role in getting people – both inside and outside the organization – to talk with one another and to understand their role in reducing bird hazards to aviation. Communication will often be the key to obtaining resources (funding, equipment, and personnel) for effective bird control.

Attachment 1

ISO 14001 ENVIRONMENTAL MANAGEMENT SYSTEMS REQUIREMENTS SPECIFICATION

General (Clause 4.1):

An organization shall establish and maintain an Environmental Management System in accordance with the requirements of this International Standard.

Environmental Policy (Clause 4.2)

Top Management defines the organization's environmental policy and ensures that it is:

- Appropriate to the environmental impacts of its activities, products or services
- Includes a commitment to continual improvement and pollution prevention
- Includes a commitment to comply with relevant regulations and other requirements
- Provides the framework for setting and reviewing environmental objectives and targets
- Documented, implemented, maintained, and communicated to all employees
- Available to the public

Planning

2.1 Environmental aspects (Clause 4.3.1)

Establish and maintain procedures to identify the environmental aspects of activities, products or services. Ensure that aspects related to significant impacts are considered in setting environmental objectives. Keep this information up to date.

2.2 Legal and other requirements (Clause 4.3.2)

Establish and maintain a procedure to identify and have access to legal and other requirements that are applicable to the environmental aspects of company activities, products or services.

2.3 Objectives and targets (Clause 4.3.3)

Establish and maintain documented environmental objectives and targets at each relevant function and level within the organization. Consider legal and other requirements when setting objectives and targets. The objectives and targets shall be consistent with the environmental policy, including the commitment to pollution prevention.

2.4 Environmental management program(s) (Clause 4.3.4)

Establish and maintain a program(s) for achieving objectives and targets. The program shall include designation of responsibilities and means and time frame for achievement.

Implementation and Operation

3.1 Structure and responsibility (Clause 4.4.1)

Define, document and communicate roles, responsibilities and authorities. Management shall provide resources essential to the implementation and control of the EMS. The resources should include dedicated individuals responsible for establishing, implementing, maintaining, and reporting on the EMS to top management.

3.2 Training, awareness and competence (Clause 4.4.2)

Identify training needs and require all personnel whose work may create a significant impact on the environment to receive appropriate training. Establish and maintain training procedures. Personnel performing tasks, which can cause significant environmental impacts, shall be competent on the basis of education, training and experience.

3.3 Communication (Clause 4.4.3)

With regard to its environmental aspects and EMS, establish and maintain procedures for internal and external communications. Consider external communications on significant environmental aspects.

3.4 EMS documentation (Clause 4.4.4)

Establish and maintain information, in paper or electronic form, to describe the elements of the EMS and their interaction along with direction to related documentation.

3.5 Document control (Clause 4.4.5)

Establish and maintain procedures controlling all documents required by the ISO 14001 Standard. Documentation shall be legible, dated, identifiable, orderly and retained for a specified period of time. Establish and maintain a procedure to create and modify all documents.

3.6 Operational control (Clause 4.4.6)

Identify and plan those operations and activities associated with the significant environmental aspects in line with policy, objectives and targets. Establish and maintain procedures for operational control to address situations that could lead to deviation from the policy, objectives and targets.

3.7 Emergency preparedness and response (Clause 4.4.7)

Establish and maintain procedures to identify the potential for and response to accidents and emergency situations, and for preventing and mitigating the environmental impacts that may be associated with them. Test procedures periodically where practicable.

4. Checking and corrective action

4.1 Monitoring and measurement (Clause 4.5.1)

Establish and maintain documented procedures to monitor and measure, on a regular basis, the key characteristics of operations and activities that can have a significant impact on the environment. Record performance and track information. Calibrate and maintain monitoring and measurement equipment, and keep calibration records.

4.2 Nonconformance and corrective and preventive action (Clause 4.5.2)

Establish and maintain procedures for handling and investigating nonconformance, taking action to mitigate impacts, and corrective/preventive actions. Implement corrective or preventive actions commensurate with nonconformance. Record changes to procedural documentation relative to corrective and/or preventive actions.

4.3 Records (Clause 4.5.3)

Establish and maintain procedures for the identification, maintenance and disposition of environmental records, including training and audit records. Ensure that records are legible, identifiable, traceable, protected from loss and damage, and maintained. Establish record retention times.

4.4 Environmental management system audit (Clause 4.5.4)

Establish and maintain a program and procedures for periodic EMS audits. Schedule audits based on importance of the activity. Establish a procedure to address the scope, frequency, methodology, reporting responsibilities and requirements for conducting audits.

5. Management Review (Clause 4.6)

Top management shall periodically review the EMS to ensure continuing suitability, adequacy and effectiveness. Document the review. Address the need to change the policy, objectives and other elements in light of audit results, changing circumstances and commitment to continual improvement.

Attachment 2

ENVIRONMENTAL MANAGEMENT SYSTEM WEB SITES

There are many organizations that can help with all aspects of development, implementation and assessment of an EMS. This is a short list of Web sites that contain EMS information. Most of these sites contain links to other sites.

International Organization for Standardization (ISO)

<http://www.iso.ch/iso/en/iso9000-14000/iso14000/iso14000index.html>

European Union Eco-Management and Audit Scheme (EMAS)

http://europa.eu.int/comm/environment/emas/index_en.htm

U.S. Environmental Protection Agency

<http://www.epa.gov/ems/>

Transport Canada

<http://www.tc.gc.ca/programs/Environment/EMS/menu.htm>

ICF Consulting

<http://www.icfconsulting.com/lca/envmgmt02.asp>

Multi-State Working Group on EMS

<http://www.iwrc.org/mswg/>