



Dryden Flight Research Center
Edwards, California 93523

EMSM, Revision B
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Code S

Environmental Management System Manual

Electronically approved by
Assistant Director for Management Systems

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Dryden Flight Research Center Environmental Management System Manual (EMSM)



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1.0 PURPOSE OF DOCUMENT

This document serves as a “road map” to the operation of the Dryden Flight Research Center (DFRC) Environmental Management System (EMS) and to direct interested parties to the procedures, documents, and records that DFRC follows in operating and improving its EMS. The EMSM delegates the appropriate authority to all DFRC personnel to carry out their responsibilities within the EMS.

The complete descriptions of the components of the EMS are found in the controlled documents that are referenced in this manual. The EMSM is the Center-level program document for the EMS that describes

- Core elements of the EMS.
- Personnel responsibilities.
- Reference to documents required to operate and improve the EMS.
- Definitions of EMS terms used within the EMSM.

2.0 SCOPE & APPLICABILITY

This document, and the EMS it describes, applies to the entire DFRC organization (civil service and contract employees) and associated activities, products, and services.

3.0 EXCLUSIONS

There are no exclusions to the requirements governing the operation and maintenance of the EMS.

4.0 RELEVANT DOCUMENTS

4.1 Authority Documents

- [NPD 8500.1](#) NASA Environmental Management
- [NPR 8553.1](#) NASA Environmental Management System

4.2 Reference Documents

- [NPD 1440.6](#) NASA Records Management
- [NPR 1441.1](#) Records Retention Schedules
- [NPR 7120.5](#) Program and Project Management Processes and Requirements
- [DCP-M-316](#) Records Management

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| | |
|---------------------------|---|
| DCP-S-054 | (draft Emergency Preparedness & Response) |
| DCP-S-101 | Environmental Management System Air Resources Management |
| DCP-S-102 | Environmental Management System Chemical Management |
| DCP-S-103 | Environmental Management System Cultural Resources Management |
| DCP-S-104 | Environmental Management System National Environmental Policy Act (NEPA) Program Management |
| DCP-S-105 | Environmental Management System Natural Resources Management |
| DCP-S-106 | Environmental Management System Restoration Management |
| DCP-S-107 | Environmental Management System Water Resources Management |
| DCP-S-108 | Environmental Management System Objectives and Targets |
| DCP-S-109 | Environmental Management System Training |
| DCP-S-112 | Environmental Management System Internal Regulatory Compliance Assessment |
| DOM | Dryden Organizational Manual |
| DOP-S-027 | Industrial Hygiene (IH) Equipment Calibration |
| DOP-S-101 | Environmental Management High Priority Aspects and Impacts |

5.0 OVERVIEW

The DFRC EMS receives policy direction and implementation requirements from NPD 8500.1 and NPR 8553.1, respectively. Roles and responsibilities are also designated by each of these documents. Consistent with NPD 8500.1, DFRC is committed to compliance with applicable environmental requirements, prevention of pollution, and continual improvement of the EMS and its role in carrying out the mission of flight research.

The DFRC EMS is an integrated component of the DFRC management system as defined in the Dryden Management System Manual (DMSM). This integration has allowed DFRC to leverage existing procedures, such as the DFRC document control processes, and realize the following benefits.

- Prevention of procedural redundancy
- Reduction in implementation and maintenance costs
- Maximum use of existing software tools

The EMS master document list can be viewed at <http://xnet.dfrc.nasa.gov/DrydenManagement/DMS/enviromgmt.html>

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6.0 RESPONSIBILITIES

The EMS relies upon all DFRC personnel to work together as a team in order to effectively and efficiently manage activities and products, and services that have the potential to harm our health and the environment. Consequently, there are specific responsibilities that must be fulfilled by individuals, organizations, and management. At DFRC, these responsibilities are:

- 1) Every DFRC employee is responsible for complying with environmental regulations and NASA policy related to official duties.
- 2) Each DFRC organization is responsible for incorporating the requirements of the EMS, as appropriate, into planning and budgeting; ensuring appropriate training; overseeing environmental process and material selection; minimizing hazardous waste; and stewardship for energy and water usage.
- 3) The Center Director is responsible for:
 - a. Appointing the Center EMS representative (at DFRC the representative is the Environmental Officer(EO)EO) who will be responsible for the overall implementation of the EMS
 - b. Assigning roles and responsibilities for the EO.
 - c. Providing the authority and resources needed for the EO to implement, operate, and maintain the Center EMS.
- 4) Program and project managers are responsible for (See NPR 7120.5 and NPD 8500.1):
 - a. Implementing environmental policies and requirements within existing programs and projects including life cycle planning, development, execution, and disposition activities.
 - b. Ensuring the requirements of the National Environmental Policy Act (NEPA) are satisfied for any proposed new or modified programs and projects.
 - c. Coordinating with the local environmental manager on both existing and new programs and projects to ensure compliance with the law and the effective implementation of environmental requirements.
- 5) The Center EO is responsible for:
 - a. Advocating, managing, and allocating environmental program resources assigned by NASA Headquarters and DFRC.
 - b. Serving as the local source of expertise on environmental policies, procedures, requirements, and processes.
 - c. Supporting functional reviews as necessary to ensure that Center programs, projects, facilities, systems, and operations comply with all applicable environmental requirements.

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- d. Identifying and tracking legal and other requirements that are applicable to DFRC activities, products, and services through sources including web sites, periodicals, and professional contacts, and communicating them to responsible organizations. Consult with the Office of Chief Counsel on legal and other requirements as appropriate.
- e. Coordinating with internal and external organizations to ensure compliance with the law and effective implementation of environmental policies, procedures, and processes.
- f. Reporting information regarding environmental management activities at the DFRC and Headquarters levels.
- g. Updating the legal and other environmental requirement in the EMS and operational control procedures.
- h. Developing, coordinating, and implementing internal and external communication efforts, and receiving, recording as appropriate, and responding to inquiries regarding environmental aspects and EMS information.
- i. Review contracts at the time of recompetition to ensure the need for contractors to comply with applicable EMS requirements is documented.

7.0 EMS PROCESS MODEL

The strength of the EMS is its simplicity of process design with its emphasis on monitoring, measuring, and continual improvement for achieving environmental program objectives. The EMS is designed to ensure that process and component procedures are effective, compliant with NPR 8553.1, and seamlessly integrated with the DMS. Procedures have been implemented that evaluate effectiveness and identify deficiencies. A high-level EMS process model is depicted in Figure 1 below and is followed by a description of the process components as they are outlined in NPR 8553.1.

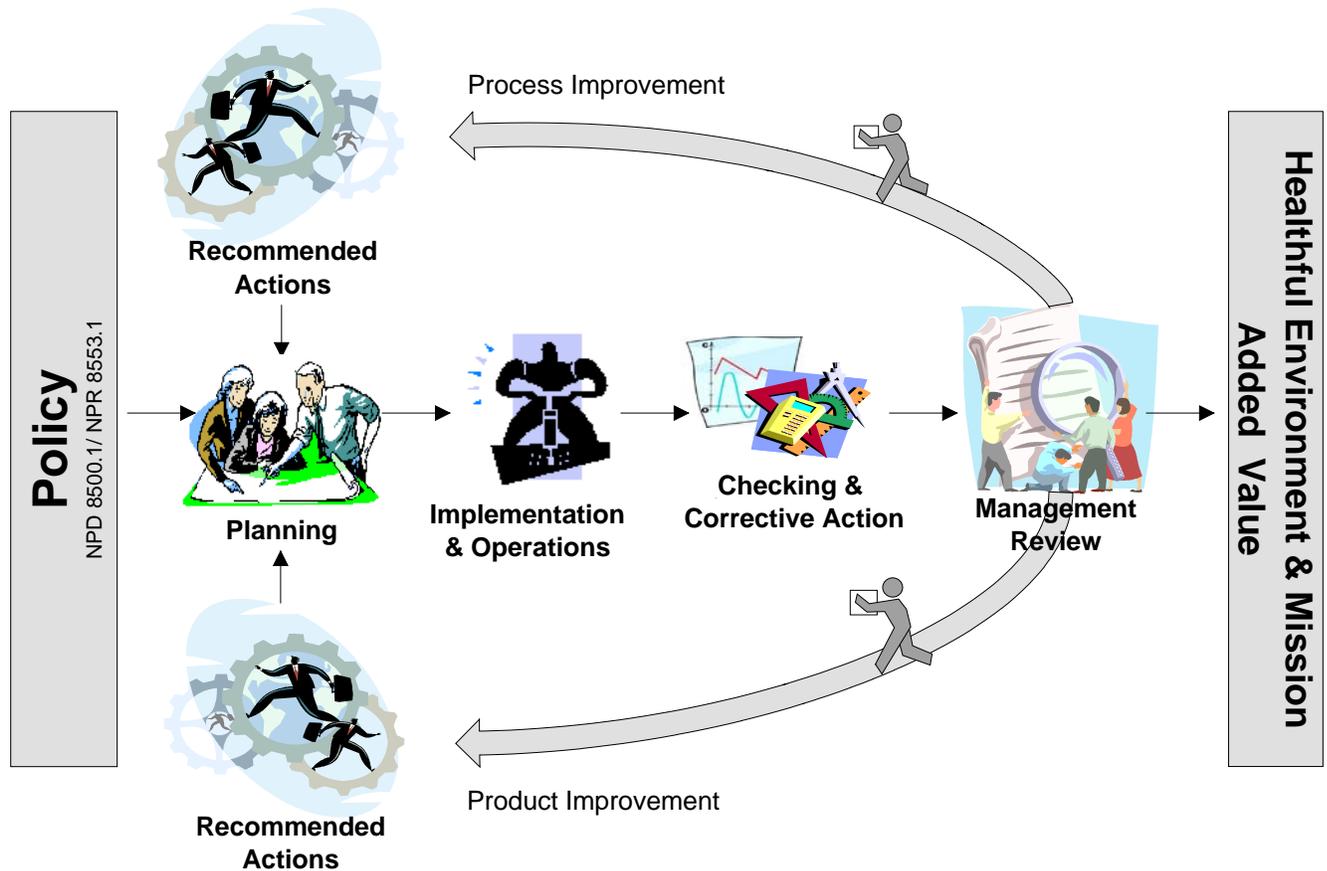


Figure 1 – DFRC EMS Process Model

7.1 Policy

Documentation of DFRC's EMS is mandated by NPD 8500.1, NASA Environmental Management, which is NASA's and DFRC's formal environmental policy. Requirements for the implementation and operation of the EMS are specified in NPR 8553.1, NASA Environmental Management System.

Consistent with NPD 8500.1, DFRC will accomplish the mission of flight research in a manner that protects human health and the environment through proactive stewardship and sustainable use of resources. This goal is enabled through the DFRC EMS, which is based on the following commitments.

- Compliance with applicable federal, state, and local environmental laws, regulations, and rules

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- Prevention or reduction of pollution, wherever possible, to cost effectively avoid environmental consequences
- Continual improvement of the EMS as a basis for better serving our customers to enhance the execution of DFRC's mission

7.2 Planning

The EO performs the planning activities necessary to implement and manage an effective EMS. The EO is supported by the EMS Leadership Team that is composed of individuals knowledgeable in environmental requirements, practices, and management systems. As a part of planning, the EO must consider the needs of customers and stakeholders and the policy commitments of compliance with applicable environmental requirements, prevention of pollution, and continual improvement of the EMS and its role in carrying out DFRC's mission of flight research.

During the planning process, Center activities, products, and services are evaluated and relevant environmental aspects and associated impacts are identified ([DOP-S-101](#), High Priority Aspects and Impacts). The potential environmental aspects are ranked by level of risk and documented using the EMS Risk Ranking Matrix. Objectives and targets are developed ([DCP-S-108](#), Objectives and Targets) to mitigate aspects that pose a potentially high risk of environmental impact. An Environmental Management Plan (EMP) that details how and when these objectives and targets will be achieved is signed by DFRC organizations responsible for implementing them. The EMP is reviewed and updated as appropriate.

This planning process is repeated when there are changes in DFRC programs, operations, legal, and other requirements, or other developments that could affect the aspect and impact analysis.

7.3 Implementation and Operation

The EMS process and supporting procedures are implemented and maintained in accordance with Dryden Management System (DMS) document control procedures.

In order to effectively implement an EMS, employees engaged in activities that have the potential to affect the environment must have received the training necessary to carry out these tasks. Training can range from providing an awareness level to giving instructions on how to incorporate specific requirements into a task. The EO evaluates training needs and ensures the appropriate training is conducted, records maintained, and data collected to ensure the training was effective. This activity is conducted in accordance with [DCP-S-109](#), Environmental Management System Training.

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Training and communication are closely related. Communication with internal and external parties regarding EMS activities is key to ensuring that there is a shared understanding of EMS goals, objectives, requirements, work responsibilities, and status. Code SH environmental staff will initiate, receive, and respond to internal communications in coordination with appropriate managers, supervisors, and other staff. This internal communication will use a variety of communication tools and resources such as emails, internet, meetings, videos, etc. In addition, the environmental staff will receive, record, and respond to EMS communications initiated by sources external to DFRC, e.g. NASA Headquarters, Air Force Flight Test Center, environmental regulatory agencies, and the public. External communications will be within the framework for effective communication at all organizational levels and with external parties in accordance with Freedom of Information requirements (<http://www.hq.nasa.gov/office/pao/FOIA>). To ensure the integrity of internal and external communications, the EO or designee will review and approve the methods of responding to EMS issues, distribution of EMS information, and all correspondence written on DFRC letterhead.

Documented operational control procedures are critical for establishing a framework that ensures the EMS is effective and efficient in supporting the mission of flight research. To ensure that environmental laws and regulations governing DFRC activities are followed, operational control procedures document requirements for civil servants and contractors. These procedures are organized according to the following 10 primary environmental functional areas:

- Air Resources Management
- Chemical Management
- Cultural Resources Management
- Environmental Management System National Environmental Policy Act (NEPA) Program Management
- Natural Resources Management
- Restoration Management
- Water Resources Management
- Environmental Management System Objectives and Targets
- Environmental Management System Training
- Environmental Management System Internal Regulatory Compliance Assessment

Also, [DCP-S-054](#), Emergency Preparedness and Response, stipulates actions necessary to address incidents with the potential for adverse environmental impacts.

7.4 Checking and Corrective Action

To verify the adequacy of EMS activities and procedures, the EO must identify, monitor, and measure key factors associated with EMS high priority aspects and impacts, DFRC operations, and investigation and resolution of deficiencies. To conduct these activities, the EO will follow established EMS procedures or identify DMS procedures to:

- Evaluate progress toward achieving objectives and targets ([DCP-S-108](#), Objectives and Targets).
- Assess conformance of the EMS with NPR 8553.1 requirements and applicable environmental laws and regulations ([DCP-S-112](#), Internal Regulatory Compliance Assessment).
- Ensure adequate root cause analysis, effective implementation of corrective action plans, and closure of nonconformances ([DCP-X-037](#)).
- Monitor equipment calibration procedures ([DOP-S-027](#)), Industrial Hygiene (IH) Equipment Calibration) for those equipment units that are used in the EMS.

DFRC management system internal audits evaluate all requirements of NPR 8553.1 on a three year cycle. The final audit in this cycle is completed prior to the external functional assessment performed by the NASA Headquarters Environmental Management Division (EMD), also on a three year cycle. Lessons learned and trending data obtained from internal and external functional assessments are a primary source for continual improvement of the EMS. Input from various assessments will be integrated as needed to facilitate the implementation of corrective and preventive actions. A list of Audit and Corrective Action procedures can be found at Internal [Audits](#) and [Corrective Action](#).

7.5 Management Review

The EO and DFRC senior management have primary responsibility for reviewing the EMS to ensure that it continues to be suitable, adequate, and effective. The EO determines the methods and forums for communicating EMS status information and gaining commitment for new or changed EMS objectives and targets. The results of functional assessments and resolution of deficiencies are important inputs to the management review. The EO reports EMS status to the appropriate levels of Center management (e.g., Safety and Mission Assurance Director, Dryden Management System Board, Center Director's Safety

Review). Additional information regarding management system reviews can be obtained at [Dryden Organization Manual](#) (DOM). The EO also updates metrics requested by NASA Headquarters EMD

7.6 Continual Improvement

The continual improvement cycle consists of checking prior decisions to determine implementation strategies and reviewing the EMS periodically to ensure it is delivering the products and services for which it was designed. Changes will then be made as required to continually improve the processes.

8.0 MANAGEMENT RECORDS AND RECORDS RETENTION

NPR 1441.1, NASA Records Management, is the documented Agency policy and procedure for identifying, filing, storing, protecting, dispositioning, and archiving records. Records are maintained to ensure they are legible and readily retrievable, and stored in facilities that prevent damage, deterioration, or loss. Records that have not been assigned a retention time in NPR 1441.1 utilize the retention period identified in [DCP-M-316](#), Records Management. EMS records and retention periods are directly identified in the Code S Records Log ([D-WK 89-1](#)).

Destruction of any records, regardless of format, without an approved schedule is a violation of Federal law.

Appendix A – Definitions

This Appendix contains definitions of terms that are used in this document.

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|---|--|
| Continual Improvement | Process of enhancing the EMS to achieve improvement in overall environmental performance in line with the organization's environmental policy, vision, and mission. |
| Environmental Officer | The DFRC employee responsible for the overall implementation of the EMS. The responsibilities of the EO are to build and direct the EMS Leadership Team; develop and execute the EMS implementation schedule; delegate tasks and establish deadlines; report EMS status and results of functional assessments, audits, and management reviews to DFRC management and NASA Headquarters; and facilitate cross-functional organizational support and buy-in. |
| EMS Leadership Team | The group of Center personnel that assists with the implementation, operation, maintenance, and continual improvement of the EMS. |
| Environmental Aspect | An element of an organization's activities, products, or services that can interact with and change the environment (e.g., flying aircraft produces air pollutants). |
| Environmental Impact | Any change to the environment, whether adverse or beneficial, that results from an organization's activities, products, or services (e.g., air pollutants from aircraft may degrade air quality). |
| Environmental Management Plan | The mechanism used to document the organization's objectives and targets. The EMP is reviewed and approved at the organizational level(s) responsible to commit resources required to achieve the objectives and targets. |
| Environmental Management System (EMS Definition from ISO 14001) | The part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy. |
| High-Priority Environmental Impact | An environmental impact that has been determined to be a priority for management under the EMS because of the risk it poses to the environment and the mission. |
| Objective | An overall environmental goal, arising from the environmental policy, that is designed to reduce the risk of an actual or potential environmental impact. |
| Risk | The combination of the likelihood of occurrence of a specified impact and its consequences. |
| Risk Matrix | The product of the risk ranking process prescribed in NPR 8553.1. Activities, products, and services are evaluated for environmental aspects and potential impacts. The impacts are assigned a risk |

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| | value and objectives and targets are developed for high priority impacts to reduce their level of risk. |
| Root Cause Analysis | A systematic process to uncover the underlying causes of an issue or event. |
| Senior Management | Senior management, for purposes of the EMS, is defined as the Dryden Management System Board. Senior management has authority over all areas and functions of the EMS, and has the authority to initiate actions and allocate resources without further review or approvals. |
| Target | A detailed and measurable performance requirement, arising from environmental objectives, that must be met to achieve those objectives. |

APPENDIX B – ACRONYMS

| | |
|------|---|
| DMS | Dryden Management System |
| DMSM | Dryden Management System Manual |
| DCP | Dryden Centerwide Procedure |
| DOP | Dryden Organizational Procedure |
| EMD | (NASA Headquarters) Environmental Management Division |
| EMP | Environmental Management Plan |
| EMS | Environmental Management System |
| EMSM | Environmental Management System Manual |
| EO | Environmental Officer |
| NEPA | National Environmental Policy Act |
| NPR | NASA Procedural Requirement |

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Document History Log

IPRP Review Date: 02-11-11

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| Status Change | Document Revision | Effective Date | Page | Description of Change |
|---------------|-------------------|----------------|-----------|---|
| Baseline | | 12-15-05 | | |
| Revision | A | 05-19-06 | 8, 10, 11 | <ul style="list-style-type: none"> • Page 8: Corrected DCP-S-101 to DOP-S-101 • Page 10: Corrected <i>Archiving Records</i> to <i>Records Archiving</i> • Page 11: Changed DCP-S-111, Monitoring and Measuring (cancelled) to DOP-S-029, Industrial Hygiene (IH) Equipment Calibration • Page 11: Corrected typo (DOP-S-108 corrected to DCP-S-108) |
| Admin change | A-1 | 03-16-07 | All | <ul style="list-style-type: none"> • Page 11: Corrected document number: DOP-S-029 to DOP-S-027 • Added expiration date to header |
| Admin Change | A-2 | 06-22-07 | All | <ul style="list-style-type: none"> • Page 10: Removed reference to cancelled DCP-X-013 • Updated form number DFRC 79 to D-WK 89-1. To access old form DFRC 79, contact the Forms Manager, ext. 2835. • Updated footer text. |
| Revision | B | 04-01-11 | All | <ul style="list-style-type: none"> • Updated references. • Minor wording changes and clarification of Section 7.6. • Deleted repeated text and generic descriptive text not pertinent to the EMS process. (Sections 5.0 and 7.1) • Completed Section 4.2. • Incorporated information from cancelled DOP-S-102 and DOP-S-103. |
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