

**Draft**

**Staff Draft**

**This document has not been reviewed or approved by management.**

**GUIDANCE**

**ON**

**AIRPORT EMISSION REDUCTION CREDITS FOR EARLY MEASURES**

**THROUGH**

**VOLUNTARY AIRPORT LOW EMISSION PROGRAMS**

**Environmental Protection Agency**

**in consultation with the  
Federal Aviation Administration**

7/1/2004

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## List of Acronyms and Terms

ACS	Airport Credit Statement
AERC	Airport Emission Reduction Credit
AIP	Airport Improvement Program
APU	Aircraft Auxiliary Power Unit
AQ	Air Quality
CAA	Clean Air Act
DOT	Department of Transportation
EDMS	FAA's Emission and Dispersion Modeling System
EIP	Economic Incentive Programs
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
GAV	Ground Access Vehicles
GSE	Ground Support Equipment
ILEAV	Inherently Low Emission Airport Vehicle pilot program
MOBILE6	EPA Onroad Emission Model
NAAQS	National Ambient Air Quality Standard
NON-ROAD	EPA's Off-road Emission Model
NSR	New Source Review
PFC	Passenger Facility Charge
PGL	Program Guidance Letter
PM	Particulate Matter

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PSD	Prevention of Significant Deterioration
SIP	State Implementation Plan
TANKS	EPA model to assess emissions of evaporative hydrocarbons from a single storage tank
VALE	Voluntary Airport Low Emission program
<i>Vision 100</i>	<i>The Vision 100—Century of Aviation Reauthorization Act, Public Law 108-176</i>

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### CHAPTER 1

#### INTRODUCTION

The *Vision 100—Century of Aviation Reauthorization Act* (the *Vision 100 Act*), signed into law in December 2003<sup>1</sup>, establishes a voluntary program to reduce airport ground emissions at commercial service airports in air quality nonattainment and maintenance areas.<sup>2</sup> The *Vision 100 Act* directs the Administrator of the Environmental Protection Agency (EPA), in consultation with the Secretary of the U.S. Department of Transportation (DOT)/Federal Aviation Administration (FAA), to issue guidance on how to insure that airport sponsors (i.e., operators) receive appropriate emission reduction credits for carrying out projects described in the *Vision 100 Act*.

#### 1.1 Purpose of the guidance

This document provides guidance on emission reduction credits for voluntary early emission reduction programs at airports. The emission savings realized under this program will contribute to improved regional air quality and provide an impetus for accelerated use of new and cleaner technology.

Participation in the program is entirely voluntary for both airport sponsors and States. States have the opportunity to realize the benefits of early reductions in airport emissions in nonattainment and maintenance areas in exchange for granting appropriate emission credits for use in future conformity determinations and new source review projects. Airport sponsors have the opportunity to apply for FAA Airport Improvement Program (AIP) grants and other revenues from passenger facility charges (PFCs) to achieve early emission reductions that earn emission credits from State air quality agencies.<sup>3</sup> Airport sponsors may use the emission credits on airport development projects at a later date to satisfy general conformity and new source review requirements under the Clean Air Act.

Participation by airport sponsors and States in the program should be done on the basis of this guidance, which is consistent with the Clean Air Act. In order for FAA to approve funding for the emission reduction measure under the *Vision 100 Act*, it must receive assurance from the State air quality agency that the airport sponsor will receive appropriate emission reduction credits. This guidance provides information on the granting of that assurance in a form and manner that can be used by the airport sponsor and the FAA to enable funding for airport emission reduction measures.

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<sup>1</sup> Public Law 108-176, Sections 121 (PFC), 151 (apportionment), 158 (airport emission reduction credits), and 159 (AIP).

<sup>2</sup> 49 U.S.C. §§ 40117, 47139, and 47140.

<sup>3</sup> Includes delegated local and Tribal air quality agencies.

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This *Vision 100* program is intended to complement existing programs for airport compliance with the Clean Air Act. Voluntary early emission reductions generated through this program do not change or reduce current airport project requirements to mitigate the emissions effects of airport development or otherwise comply with the Clean Air Act.

### **1.2 *Vision 100* provisions governing airport emission reduction credits**

This EPA document provides guidance on the creation and use of emission reduction credits for the *Vision 100* program, hereafter referred to as the Voluntary Airport Low Emission (VALE) program. With this guidance, no other formal agreements or protocols between the airport sponsors and Federal and State agencies would be needed. At the discretion of States and airport sponsors, this guidance may also be used for other airport early emission reduction programs that are not within the funding purview of the VALE program.

As specified in the *Vision 100* Act, approval of AIP grants or PFC funding for this program is contingent upon an assurance to the Secretary of DOT from the State in which the project is located (or from the EPA Administrator where there is a Federal implementation plan) that the low emission measures of the project will receive appropriate emission credits in accordance with this guidance.

The State's assurance to DOT/FAA on airport emission reduction credits is a key component of the voluntary, incentives-based VALE program. AIP and PFC funding does not provide sufficient incentives for early airport emission reductions without emission credits. The FAA has stated that the lack of emission credits has been a serious disincentive for airports to reduce emissions because: voluntary reductions simply lowered an airport's emissions baseline; the impact of subsequent airport development projects were judged against the lower baseline; and the airport that had already reduced emissions had fewer options for producing more reductions for new airport development projects. For these reasons, airport sponsors have reportedly deferred emission reductions until needed at the time of development projects.

The *Vision 100* Act directs the Administrator of EPA to issue guidance with the following conditions:

- The provision of credits is consistent with the Clean Air Act;
- Credits generated by the emission reductions are kept by the airport sponsor<sup>4</sup> and may only be used for purposes of any current or future general conformity determination

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<sup>4</sup> Emission credits for the VALE program may only be obtained and used by airport sponsors. For purposes specified in the *Vision 100* Act, such credits may not be transferred or traded to airport tenants or operators, other airports, or any other entity.



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under the Clean Air Act or as offsets under EPA's new source review program for projects on the airport or associated with the airport;

- Credits are calculated and provided to airports on a consistent basis nationwide;
- Credits are provided to airport sponsors in a timely manner;
- A method is established to assure the Secretary of Transportation that, for any specific airport project for which funding is being requested, the appropriate credits will be granted.<sup>5</sup>

The *Vision 100* Act does not require States to grant emission credits to airports. However, voluntary airport ground emission reduction programs would not be funded under the *Vision 100* Act where States do not provide appropriate emission credits in accordance with this guidance.<sup>6</sup>

### 1.3 Eligibility guidance for the program

The FAA is preparing other companion program guidance for airports to use in planning their low emission projects and in determining the eligibility of project measures.<sup>7</sup> The FAA will issue a Program Guidance Letter (PGL) on airport and project eligibility for the overall program and another PGL for the special AIP pilot program established under the *Vision 100* Act for the purpose of evaluating the use of cleaner conventional fuel and retrofit technology on aircraft ground support equipment at ten airports.<sup>8</sup>

Sponsors of commercial service airports in air quality nonattainment and maintenance areas may apply to the FAA for AIP grants or to collect and use PFCs to assist in funding the acquisition or conversion of airport-dedicated vehicles and ground support equipment to low emission technologies. AIP-funded low emission technologies must perform to the best achievable low emission standards established by the EPA and must rely exclusively on alternative fuels that are substantially non-petroleum based as defined by the Department of Energy,<sup>9</sup> but not excluding hybrid systems or natural gas powered vehicles.<sup>10</sup> PFC funding

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<sup>5</sup> 49 U.S.C. 47139(a) (1)-(5)

<sup>6</sup> 49 U.S.C. 47139(b).

<sup>7</sup> VALE program information located at FAA website: [www.faa.gov/arp/environmental/vale/](http://www.faa.gov/arp/environmental/vale/)

<sup>8</sup> Section 159, Low-Emission Airport Vehicles and Infrastructure, of the *Vision 100* Act.

<sup>9</sup> U.S. Department of Energy (DOE) definition of nonpetroleum alternative fuels can be found at <http://www.eere.energy.gov/cleancities/progs/afdc/dropdown.cgi?afdc|FAQ|110|0>

Alternative fuels are substantially nonpetroleum and yield energy security and environmental benefits. As defined by the Energy Policy Act of 1993 (EPAAct), DOE currently recognizes the following as alternative fuels: Mixtures containing 85% or more by volume of alcohol fuel, including methanol and denatured ethanol;natural gas (compressed or liquefied);liquefied petroleum gas (propane);hydrogen;coal-derived liquid

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is more flexible and may also be used for technologies using cleaner conventional fuels with emission control technologies certified or verified by EPA.

In addition to low emission vehicles, AIP grants and PFC funding may be used for supporting airport infrastructure, such as refueling or recharging stations and airport terminal gate electrification to provide power and air to parked aircraft. As long as airport safety and security are assured, public access to airport refueling or recharging stations may be allowed.

Underlying the program guidance to airports, the FAA is developing a supporting technical report in consultation with the EPA, other Federal agencies, industry, and the public. This report will provide more detailed information and background on various aspects of the program, including:

- Allowable alternative fuels and clean conventional fuels
- Allowable infrastructure to reduce emissions
- Low emission vehicle performance standards
- Emission assessment and cost-effectiveness methodology
- Airport-dedicated use and useful life assurances
- Public access limitations to refueling and recharging stations
- Reporting and monitoring requirements

The FAA plans to distribute all of the published guidance documents to airports and State air quality agencies to encourage their participation in the program and to facilitate the planning, application, and implementation phases of the program.

### **1.4 Description of the contents in this document**

The following chapters of this guidance document explain the process and criteria for airports to obtain and use emission reduction credits under the program. Chapter 2 outlines the regulations that support and authorize the creation of early emission reduction programs. Chapter 3 discusses the criteria for early emission reduction programs and associated credits. Chapter 4 addresses the methods for assessing and quantifying emission reductions. Chapter 5 discusses the process that airports and State air quality agencies should follow when creating an early emission reduction program. This process includes the procedures used by airport sponsors to apply for credits, to quantify and document emission reductions, and to verify the ongoing benefits of their low emission programs. Finally, Chapter 6 explains how airport sponsors could apply their emission reduction credits in the future toward their regulatory requirements and the limits that would apply to such use.

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fuels;fuels derived from biological materials;electricity (including electricity form solar energy);100% biodiesel (B100).

<sup>10</sup> 49 U.S.C. §47102(11)

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There are four appendices to this report. Appendix A contains Section 158 of the Vision-100 FAA reauthorization bill that mandates this guidance document. Appendix B offers a State letter of assurance to the FAA on granting emission reduction credits to airports. Appendix C is a sample credit statement by the State to the airport sponsor awarding numerical credits. Appendix D contains a description of proposed software enhancements to the FAA air quality model, the Emissions and Dispersion Modeling System, to meet the information requirements of this program.

## CHAPTER 2

### REGULATORY BACKGROUND

The Clean Air Act (CAA)<sup>11</sup> governs air quality control by directing Federal, State, and local agencies to regulate air pollution activities by industries and individuals. The following is a brief discussion of relevant sections of the CAA that relate to the development of emission reduction programs.

#### 2.1 Relationship of the guidance to the Clean Air Act (CAA)

This document provides guidance to State air quality agencies, airports, and the general public on how early control measures to reduce airport emissions may be used to meet general conformity and new source review (NSR) requirements. Participation in the VALE program does not affect or change obligations under CAA provisions or implementing regulations. General conformity requirements can be found in Section 176(c) of the CAA. NSR requirements can be found in sections 160 through 169, 172, and 173 of the CAA.

This guidance document under the *Vision 100* Act addresses both general conformity and NSR requirements for airports. Airport sponsors and State air quality agencies that choose to participate in the program would be subject to the Vision 100 Act's requirements on airport emission reduction credits that are explained in this document. Participating airports are also bound by FAA compliance regulations for the AIP and PFC programs, which are described in FAA Order 5100.38B and related guidance documents.

#### 2.2 Description of the national air quality management process

Section 109 of the CAA requires EPA to set national ambient air quality standards (NAAQS) for pollutants considered to be harmful to human health or the environment. EPA has established standards for six pollutants known as "criteria" pollutants. They include carbon monoxide, nitrogen dioxide, ground level ozone, lead, particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>)<sup>12</sup>, and sulfur dioxide.

Under the provisions of section 107 of the CAA, EPA designates areas as attainment, nonattainment, or unclassifiable for the criteria pollutants. Areas that are designated nonattainment and subsequently come into attainment are required to adopt a maintenance plan before EPA can redesignate the area to attainment. Redesignated areas with maintenance plans are known as maintenance areas.

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<sup>11</sup>42 U.S.C. 7401 et seq

<sup>12</sup> PM 10 is defined as "particles with Aerodynamic Diameter Less than or Equal to a Nominal 10 micrometers." PM 2.5 is defined as "particles with Aerodynamic Diameter Less than or Equal to a Nominal 2.5 micrometers."

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Under Section 110 of the CAA, States are directed to develop plans that provide for the implementation, maintenance and enforcement of the NAAQS within their States. These plans are known as State implementation plans (SIPs). If monitoring data indicate that an area is not meeting the standards, EPA will designate the area as nonattainment.<sup>13</sup> If an area is designated nonattainment, the State must then revise its SIP to show how it will reduce emissions so that it will attain the NAAQS within that area. Once a nonattainment area attains the NAAQS, the area is considered to be a maintenance area. States must revise their SIPs to show how the maintenance areas will maintain compliance with the NAAQS for at least 20 years after the area achieves attainment.

### 2.3 General Conformity

Section 176(c) of the CAA<sup>14</sup> requires that EPA adopt regulations to ensure that projects sponsored by Federal agencies do not interfere with a State's ability to meet or maintain the NAAQS. In order to fulfill the CAA requirements, EPA promulgated the Transportation Conformity Regulations on November 24, 1993<sup>15</sup> and the General Conformity Regulations on November 30, 1993.<sup>16</sup> The Transportation Conformity Regulations address highway and mass transit transportation plans, programs, and projects funded under title 23 U.S.C. or the Transit Act. The General Conformity Regulations<sup>17</sup> are applicable to all other Federal projects and actions, including FAA actions for airport development.

The General Conformity Regulations prevent Federal agencies from taking actions that increase emissions in violation of the SIP. Compliance with the General Conformity Regulations can be achieved in several ways, including:

- Documenting that planned emission increases are included in the existing SIP;
- Persuading the State to include the emission increases in the SIP;
- Offsetting emission increases with concurrent emission decreases of the same size; and
- Mitigating the emissions.

All Federal actions are subject to general conformity requirements unless otherwise exempt. Examples of exempt actions include:

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<sup>13</sup> Under Section 107 of the CAA, EPA designates areas as attainment or nonattainment for criteria pollutants.

<sup>14</sup> 42 U.S.C. 7506(c)

<sup>15</sup> 58 FR 62188-62253

<sup>16</sup> 58 FR 63214-63259.

<sup>17</sup> 40 CFR 93. 150-160

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- Actions covered by the Transportation Conformity Regulations;
- Actions with total direct and indirect emissions below specified de minimis levels;
- Actions specifically listed in the rule as exempt; or
- Actions included on any list of “presumed to conform” actions published by FAA.<sup>18</sup>

Most of the air quality requirements for airports are associated with the General Conformity Regulation. Under general conformity, this program can help an airport to show that a proposed project is either exempt or conforming with the SIP. Airports are encouraged to take immediate measures to reduce emissions by allowing them to carry these early emission reductions forward on an annual basis (see Chapter 6) as if they were planned as part of a future airport development project.

### **2.4 New Source Review (NSR)**

New and modified stationary sources at airports are sometimes subject to requirements of EPA and State new source review (NSR) programs. Possible examples of airport sources subject to NSR include airport power plants and painting and maintenance facilities.

The basic requirements of the NSR program are established under Parts C and D of Title I of the CAA. Generally administered by State air quality agencies, the NSR program is a means to control air emissions from new or modified stationary sources by requiring pre-construction review and the use of air pollution control technology or other emission reduction strategies. The NSR program is comprised of three permitting programs: 1) minor sources located in attainment, unclassified, or designated nonattainment areas (minor source NSR), 2) major stationary sources located in designated nonattainment areas (nonattainment NSR), and 3) major sources located in attainment or unclassified areas (Prevention of Significant Deterioration or PSD).

The nonattainment NSR permit program only applies to construction projects that will result in potential emissions that exceed certain thresholds. For new sources the potential emissions must exceed the levels that make it a “major” source. The “major” thresholds vary by pollutant and by the degree of nonattainment for the area in which the source is located (based on the sources potential to emit from 100 tons per year down to 10 tons per year). For modifications (a physical change or change in the method of operation) to existing major sources, the modification must result in a “significant” net increase in emissions for the NSR requirements to be triggered. Under this program, the owners or operators for new or modified major stationary sources must install control technology representing the lowest achievable emission rate and offset any emission increases above baseline emission levels.

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<sup>18</sup> 40 CFR 93.153-160.

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The PSD program applies to new or modified major stationary sources located in areas that are meeting the NAAQS for at least one criteria pollutant, including areas designated as maintenance areas. The PSD program also applies to new or modified major sources of non-criteria pollutants regulated under the CAA, except for hazardous air pollutants listed and regulated under section 112 of the CAA. Under the PSD program, a source is considered major if it is in one of the 28 named source categories and emits or has the potential to emit 100 tons per year, or is not in the named categories and emits or has the potential to emit 250 tons per year of a PSD regulated pollutant.

### **2.5 Economic incentive programs**

Section 182 of the CAA allows States to achieve an air quality objective by developing market-based incentive programs to reduce emissions. By providing sources with flexibility in meeting an emission reduction goal, economic incentive programs (EIPs) create opportunities to find the most suitable and cost effective means to fit the circumstances.

An early emission reduction program is one form of an EIP. Economic incentives for early reductions can result in greater long-term emission reductions and in earlier development of innovative technologies. The EPA guidelines for EIPs are published in the document, Improving Air Quality With Economic Incentive Programs.<sup>19</sup> The emission reduction credit guidance in this document for the VALE program is consistent with the EIP guidance.

### **2.6 FAA Inherently Low Emission Airport Vehicle (ILEAV) pilot program**

Based on Section 158 of the *Vision 100* Act (Previously Approved Projects),<sup>20</sup> the ten airport sponsors participating in the FAA ILEAV Program (Section 47136) may apply for and receive emission reduction credits under this guidance for all emission reductions produced by the airports through the ILEAV program, including airport project previously approved under 49 U.S.C. §47136. Since the ILEAV funding approval has already been granted, airport sponsors of ILEAV projects are at the project implementation phase and in a position to apply for airport emission reduction credits.

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<sup>19</sup> Improving Air Quality with Economic Incentive Programs (EPA-452/R-01-001, January 2001

<sup>20</sup> 49 U.S.C. 47139(c).

## CHAPTER 3

### CRITERIA FOR AIRPORT EMISSION REDUCTION CREDITS (AERCs)

Approved measures for early emission reductions, which can be applied by the airport sponsor to general conformity or NSR permit requirements, cannot interfere with other requirements of the CAA and must be consistent with SIP attainment, maintenance, and progress requirements<sup>21</sup>.

To be eligible for airport emission reduction credits (AERCs), the emission reductions would need to meet the quantifiable, surplus, enforceable, and permanent criteria specified in EPA guidance for SIP development.<sup>22</sup> This guidance also follows the Voluntary Mobile Source Emission Reduction Program and the Voluntary Stationary Source Guidance<sup>23</sup> and includes an additional criterion that the airport sponsor's VALE program is adequately supported.

**3.1 Quantifiable** - The emission reductions from an approved activity are quantifiable if they can be reliably measured and if the method for measuring can be replicated. The airport sponsor would need to provide the State air quality agency with sufficient data and information to enable the agency to replicate the calculations if it chooses to do so.

Airport sponsors should calculate emission reductions for each year of the project (i.e., the useful life of the purchased low emission equipment or systems). Airport sponsor quantification of emission reductions would need to be completed before the State air quality agency could determine if the measure is eligible and provide written assurance to FAA that AERCs could be granted. The FAA has stated that it must receive this written assurance before it can approve project funding. Airport sponsors may need to update their initial program application emission reduction estimates in the future to reflect changes in funded measures, planned operations, commercially available technology, or Federal or State regulations.

The Emission and Dispersion Modeling System (EDMS) is the FAA-required methodology for airport air quality analysis of aviation sources: aircraft, auxiliary power units, and ground support equipment.<sup>24</sup> For the VALE program, the FAA requires the airport sponsor to calculate the baseline and project emissions from project-related airport sources using

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<sup>21</sup> Specific terms for progress requirements are called reasonable further progress/rate of progress (RFP/ROP).

<sup>22</sup> Memorandum: Guidance on incorporating Voluntary Mobile Source Emission Reduction Programs into the SIP, October 24, 1997.

<sup>23</sup> The Voluntary Measures Policy should be consulted if SIP revisions or SIP credits are sought under this policy. A description of this policy is available at the following web site:  
<http://www.epa.gov/otaq/transp/traqvoldm.htm>.

<sup>24</sup> FAA Orders 1050.1E, 5050.4B, and Air Quality (Handbook) Procedures for Civilian Airports and Air Force Bases, version 1c, 2004.



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EDMS.<sup>25</sup> Airport sponsors may supplement or refine their EDMS analysis of non-aviation sources using other EPA guideline models, such as MOBILE 6 for on-road vehicles (see Chapter 4 for more detailed discussion of the assessment methodology).

**3.2 Surplus** - Creditable emission reductions would be reductions not otherwise required by Federal or State regulations, and for which emission reduction credit has not already been taken. Such reductions could generally be used as long as they are not otherwise relied on to meet other applicable air quality attainment and maintenance requirements.

In evaluating if the AERCs are surplus, the State should compare a project baseline against the proposed project action (see Section 4.1, Baseline development). The net difference between baseline and project scenarios represents the amount of emission reductions that may be surplus and creditable.

The airport sponsor and State air quality agency need to carefully consider factors that could influence the surplus status of projected emission reductions over time. For example, new Federal emission standards or other air quality attainment and maintenance requirements could decrease the surplus status of related emission reduction measures. Conversely, surplus reductions could increase, for example, if a State deleted specific control measures from the SIP.

The surplus criterion is not disadvantageous to the airport sponsor making the early voluntary reduction because AERCs ultimately available for use would not be less than if the airport sponsor waited to implement the emission reduction strategies in the future as part of a project development.

**3.3 Enforceable** – Credited emission reduction measures must be enforceable at the Federal and State levels.<sup>26</sup> AERC emission reduction measures would generally be considered Federally enforceable if they meet all of the following requirements:

- The measures are independently verifiable.
- A complete schedule to implement and verify approved measures has been adopted by the airport sponsor in accordance with AIP and PFC guidelines.
- Violations of AERC requirements are practicably enforceable in accordance with the Clean Air Act, EPA regulations, and FAA AIP and PFC regulations and grant assurances.

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<sup>25</sup> “Project-related airport sources” are directly related to the sponsor’s VALE program and do not include other or all airport emission sources.

<sup>26</sup> See § 110(a)(2)(A) of the CAA (42 U.S.C. §7410(a)(2)(A))

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- Liability for violations can be identified.
- All required airport emissions-related information is made publicly available.

In addition, AERCs used as offsets for sources subject to NSR regulations must meet the enforceability requirements of NSR regulations.

Verification of airport program implementation relies on the established FAA compliance programs for the AIP and PFC programs. These compliance programs have been in place for many years and have a strong record of effectiveness. Airport sponsors are required to provide the FAA with numerous grant and program assurances that Federal funds are being applied in accordance with the applicable laws, regulations, and program guidance.<sup>27</sup> In addition to the standard assurances and reporting requirements, airport sponsors would also need to meet any special grant assurances that the FAA adds to the VALE program.

To ensure State and EPA enforceability, the State may choose to incorporate airport emission reduction measures into the SIP either when it receives an updated emissions reduction report from the airport sponsor, following FAA funding approval, or at the time that the AERCs created by the measure are used by the airport sponsor.<sup>28</sup> The State may include the measure directly in the SIP by adopting and submitting a SIP revision or by issuing a permit for the measure as part of an approved SIP permit program (see section 5.3).

**3.4 Permanent** – Emission reductions that are credited need to be permanent in that they continue to occur at the estimated level throughout the lifetime of the project. The FAA addresses this requirement through grant and program assurances in the AIP and PFC programs. While infrastructure improvements and capital assets are permanent by design, the FAA expects that the VALE program will also include a special condition, similar to the existing FAA ILEAV pilot program assurance, stating that low emission vehicles funded under the AIP and PFC programs would be maintained and used for their useful life at the airport for which they were purchased. In the event that program funds are used to assist parties other than the airport sponsor, the FAA plans to require the airport sponsor to enter into agreements with the purchasing party that requires that the vehicles be maintained and used at the airport for their useful life.

Another special condition for the VALE program is the FAA requirement that any vehicles or equipment replaced under the program, whether airport or privately owned, cannot be transferred to another airport or location within the same nonattainment or maintenance area or, similarly, to any other nonattainment or maintenance area in the country. This assurance

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<sup>27</sup> List of airport assurances are listed on the FAA Airports Office web site at: <http://www.faa.gov/arp/financial/aip/assurances.cfm>

<sup>28</sup> The Voluntary Measures Policy, <http://www.epa.gov/otaq/transp/traqvom.htm>.

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protects regional air quality, prevents adverse effects on other sensitive locations, and eliminates the possibility of a duplication of federal or federally-approved funding for the same vehicles or equipment that have been moved to other locations.

In order to assure a permanent stream of emission reductions based on the operational forecast of vehicle and equipment use, the airport sponsor should use and maintain program vehicles and equipment in a consistent manner with their usage estimates. New cleaner vehicles and equipment should be operated as planned even if old systems are still available. The airport sponsor should develop and maintain usage records and periodically update their annual emission reduction estimates if usage or other factors change that could affect estimated emission reductions.

**3.5 Adequately supported** – The airport sponsor should demonstrate that it has adequate funding, personnel, and other resources to implement and verify the approved low emission measures on schedule.

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CHAPTER 4

**METHODOLOGY FOR CALCULATING AERCs**

Emission reductions are usually quantified as a rate-based number (weight per unit of time). The rate-based approach to calculating emission reduction credits results in a permanent, continuous stream of reductions over time. Under the rate-based approach, emission reductions for the VALE program would be computed and tracked for criteria pollutants on an annual basis in pollutant tons per calendar year.

In the simplest form, AERCs would be based on the net surplus reductions between existing baseline emissions and project emissions from implementation of proposed measures. This comparison is limited to the project-related low emission vehicles and equipment and would not require the airport sponsor to perform an analysis or inventory of non-project or total airport emissions.

Airport sponsors may incorporate into their project, and receive AERCs for, the emission reductions of vehicle and equipment not funded by either AIP or PFC, if these source reductions are part of the overall VALE project (e.g., conversions of vehicles or equipment with airport revenue or private sector funding that utilize a VALE alternative fueling or recharging station owned by the airport). Accounting for these additional emission reductions should be based on the proportion of reductions that are directly related to the VALE program and can be supported with documentation.

**4.1 Baseline development**

Baseline emissions would be considered to be the lower of the actual or allowable project-related emissions whichever is less (see discussion of allowable emissions below). Most mobile source baselines should be based on what emissions would have occurred if the voluntary emission reduction measure was not implemented.<sup>29</sup>

The baseline-project comparison for mobile sources will either be “old vs. new” or “new vs. new.” In the first type of comparison when existing vehicles are being converted or retired (old vs. new), airport sponsors should establish the emissions baseline using historical records of vehicle operations for the past two years. Developing the correct baseline for an actual piece of equipment that is being replaced would require such information as its hours of operation per month, remaining useful life, and emission factors. In the event that the airport sponsor lacks adequate historical usage records, then quantification of the baseline emissions would be more difficult and a minimum (i.e., conservative) estimate of baseline usage should be used (see section 4.1.1).

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<sup>29</sup> EPA 452/R-01-001, Section 16.3.4.a(1).

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In the second type of comparison (new vs. new), the airport sponsor may be proposing to purchase new low emission vehicles because of airport growth. These low emission vehicles are in lieu of purchasing new conventional (gasoline or diesel) fuel vehicles. The appropriate baseline in this case would be the certified emission levels of comparable new conventional fuel vehicles.

For purposes of this program, the airport's baseline emission levels should reflect the allowable requirements and emission levels that should exist at the airport. Allowable requirements refer to any restricted levels of airport emissions that are part of the SIP or other Federal and State requirements and standards. At present, there are relatively few special State agreements that might affect the determination of allowable airport emissions. In addition, it should be noted that States sometimes do not identify airport sources separately in their SIPs, electing to count airport emission sources in their allocations for mobile, stationary, and construction sources.

Below are two examples to clarify the appropriate baseline comparison:

Example 1. An airport is replacing an old gasoline vehicle and decides to purchase a new electric vehicle instead of a new or repowered gasoline vehicle that would meet newer emission standards. The correct comparison for determining the surplus is the difference between the new electric vehicle and the equivalent new gasoline vehicle that meets the existing standards. The surplus emissions would not be the difference between the old vehicle and the new electric vehicle (zero tailpipe emissions).

Example 2. An airport decides to replace diesel maintenance equipment with electric equipment and receives credit for the PM emission reductions. Then, at a later date, the State or EPA requires the diesel equipment to be retrofitted with particulate traps. The estimated and credited reductions for the current and future years should be adjusted to equal the difference between the electric equipment and the diesel equipment with the particulate traps.

### **4.2 Assessment methodology**

The following procedures should be observed when calculating emissions reductions.

#### **4.2.1 FAA Emissions and Dispersion Modeling System (EDMS)**

The FAA requires airport sponsors to use EDMS to calculate all emissions at the airport related to the VALE program. This includes aviation sources, namely aircraft, APUs, and GSE, as well as ground access vehicles (GAV), and various stationary sources located at the airport. Airports may choose to supplement EDMS calculations for non-aviation sources with approved EPA emission models such as MOBILE 6 for on-road vehicles, NON-ROAD for off-road vehicles, PART5 for vehicle particulates, and TANKS for evaluating evaporative emissions from single fuel storage tanks.

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The VALE program is being supported by dedicated FAA enhancements to EDMS that are designed to: 1) simplify airport applications to the program, and 2) increase consistency of assessments and reports for improved Federal and State agency review of airport emission reduction calculations. A description of the new EDMS enhancements, including a standardized analysis output form, is provided in **Appendix D: Program Functional Specifications Document for the FAA Emissions and Dispersion Modeling System**.

In developing their projects, airport sponsors should use the most recent version of EDMS and other EPA approved models. This general approach should be followed at logical intervals in the future to take advantage of model improvements. In the event that follow-on projects to an earlier project demand modeling consistency, an airport sponsor may stay with the original version of a model(s) if a clear rationale is provided. In all cases, the same version of EDMS and other models should be used to calculate emissions for both the baseline and project scenarios. Emission reductions and AERCs obtained using one version of the model would not need to be re-calculated each time a new version of a model is released.

### 4.2.2 Recommended input procedures

Conservative assumptions and consistent inputs are critical to effective analysis. Conservative assumptions, which err on the side of underestimating emission reduction benefits, should be used in developing modeled inputs wherever uncertainties exist. In line with this, activity levels for baseline and future scenarios should be the same,<sup>30</sup> unless there is a supportable forecast that vehicle and equipment fleets or usage rates will change in the future. Areas of potential uncertainty should be identified and described in the airport sponsor's reports whenever possible (e.g., vehicle emission factors).<sup>31</sup>

Whenever possible, airport sponsors are encouraged to perform actual emission measurements of operational program vehicles and equipment in order to verify the accuracy of their emission reduction estimates.

The emission reduction analysis must carefully consider factors that will change emission reduction estimates year-to-year and whether these reductions continue to be surplus. It is possible that AERCs (i.e., surplus status of emission reductions) may diminish with time depending on the schedule of new Federal emission standards. Operational factors include the number of vehicles, fleet mix, vehicle operations or usage rates, and the useful life of current and new equipment. The modeled emission factors are expected to account for vehicle deterioration rates automatically. Emission reduction estimates may also be affected

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<sup>30</sup> EPA-452/R-01-001, 4.1 (b) or 16.3.4.

<sup>31</sup> EPA-452/R-01-001, 6.4.

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by organizational factors such as funding and schedule modifications or the financial status of airlines and other non-airport participants.

## CHAPTER 5

### PROCESS FOR OBTAINING AERCs

#### 5.1 Airport planning for a low emission program

The AERC process begins when an eligible commercial service airport<sup>32</sup> in a designated nonattainment or maintenance area decides to develop a voluntary early low emission program and apply for AIP and/or PFC funding. Airport planning for this low emission program should adhere to FAA VALE program guidance on allowable activities and equipment. The proposed airport program should be tailored to the local air quality problems causing the area's nonattainment or maintenance status.

As early as possible, the airport sponsor should contact Federal and State agencies to inform them of the airport's interest and to obtain needed information. For example, State air quality agencies can verify nonattainment and maintenance classifications for the area. These agencies can also describe how an airport early reduction program may be related to the SIP and whether there are any provisions in the SIP or supplemental agreements that could affect the airport's proposed program. EPA Regional Offices can provide additional help in answering questions on General Conformity and this AERC guidance. FAA Regional Airports Division and Airport District Offices (hereafter referred to as "FAA regional offices") can provide guidance on the use of PFC and AIP funds to support the proposed low emission activities.

There are several important reasons for airport sponsors to take enough time in the early stages of the process to develop a comprehensive and long-range plan for their low emission program. Airport sponsors should plan VALE projects to coincide with the anticipated year(s) of elevated airport emissions resulting from construction and/or operational activities. Other considerations are the limited resources of agencies and the annual cycle of FAA project reviews and funding approvals, which typically involves multi-year acquisitions through AIP and PFC programs. For these reasons, the FAA recommends that interested airport sponsors submit no more than one VALE program application per year.

On the basis of early discussions, the State air quality agency can be expected to work with the airport sponsor to develop a program that is consistent with the SIP and other Federal and State air quality requirements. At any point in the process, the FAA and EPA regional offices are available to discuss the applicability and feasibility of proposed low emission projects and to provide information about other airport emission reduction programs throughout the country that may be useful models.

#### 5.2 Airport program application to the State air quality agency, EPA, and FAA

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<sup>32</sup> Listed in the FAA National Plan of Integrated Airport System (NPIAS)

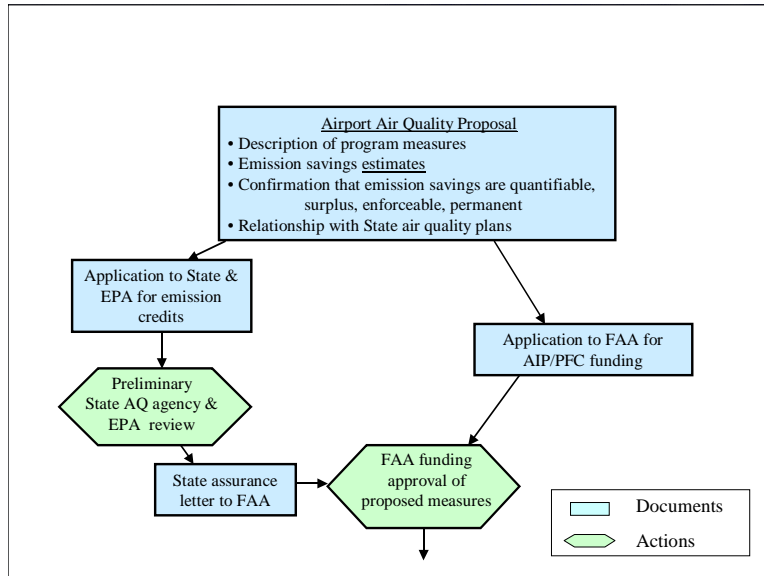


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Based on program guidance and discussions with the appropriate agencies, the airport sponsor begins the formal application process (see Figure 1) by preparing a program proposal for State, EPA, and FAA review. This proposal should not be highly complex or lengthy but should provide all of the needed elements of information, including:

- Description of the program measures. This includes specific information on the proposed low emission vehicles, the replaced/displaced conventional fuel vehicles, supporting infrastructure and equipment such as refueling and recharging stations, how the equipment will operate, and the expected deployment and expiration dates for each unit of equipment.
- Emission savings estimates. The airport sponsor should quantify the expected emission reductions from the program (in tons per calendar year per criteria pollutant) and cite the methods and models used to obtain these estimates (see Chapter 4)
- Confirmation that the projected emission savings meet CAA requirements – quantifiable, surplus, enforceable, permanent (see Chapter 3). Confirmation should include the airport sponsor’s proposed approach to keeping records, public reporting, and program monitoring over the life of the program.
- Relationship with State air quality plans. As part of the airport sponsor’s showing that the early emission reductions program is surplus, the airport sponsor should consult with the State air quality agency to identify what, if any, provisions in the SIP or other state agreements would affect the proposed measures or the airport calculation of emission benefits.

**Figure 1  
Program Application Phase**



The airport sponsor should submit its program proposal concurrently to the State air quality agency, the EPA Regional Office, and the FAA regional offices for review. The submissions to the State air quality agency and the EPA do not require the cost-effectiveness information that may be required by the FAA.

The State air quality agency should review the airport sponsor’s proposal to ensure that project information and descriptions are adequate and that the projected emission reductions are reasonable and accurate. The State air quality agency may request further information or clarification from the airport sponsor to complete its review on a timely basis.

The State air quality agency should consider any comments submitted by the EPA on the proposed emission reduction measures and associated AERCs. The EPA should provide comments to the State air quality agency (with copies to the airport sponsor and FAA regional offices) within 30 calendar days.

The State air quality agency should make a finding for the airport sponsor within 45 days that will be either a letter of assurance to the FAA (application phase) or the granting of AERCs to the airport sponsor (implementation phase). The State air quality agency and EPA review

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periods should be concurrent. Thus, the findings of the State air quality agencies should occur no more than 45 days after receipt of the airport sponsor's submission.

The FAA review of the airport sponsor's proposal includes the factors considered by the State as well as project cost effectiveness. The FAA may request additional information or clarification from the airport sponsor as needed. The FAA has stated that it must determine that the proposed measures are a sound economic investment for the Federal government based on emission reductions per dollar spent on the program.

FAA funding approval for a proposed airport low emission program is contingent upon a letter from the State air quality agency (or other governing air quality entity) to the FAA that the airport sponsor will receive emission credits for the proposed program in accordance with the conditions in this guidance (see State letter in **Appendix B**). In accordance with the *Vision 100* Act, the FAA must receive this letter before AIP or PFC funding can be approved. The letter from the State air quality agency should indicate the State's interest in participating, its preliminary favorable review of the airport proposal, and its assurance that the airport's estimated emission reductions, if implemented as proposed, will receive an equal amount of AERCs. Without a State letter to this effect, the airport sponsor's proposal is ineligible for FAA funding approval.

### **5.3 Inclusion of the AERC in the State Implementation Plan (SIP)**

States may choose to incorporate airport emission reduction measures into the SIP to ensure State and EPA enforceability, as required under General Conformity<sup>33</sup> and NSR<sup>34</sup> regulations. If States choose to manage this program outside of the SIP, VALE emission reduction measures are still enforceable through FAA grant assurances and airport program requirements to update and verify emission reduction estimates for their AERC application to the State air quality agency.

Inclusion of VALE measures in the SIP may be included in a SIP revision or as part of a permit program that is included in the SIP. Whatever approach is chosen, the State should meet its VALE program commitments on a timely basis. Processing of the measures for the SIP should not interfere with or delay the State 45-day period of performance discussed above for reviewing VALE project applications and making AERC determinations.

In general, States should wait until the FAA has approved project funding and the airport sponsor has submitted updated emission reduction estimates before including the airport's emission reduction measures in the SIP. While airports may use their AERCs as soon as they

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<sup>33</sup> 40 C.F.R. 93.152 *Emission offset*

<sup>34</sup> 40 C.F.R. 51.165

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are issued by the State air quality agency, it is suggested that the applicable SIP revision or permit issuance occur before AERCs are used.

It should be stated in the SIP that airport AERCs are being held for their use in general conformity evaluations or as NSR offsets and are therefore not available for use as part of the attainment demonstration. In other words, emission reductions set aside for the airport sponsor to meet general conformity and NSR requirements cannot be double-counted by the State as part of its attainment demonstration.

VALE emission reduction measures also need to be managed within the context of existing SIP commitments that are made by the airport sponsor and its operators and tenants. Control measures already in the SIP through State and local agreements (e.g., Houston and the South Coast Air Quality Management District) are a factor in determining the surplus status of VALE emission reductions. Established SIP commitments need to be satisfied first before additional (surplus) VALE emission reduction measures are creditable. It should be noted that airport sponsors are eligible for FAA funding to meet their CAA obligations under local agreements independent of the VALE program.

In the event that the States and airlines conclude a voluntary “national stakeholders agreement,” the airport sponsor may receive GSE-related emission reduction credits under this agreement to the extent that VALE funding is used to support any part of the acquisition and conversion to cleaner GSE at its airport, including related fueling infrastructure.

### **5.4 FAA approval and program implementation**

The implementation phase of the program begins with FAA funding approval. The FAA may approve all, some, or none of the proposed airport low emission measures based on the availability of funding, project cost-effectiveness, regional considerations, and other factors in the AIP and PFC decision process. The FAA may also stipulate modifications to proposed measures as needed.

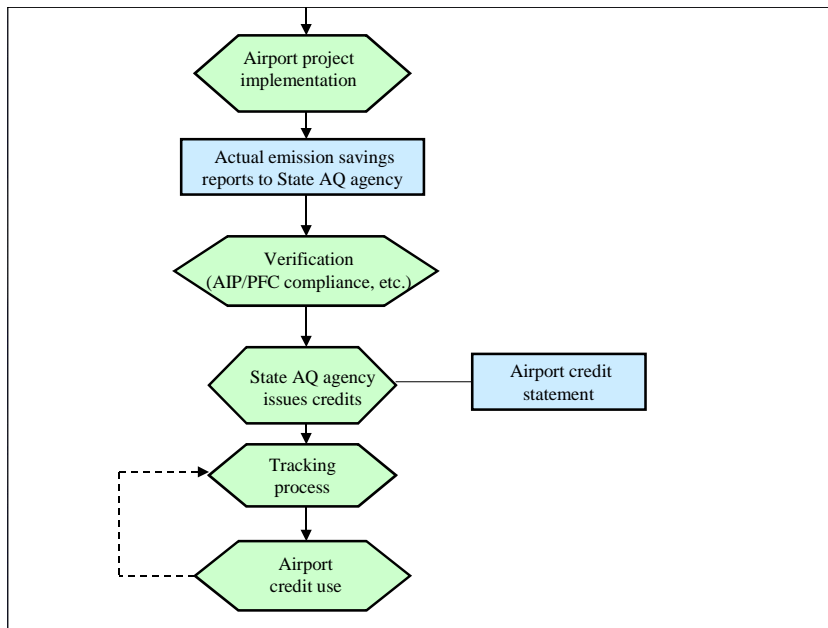
The FAA funding decision is one of several factors that could affect the airport sponsor’s proposal between the application phase and the implementation phase. Other factors that could affect the airport sponsor’s acquisition and deployment of equipment could be the availability of new or improved technology, changing usage estimates or costs, and the status of participating manufacturers or operators.

It is therefore necessary for the airport sponsor to confirm, and as necessary to revise, its program and emission reduction estimates at the implementation phase based on updated information for the approved program. While the airport sponsor may determine when to send its updated report to the State air quality agency for AERCs, the timing of the airport sponsor’s submittal depends on the airport sponsor’s confidence in the implementation phase about the size, timing, and details of its funded project. The updated report should be

presented to the State air quality agency in the same way as the initial application. If the airport sponsor submits the report after it has deployed major parts of its program, the airport sponsor should attempt, as practicable, to compare available information on actual operations with emission reduction estimates (based originally on certification, manufacturer, and/or model data).

It is expected that State program review during the implementation phase will go quickly due to the previous State review during the application phase. Figure 2 shows the steps in the project implementation phase and crediting. Chapter 6 discusses how the State air quality agencies would issue AERCs to airports, when airports could use them, and how the AERCs would be updated and tracked.

**Figure 2**  
**Project Implementation Phase and Crediting**



**CHAPTER 6**

**GRANTING AND USING AERCS**

## DRAFT

As stated in the *Vision 100 Act*,<sup>35</sup> AERCs are obtained and held by the airport sponsor and may only be used for any current or future general conformity or NSR permit requirements under the CAA. Credits that are in excess of what the airport sponsor needs for such purposes could not be traded, sold, or redirected and would simply represent an extra emissions benefit for the area.

### **6.1 Granting of AERCs by the State air quality agency**

When the State air quality agency receives the airport sponsor's updated emission reduction report during the project implementation phase, the State air quality agency should reevaluate the reasonableness of the emission reduction estimates and should issue an appropriate level of AERCs to the airport sponsor in a timely manner. The AERCs should be allocated by the State according to the same annual schedule and amount (tons per year) of emission reductions provided by the airport sponsor's project.

This process for issuing AERCs anticipates that the State air quality agency would provide an airport credit statement (ACS) to the airport sponsor (see **Appendix C** for a sample State credit statement to the airport). The ACS should list eligible credits by year.

Depending upon the agency's preference, the document (or certificate) could either be a paper document or electronic. A copy of this document would need to be made available to the public upon request. Multiple certificates could be applied to a single new project, and a single certificate could be applied to multiple projects that are proposed simultaneously.

The AERC process is intended to be simple with no disincentives to airport sponsors (e.g., discount ratios, penalties, administrative processing fees). The basic rules for granting and using AERCs are as follows:

- AERCs would be granted on a one-for-one annualized basis for each criteria pollutant – one ton per year (tpy) of emissions credit for one tpy of emissions reduction.
- Annual AERCs for any current or future year may only be used once.
- If applicable, AERC's could be used or withdrawn for each year on a "first in, first out" basis.

### **6.2 Life of the AERCs**

The value of an emission reduction measure may diminish over time if more stringent government regulations are adopted and these new requirements were not considered in the airport sponsor's emission reduction calculations. Such events would decrease the surplus value of the early emission reductions used to obtain corresponding AERCs.

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<sup>35</sup> 49 U.S.C. § 47139(a)(2).

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In addition, the eligibility of emission reduction measures to create AERCs would generally expire after 20 years, unless AERC form the measure are being used to offset emissions from an action subject to general conformity or for a new source review offset. However, with agreement between the stakeholder some stationary source improvements through the VALE program may be eligible for up to 40 years. This lifetime or “sunset” provision is consistent with AIP and PFC terms, conditions, and assurances, which remain in full force and effect throughout the useful life of the facilities or equipment acquired for an airport development project over the same period of years.

### 6.3 Airport sponsor use of AERCs

The VALE program is one of many ways that airport sponsors can meet their air quality responsibilities. The benefit of early reductions and AERCs made possible through the program will vary from airport to airport.

The *Vision 100* Act requires that AERCs be kept by the the airport sponsor and only used for meeting Federal general conformity requirements and NSR permit requirements. Consistent with AIP and PFC funding to individual airports and environmental compliance, the FAA considers each airport as an “independent facility” for purposes of receiving and using AERCs.

For purposes of this program, AERCs represent a year-to-year credit system and not a multi-year “banking” system where all past emission savings add-up or accumulate. In effect, airport sponsors would produce emission reductions for each year and would obtain the equivalent number of AERCs on an annual basis for as many years as the project lasts. Airport sponsors could only apply AERCs to the year in which the associated emission reductions are projected to occur. The annualized framework for applying AERCs is reflected in the air quality regulatory process:

- SIP budgets are generally developed on an annual basis making it is more realistic to apply AERCs to the year in which the emissions occur.
- General conformity de minimis thresholds are annualized and expressed similarly in tons per year. This allows a consistent application of AERCs to de minimis levels in the context of project “design measures.” (see Section 6.3.1 General Conformity)
- Airport sponsor updates to emission reduction estimates, emission factors, and assessment methodologies can focus on current and future years without concern to past years.
- Implemented airport low emission projects should produce the same or similar emission reductions for many years into the future.

Because AERCs would be acquired and used year-to-year, airport sponsors could not carry or accumulate past year emission reductions and AERCs forward to the current year or future

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years for use. In effect, these emission reduction benefits are no longer counted as credit toward general conformity and NSR permit requirements and become voluntary benefits to the environment that the State can claim towards meeting the SIP goals.<sup>36</sup>

The VALE program is not designed for emissions “trading.” Thus, this guidance document does not address the separate activity of trading, which is limited under the CAA and would conflict with various restrictions in the AIP and PFC programs pertaining to Federal revenue diversions and reimbursements.

### 6.3.1 General Conformity

Airport general conformity requirements are the major focus of the VALE program. Under General Conformity, airport sponsors would be allowed to apply AERCs as “design measures”<sup>37</sup> against the annual de minimis levels established in the CAA for demonstrating conformity. When applied as design measures, the airport sponsor could reduce the total direct and indirect emissions from the project emissions to below the de minimis emission levels. If an airport sponsor’s application of AERCs to an airport development project results in project emissions below de minimis levels, no general conformity determination is required – as consistent with current general conformity rules.

This approach to applying AERCs is intended to provide airport sponsor’s with greater incentive to employ early emission reductions. Design measures are considered related to future airport projects in time as if the emission reductions occurred as part of the future planning and design for the project. The early emission reductions would also considered related in space or proximity because the airport is considered a single facility for air quality management under this program.

### 6.3.2 NSR

For purposes of NSR permitting in nonattainment areas, AERCs could be used only as offsets. The EPA NSR program includes legally mandated offset ratios based on the severity of nonattainment areas. While it is appropriate to use AERCs for all of the NSR offset requirements, other adjustments to NSR AERCs are not recommended if they tend to discourage airports from taking early reduction measures. For example, some States include a discounting feature in their NSR banking programs. Such features reduce the value of early emissions reductions when the AERCs are either generated or used. While the discounting mechanisms allow States to retire credits to increase their progress toward their SIP attainment goals, such conditions suppress airport interest in early action.

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<sup>36</sup> In the event that the State air quality agencies develop airport emission “budgets” as part of the SIP, the AERCs earned by the airport sponsor may be applied to meeting this budget.

<sup>37</sup> See EPA and FAA *General Conformity Guidance for Airports, Q&A’s*, September 25, 2002. Question #38 clarifies the distinctions between “design measures”, “mitigation measures”, and “offsets.”



#### **6.4 Updating, tracking and record keeping**

The airport sponsor should keep effective equipment records and label equipment that has been purchased through this program. Ongoing verification of equipment, operations, and the surplus nature of credited reductions would be needed, especially after the State issues the ACS and AERCs to the airport sponsor.

The State air quality agency and the airport sponsor would both be responsible for maintaining copies of the ACS as well as tracking changes in Federal and State regulations that may affect the value of allocated AERCs over time. The airport sponsor may have incorporated planned regulatory changes into the future baseline and project calculations. If not, the airport sponsor would need to consider any difference in existing regulations when providing periodic updates to its emission reduction estimates, especially in the period preceding proposed use of AERCs.

The airport sponsor would be responsible for updating its underlying emission reduction estimates in two cases: 1) when changes warrant corrections to the estimates; and 2) when the airport sponsor declares that it intends to use its AERCs. In both cases, the airport sponsor should provide its updated report, and the effects on the ACS and number of AERCs, to the State air quality agency, the EPA, and the FAA. Updated calculations would be only required for current and future project years.

In addition, the airport sponsor should keep track of operational and facility changes over time that could affect the emission reduction estimates. Any new information that may change the amount of allocated AERCs (higher or lower) would need to be presented to the State air quality agency prior to AERC use in order to verify the continued validity of the AERCs and the emission reduction estimates upon which they are based.

State air quality agencies and airport sponsors do not have to notify the public when AERCs are granted through the ACS. However, when an airport sponsor decides to use its AERCs to meet Federal general conformity requirements or NSR permit requirements, the airport sponsor would need to notify the public (e.g., press release) and in writing to the State air quality agency and the EPA Regional Office that they are intending to do so. Following the airport use of AERCs, the State air quality agency would need to revise the airport's AERC balance accordingly and send the airport sponsor a new credit statement on the airport's remaining AERCs.

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**APPENDIX A**

**Section 158. Emission Credits for Air Quality Projects**

H.R.2115

*One Hundred Eighth Congress  
of the  
United States of America*

AT THE FIRST SESSION

*Begun and held at the City of Washington on Tuesday,  
the seventh day of January, two thousand and three*

*An Act*

To amend title 49, United States Code, to reauthorize programs for the Federal Aviation Administration, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

**SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

(a) **SHORT TITLE-** This Act may be cited as the `Vision 100--Century of Aviation Reauthorization Act'.

(b) **TABLE OF CONTENTS-** The table of contents for this Act is as follows:

Sec. 1. Short title; table of contents.

Sec. 2. Amendments to title 49, United States Code.

Sec. 3. Applicability.

Sec. 4. Findings.

**TITLE I--AIRPORT AND AIRWAY IMPROVEMENTS**

**Subtitle A--Funding of FAA Programs**

Sec. 101. Airport planning and development and noise compatibility planning and programs.

Sec. 102. Air navigation facilities and equipment.

Sec. 103. Federal Aviation Administration operations.

Sec. 104. Funding for aviation programs.

Sec. 105. Agreements for operation of airport facilities.

Sec. 106. Insurance.

**Subtitle B--Passenger Facility Fees**

Sec. 121. Low-emission airport vehicles and ground support equipment.

Sec. 122. Use of fees to pay debt service.

Sec. 123. Streamlining of the passenger facility fee program.

Sec. 124. Financial management of passenger facility fees.

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Subtitle C--AIP Modifications

- Sec. 141. Airfield pavement.
- Sec. 142. Replacement of baggage conveyor systems.
- Sec. 143. Authority to use certain funds for airport security programs and activities.
- Sec. 144. Grant assurances.
- Sec. 145. Clarification of allowable project costs.
- Sec. 146. Apportionments to primary airports.
- Sec. 147. Cargo airports.
- Sec. 148. Considerations in making discretionary grants.
- Sec. 149. Flexible funding for nonprimary airport apportionments.
- Sec. 150. Use of apportioned amounts.
- Sec. 151. Increase in apportionment for, and flexibility of, noise compatibility planning programs.
- Sec. 152. Pilot program for purchase of airport development rights.
- Sec. 153. Military airport program.
- Sec. 154. Airport safety data collection.
- Sec. 155. Airport privatization pilot program.
- Sec. 156. Innovative financing techniques.
- Sec. 157. Airport security program.
- Sec. 158. Emission credits for air quality projects.**
- Sec. 159. Low-emission airport vehicles and infrastructure.
- Sec. 160. Compatible land use planning and projects by State and local governments.
- Sec. 161. Temporary increase in Government share of certain AIP project costs.
- Sec. 162. Share of airport project costs.
- Sec. 163. Federal share for private ownership of airports.
- Sec. 164. Disposition of land acquired for noise compatibility purposes.
- Sec. 165. Hangar construction grant assurance.
- Sec. 166. Terminal development costs.

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SEC. 158. EMISSION CREDITS FOR AIR QUALITY PROJECTS.

(a) EMISSIONS CREDIT- Subchapter I of chapter 471 is further amended by adding at the end the following:

“§ 47139. Emission credits for air quality projects

“(a) IN GENERAL- The Administrator of the Environmental Protection Agency, in consultation with the Secretary of Transportation, shall issue guidance on how to ensure that airport sponsors receive appropriate emission reduction credits for carrying out projects described in sections 40117(a)(3)(G), 47102(3)(F), 47102(3)(K), and 47102(3)(L). Such guidance shall include, at a minimum, the following conditions:

“(1) The provision of credits is consistent with the Clean Air Act (42 U.S.C. 7402 et seq.).

“(2) Credits generated by the emissions reductions are kept by the airport sponsor and may only be used for purposes of any current or future general conformity determination under the Clean Air Act or as offsets under the Environmental Protection Agency's new source review program for projects on the airport or associated with the airport.

“(3) Credits are calculated and provided to airports on a consistent basis nationwide.

“(4) Credits are provided to airport sponsors in a timely manner.

“(5) The establishment of a method to assure the Secretary that, for any specific airport project for which funding is being requested, the appropriate credits will be granted.

“(b) ASSURANCE OF RECEIPT OF CREDITS- As a condition for making a grant for a project described in section 47102(3)(F), 47102(3)(K), 47102(3)(L), or 47140 or as a condition for granting approval to collect or use a passenger facility fee for a project described in section 40117(a)(3)(G), 47103(3)(F), 47102(3)(K), 47102(3)(L), or 47140, the Secretary must receive assurance from the State in which the project is located, or from the Administrator of the Environmental Protection Agency where there is a Federal implementation plan, that the airport sponsor will receive appropriate emission credits in accordance with the conditions of this section.

“(c) PREVIOUSLY APPROVED PROJECTS- The Administrator of the Environmental Protection Agency, in consultation with the Secretary, shall determine how to provide appropriate emissions credits to airport projects previously approved under section 47136 consistent with the guidance and conditions specified in subsection (a).

“(d) STATE AUTHORITY UNDER CAA- Nothing in this section shall be construed as overriding existing State law or regulation pursuant to section 116 of the Clean Air Act (42 U.S.C. 7416).”.

(b) CONFORMING AMENDMENT- The analysis for chapter 471 is further amended by inserting after the item relating to section 47138 the following:

“47139. Emission credits for air quality projects.”.

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**APPENDIX B**

**State Air Quality Agency AERC Letter of Assurance to the FAA  
(The following letter of assurance is required by the FAA)**

Manager, Airports Division  
Regional Airports Division and Airport District Office (copy to APP-600)  
Federal Aviation Administration  
Local Address

To the Program Manager:

The \_\_\_\_\_ (name of State air quality agency) has reviewed the application for airport emission reduction credits (AERCs) submitted to us by the \_\_\_\_\_ (name of airport sponsor) on \_\_\_\_\_ (date by month, day, year). The early emission reductions sought by the airport sponsor are intended to promote better regional air quality and greater use of cleaner airport technology.

We have determined that the proposed low emission project described in the airport sponsor's application meets the requirements of the Clean Air Act (CAA) and is consistent with U.S. Environmental Protection Agency (EPA) program guidance on AERCs, entitled "*Guidance on Airport Emission Reduction Credits for Early Measures through Voluntary Airport Low Emission Programs.*"

Our review of the material indicates that the airport emission reduction estimates for the proposed low emission project are reasonable and accurate. Based on this preliminary evaluation, we acknowledge the airport sponsor's funding application to the Federal Aviation Administration (FAA) and agree to provide appropriate AERCs to the airport sponsor on a timely basis in accordance with the terms and procedures of the EPA guidance cited above and without additional requirements or agreements.

The \_\_\_\_\_ (name of State air quality agency) will grant AERCs to the airport following FAA funding of the project and the airport sponsor's updated assessment of project emission reductions. AERCs will be granted equal to the amount of surplus emission reductions and maybe used by the airport sponsor to meet general conformity and NSR permit requirements under the CAA. We look forward to an ongoing effort with the airport sponsor to track the progress of their program and their use of AERCs in the future.

Sincerely,

Director  
State Air Quality Agency

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**APPENDIX C**

**Sample State Air Quality Agency Credit Statement (ACS) to the Airport Sponsor**

[Date]

Airport Manager (Name & Title)

Airport Name

Address

City, ST, Zip

To \_\_\_\_\_ [Airport Manager Name]

Based on the updated report submitted by \_\_\_\_\_ [airport sponsor's name] on \_\_\_\_\_ [date] for the VALE program, the \_\_\_\_\_ [State air quality agency] has determined that the airport sponsor's estimates for early emissions reductions are reasonable and accurate. In accordance with these projections, the following airport emission reduction credits (AERCs) are hereby granted to the airport sponsor:

Annual AERC Allocation (tons/year)							
	Project Year	NOx	VOCs	CO	PM <sub>10</sub>	SO <sub>2</sub>	Other
1	2006						
2	2007						
3	2008						
4	2009						
5	2010						
6	2011						
7	2012						
8	2013						
9	2014						
10	2015						
11	2016						
12	2017						
13	2018						
14	2019						
15	2020						
16	2021						
17	2022						
18	2023						
19	2024						
20	2025						

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Based on information provided by \_\_\_\_\_ [airport sponsor name], we have determined that all [nearly all, a portion, etc.] of the estimated emission reductions meet AERC requirements in accordance with U.S. Environmental Protection Agency (EPA) “*Guidance on Airport Emission Reduction Credits for Early Measures through Voluntary Airport Low Emission Programs.*” Annual AERCs have been allocated on a 1:1 basis with annual surplus emission reductions (tons/year).

*[optional paragraph if State air quality agency issues fewer AERCs than requested]* The reason for fewer AERCs allocated than requested for the year(s) of \_\_\_\_\_ or for the pollutant(s) \_\_\_\_\_ is as follows:

The airport sponsor may use the AERCs granted in this Statement to meet future general conformity evaluation and NSR permit requirements for the year in which the AERCs are generated and listed above. In accordance with EPA guidance, the airport sponsor should notify the State air quality agency, the EPA Regional Office, and the public of its intention to use AERCs. At time of use, the airport sponsor must demonstrate to the State air quality agency that AERC-based emission reductions continue to represent real and surplus reductions.

If you have any questions, please contact \_\_\_\_\_ [contact name at State air quality agency] at \_\_\_\_\_ [phone] or \_\_\_\_\_ [email address].

Sincerely,

Director  
State Air Quality Agency

cc: EPA Regional Office, FAA regional offices

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APPENDIX D  
**1<sup>st</sup> DRAFT**

**Program Functional Specifications Document for the FAA  
Emissions and Dispersion Modeling System**

**April 22, 2004**

**Prepared by:**

**CSSI, Inc.  
Washington, DC**

**Prepared for:**

**Federal Aviation Administration  
Office of Environment and Energy  
Washington, DC**



## DRAFT

### IMPORTANT

The following is the first draft of the functional specifications document. The second draft is expected to be ready shortly. The key changes for the 2<sup>nd</sup> draft are as follows:

1. EDMS enhancements for the program will be part of a new version of the model, Version 4.2, rather than current Version 4.12. These enhancements include a post-processing capability for Version 4.2 that will combine and display output results. This capability will be fully integrated in Version 5.0.
2. Additions and updates to the text to clarify the proposed software and procedures.
3. EDMS 4.2 will include a direct interface to MOBILE6, the reference on-road vehicle emissions model for the program. Users will need to select the MOBILE6 option from the study setup screen in EDMS 4.2 to take advantage of this feature. All references to running MOBILE6 outside of EDMS can be ignored in the following 1<sup>st</sup> draft document. Incrementing the study year in EDMS will automatically retrieve the proper emission factors from MOBILE.
4. The current text (Section 4.2, 1<sup>st</sup> paragraph) states:

"If additional emissions data become available for the sources modeled in EDMS, the FAA also intends to provide emission results for other than the criteria pollutants, such as VOC and NMHC."

The FAA expects to have VOC and NMHC data for mobile sources in EDMS 4.2 and is working with the EPA to provide these data for stationary sources also.

5. The FAA may attempt to improve the accuracy of EDMS 4.2 to compare emission factors for individual vehicles as opposed to using current fleet averages and built-in assumptions about future technology improvements that reduce baseline emissions regardless of the case comparison.

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## 1. INTRODUCTION

The FAA's Emissions and Dispersion Modeling System (EDMS) is used to calculate emissions from airport sources and to model air quality at an airport. The following EDMS enhancements are intended to support the new emission provisions in the Federal Aviation Administration (FAA) reauthorization, Vision-100 – Century of Flight Authorization Act of 2003 (P.L. 108-176). The new program for airports is voluntary and is called the Voluntary Airport Low Emissions Program (VALE). To be eligible, airports must be located in Nonattainment or Maintenance Areas designated by the U.S. Environmental Protection Agency (EPA).

The planned enhancements to EDMS will facilitate airport applications for VALE program funding based on the proposed project's emissions savings and cost effectiveness. In addition, the proposed EDMS enhancements will provide standardization of airport emission reduction estimates and reporting forms for the benefit of State and local air quality agencies, which will grant airport emission reduction credits (AERCs) to airports for their projects.

The FAA proposes to conduct a phased approach for developing new EDMS capabilities to support VALE requirements and early emission reductions by participating airports. In the first phase, applicants will use the current version of EDMS, version 4.12, in combination with a new EDMS post processor that will facilitate emission reduction calculations until a fully automated enhancement is added to EDMS. In the second phase, applicants will use a new version of EDMS, version 5.0, which will fully automate the emission reduction calculation capability.

The objective of this functional specification document is to describe the methodology and software tools necessary for demonstrating reductions in airport emissions. The new methodology allows more efficient comparison of a baseline scenario against a proposed low emission project alternative to determine the amount of emissions savings due to the project. These savings by criteria pollutant are computed on an annual basis for up to 20 years into the future.

The methodology, or process to be followed, is based upon current version 4.12 of EDMS and is analogous to the logic to be used in automating the process in the forthcoming software tools: the proposed future version 5.0 of EDMS and the interim Airport Emissions Reduction Credit Post Processor (AERCPP). The proposed EDMS version 5.0 is described herein, as well as guidelines for utilizing the new automation feature. In the interim before EDMS version 5.0 is released, the proposed AERCPP tool is described herein as a means to automate the comparison of emissions inventories generated in EDMS version 4.12.

## 2. METHODOLOGY

In EDMS, a collection of user inputs is called a study. In the current version of EDMS (version 4.12), a study represents only one user-specified calendar year of airport operations. After users enter all of the operational inputs that they wish to model into a study, they generate an annual emissions inventory by selecting “Run Emissions Inventory” from the “Emissions” menu. The generated inventory is a set of tables that list the total annual emissions of five pollutants (CO, HC, NO<sub>x</sub>, SO<sub>x</sub> and PM) for each emissions source, source category (aircraft, on-road vehicles, etc...) and the entire airport.

Assuming no change in year-to-year total operations (e.g., no growth), modeling another year only requires the user to change the “Study Year” input. Because EDMS 4.12 has the ability to only model one year at a time (i.e., only one study can be open within EDMS at a time), regenerating the emissions inventory overwrites all previous results for a given study. EDMS 4.12 stores the most recently generated emissions inventory in data tables (.DBF files) located in the study directory. The EDMS file format allows users to easily view and copy emission inventory values using external applications, like Microsoft Excel, for example. The necessary workaround to compare emissions inventories is for the user to manually copy EDMS study results into an external application for comparison.

With respect to EDMS 4.12, a scenario is defined as a set of studies in which each study represents a distinct calendar year of activity and these years form a consecutive set. In most cases, users will need to compare only two studies: a *baseline* and a *proposed project*. Both studies will consist of a set of inputs, corresponding to the same calendar year of activity. Users should first develop a consecutive set of *baseline* studies for each calendar year in chronological order. Second, users should develop a set of *proposed* studies. The manner which the baseline and proposed studies should be created is described below.

Sections 2.1 through 2.4 detail the main steps of the methodology, summarized as follows:

1. Create the first study for the baseline activity in EDMS 4.12, and generate an emissions inventory. This will correspond to the first year and first level of activity being examined.
2. Make a duplicate copy of the study.
3. Make the necessary adjustments to define a new study for the next year of the same baseline activity, and generate another emissions inventory.
4. Repeat steps 2 and 3 for the remaining baseline studies and analysis years.
5. Repeat steps 1 through 4 for the proposed project studies.
6. Create an AERC report by opening all of the generated emissions inventory tables and copying-and-pasting data from each of them into the report.

## 2.1 Creating a First Year Study

EDMS users should already be familiar with the creation of new studies and how the user interface accepts input. EDMS itself has been sufficiently documented to allow new users to acquaint themselves with its features. The user is encouraged to name all of their studies in a standardized way. For example, if the airport being modeled is XYZ and the first year being modeled is 2005, then the first baseline study should be named “XYZ Baseline 2005”, and all successive studies should be similarly named. To reduce confusion, all years should be entered as four-digits (e.g., not “05”). The AERCPP tool proposed in section 3, will only understand the four-digit year format. If a study relates to the proposed airport project, then “Proposed” ought to replace “Baseline” in its name.

Users should be especially familiar with the “Study Setup” dialog box where most of the “global” parameters of a study can be set. This dialog is automatically displayed immediately after creating a new study. After opening a previously created study, the “Study Setup” dialog box is accessed by selecting “Setup...” under the “File” menu. In this dialog, the user is encouraged to select or type the airport ID, which causes the airport’s elevation, among other things, to be retrieved from the system tables. For AERC studies, the user should not be concerned with performing any dispersion analysis; and therefore, should have “Emissions Only” checked. Generally, the layout units of choice only affect dispersion input; and therefore the “Airport Layout Units” setting is irrelevant to AERC purposes. Based on the Ground Support Equipment (GSE) data on hand, the user must understand how GSE can be modeled for properly setting the “GSE Modeling Basis”. If the user has obtained airport population data on GSE (e.g, an inventory of all GSE operating at an airport with annual operating times), then “Population Based” would most likely be the appropriate choice. Otherwise, if EDMS’s default GSE data is sufficient for the user’s needs or if the user has data on GSE operations on a per aircraft operation basis, then “LTO Based” should be selected. It is important to note that selecting the latter option requires the user to input aircraft operations data in addition to the GSE operations.

Four parameters in the “Study Setup” dialog box are critical to correct emissions modeling. They are: the elevation, the average yearly temperature, the mixing height and the study year. Table I summarizes their respective impacts on emissions.

**Table I. EDMS 4.12 Study Parameters Critical to Emissions Modeling.**

Parameter Name	Emissions Impact
Elevation	On-road Vehicles
Average Yearly Temp	On-road Vehicles
Mixing Height	Aircraft
Study Year	On-road Vehicles Ground Support Equipment

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The first three, elevation, average annual temperature and mixing height do not normally vary from year to year. Their values should be kept set to values which accurately correspond to the geographic location of the airport. On the other hand, the study year should be adjusted to match the calendar year in which the modeled emissions are meant to occur. For example, if the first year in the scenarios is 2005, the study year should be initially set to “2005”.

The study year indirectly changes the emission indices for on-road vehicles and ground support equipment due to the fleet assumptions embedded into Mobile 5a<sup>38</sup> and NONROAD by EPA. This includes scheduled emission standards, the average age of the fleet, and the associated deterioration rates. Advanced users who need to modify these parameters directly will need to run the associated model outside of EDMS and then import the new emission factors.

Finally, after all inputs have been made to EDMS, the emissions inventory should be generated by selecting “Run Emissions Inventory” from the “Emissions” menu. A window will appear when the emissions inventory is complete to display the results.

### 2.2 Duplicating a Study

EDMS studies consist of a directory populated by a single EDMS study (.EDM) file, several database (.DBF) files and several files of a few other file types. Duplication of a study is essentially the duplication of its directory and the directory’s contents.

Users can duplicate studies within EDMS by using the “Save Study As...” function under the “File” menu. This is done to create new studies based on previously input studies. This can be a significant timesaver, especially when there is little difference in airport operations from one year to the next or between two scenarios for a given year. When a user selects “Save Study As...”, he or she is prompted to specify the location and the name for a new directory that will be created to contain the duplicated files. In addition, the duplicated .EDM file will be appropriately renamed to correspond to the name of the new directory.

It is important to note that the actual name of the .EDM file and directory is immaterial to EDMS; however, users should follow a standardized naming scheme similar to the one described in section 2.1 to avoid confusion and to comply with the AERCPP tool requirements described in section 3. For example, if the study being copied is “XYZ Baseline 2005”, the most appropriate name for the new study might be “XYZ Baseline 2006”. If a user enters this in the “Save Study As...” dialog box, EDMS will create a new

---

<sup>38</sup> Users planning to include on-road vehicle emissions in their study must run Mobile 6 outside of EDMS 4.12. This version of EDMS only contains emission factors from Mobile 5a. To add the emission factors calculated from an outside run of Mobile 6, the user is able to use the import function from the EDMS utilities menu, or may type them in on the appropriate on-road vehicle screen. Future versions of EDMS beginning with version 4.2 will allow the user to select from Mobile 5a, 5b, and 6 directly within the model.

directory called “XYZ Baseline 2006”, copy all of the pertinent files in the “XYZ Baseline 2005” directory into the “XYZ Baseline 2006” directory and rename “XYZ Baseline 2005.EDM” to “XYZ Baseline 2006.EDM”. EDMS will then automatically close the original “XYZ Baseline 2005” study, open the newly created “XYZ Baseline 2006” study and be ready to accept incremental changes to the inputs of the new study (e.g., adjusting the study year).

### 2.3 Incrementing a Study

Incrementing a study is the process of making changes to the inputs of a study to reflect the changes from year to year. These changes may be internal to the emission factors (e.g., vehicle deterioration rates) or they may be working assumptions, for example:

- Number of vehicles
- Vehicle fleet mix
- Vehicle usage rates
- Useful life of current and new equipment
- Introduction of new Federal emission standards

EDMS currently provides the ability to print out all of the model inputs on the basis of a single study by year. The airport sponsor can submit these annual input records to the State air quality agency as part of their project proposal. In addition, to insure understanding of the study changes affecting emissions inventory results, airport sponsors should summarize and compare the modeled changes that occur year-to-year manually and include this information in their project proposal to the FAA and State air quality agencies.

Table II lists the major sources and some of the variables of a study that will impact the emissions inventory results. These items along with the parameters listed in Table II represent the changes at the airport that the modeler is able to capture for each year within EDMS.

**Table II. Sources to be Incremented in an EDMS Study by User.**

**Comment:** This is a comprehensive list of all of the sources that can be changed in EDMS. Given the target audience, Jake may want to revise the list to only include those sources applicable to the AERC program.

**Comment:** This is a comprehensive list of all of the sources that can be changed in EDMS. Given the target audience, Jake may want to revise the list to only include those sources applicable to the AERC program.

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Source	Change
Aircraft	Annual operations Total taxi and queue time Fleet change GSE assignments
Auxiliary Power Unit (APU)	Operating time Equipment change
Ground Support Equipment (GSE)	Fleet change Fuel type change (e.g. conversion to CNG or electric) Operating time
Parking structures	Average speed Average idle time Average distance traveled
Roadways	Average speed Distance traveled
Stationary sources	Operations
Training fires	Fuel consumption

The first incremental change made should be to adjust the study year in the “Study Setup” dialog box as described in section 2.1. For example, for the “XYZ Baseline 2006” study, set the study year to “2006” in the “Study Setup” dialog box. Setting the study year is critical to correctly modeling the emissions of on-road vehicles and GSE. When the study year is changed, users must acknowledge the changes by clicking “Yes” on the dialog box that pops up or the change will revert. The user should press “OK” to close the “Study Setup” dialog box. This will save all of the changes and update the vehicular and GSE emissions. The user should then make whatever incremental changes are necessary to the annual airport operations being modeled.

Following the previous example, the “XYZ Baseline 2006” study initially has its inputs set for modeling calendar year 2005 activity. These inputs should be adjusted to model calendar year 2006 activity. If there is no change in modeled activities, the user can simply skip this part.

The study year cannot be set later than “2020”. To model study years later than 2020, users must set the study year to “2020” and indicate the actual study year in either the name of the study or in the study’s comment box. As explained in section 2.1, entering the four-digit year format is highly recommended.

Because the study year impacts vehicular and GSE emission rates, when modeling beyond 2020, advanced users may opt to extrapolate their own emission rates for vehicular sources and/or user-created GSE. Novice users can learn more about this by reviewing the EDMS online help (press the “Help” button on the “Parking Lots” or “User-Created GSE” dialog box) or EDMS documentation (sections 3.5, 6.2.2, 5.2 and 6.7.2 of the EDMS manual).



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However, this is optional because GSE and vehicular emission rates generally decrease and level-off over time; and therefore, not opting to include extrapolated emission rates is a conservative choice.

Finally, after all incremental changes to the inputs of a study are made, the emission inventory should be generated by selecting “Run Emissions Inventory” from the “Emissions” menu. Once inventories are created for each study, the user will have a set of annual results for each scenario.

## 2.4 Creating an AERC Report

After generating emission inventories for all studies in both the baseline and proposed scenarios, users can copy the inventory data into their reports for submittal. EDMS 4.12 stores a summary of the most recently generated emissions inventory for a study in ALL\_EMIS.DBF. The contents of this file can be viewed and/or copied using spreadsheet applications such as Microsoft Excel. One large caveat to the user is to never save a .DBF file that has been opened in an external software application (e.g., Excel) as it will become corrupted and unusable to EDMS. Cell data from ALL\_EMIS.DBF should be copied into a new spreadsheet file (.XLS, for example) using the standard Windows™ copy-and-paste technique. After the user has collected the necessary data, the user must format the data to match the required presentation format.

Table III is an example of what the contents of a study’s ALL\_EMIS.DBF file could look like. The units of the numerical values in the table are short tons (i.e., 2,000 pounds avoirdupois). Each value represents the total annual emissions of the pollutant listed in its column’s topmost entry for the source category in its row’s leftmost entry, except for the value in the “FUEL\_TONS” column that represents total aircraft fuel consumed. Each source category is mutually exclusive; therefore, the values in the bottom “Total” row are the sums of all of the above values in their respective columns.

**Table III. Example of an ALL\_EMIS.DBF Table.**

NAME	CO_TONS	HC_TONS	NOX_TONS	SOX_TONS	PM10_TONS	FUEL_TONS
Aircraft	133.351	12.201	33.959	4.006		4437.471
GSE/AGE/APU	12.170	2.595	31.452	4.309	2.273	
Roadways	521.834	65.698	48.502	2.491	2.315	
Parking Lots	12.373	1.780	0.490	0.017	0.017	
Stationary	1.764	0.700	8.818	0.053	0.265	
Sources						
Fires	0.209	0.191	0.038	0.000	0.703	
Total	681.701	83.165	123.259	10.876	5.573	

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Ordinarily, users will be required to include a table in their report for each criteria pollutant. If the user is preparing a table for carbon monoxide (CO), the total CO value (e.g., “681.701” in Table IV) should be copied-and-pasted into the report’s CO table’s cell the corresponds to the study from which the value is copied. Table IV shows an example of what an AERC report’s table could look like. For this example, we have assumed that the criteria pollutant is CO and the data in corresponds to year 2005 in the baseline scenario.

**Table IV. Example Format of a Criteria Pollutant’s Emission Reduction Table.**

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Baseline	681.701	618.4	...							
Project	608.100	512.7	...							
Project Emission Reduction	73.601	105.7	...							
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Baseline										
Project										
Project Emission Reduction										

Users must open every generated ALL\_EMIS.DBF data table file (i.e., one for each study) to collect all of the necessary values. The total annual emissions values for each pollutant, scenario and year must be manually copied and presented in a format like that of Table IV. Essentially, this part of the methodology involves a significant amount of copying-and-pasting. Fortunately, this task can be automated by forthcoming EDMS software tools: EDMS version 5.0 and the interim post processor tool AERCPP, which are discussed below.

It is notable that a study’s summary emissions table, ALL\_EMIS.DBF, contains the totals of four other more detailed emissions tables that are also located in the study directory. The file names are: AIR\_EMIS.DBF, GSE\_EMIS.DBF, VEH\_EMIS.DBF and STN\_EMIS.DBF. The data in the more detailed emission tables can be accessed if desired and/or needed. As with ALL\_EMIS.DBF, the contents of these files can be viewed and/or copied using spreadsheet applications such as Microsoft Excel, but the files should never be saved when opened in an external software application (e.g., Excel) as it will become corrupted and unusable to EDMS.

### **3. PHASE I: INTERIM POST PROCESSOR FOR EDMS 4.12**

The interim Airport Emission Reduction Credit Post Processor (AERCPP) tool will be an application with a graphical user interface that will run on Microsoft's Windows™ operating systems (versions 95 and later). The AERCPP tool will accept as input EDMS 4.12 studies whose emissions inventories have been previously generated. Its primary function is to collect emission inventory data from previously generated EDMS studies and reformat them in the form of an AERC report as described in section 2.4.

Users will follow the instructions below in using the AERCPP tool:

1. Add Baseline EDMS 4.12 studies.
2. Add Proposal EDMS 4.12 studies.
3. Ensure that all of the relevant studies have been included. If not, repeat steps 1 and 2.
4. Print, save and/or copy the automatically generated AERC report.

Conceptual prototype screens for the tool and a description of its use follows. The actual look and feel of the tool is subject to refinement based on feedback from the software testers.

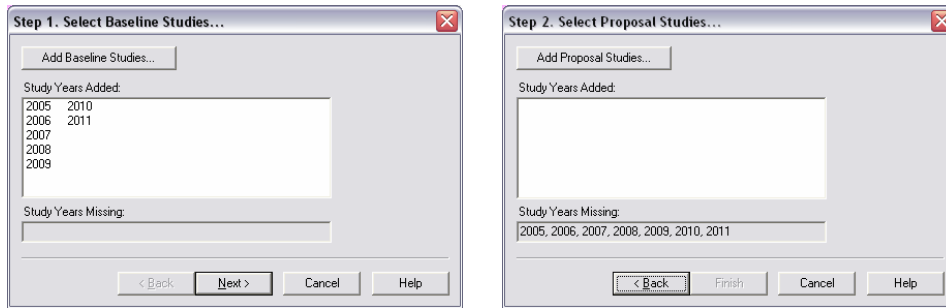
#### **3.1. Input**

To ease user input, the AERCPP tool will invoke on startup a simple two-page wizard as seen in Figure 1. The wizard will allow the user to perform the first three steps of the above instructions.

On page 1 of the wizard, the user identifies the EDMS 4.12 studies that serve as the baseline. The "Add Baseline Studies..." button will bring up a standard file dialog box that allows users to browse through their files to select the desired EDMS 4.12 studies. Below the button, the "Study Years Added:" window will list the calendar years corresponding to the studies the user has specified. Because the years must form a consecutive set, any missing years will be listed below in the "Study Years Missing:" box. If there are no missing years and the user has added at least 1 year, the user is free to continue onto the second page of the wizard by clicking the "Next" button.

On page 2, the "Add Proposal Studies..." button and the "Study Years Added:" window serve the same functions for proposed project studies as their counterparts on page 1 did for baseline studies. As on page 1, the selected study years must form a consecutive set, and any missing years will be listed below in the "Study Years Missing:" box. Additionally, any year that has been specified as part of the baseline scenario on page 1 will also be considered missing on page 2, unless the user has also specified it on page 2. If there are no missing years, the user is free to click the "Finish" button that will automatically generate the AERC report.

**Figure 1. AERCPP Input Wizard Concept**



The AERCPP tool will be able to read the EDMS 4.12 file format to determine which calendar year of activity a selected study corresponds to in a scenario. For those studies with study year “2020”, the AERCPP tool will parse the study’s name and comment section (which is input in the “Study Setup” dialog box) to determine the year to which the study actually corresponds. The AERCPP tool will assume the user has followed a naming convention similar to one described in section 2.1. Therefore, the first string of characters to match the pattern “20XY” where X and Y are digits between 0 and 9 inclusive will be assumed to be the year.

### 3.2. Error Messages

The AERCPP tool will generate an error for the following reasons:

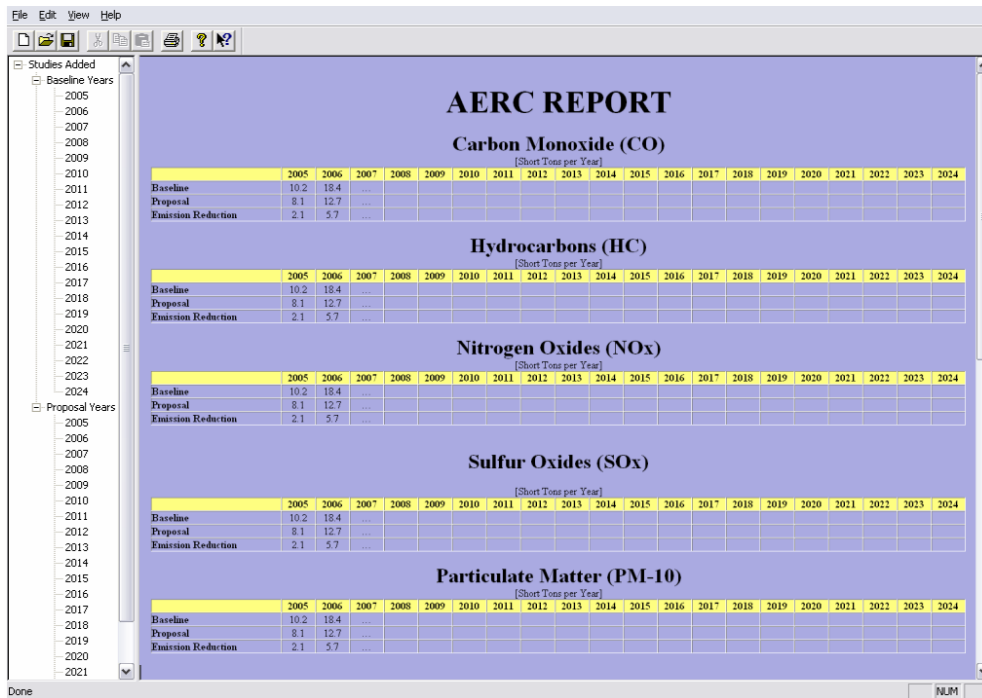
1. No data has been supplied.
2. A scenario has one or more missing years of data.
3. The ranges of years in both scenarios’ datasets are not the same.
4. New Federal emission standards have not been considered in the development of the future baseline.

These errors will prevent or abort the generation of an AERC report and will generate a message to alert the user in order to possibly correct the situation.

### 3.3. Output

The AERCPP tool will produce an AERC report on-screen that can be printed, saved, or copied to the system clipboard for pasting to other documents. Figure 2 illustrates how this might look.

Figure 2. AERCPP Report Window Concept



In Figure 2, the generated report takes up a majority of the screen space. The panel on the left side indicates which data years have been specified by the user. The menu at the top of the figure provides users with several features which are described below.

Users will be able to print the generated report by selecting the “Print...” option under the “File” menu. Users will be able to save the report as an HTML file and save all of the inputs used to generate the report in a new proprietary format called an AERC file. The AERCPP tool will be able to read in previously saved AERC files, to allow users to edit and resave them.

The “Edit” menu will allow users to add additional years of data or remove or replace other years. The options under the “Edit” menu will be analogous to the functionality provided by the wizard described earlier.

The “View” menu will provide users with the options to view the emissions of only specific pollutants, for specific years and/or for specific source groups (e.g., aircraft, roadways, etc...).

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### **4.0 PHASE II: AUTOMATED MULTI-YEAR SCENARIO DEVELOPMENT IN EDMS 5.0**

In every version of EDMS released to date, EDMS studies (the EDMS application documents) have represented a single airport operating scenario for an individual calendar year. The FAA intends to provide the ability to easily input operational data for multiple years in a future release of EDMS, version 5.0. Plans for this release of EDMS include a means of tracking the changes made to the inputs for each year and the ability to generate AERC reports as described below.

#### **4.1 Input: Operations**

In version 5.0, EDMS users will be able to enter operations for multiple years or scenarios for each emissions source at the airport. This will be accomplished through updated user interfaces, import utility, and data tables. To accommodate performing an AERC analysis within EDMS 5.0, users will be able to easily enter the incremental operational changes from year to year without having to save multiple copies of their study.

As mentioned in section 2.3, EDMS version 4.2 and later will allow users to select the version of Mobile that is appropriate for their study. This will eliminate the need for AERC users of EDMS to run Mobile 6 outside of EDMS and import their emission factors.

#### **4.2 Output: Emissions**

As in the current version of EDMS, after all of the operational inputs have been entered, the emissions inventory can be generated. The proposed version would automatically generate all of the emissions inventories necessary for completing an AERC report as described in section 2.4. The proposed version would be capable of displaying the report, producing a hard copy and allowing the user to electronically copy the report. The output from EDMS 5.0 will be similar to what is shown in Figure 2. If additional emissions data become available for the sources modeled in EDMS, the FAA also intends to provide emission results for other than the criteria pollutants, such as VOC and NMHC.

In addition, since EDMS 5.0 will be able to track the incremental changes made to a scenario for each year, it will be possible to provide a report of those changes to be included in the AERC submittal.