



January 8, 2008

WALTER O'TORMEY  
VICE PRESIDENT, ENGINEERING

SUBJECT: Audit Report — Ventilation Filtration System Utilization  
(Report Number DA-AR-08-001)

This report presents the results of our self-initiated audit of Ventilation Filtration System (VFS) utilization (Project Number 07YG069DA000). The VFS is designed to limit the dispersion of particulate matter ejected from in-process mail, thereby reducing the risk of contamination from biological or chemical agents to U.S. Postal Service employees.

### **Background**

Because of the mail anthrax attack in the fall of 2001, the Postal Service developed an Emergency Preparedness Plan (EPP) that outlines programs and activities to mitigate and deter future biological attacks using the mail system. The VFS is one of the major programs identified in the EPP.

The VFS is attached to the Advanced Facer Canceler System (AFCS). Its main purpose is to remove light dust, debris, and contaminants from the mail path while mail is being processed. The Postal Service designed the VFS to operate simultaneously with the AFCS and to automatically shut down 45 minutes after the AFCS is turned off.

As depicted in Illustration 1, the most important feature of the VFS is filtration of the air. Three stages of filters remove light dust, debris, and contaminants from the airflow resulting in air that is 99.97 percent clean at the outlet. This is accomplished with filters, including High Efficiency Particulate Air (HEPA) filters that remove almost all particles from the airflow.

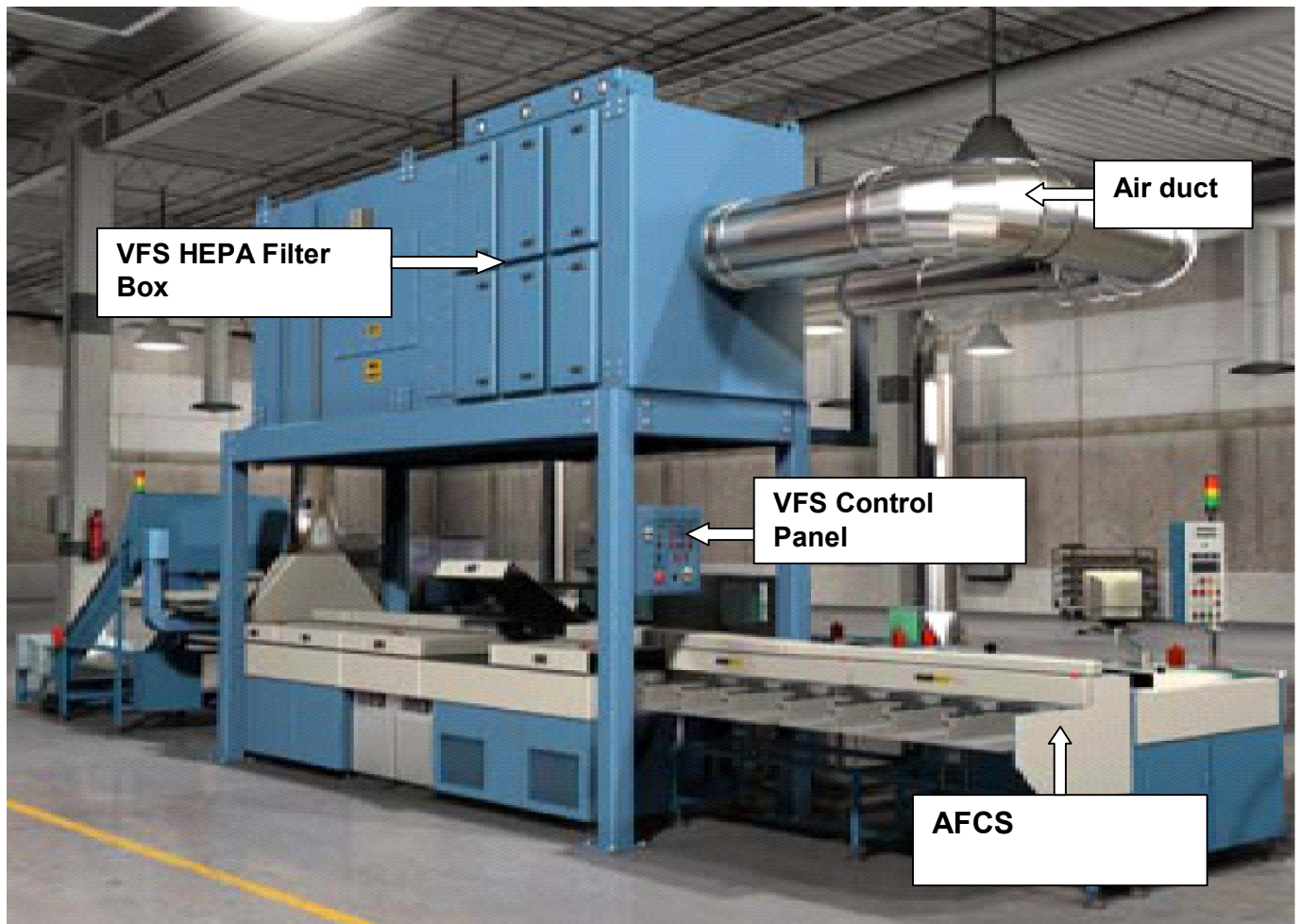


Illustration 1. VFS and AFCS Operations

The Postal Service performed preliminary site surveys and engineering studies at 281 major mail processing plants to identify the building systems upgrades required to support the proposed equipment, including existing electrical capacity and any other power constraints. The operational risk of installing VFS equipment indicated that noise and temperature might increase in the work environment.

On March 31, 2003, the Postal Service Board of Governors approved a total of [REDACTED] to modify selected mail processing equipment (MPE) with ventilation intakes and filters to capture airborne particulate matter. Management completed deployment of 1,060 AFCS and VFS machines on October 31, 2006.

According to VFS–Siemens<sup>1</sup> brochure information, operations personnel should monitor proper use of the VFS equipment. This means ensuring the VFS equipment starts each time the AFCS operates and ensuring the VFS shuts down (after a 45-minute delay) when the AFCS stops. The operator should also report any degradation or malfunction of the VFS to maintenance personnel.

<sup>1</sup> Siemens Dematic Postal Automation L.P. is the contractor that developed the VFS.

Maintenance personnel are responsible for maintaining the VFS equipment. This entails replacing the filters periodically and ensuring the VFS operates properly. Plant managers oversee operational and maintenance activities.

### **Objective, Scope, and Methodology**

The objective of our audit was to assess utilization of the VFS. Specifically, we determined whether the operation of VFS occurred in tandem with AFCS at applicable locations. Our review did not address the frequency of VFS HEPA filter changes, but we noted observations made during field visits.

To accomplish this objective, we conducted 22 site visits<sup>2</sup> that included 129 VFS machines, as depicted in Table 1. We judgmentally selected our sites and grouped them in each geographical region. We reviewed data from each site from the VFS installation end date<sup>3</sup> to the date we took a picture of the VFS runtime meter.<sup>4</sup> We used available mail processing system data to calculate the AFCS runtime for the same period the VFS was operated. Additionally, we interviewed maintenance managers at each site to document VFS operation and maintenance procedures.

We conducted this audit from June 2007 through January 2008 in accordance with generally accepted government auditing standards and included such tests of internal controls as we considered necessary under the circumstances. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. We reviewed policies and procedures for internal controls, discussed our observations and conclusions with management officials, and included their comments where appropriate. We relied on End of Run data maintained for AFCS machines. We did not test the validity of controls over these systems. However, we discussed data quality with Postal Service management and reviewed prior audit reports. Our preliminary assessment concluded the data used was sufficiently reliable to answer the audit objective.

### **Prior Audit Coverage**

The U.S. Postal Service Office of Inspector General (OIG) previously issued two Management Advisory reports related to the VFS: *Postal Service Efforts to Implement Prevention and Detection Technology* (Report Number DA-AR-02-008, dated September 4, 2002); and *Biohazard Filtration System* (Report Number DA-MA-02-002, dated September 24, 2002).

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<sup>2</sup> [REDACTED]

<sup>3</sup> The earliest install end date for all 22 sites. (See Appendix A.)

<sup>4</sup> See Appendix A.

The first report focused on obtaining background information and identifying potential audit issues for biohazard filtration and detection technologies. The report recommended Postal Service Engineering test the filtration and detection systems simultaneously on a single piece of MPE to ensure there was no adverse effect on either system prior to acquisition. Management agreed with this recommendation and stated if the air filtration system on the AFCS was approved, the production detection system would be further tested in conjunction with the accepted air filtration system.

The second report addressed the effectiveness of the VFS and assessed the overall impact of the system on Postal Service operations. The report indicated the level of protection the VFS provided was questionable and no one had tested the filtration of the system to determine its effectiveness.

Consequently, the report recommended that Postal Service Engineering continue to assess the VFS program to determine if the level of protection provided was sufficient; have the National Institute for Occupational Safety and Health test the filtration unit to determine its actual efficiency; and investigate ways to reduce the cost of site preparation for the installation of the filtration unit. Management agreed with the recommendations and stated they would continue to assess the filtration system. Management also stated they had plans in place to perform additional tests and find ways to reduce the cost of site preparation.

### **Audit Results**

The VFS machines were not utilized for the required time period and, therefore, did not fully support program runtime requirements of operating 45 minutes after AFCS machines were turned off. Specifically, following VFS procedures would result in VFS runtime hours that are greater than AFCS runtime hours. However, we found operating runtime hours of VFS machines were less than those for AFCS machines.

This deficiency in VFS runtime hours occurred primarily because (1) the specific responsibilities of operations and maintenance personnel for starting and stopping the VFS are not clearly defined, and (2) operators have the ability to access the VFS control panel and turn the VFS off. Because of these control weaknesses, there is reduced protection for Postal Service personnel and the public against potential exposure to biological and chemical agents through the mail stream.

### **VFS Utilization Analysis**

VFS machines showed a 78 percent utilization rate compared to AFCS machines' runtime. (See Appendix B.) The range of utilization was as low as 30 percent and was as high as 116 percent, the latter being reasonable since a VFS is expected to run 45 minutes after the AFCS shutdown. As depicted in Table 1, VFS machines were underutilized when compared to AFCS runtimes at 19 of 22 sites, regardless of site size.

**Table 1. Utilization by Site Size (the number of AFCS/VFS machines is in parenthesis) – Selected Processing and Distribution Centers (P&DC) and Processing and Distribution Facilities (P&DF)**

Large Sites		Medium Sites		Small Sites	
Facilities	Utilization Rate* Percentage	Facilities	Utilization Rate Percentage	Facilities	Utilization Rate
██████████	69	██████████	83	██████████	86
██████████	69	██████████	80	██████████	116
██████████	94	██████████	96	██████████	81
██████████	54	██████████	101	██████████	30
██████████	74	██████████	46	██████████	83
██████████	74	██████████	85	██████████	94
		██████████	99	██████████	82
		██████████	95	██████████	109
<b>Average</b>	72		86		85
<b># of machines : 57</b>		44		28	
<b>Total Number of Machines : 129</b>					
* As a percentage of AFCS runtime					

**Causes of VFS Underutilization**

During reviews of 22 plants, we determined VFS underutilization occurred because:

- The specific responsibilities for operations and maintenance personnel for starting and stopping a VFS are not clearly defined. At some sites maintenance personnel claimed procedural responsibility, while the VFS—Siemens brochure indicated that operational personnel were responsible for proper operation of the VFS. Responsibilities include ensuring the VFS remains in the auto-mode for coordinated starts and stops. Many sites did not leave the VFS in the auto-mode.
- Operators can access the VFS control panel<sup>5</sup> and turn the VFS off. Program requirements call for the VFS to operate in the auto-mode in conjunction with the AFCS. We noted examples of operational personnel turning off the VFS during AFCS runs when they detected loud noise levels and high temperatures from VFS machines. However, based on the sites we reviewed, the noise level readings were below the Occupational Safety and Health Administration’s permissible exposure limit of 90 decibels except at two sites, ██████████<sup>6</sup> and ██████████.

<sup>5</sup> See Appendix C for a picture of the VFS control panel.

<sup>6</sup> The noise level for ██████████, was 98.8 db at 4:30 p.m.; and for ██████████ was 96.9 db at 7:30 p.m.

Additionally, we identified only one site<sup>7</sup> that had an indoor temperature higher than 78 degrees, which is the permissible indoor temperature per Maintenance Management Office requirements.

Maintenance personnel suggested adding a locking device to the VFS control panel to limit the access of operators. This low-cost solution would also prevent premature shutoff and keep the control panel in auto-mode.

### **Impacts of VFS Underutilization**

The major benefits of the VFS are to increase the safety of Postal Service employees by limiting the dispersion of chemical or biological agents and to promote a healthier work environment by reducing exposure to various dust particles. However, if employees do not use VFS machines as intended, Postal Service personnel and the public could be inadequately protected from potential exposure to biological and chemical agents. Our results show a cumulative utilization rate of 78 percent for VFS machines at the sites we reviewed, when at least 100 percent utilization is required to ensure protection of employees. Consequently, Postal Service employees at the reviewed sites and the customers they serve were not properly protected 22 percent of the time.

### **Other Audit Matters**

At the time of our field visits in the Pacific Area, we noted the sites did not change stage 3 HEPA filters according to program requirements, which potentially reduces the effectiveness of the VFS machines. Specifically, the [REDACTED], and [REDACTED] P&DCs had not changed the stage 3 HEPA filter since VFS installation, although program requirements call for changing these filters yearly. Maintenance personnel attributed this condition to inadequate procedural awareness.

### **Recommendations**

We recommend the Vice President, Engineering:

1. Develop and implement a mechanical lockout device for the Ventilation Filtration System (VFS) control panel. This will limit control panel access for making operating mode changes to authorized personnel.
2. Develop and distribute standard operating policy and procedures concerning the operation of VFS machines to include the plant manager's responsibility and accountability for proper VFS operations. Operational procedures should require that VFS is operating at all times when the Advanced Facer Canceler System is processing mail.
3. Remind maintenance managers to monitor and change VFS filters according to program requirements.

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<sup>7</sup> [REDACTED] recorded an indoor temperature of 85 degrees Fahrenheit at 6:19 p.m.

## **Management's Comments**

Management agreed with our three recommendations and is taking the following actions to implement corrective measures:

- In response to recommendation 1, by the end of April 2008, Postal Service Engineering will develop and install a mechanical lockout device for the VFS control panel.
- In response to recommendation 2, by the end of January 2008, Postal Service Processing Operations and Engineering Maintenance Policies and Programs will develop and issue a service talk to VFS field offices. The service talk will emphasize adhering to current established guidelines that aid in proper operation and use of the VFS.
- In response to recommendation 3, by the end of January 2008, Engineering Maintenance Policies and Programs will republish established procedures for changing filters in an edition of the Maintenance Update and Maintenance Line. Additionally, Engineering will send an email message to maintenance managers at all VFS sites to remind them of the procedures.

Management comments, in their entirety, are included in Appendix D.

## **Evaluation of Management's Comments**

We consider management's actions, taken or planned, responsive to the issues identified in this report and to all the recommendations.

The OIG considers recommendations 1, 2, and 3 significant, and therefore requires OIG concurrence before closure. Consequently, the OIG requests written confirmation when corrective actions are completed. These recommendations should not be closed in the follow-up tracking system until the OIG provides written confirmation that the recommendations can be closed.

We appreciate the cooperation and courtesies provided by your staff. If you have any questions or need additional information, please contact Miguel A. Castillo, Director, Engineering, or me at (703) 248-2100.

E-Signed by Darrell E. Benjamin,   
VERIFY authenticity with ApproveIt

Darrell E. Benjamin, Jr.  
Deputy Assistant Inspector General  
for Support Operations

Attachments

cc: Katherine S. Banks



**APPENDIX A. SURVEY OF POSTAL SERVICE AREAS**

<i>Area Office</i>	<i>VFS Initiative Review</i>		<i>Date Picture of VFS Meter was Taken</i>
	<i>Sites</i>	<i>Install End Date</i>	
<b>Capital Metro</b>		5/14/2004	3/27/2007
		2/15/2004	4/3/2007
		4/2/2005	4/3/2007
		7/7/2004	3/29/2007
		9/7/2004	4/26/2007
<b>Eastern</b>		5/4/2006	5/31/2007
		6/16/2004	4/26/2007
<b>Northeast</b>		6/23/2005	7/24/2007
		7/26/2005	7/24/2007
<b>New York Metro</b>		4/28/2005	7/23/2007
		5/29/2004	7/23/2007
<b>Western</b>		7/6/2005	7/25/2007
		7/29/2005	7/26/2007
<b>Pacific</b>		2/27/2006	7/12/2007
		7/9/2005	7/10/2007
		7/9/2005	7/11/2007
<b>Southeast</b>		1/31/2005	7/26/2007
		10/28/2004	7/24/2007
<b>Southwest</b>		9/20/2005	7/24/2007
		9/27/2005	7/24/2007
<b>Great Lakes</b>		9/22/2005	7/10/2007
		8/1/2005	7/4/2007

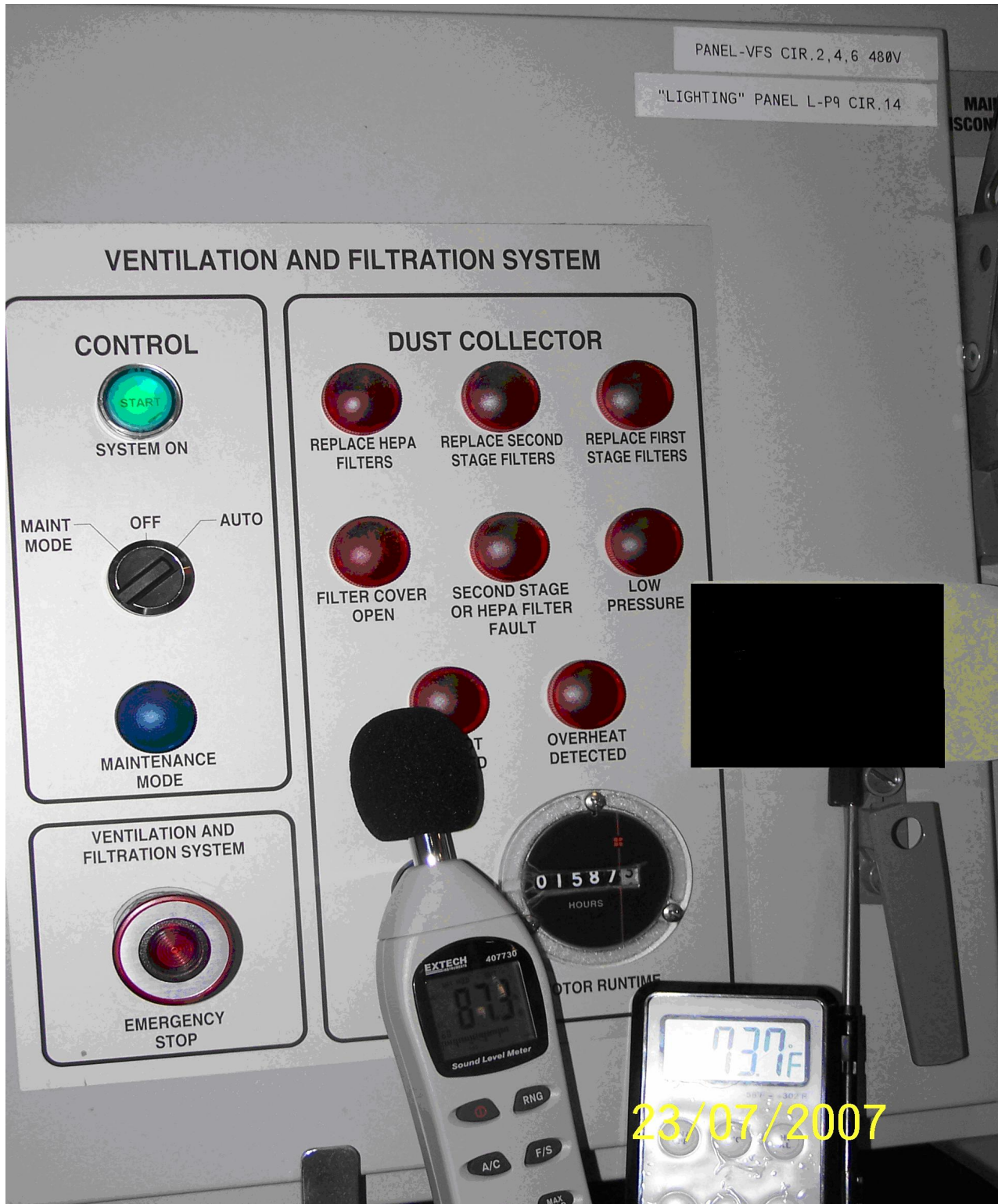
**APPENDIX B. OPERATIONAL HOURS OF VENTILATION FILTRATION SYSTEM AND ADVANCED FACER CANCELER SYSTEM**

Site	AFCS Wall Clock Time <sup>8</sup>	VFS Motor Runtime	Difference	Percent of VFS Utilization
	16,293	13,448	2,845	83
	65,078	35,346	29,732	54
	29,873	24,785	5,088	83
	23,760	20,101	3,659	85
	10,589	4,883	5,706	46
	30,597	24,508	6,089	80
	20,192	13,843	6,349	69
	6,217	5,088	1,129	82
	32,372	30,437	1,935	94
	18,357	5,596	12,761	30
	16,164	16,068	96	99
	9,968	11,605	(1,637)	116
	16,898	16,183	715	96
	32,157	22,255	9,902	69
	11,774	10,105	1,669	86
	16,664	12,352	4,312	74
	8,950	9,744	(794)	109
	12,237	11,442	795	94
	13,863	13,142	721	95
	18,257	18,455	(198)	101
	27,417	20,343	7,074	74
	13,511	11,010	2,501	81
<b>Total</b>	<b>451,188</b>	<b>350,739</b>	<b>100,449</b>	<b>78</b>

\* Total VFS motor runtime hours 350,739 divided by AFCS total wall clock hours 451,188.

<sup>8</sup> Wall clock Time: The total time the MPE was operating, regardless of whether mail was being processed; the difference between end time, when the machine was turned off, and begin time, when the machine was turned on. (End time minus begin time).

### APPENDIX C. VENTILATION FILTRATION SYSTEM CONTROL PANEL



## APPENDIX D. MANAGEMENT'S COMMENTS

WALTER O'TORMEY  
VICE PRESIDENT  
ENGINEERING



December 26, 2007

DARRELL E. BENJAMIN, JR.  
DEPUTY ASSISTANT INSPECTOR GENERAL  
FOR SUPPORT OPERATIONS

SUBJECT: Review of Ventilation Filtration System Utilization  
(Report Number DA-AR-07-DRAFT, Dated December 11, 2007)

Thank you for the opportunity to review and provide comments on the subject draft audit report.

We agree with the audit recommendations. The responses to the recommendations identify the corrective actions to be undertaken.



If you have any questions or comments on this response, please contact Dominic Bratta, Maintenance Planning and Logistics Policies, Engineering, at (703) 280-7365, or J. Otis Smith, Technology Acquisition Management, Engineering, at (703) 280-7851.

  
Walter O'Tormey

Attachment

8403 LEE HIGHWAY  
MERRIFIELD VA 22082-8101  
703-280-7001

**RESPONSES TO OIG REPORT RECOMMENDATIONS**

*We recommend the Vice President, Engineering:*

1. *Develop and implement a mechanical lockout device for the VFS control panel. This will limit control panel access for making operating mode changes to authorized personnel.*

**Management Response:** The USPS Engineering will develop a mechanical lockout device for the VFS control panel. Once the design is completed a Maintenance Work Order (MWO) will be issued to all VFS field sites. Installation of the new device will be completed by local site maintenance personnel. This effort is scheduled to be completed by the end of April 2008.

2. *Develop and distribute standard operating policy and procedures concerning the operation of VFS machines to include the plant manager's responsibility and accountability for proper VFS operations. Operational procedures should require that VFS is operating at all times when the AFCS is processing mail.*

**Management Response:** USPS Processing Operations and Engineering Maintenance Policies and Programs will develop and issue a service talk to field VFS offices. This service talk will re-emphasize adhering to the current established guidelines that aid in proper operation and utilization of the VFS. The service talks will include, but are not limited to:

- a. Notification to maintenance when operational problems are detected.
- b. Operating the VFS when the AFCS is running.
- c. Observation of machine malfunction indicators.

This effort is scheduled to be completed by the end of January 2008.

3. *Remind Maintenance Managers to monitor and change VFS filters according to program requirements.*

**Management Response:** Maintenance Managers will be reminded of already established filter changing procedures. These procedures will be republished in an edition of the Maintenance Update and Maintenance Line. Also, an email message will go out to Maintenance Managers at each VFS site reminding him/her of the procedures for changing filters. This effort is scheduled to be completed by the end of January 2008.