

Office of Inspector General | United States Postal Service

## Audit Report

# Postal Service's Heating, Ventilation, and Air Conditioning Preventive Maintenance Process

Report Number SM-AR-19-006 | August 22, 2019



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# Highlights

## Objective

As of February 2018, the U.S. Postal Service had 286 mail processing facilities nationwide, including 236 postal-owned and 50 leased facilities.

Postal Service policy requires that an effective and efficient preventive maintenance (PM) program be in place to ensure optimum performance, minimum downtime, and appropriate service life of building equipment. Mail processing facilities' management is responsible for safely, efficiently, and effectively maintaining heating, ventilation, and air conditioning (HVAC) systems to ensure the safety and well-being of the building and its occupants.

Our objective was to evaluate the HVAC PM process at mail processing facilities. We reviewed a statistical sample of 118 facilities to assess HVAC PM performance for a two-year period from September 1, 2016, through October 31, 2018.

## What the OIG Found

Preventive maintenance on HVAC equipment is not being consistently conducted per the designated PM route assignments. PM routes define the specific pieces of HVAC equipment to be serviced. In fiscal years (FY) 2017 and 2018, the electronic Maintenance Activity Reporting & Scheduling (eMARS) system generated 351,254 and 350,878 scheduled HVAC PM routes, respectively, at the 118 facilities we reviewed.

We noted 80 facilities (68 percent) in FY 2017, and 71 facilities (61 percent) in FY 2018 achieved below a 90 percent PM completion rate for designated PM route assignments. This means that 18 percent or more of the time scheduled

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*“Postal Service policy requires that an effective and efficient PM program be in place to ensure optimum performance, minimum downtime, and appropriate service life of building equipment.”*

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HVAC PM routes were not completed. Per Postal Service building maintenance indicators, PM completion rates are measured by three indicators: >95% - Green; 90% to 95% - Blue; <90% - Red.

When a scheduled HVAC PM route is not completed, one of the following bypass codes is recorded in the eMARS system to indicate why.

- **Code 0:** No input, a system-generated bypass
- **Code 1:** Non-availability of resources
- **Code 7:** Operational requirements
- **Code 8:** Equipment not available for PM

A review of bypass activities indicated that bypass code 0 was the most utilized code at 67 percent in FY 2017, and 63 percent in FY 2018. Bypass code 0 is a system-generated code that indicates the PM was not conducted, management did not take actions to monitor due dates and assign the scheduled PM routes, and/or management did not enter an appropriate bypass code in eMARS.

Bypass code 1 was the second most utilized code at 32 percent in FY 2017, and 35 percent in FY 2018, indicating resources were not available to perform the scheduled PM route.

PM completion rates were not consistently 95 percent or greater due to several reasons: (1) shortages of staffing or building equipment mechanics resources, (2) other tasks being assigned a higher priority, and (3) management did not enter any bypass codes in the eMARS system, so it defaulted to code 0.

Since October 2015, management implemented a hiring freeze for Maintenance Operations' building systems equipment positions; however, any hiring exceptions to fill the position had to receive headquarters Maintenance Operations approval. As a result, mail processing facility building equipment mechanics on the rolls decreased by 282 positions (14 percent) from 1,965 in FY 2015 to 1,683 in FY 2018.

Additionally, in some instances, maintenance management placed higher priority on other projects such as relocating mail processing equipment. Further, as identified by the Postal Service MS-1 Handbook revision team, some facilities adopted a 'run to failure' practice where repairs are performed when systems fail instead of performing recommended PM when due.

When an HVAC PM route is not completed, HVAC systems are at risk of not operating safely, efficiently, and effectively. In addition, the equipment is at risk of reducing its life expectancy, voiding the manufacturer's warranty, and/or incurring additional repair costs. Additionally, when an HVAC PM route is not completed and the eMARS system automatically generates a code 0 bypass, sufficient data is lacking to assess why the PM was not conducted.

## What the OIG Recommended

We recommended management: fill building systems equipment vacancies at each mail processing facility up to the authorized levels, create Standard Work Instructions to provide maintenance management detailed operating procedures and job aids related to their HVAC PM responsibilities, and implement a process to reduce the use of code 0, the automatic system-generated bypasses code in the eMARS system.

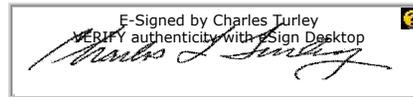
# Transmittal Letter



OFFICE OF INSPECTOR GENERAL  
UNITED STATES POSTAL SERVICE

August 22, 2019

**MEMORANDUM FOR:** ROBERT CINTRON  
VICE PRESIDENT, NETWORK OPERATIONS



**FROM:** Charles L. Turley  
Deputy Assistant Inspector General  
for Supply Management and Human Resources

**SUBJECT:** Audit Report – Postal Service’s Heating, Ventilation,  
and Air Conditioning Preventive Maintenance Process (Report  
Number SM-AR-19-006)

This report presents the results of our audit of the U.S. Postal Service’s Heating, Ventilation, and Air Conditioning Preventive Maintenance Process (Project Number 18SMG024SM000).

We appreciate the cooperation and courtesies provided by your staff. If you have any questions or need additional information, please contact Lori Lau Dillard, Director, Supply Management, or me at 703-248-2100.

Attachment

cc: Postmaster General  
Corporate Audit Response Management

# Results

## Introduction/Objective

This report presents the results of our self-initiated audit of the U.S. Postal Service's Heating, Ventilation, and Air Conditioning (HVAC) Preventive Maintenance (PM) Process (Project Number 18SMG024SM000). Our objective was to evaluate the HVAC PM process at mail processing facilities.

As of February 2018, the Postal Service had 286 mail processing facilities nationwide. Of the 286 facilities, 236 are postal-owned and 50 are leased facilities. We reviewed a statistical sample of 118 facilities to assess HVAC PM performance for a two-year period from September 1, 2016, through October 31, 2018.

## Background

Postal Service mail processing facilities consist of processing and distribution centers, network distribution centers, annexes, surface transfer centers, remote encoding centers, and international service centers.

PM is the scheduled, systematic inspection, examination, cleaning, lubricating, adjusting, and servicing activities conducted to retain equipment functionality. Postal Service policy<sup>1</sup> requires that an effective and efficient PM program be in place to ensure optimum performance, minimum downtime, and appropriate service life. Mail processing facilities' management is responsible for safely, efficiently, and effectively maintaining HVAC systems to ensure the safety and well-being of the building and its occupants.

The Postal Service records HVAC inventory data in the electronic Maintenance Activity Reporting & Scheduling<sup>2</sup> (eMARS) system, including the specific pieces of HVAC equipment to be serviced<sup>3</sup> and the minimum required PM services and frequencies. Facility maintenance management are responsible for ensuring that HVAC PM is performed, recorded, and tracked in the eMARS system in accordance with prescribed policies and procedures.

<sup>1</sup> Maintenance Series Handbook MS-63, Maintenance Operations, Section 11, Preventive Maintenance, June 2006.

<sup>2</sup> eMARS system maintains equipment history that provides the location, cost, and other identifications to create work orders, establish PM work, and issue parts.

<sup>3</sup> PM routes define the specific pieces of HVAC equipment to be serviced.

<sup>4</sup> Handbook MS-63, Section 14.2.2, Responsibilities.

<sup>5</sup> A weekly report, Building Maintenance Indicators, issued by headquarters to the seven area Maintenance Operations managers. The report is used to monitor PM completion rates for major building components - safety, mail processing, and HVAC equipment - at mail processing facilities nationwide.

## Finding #1: Incomplete HVAC Preventive Maintenance

Preventive maintenance on HVAC equipment is not being consistently conducted per the designated PM route<sup>3</sup> assignments. Per policy,<sup>4</sup> maintenance management is required to ensure HVAC PM routes are accounted for either by assigning the work to building equipment mechanics (BEM) for completion, or entering an appropriate justification for bypassing the scheduled PM in the eMARS system.

In fiscal years (FY) 2017 and 2018, the eMARS system generated 351,254 and 350,878 scheduled HVAC PM routes, respectively, at the 118 facilities we reviewed (see Table 1). We noted:

- Eighty facilities (68 percent) in FY 2017 and 71 facilities (61 percent) in FY 2018 achieved below a 90 percent PM completion rate for designated PM route assignments.
- Six facilities (5 percent) in FY 2017 and five facilities (4 percent) in FY 2018 achieved a 100 percent PM completion rate for designated PM route assignments.

As illustrated in Table 1, this means that 18 percent or more of the time scheduled HVAC PM routes were not completed. Per Postal Service building maintenance indicators,<sup>5</sup> PM completion rates are measured by three indicators: >95% - Green; 90% to 95% - Blue; <90% - Red. The actual PM performance indicates that the majority of route assignments we reviewed fall within the lowest key performance indicator category of <90% - Red.

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***“Preventive maintenance on HVAC equipment is not being consistently conducted per the designated PM route assignments.”***

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**Table 1. Completion Rates for Sampled Facilities**

Completion Rate	FY 2017			FY 2018		
	Number of Facilities Reviewed	Scheduled Routes	Bypassed Routes	Number of Facilities Reviewed	Scheduled Routes	Bypassed Routes
100%	6	1,830	0	5	1,527	0
95-99%	20	62,749	1,601	15	52,077	898
90-95%	12	28,073	1,725	25	65,512	4,598
Below 90%	80	258,602	73,396	71	231,762	60,953
<b>Total</b>	<b>118</b>	<b>351,254</b>	<b>76,722</b>	<b>116<sup>6</sup></b>	<b>350,878</b>	<b>66,449</b>

Source: eMARS.

To understand the reasons for the low HVAC PM completion rates, we reviewed the processes for PM routes. When a scheduled PM route is completed, the status of the work performed for the PM route is entered in the eMARS system. When a scheduled HVAC PM route is not completed, a bypass code is recorded in the eMARS system to indicate why. Table 2 shows the PM bypass codes in eMARS.

**Table 2. eMARS Preventative Maintenance Bypass Codes**

Bypass Code	Code Description
Code 0	Routes without any input will be reported as “bypassed” in the eMARS Report module automatically.
Code 1	Non-availability of resources.
Code 7	Operational requirements.
Code 8	Equipment not available for PM due to maintenance.

A review of bypass activities indicated that bypass code 0 was the most utilized code at 67 percent in FY 2017, and 63 percent in FY 2018. Bypass code 0 is a system-generated code that indicates either PM was not conducted, management did not take action to monitor due dates and assign the scheduled PM routes, and/or management did not enter an appropriate bypass code in the eMARS system.

Bypass code 1 was the second most utilized code at 32 percent in FY 2017, and 35 percent in FY 2018, indicating resources were not available to perform the scheduled PM route. Figure 1 provides an overview of the frequency of bypass codes used to communicate why HVAC PM inspections were not conducted in FYs 2017 and 2018.

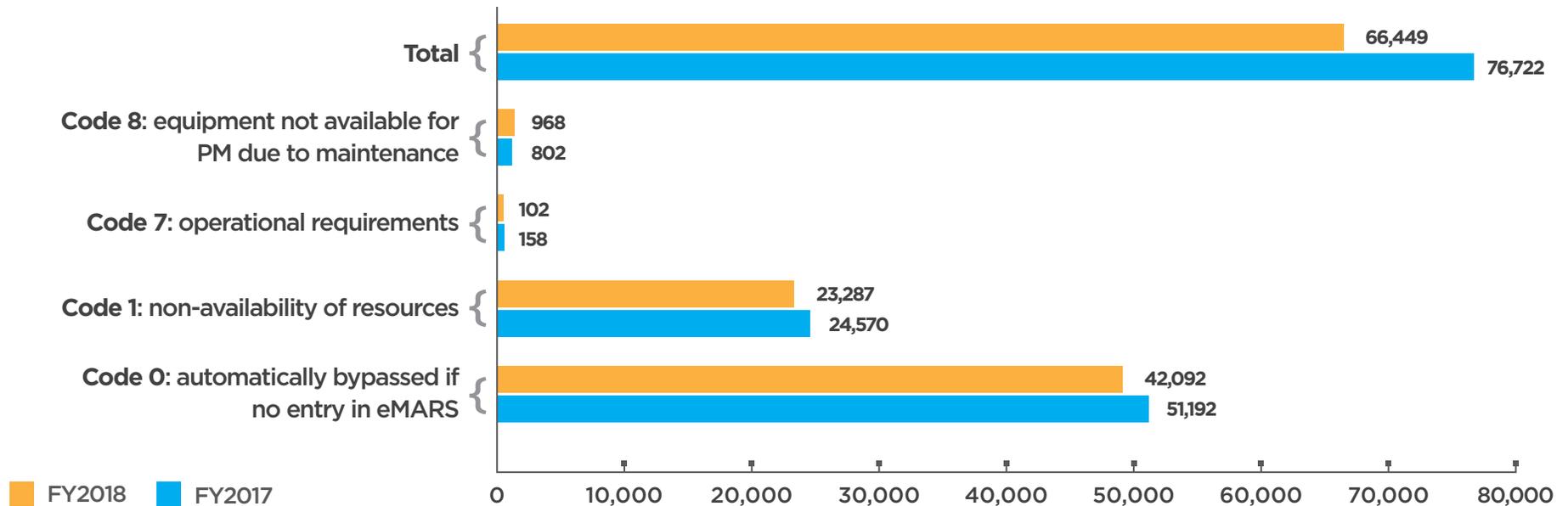
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***“Management did not take action to monitor due dates and assign the scheduled PM routes, and/or management did not enter an appropriate bypass code in the eMARS system.”***

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<sup>6</sup> There were two fewer facilities in the FY 2018 sample because one facility was closed and the other had no activities.

**Figure 1. Incomplete Scheduled HVAC PM Routes**



Source: eMARS

PM completion rates were not consistently 95 percent or greater due to several reasons: (1) shortages of staffing or BEM resources, (2) other tasks being assigned a higher priority, and/or (3) management did not enter any bypass codes in the eMARS system, so they defaulted to code 0.

Since October 2015, management implemented a hiring freeze<sup>7</sup> for Maintenance Operations' building systems equipment positions; however, any hiring exceptions to fill the position had to receive headquarters Maintenance Operations approval. As a result, mail processing facility BEMs on the rolls decreased by 282 positions (14 percent), from 1,965 in FY 2015 to 1,683 in FY 2018.<sup>8</sup>

These issues occurred because, in some instances, maintenance management placed higher priority on other projects such as relocating mail processing equipment. Also, as identified by the Postal Service MS-1 Handbook revision

team, some facilities adopted a 'run to failure' practice where repairs are performed when systems fail instead of performing recommended PM when it is due.

When an HVAC PM route is not completed, HVAC systems are at risk of not operating safely, efficiently, and effectively. In addition, the equipment is at risk of reducing its life expectancy, voiding the manufacturer's warranty, and/or incurring additional repair costs. Additionally, when an HVAC PM route is not completed and the eMARS system

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***“When an HVAC PM route is not completed, HVAC systems are at risk of not operating safely, efficiently, and effectively.”***

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<sup>7</sup> On September 22, 2015, the Vice President, Network Operations, issued a memo stating that all Labor Distribution Code 37, Building Systems Equipment, positions would be frozen. Separately, in the OIG audit, Facility Condition Reviews - Mail Processing Facilities (Report Number SM-AR-19-003, dated May 7, 2019), management stated they are “currently implementing a new MS-1 staffing process and that field vacancies were not being filled to allow for potential reductions. This new process will determine the current LDC 37 staffing for each plant, and once each staffing package is approved, sites will be allowed to fill any authorized vacancies that remain.”

<sup>8</sup> Postal Service's Field Staffing and Support Dashboard, Complement History.

automatically generates a code 0 bypass, sufficient data is lacking to assess why the PM was not conducted.

### Recommendation #1

The **Vice President, Network Operations**, fill building systems equipment vacancies up to the authorized levels at applicable facilities.

### Recommendation #2

The **Vice President, Network Operations**, create Standard Work Instructions to provide maintenance management detailed operating procedures and job aids related to their Heating, Ventilation, and Air Conditioning preventive maintenance responsibilities.

### Recommendation #3

The **Vice President, Network Operations**, implement a process to reduce the use of code 0, the automatic system-generated bypasses code in the electronic Maintenance Activity Reporting and Scheduling system.

## Management's Comments

Management agreed with the report's findings and recommendations.

Regarding recommendation 1, management stated that the change in the process for filling maintenance vacancies in October of 2015 resulted in a net decrease of 282 positions from FY 2015 to FY 2018. Management stated they are currently implementing a new staffing process to determine the correct maintenance staffing for each plant. This process is currently in progress and as of July 27, 2019, all maintenance staffing packages were completed and any increases to field maintenance staff have been adjusted in the staffing program. Management stated that plant managers are working with Human Resources, Labor Relations, and area and headquarters Maintenance Operations to ensure contractual compliance in adjusting to their new staffing levels. Management requested that we close the recommendation with the issuance of this report.

Regarding recommendation 2, management stated the Manager, Maintenance Planning and Support, will create Standard Work Instructions to provide maintenance management with detailed operating procedures and job aids to ensure the use of correct processes to assign and close out employee assignments. The target implementation date is October 4, 2019.

Regarding recommendation 3, management stated the Manager, Maintenance Planning and Support, will create reports focused on the use of bypass code 0. Management stated they will reduce the use of bypass code 0 through area maintenance staff working with field sites. The target implementation date is October 4, 2019.

See [Appendix B](#) for management's comments in their entirety.

## Evaluation of Management's Comments

The OIG considers management's comments responsive to the recommendations and planned actions should resolve the issues identified in the report.

Regarding recommendation 1, management requested that we close the recommendation upon issuance of the report. However, management has not provided documentation to support that they have completed all maintenance staffing packages and adjusted increased field maintenance staff numbers in the staffing program; and that site managers are working to ensure contractual compliance in adjusting to new staffing levels. Therefore, we will keep this recommendation open until we receive the supporting documentation.

# Appendices

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# Appendix A: Additional Information

## Scope and Methodology

Our audit scope included 286 mail processing facilities the Postal Service had as of February 12, 2018. We statistically selected 118 mail processing facilities — selecting some from each Postal Service area — to evaluate the HVAC PM process.

To accomplish our objective, we:

- Used the Facility Risk Model to obtain a statistical sample of 118 out of 286 Postal Service mail processing facilities.
- Reviewed FYs 2017 and 2018 eMARS HVAC PM completion rate reports for all mail processing facilities.
- Reviewed FYs 2017 and 2018 Cost Data reports to determine individual sample mail processing facilities' HVAC repair costs.
- Determined whether PM work for HVAC systems are being completed as required at Postal Service mail processing facilities.
- Conducted four site visits to mail processing facilities with high and low completion rates to obtain an understanding of their HVAC PM processes and interview mail processing facility personnel.
- Received and consolidated maintenance management responses from 45 sample mail processing facilities.
- Obtained and reviewed information associated with Postal Service Maintenance Series Handbook MS-1 revision status from headquarters Facilities management and the director of the American Postal Workers Union maintenance division.
- Conducted interviews with Postal Service Maintenance Planning and Support managers to discuss maintenance staff shortages and HVAC PM management oversight responsibilities.
- Gained an understanding of Postal Service area maintenance managers' oversight functions associated with HVAC PM at the mail processing facilities.

We conducted this performance audit from September 2018 through August 2019, 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 discussed our observations and conclusions with management on July 11, 2019, and included their comments where appropriate.

We assessed the reliability of eMARS data by verifying the HVAC PM work information listed on employee assignment worksheets obtained during field visits to the detailed HVAC PM work records included on the eMARS reports provided by headquarters Facilities management. We also assessed the reliability of HVAC cost data by verifying HVAC repair transactions for a sample of facilities shown in the electronic Facility Management System to the HVAC cost data reports provided by headquarters Facilities program management. We determined that the data were sufficiently reliable for the purposes of this report.

## Prior Audit Coverage

Report Title	Objective	Report Number	Final Report Date	Monetary Impact
<i>U.S. Postal Service Roofing Preventive Maintenance Program</i>	Evaluate the effectiveness of the roofing preventive maintenance program.	SM-AR-18-006	7/25/2018	\$18,760

# Appendix B: Management's Comments

ROBERT CINTRON  
VICE PRESIDENT  
NETWORK OPERATIONS



August 15, 2019

LORI LAU DILLARD

SUBJECT: Postal Service's Heating, Ventilation, and Air Conditioning  
Preventive Maintenance Process  
(SM-AR-19-DRAFT)

Management met with the Audit Team prior to and during the audit repeatedly, providing a majority of the data that was used by the Audit Team. The Audit Team indicated that a reduction in staffing, higher priority work, and the use of bypass code 0 were the contributing factors to the low preventative maintenance route completion. The reduction in staffing was due to the implementation of the MS-1 handbook and staffing guides which creates the staffing package for each site. Due to the potential reduction, management implemented a process in which the filling of all LDC37 positions required an approval from HQ Maintenance Operations. This process was put in place to minimize the needs for excessing employees once full implementation had been achieved. The OIG Audit Team also indicated that there was other higher priority tasks that inhibited the completion of preventative maintenance routes. The data that was provided by the OIG Audit Team as it related to "higher priority tasks" pointed to tasks that were not what the plant was staffed, and should have been completed through the use of overtime. The use of bypass code 0 carries no additional weight than the other bypass codes. Although the use of bypass code 0 is not a preferred method of bypass, it is not a reason for the reduced completion rate of preventative maintenance routes.

**Recommendation 1:**

The Vice President, Network Operations, fill building systems equipment vacancies up to the authorized levels at applicable facilities.

**Management Response/Action Plan:**

The Vice President, Network Operations agrees with recommendation number one.

475 L'ENFANT PLAZA SW RM 7011  
WASHINGTON, DC 20006-7327

Although there was a change in the process for filling vacancies in October of 2015, which resulted in a decrease of 282 positions from FY15 to FY18, HQ Maintenance also informed the OIG that there were 697 positions filled during FY16, 17, and 18. The OIG audit team was also made aware that we were currently implementing a new MS-1 staffing process and that field vacancies were not being filled to allow for potential reductions. This new process determined the correct LDC37 staffing for each plant, and once each staffing package was approved, sites would be allowed to fill any authorized vacancies that remain. This process is currently in progress and as of Saturday, 7/27/19, all MS-1 staffing packages were completed and any increases to Field Maintenance staff have been adjusted in the staffing program. Sites are working with the Areas, Human Resources, Labor Relations, and HQ Maintenance Operations to ensure contractual compliance in adjusting to their new staffing levels.

**Target Implementation Date:**

Please close out this recommendation.

**Responsible Official:**

The Manager, Maintenance Planning and Support is responsible for the implementation of the above indicated action, and worked with Area Manager Maintenance Operations, Area and HQ Human Resources, and Area and HQ Labor Relations to ensure that all right-sizing is contractually compliant.

**Recommendation 2:**

The Vice President, Network Operations, create Standard Work Instructions to provide maintenance management detailed operating procedures and job aids related to their Heating, Ventilation, and Air Conditioning preventive maintenance responsibilities.

**Management Response/Action Plan:**

The Vice President, Network Operations agrees with recommendation number two.

HQ Maintenance Planning and Support will create standard work documents to provide Maintenance Management detailed operating procedures and job aids to ensure that the correct processes are being used to assign and close out employee assignments.

**Target Implementation Date:**

The process indicated above will be implemented by 10/4/19.

**Responsible Official:**

The Manager, Maintenance Planning and Support will be responsible for the implementation of the above indicated action.

**Recommendation 3:**

The Vice President, Network Operations, implement a process to reduce the use of code 0, the automatic system-generated bypasses code in the electronic Maintenance Activity Reporting and Scheduling system.

**Management Response/Action Plan:**

The Vice President, Network Operations agrees with recommendation number three.

Maintenance Planning and Support will create reports to focus on the use of Bypass Code 0's and will drive the required behavior through the Area Maintenance staffs to work with field sites on reducing the use of Bypass Code 0's.

**Target Implementation Date:**

The process indicated above will be implemented by 10/4/19.

**Responsible Official:**

The Manager, Maintenance Planning and Support will be responsible for the implementation of the above indicated action.



Robert Cintron  
Vice President  
Network Operations

cc: Manager, Corporate Audit Response Management



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