



Internal Audit Report

Comprehensive Operational Audit
Aviation Maintenance Department

January 1, 2012 – September 30, 2013

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Transmittal Letter

Audit Committee
Port of Seattle
Seattle, Washington

We have completed an audit of the Aviation Maintenance Department.

We reviewed information relating to the Aviation Maintenance Department from January 1, 2012 – September 30, 2013.

We conducted the audit in accordance with Generally Accepted Government Auditing Standards and the International Standards for the Professional Practice of Internal Auditing. 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 objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

We extend our appreciation to the management and staff of the Aviation Maintenance Department for their assistance and cooperation during the audit.



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Audit Team:

Brian Nancekivell, Senior Internal Auditor
Jack Hutchinson, Internal Audit Manager

Responsible Management Team:

John Christianson, General Manager, Retired
Stuart Mathews, General Manager

Executive Summary

Audit Scope and Objective The purpose of the audit was to determine whether the Department's controls are adequate to ensure:

1. Inventory records are accurate and complete.
2. Asset information is recorded completely, accurately, and timely in the Maximo system.
3. The preventive maintenance program is timely and effective.

We reviewed information for the period January 1, 2012 – September 30, 2013.

Background Aviation Maintenance is the Port's largest department with approximately 360 employees and an annual operating budget of approximately \$56 million. There are nine separate labor unions representing approximately 300 Aviation Maintenance employees. Department operations are located throughout the airport and surrounding area. The Department's primary objective is to ensure properly functioning systems and equipment at aviation facilities. The Department does not have regular revenue streams; however, it generates nominal reimbursements for work related to warranties or damage caused to Port property by third parties, which offset expenses.

In support of maintenance efforts, the Department maintains an inventory of materials valued at over \$6 million at its distribution center and at shop locations throughout the airport. The Department uses Maximo, a computerized maintenance management system, to process maintenance work orders, manage purchasing and inventory, and report on key management metrics. Maximo supports most aspects of the Department's operations.

Audit Result Summary Aviation Maintenance's controls are adequate to ensure that inventory records are accurate and complete, asset information is recorded completely, accurately and timely, and the preventive maintenance program is timely and effective.

Background

Aviation Maintenance is the Port's largest department with approximately 360 employees and an annual operating budget of approximately \$56 million. There are nine separate labor unions representing approximately 300 Aviation Maintenance employees. Department operations are located throughout the airport and surrounding area. The Department's primary objective is to ensure properly functioning systems and equipment at aviation facilities. The Department does not have regular revenue streams; however, it generates nominal reimbursements for work related to warranties or damage caused to Port property by third parties, which offset expenses. Salaries and benefits are the Department's largest expense.

Operating Expenses (in thousands)	2011	2012
Salaries, Wages, & Benefits	36,299	41,361
Equipment & Supplies	5,644	6,770
Other Expenses	6,414	5,700
Total	48,357	53,831

Data Source: PeopleSoft, as of November 7, 2013

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Highlights and Accomplishments

During the course of the audit, we noted some significant Department highlights and accomplishments. The Department:

- Implemented a robust system of metrics to monitor, assess, and modify businesses practices.
- Developed and is implementing a plan to use mobile devices in the field to improve the efficiency of maintenance operations.
- Implemented LEAN strategies in certain areas to assess and improve work plans and internal procedures, and is extending lessons learned to other areas of Department operations.

Audit Scope and Methodology

We reviewed information for the period January 1, 2012 – September 30, 2013. We utilized a risk-based audit approach from planning to testing. We gathered information through research, interviews, observations, and analytical reviews, in order to obtain a complete understanding of the operations of the Aviation Maintenance Department. Risks associated with small tools and equipment were not addressed in this engagement because the Internal Audit Department is addressing this area in a separate port-wide audit, the results of which will be published in early 2014.

We applied additional detailed audit procedures to areas with the highest likelihood of significant negative impact as follows:

To determine whether the Department's controls are adequate to ensure that inventory records are accurate and complete, we performed the following procedures:

1. Inventory Testing

We conducted a physical inventory of a sample of 42 items, with a higher likelihood of inaccurate records, on hand at 16 Aviation Maintenance inventory locations to verify that the inventory information (e.g., counts and locations) reflected in Maximo were accurate.

2. Inventory Associated With Maintenance Assets

We identified the 832 items added to Maximo during the period February 28, 2013 – September 30, 2013, and determined whether new items were associated with the assets for which they are required.

3. Zero Value Inventory

We traced a sample of 23 items contained in the zero value warehouse to inventory usage records to determine whether zero value items were being used before regular inventory. Zero value inventory consists of items that were returned unused after work orders were closed and items of unknown origin that came into the Department's possession.

To determine whether the Department's controls are adequate to ensure that asset information is recorded completely, accurately, and timely into Maximo, we performed the following procedures:

4. Asset Information Recorded in Maximo

We determined whether key asset information was obtained and recorded by the Department for a sample of 12 Port assets that went into service and a sample of 8 Port projects that were completed during the period January 1, 2012 – September 30, 2013.

5. Aviation Asset Management Team

We reviewed documentation of the Department's efforts to date as part of the Aviation Asset Management Core Team, which is developing processes in support of the Sustainable Asset Management policy, to determine whether the team is taking a systematic approach to assessing and improving the asset management process.

To determine whether the Department's controls are adequate to ensure that the preventive maintenance program is timely and effective, we performed the following procedures:

6. Preventive Maintenance Timeliness

We analyzed the Department's progress toward its on-time preventive maintenance and proactive maintenance goals for the period January 1, 2012 – September 30, 2013, and assessed the Department's progress over time.

7. Preventive Maintenance Assessment and Optimization

We reviewed the Department's efforts toward its goal to optimize its preventive maintenance work for a sample of six maintenance shops as of the end of September 2013, to determine whether the Department followed reasonable procedures to assess and optimize its work plan.

Conclusion

Aviation Maintenance's controls are adequate to ensure that inventory records are accurate and complete, asset information is recorded completely, accurately and timely, and the preventive maintenance program is timely and effective.