

TTC AUDIT COMMITTEE REPORT NO.

MEETING DATE: January 23, 2011

SUBJECT: INTERNAL AUDIT – PLANT MAINTENANCE DEPARTMENT –
BUILDING EQUIPMENT, FACILITIES, AND PLANT
MAINTENANCE ENGINEERING

INFORMATION ITEM

RECOMMENDATION

It is recommended that the Audit Committee receive for information the attached Internal Audit Report.

Richard G. Beecroft
Chief Auditor

January 23, 2011
01-23

Attachment – Internal Audit Report

**OPERATIONS BRANCH
PLANT MAINTENANCE DEPARTMENT**

**BUILDING EQUIPMENT, FACILITIES, AND PLANT MAINTENANCE
ENGINEERING**

**Covering Period:
January 2009 to October 2010**

TABLE OF CONTENTS

	Page No.
EXECUTIVE SUMMARY	1
FOREWORD	2
AUDIT SCOPE AND OBJECTIVES	2
AUDITED ITEMS FOUND ACCEPTABLE	3
AUDITED ITEMS FOUND UNACCEPTABLE	
1. Bus and Overhead Hoist Inspections	4
2. Fire Prevention	6
3. One Time Work Orders	9
4. Operational Control Reporting/Management Information System	11
5. Administration	13

EXECUTIVE SUMMARY

This audit assessed the key management and operational controls of the Building Equipment, Facilities and Maintenance Engineering sections within the Plant Maintenance Department, Operations Branch. An Exit meeting was held on September 06, 2011 with the General Manager – Operations Branch, Deputy General Manager – Rail, and the General Superintendent – Plant Maintenance Department to discuss the findings.

Audit identified areas which required strengthening of the existing controls to minimize risk exposures.

Recommendations were made to improve the bus and overhead hoist inspection process. Specifically they need to ensure that inspections are scheduled and performed as planned, and that the inspection forms are reviewed and signed off. Management agrees with Audit's recommendation and has implemented action to improve the process.

Audit also recommended that all fire prevention equipment is inspected and maintained in accordance with the Ontario Fire Code. Management agrees and is in the process of revising the inspection schedule.

Other areas identified for improvement in controls were; the one –time work order process, as well as the emergency repairs and planned repairs and preventative maintenance monitoring process. Management agrees and is in the process of addressing noted areas of concern.

We wish to express our thanks for the cooperation and assistance received from all parties during the course of the Audit.

R.G. Beecroft
Chief Auditor

K. Draudvila
Audit Manager

FOREWORD

The Plant Maintenance Department has an overall budget of \$61.7 million in 2010 and is part of the Operations Branch - Rail. Building Equipment (93 employees), Facilities (143 employees), and Plant Maintenance Engineering (19 employees) are three of eight sections within the Plant Maintenance Department.

The Building Equipment section is responsible for on-going maintenance of exiting TTC equipment. The Facilities section is responsible for on-going maintenance of existing TTC buildings. The Plant Maintenance Engineering section provides the technical support required by the Plant Maintenance Department.

AUDIT SCOPE AND OBJECTIVES

Scope The audit included a review of key management, operational and financial controls of the Building Equipment, Facilities, and Plant Maintenance Engineering sections within the Plant Maintenance Department for the period January 2009 to October 2010.

During the audit Internal Audit consulted with the Operations Support section within the Plant Maintenance Department. This section is responsible for providing administrative services required by the Plant Maintenance Department. Internal Audit did not conduct an operational audit of the section at this time.

Objectives To assess the management and operational controls to ensure:

- accountability and reporting relationships are appropriate for the Commission;
- due regard for economy, efficiency, and effectiveness;
- procedures and processes are in place to measure and report on the Sections' activities.

To evaluate the adequacy of financial controls to ensure:

- compliance to Legislative and Commission requirements;
- the timeliness, accuracy, completeness, and authorization of transactions;
- the safeguarding and control of assets and other information.

AUDITED ITEMS FOUND ACCEPTABLE

KEY CONTROL	FINDING
Maintenance Support, Design, and Implementation	Technical and engineering support ensures that structures and equipment are maintained for revenue service.
Payroll and Attendance	Attendance records are maintained and administration of overtime, lieu-time and vacation complies with policy.
Security/Asset Control	Security measures are in place to protect assets. Inventory listings are maintained and regular verification is performed to ensure that TTC assets are properly accounted for.

AUDITED ITEMS FOUND UNACCEPTABLE

FINDING #1

BUS AND OVERHEAD HOIST INSPECTIONS

OBJECTIVE: To ensure that bus and overhead hoists are maintained in a state of good repair and are certified in accordance with the Occupational Health and Safety Act (Reg. 851, Sec 51).

ANALYSIS: Monitoring controls for the maintenance, inspection, and certification of bus and overhead hoists were found to be weak. The following deficiencies were identified:

Bus Hoists

- The Load tests for TTC Bus Hoists are scheduled and performed by the Plumbing cost centre. However, load tests are not scheduled to ensure inspections occur every 12 months or less as required under the Occupational Health and Safety Act.
- The Major Hoist Inspections for TTC Bus Hoists are not being scheduled to occur 4 times per year, the indicated frequency on the Major Hoist Inspection Form.
- The Major Hoist Inspection Forms are not always signed by the Foreperson as evidence of review.

Overhead Hoists

- Overhead Hoists are inspected and certified by an external contractor. The contractor issues a Certificate for each location, an Addendum listing the hoists tested, and a signed Inspection Form for each hoist certified.

Audit noted that the Addendum to the Certificate, that accompanies the contractors invoice, indicates that a Load Test was performed, but does not specify the weight of the load used for the test. However, the Inspection Form, which is completed during the onsite inspection, does not indicate the results of the Load Test, nor is there any indication on the form that a Load Test was performed.

- A review of the inspection forms received from the contractor found that two of the forms were not signed by the technician and 2 additional forms were missing.
- The Department does not maintain a schedule of the Overhead Hoist testing to ensure all Hoists are certified

every 12 months or less as required by the Occupational Health and Safety Act.

RECOMMENDATIONS:

Management should ensure that:

- Major Hoist Inspections of Bus Hoists are scheduled and performed per TTC policy (quarterly).
- Major Hoist Inspection forms are completed appropriately, all issues have been resolved, and the forms are reviewed and signed by the Foreperson.
- Load Tests for Bus and Overhead Hoists are scheduled and performed in compliance with legislation, and supporting documentation is complete and retained.

**MANAGEMENT
RESPONSE:**

We agree. A crew of four Plumbers is budgeted for the bus hoist inspection. They are unable to complete the schedule for all bus hoist inspections in a three month period. A review of the Commission's Bus Hoist Inspection Program has been completed. Ministry of Labour Regulations requires inspection once per year. Manufacturer's recommendations call for an annual inspection. The frequency for inspecting Commission bus hoists has been revised to twice per year. The higher frequency is due to the advanced age of the existing hoists.

Responsibility:

Superintendent – Building Equipment

Status:

Scheduled Completion: May 2012

We agree. Prior to filing Hoist Inspection Forms, they are now being checked for Foreperson signature by the Senior Clerk.

Status:

Scheduled Completion: COMPLETE

We agree. The existing schedule for bus hoists was for completion each calendar year. The schedule has been modified for load testing every 12 months.

Overhead hoists are inspected by a contractor. The contractor's inspection documentation process is being modified. The revised process will be implemented for the next inspection scheduled to begin October 2011.

Status:

Scheduled Completion: COMPLETE

FINDING #2

FIRE PREVENTION

OBJECTIVE: To ensure that TTC Fire Prevention equipment is inspected and maintained in accordance with the Ontario Fire Code.

ANALYSIS: The Department's Fire Prevention activities were reviewed and the following deficiencies were noted:

- Fire Extinguishers in the Subway Tunnel are not being inspected monthly as required by the Ontario Fire Code.
- The monthly inspections of the Subway Stations, Garages, and Surface Buildings are not being completed fully (i.e. all equipment is not being inspected monthly). Items on the checklist are selected for inspection randomly, creating the risk that some items are uninspected over an extended period of time where as others are inspected every month.
- Not all deficiencies are recorded in the database. Fire Prevention deficiencies are tracked by the Fire Prevention Department in a 'Deficiencies Database'; however deficiencies that will cost more than \$100,000 to repair are not being recorded in the listings since these are considered Capital Projects.
- The deficiencies recorded in the database are not being addressed timely, in priority sequence, and 'Safety Notices' from the Safety Department are not prioritized for repair. Deficiencies to be repaired are being selected randomly by the employees.

RECOMMENDATIONS: Management should ensure that;

- Inspections occur in accordance with the Ontario Fire Code.
- Monthly Inspection Forms are updated to indicate which items must be inspected each month.
- Ensure that all deficiencies are included in the database and are closed timely and based on priority.

**MANAGEMENT
RESPONSE:**

We Agree. Fire extinguishers must be inspected monthly as per the Ontario Fire Code and tested on an annual basis. The only Commission property where this does not take place is in the subway tunnels. This is a very labour intensive assignment due to track level access request procedures, walking inspection approval by Transit Control, setting out and retrieving blue lights and inability to go to track level during rush hour.

Plant Maintenance Department does not have the budgeted resources to inspect fire extinguishers in the subway tunnels on a monthly basis. In lieu of the monthly inspection, the fire extinguishers are replaced with new fire extinguishers that have a five year warranty, on an annual basis.

Plant Maintenance Department inspects fire extinguishers in subway cars and in Wheel Trans vehicles on a monthly basis. They also conduct annual testing of fire extinguishers on Wheel Trans vehicles. Arrangements are underway to transfer this responsibility to Rail Car & Shops Department and Wheel Trans Department. Their Mechanics will handle this work during scheduled vehicle maintenance activities. The work hours gained by Plant Maintenance Department will be utilized for monthly inspection of fire extinguishers at track level.

Responsibility: Superintendent – Building Equipment

Status: Scheduled Completion: January 2012

We agree. The random inspection applies to fire extinguishers. A separate check sheet has been developed and implemented that identifies the location, type and serial number of each fire extinguisher in all Commission facilities. This document has been added to the monthly inspection to ensure all extinguishers are inspected each month.

Status: Scheduled Completion: COMPLETE

We agree. A three level priority system has been established for Fire Prevention System deficiencies. A priority is assigned to each deficiency when input to an existing Excel spreadsheet. Repairs are assigned by the Foreperson based on the priority. The frequency of updating the spreadsheet has been increased from monthly to weekly to improve accuracy of the data for the Foreperson.

The spreadsheet is not utilized for tracking fire prevention system deficiency repairs that are covered under the Capital Budget and managed by E&C Department. A computerized maintenance management system (MAXIMO) is being set up to provide efficient and improved data management of fire prevention system deficiencies. When the system is put into operation, the Capital Budget deficiencies will be added.

Responsibility: Superintendent – Building Equipment

Status: Scheduled Completion: MAXIMO implementation is scheduled for March 2012.

FINDING #3

ONE-TIME WORK ORDERS

OBJECTIVE: Work orders are completed timely and in a cost-effective and efficient manner.

ANALYSIS: Audit's review highlighted areas in the One-Time Work Order process which are not being followed consistently and noted areas susceptible to Management Override. The following was noted:

- Some work orders were found that were processed without the approval of the participating Superintendent as required by policy. This creates the risk of duplicate work orders being submitted.
- Cost estimates are not being performed on work orders considered to be 'RUSH' creating the risk that excessive labour and material costs will be incurred and undetected by Management.
- Material Costs are not being tracked on a work order by work order basis. It was also noted that costs can be recorded in the Job Based Costing System up to two years following completion of the Work Order.

RECOMMENDATIONS: Management should ensure that;

- All exceptions to the process are explained, approved, and signed off by the Plant Maintenance Project Manager.
- Cost estimates are prepared for all Work Orders. If scheduling needs to occur before the estimate can be prepared, for example to expedite the process on 'RUSH' Work Orders, this exception should be approved by the Project Manager.
- Material costs should be tracked as incurred on each Work Order and compared to the estimate prepared.

**MANAGEMENT
RESPONSE:**

We agree. A flow chart identifying all possible activities and responsibilities in the Work Order Request process is under development. This will eliminate the need to identify exceptions to the process for separate approval. A recent reorganization within Plant Maintenance Department has transferred Work Order management responsibility to the Supervisor – Operations Support position. It will be the responsibility of the Supervisor – Operations Support to manage the approved flow chart process and ensure it is followed.

Status: Scheduled Completion: COMPLETE

We agree. This process has been addressed by the Work Order Request process flow chart being developed in Recommendation #1.

Status: Scheduled Completion: COMPLETE

We Agree. Labour costs are tracked and compared to estimated labour costs on a monthly basis because they can vary significantly in small construction projects within existing facilities. A significant labour variance can impact labour resource availability for higher priority maintenance and repair work. Non labour costs involving material purchases tend not to vary significantly and have not been analyzed in the past due to staff resource availability.

The process involved in monitoring and analyzing labour costs is under review to improve scheduling, Work Order Request management and accountability. Incorporation of non labour estimate and actual costs for completed Work Order Requests will be reviewed for inclusion. A semi annual review of significant variances on the non labour costs will be developed, implemented and assessed for value added to the process.

Responsibility: Supervisor – Operations Support

Status: Scheduled Completion: June 2012

FINDING #4

OPERATIONAL CONTROL REPORTING/ MANAGEMENT INFORMATION SYSTEM

OBJECTIVE: To ensure Management is obtaining and reviewing relevant reports in order to effectively monitor and manage the operations within the Department.

ANALYSIS: Audit's review highlighted a lack of effective Management control and review of the significant processes within the Department. Management does not receive effective reports to monitor the following:

Emergency Repairs (IMC)

- Management does not regularly receive and review MAXIMO reports showing the status of the approved Emergency Calls. This prevents Management from identifying delays and issues in a timely manner.

Planned Repairs and Preventive Maintenance

- Annual Maintenance schedules have been developed for each cost centre to indicate when maintenance activities are to be performed. However, there is minimal reporting and monitoring of the actual work performed. Management does not review the progress of actual Repair and Maintenance activities relative to the scheduled activities.

RECOMMENDATIONS: Management should ensure that;

- Emergency Repairs which have been outstanding for a significant period of time are flagged and reviewed.
- Planned Repairs and Preventive Maintenance activities are monitored, compared to the schedule and deviations are explained.

**MANAGEMENT
RESPONSE:**

We agree. Emergency repair requests are received from Industrial Maintenance Control (IMC) through a computerized maintenance management system (MAXIMO). The Superintendents presently review reports from MAXIMO every one to three months on outstanding IMC calls. All long outstanding calls are assigned to appropriate staff for follow up and close out.

Status: Scheduled Completion: COMPLETE

We agree. Safety critical preventative maintenance programs are monitored and compared to schedule through various software and paper based systems. Expansion to all planned repair and preventative maintenance programs is not feasible, nor recommended using existing processes due to the high administrative level required.

Development of zero base budgets for asset management for the individual trades is underway. Escalator, subway tunnel emergency ventilation systems and subway tunnel pumping systems are complete and the HVAC systems, Paint Shop and Sign Making Shops are under development.

The 2012-2016 Capital Program includes development and implementation of the computerized maintenance management system, MAXIMO, into use by the maintenance trades for planned repairs and preventative maintenance work.

These initiatives will allow expansion of monitoring and comparison of scheduled versus actual to the planned repair and preventative maintenance programs. This in turn will lead to continuous improvement in our asset management programs.

Status: Scheduled Completion: COMPLETE

FINDING #5

ADMINISTRATION

OBJECTIVE: To ensure that the administration function is operating effectively to support the key outputs of the Plant Maintenance Department.

ANALYSIS: Audit found the following areas where Administration was not effectively supporting the Department:

Contract Administration

- Invoices are not consistently being reconciled to the contract to ensure appropriate pricing.
- Contract specifications regarding the technical expertise and certification of the contractors are not being monitored consistently.

Fuel Cards

- Fuel card reconciliation process is not being followed consistently and Audit noted instances where missing receipts and questionable fuel purchases were not being followed up.

Training

- Audit's review of employee driver licences, trade licences and training records found employees with expired licences and training certifications.

RECOMMENDATIONS: Management should ensure that;

- A contract administration process is implemented to monitor adherence to contract terms.
- Monthly reviews of fuel purchases are conducted to verify that reconciliations are performed and purchases appear reasonable.
- Mandatory training and licence requirements have been identified and scheduled to ensure all staff and hourly employees have up to date training for their job positions.

**MANAGEMENT
RESPONSE:**

We agree. A process is presently under development.

Status: Scheduled Completion: COMPLETE

We agree. Recent implementation of the FOB system links each receipt to an individual allowing the Senior Clerk to follow up directly with the individuals. Questionable receipts are then forwarded to the Assistant Superintendent for investigation.

Status: Scheduled Completion: COMPLETE

We agree. Mandatory training by Job Title has been established and distributed to Plant Maintenance staff, Human Resources, Training Department and Support Services. The data includes driver's license requirements. The data is managed by the Training Coordinator through a recently purchased database, INTELLEX.

Status: Scheduled Completion: COMPLETE