CITY OF HAMILTON

CITY MANAGER'S OFFICE
Audit Services Division

TO: Chair and Members Audit, Finance and Administration Committee	**WARD(S) AFFECTED:** CITY WIDE
COMMITTEE DATE: October 4, 2012	
SUBJECT/REPORT NO: Follow Up of Audit Report 2010-07 - Information Services (IS) - Business Process Management (AUD12013) (City Wide)	
SUBMITTED BY: Ann Pekaruk Director, Audit Services City Manager's Office **SIGNATURE:**	**PREPARED BY:** Ann Pekaruk 905-546-2424 x4469

RECOMMENDATION

That Report AUD12013, respecting the follow up of Audit Report 2010-07, Information Services (IS) Business Process Management, be received.

EXECUTIVE SUMMARY

Audit Report 2010-07, Information Services (IS) Business Process Management, was originally issued in March, 2011 and management action plans with implementation timelines were included in the Report. In April, 2012, Internal Audit conducted a follow up exercise to determine that appropriate and timely actions had been taken. Of the 37 recommendations that management agreed to in the original Report, 12 have been completed, 11 are in progress, 12 have been initiated, one alternative has been implemented and one remains as not completed.

Alternatives for Consideration – Not Applicable

FINANCIAL / STAFFING / LEGAL IMPLICATIONS (for Recommendation(s) only)

Financial: The implementation of several recommendations was dependent on additional funding for the purchase of specific tools and capital funding for such items as a virtual server environment and meeting requirements for PCI compliance. On April 25, 2012, Council approved $465,000 allocated in the 2012 Capital Budget to proceed with the Management Action Plans as noted in Audit Report 2010-07.

Staffing: Many of the Management Action Plans referred to additional staffing resources or retraining and reallocation of current staff for the implementation of the recommendations. Since the implementations of several of these recommendations are still in the early stages, no staff increases were noted. Certain existing staff were reassigned or have had duties added to their current positions. Any annual operating impacts related to FTEs will commence in 2013 (as approved by Council on April 25, 2012).

Legal: None.

HISTORICAL BACKGROUND (Chronology of events)

The Report provided 37 recommendations for strengthening internal controls and improving the effectiveness and efficiency of the current service delivery within four Information Services (IS) business process management areas including incident, problem, change and release.

It is normal practice for Internal Audit to conduct follow up reviews within a 12-18 month period following issuance of the original report in order to determine whether action plans committed to by department management have been implemented.

POLICY IMPLICATIONS

None.

RELEVANT CONSULTATION

The results of the follow up were provided to management responsible for the administration and operations of Information Services, Corporate Services Department.

ANALYSIS / RATIONALE FOR RECOMMENDATION

(include Performance Measurement/Benchmarking Data, if applicable)

The report attached as Appendix "A" to Report AUD12013 contains the text of the original Report 2010-07 detailing the observations, recommendations and management action plans as well as follow up comments that have been added after each of the management action plans.

Twelve of the 37 recommendations have been fully implemented. These include: time tracking for IS personnel using a Project Portfolio Management tool; creation and/or more frequent meeting of work intake groups/committees (e.g. Information Services Working Committee, Project Advisory Board); and procedure and process documents that are up-to-date and appropriate for the training of personnel (e.g. Service Desk, Change Management, security log reviews of production environment).

Due to the lack of further budgetary funds, file integrity monitoring software was only installed on servers assessed as being "high-risk" as an alternative to implementation on all IS production environments.

The implementation of 11 recommendations is in progress. They are: work on the business processes as identified by prior consultant's report; the development and reporting of metrics applicable to each of the four business process management areas; a quality assurance framework; a properly documented and enforced Release Management process; and a commitment to implement a Release Management Process with several key roles in this area being assigned to staff.

Among the 12 recommendations whose implementations have been initiated are: an attempt to produce project prioritization criteria in order to develop a lead time policy; inclusion of quality reviews of high-risk areas as part of the multi-phase Quality Assurance project; the drafting and signing of Service Level Agreements (SLAs) with other City departments; a well-defined Problem Management process; investigation of an appropriate Knowledge Base tool to track and pool problems and related solutions; and a formal and well-documented testing methodology including approval levels.

The one recommendation that was not completed is the monitoring of actual costs and cost variances from budgeted costs for projects undertaken.

ALTERNATIVES FOR CONSIDERATION

(include Financial, Staffing, Legal and Policy Implications and pros and cons for each alternative)

Not applicable.

CORPORATE STRATEGIC PLAN (Linkage to Desired End Results)

Focus Areas: 1. Skilled, Innovative and Respectful Organization, 2. Financial Sustainability,
3. Intergovernmental Relationships, 4. Growing Our Economy, 5. Social Development,
6. Environmental Stewardship, 7. Healthy Community

Financial Sustainability

◆ Delivery of municipal services and management of capital assets/liabilities in a sustainable, innovative and cost effective manner.

Skilled, Innovative and Respectful Organization

◆ More innovation, greater teamwork, better client focus.

APPENDICES / SCHEDULES

Appendix "A" to Report AUD12013.

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INTRODUCTION

The purpose of this audit was to examine four business processes within the Information Services (IS) Division. The processes examined were:

- Incident Management (includes Service Desk)
- Problem Management
- Change Management
- Release Management

A brief description of each business process is provided as a reference point.

Incident Management

Incident Management is the process of managing the service desk and incidents and responding to IS user queries. Incident management also includes the collection of data that is analyzed as part of the Problem Management process.

Problem Management

Problem Management is the identification and classification of problems, root cause analysis and resolution of problems.

Change Management

Change Management is the process of ensuring that all changes (including emergency maintenance and patches) are formally managed in a controlled manner. Changes are logged, assessed and authorized prior to implementation and are reviewed against planned outcomes.

Release Management

Release Management involves the planning, designing, build configuration, documentation and testing of hardware, application and software components and the implementation of these components into the live IS environment.

Typically and simply, an incident is a single, "one-off" occurrence; similar incidents are identified as a problem; a problem may ultimately be resolved with a change(s); and changes are bundled together to be implemented as a release.

The audit report consists of a section of audit observations located at the beginning of the report that are applicable across the entire IS Division (General Observations). The remainder of the report consists of audit observations that are organized by business process (Incident & Problem Management (including the Service Desk), Change Management and Release Management). There may be some duplication of audit observations between each of these sections. This is due to the fact that several of the audit observations are applicable to multiple business processes but need to be addressed individually by the factors affecting the particular process.

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A. GENERAL

1. Consultants' Reports
   Observation
   In 2005, a consultant's report (Consultant - B. Wyze) was prepared that documented a plan to implement IT best practices process flows at the City of Hamilton.

   Again in 2009, a series of four reports, commissioned from IBM for business processes design, was completed (at a cost of approximately $100,000). To date, most of the processes discussed in the reports have either only been partially implemented or have not been implemented at all.

   Recommendation
   That IS complete the implementation of the business processes as outlined in the IBM reports, customizing them as necessary to best meet the needs of the City.

   Management Action Plan
   Agreed. The IBM study was commissioned to assist with defining the job architecture and organization structure to meet current information technology needs within the City. The definition of high level IS business processes was added to the scope at the end of IBM's engagement to assist IS with planning for the new IS organization. IS management deferred further work on the IS business processes until the restructured organization was in place to support the processes. The restructuring of the extended management group is complete and the next stage of restructuring (which involves the remaining positions) is expected to be complete by early 2011. At that time, IS will work on the development of a plan to complete the implementation of the IS business processes.

   Follow Up Comment
   In Progress. This item is impacted by several other recommendations in this report. Significant progress has been made towards the full implementation of the Incident and Change Management Processes. Development of a Release Management Process is underway. There has not been any significant progress made towards the implementation of a Problem Management Process.

2. Performance Metrics
   Observation
   It was noted throughout the audit that performance measurement metrics are generally not being compiled, analyzed and reported by the IS management team to the Director of Information Technology. Calculating metrics is a key part of current information technology best practices. The review of performance metrics would enable the IS group to optimize their decision-making processes.

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There is currently no way for SMT to be aware of the current state of the IS group, based on empirical evidence and statistics. It is extremely difficult to identify areas that are currently struggling and/or have inadequate resources allocated due to the current lack of performance measurement metrics.

Metrics and benchmarks are also not being utilized as part of the employee performance management process, where applicable (i.e. service desk).

Without adequate management information and performance measurements, it is highly unlikely that optimal decisions can be made.

Recommendation
That a reporting package be developed that will be compiled by IS staff and reported to IS management and ultimately the Director of Information Technology.

The reporting package should consist of various metrics that are considered to be critical and best practice for each of the major business processes within IS (Incident, Problem, Change and Release Management). In addition, compiled metrics should be utilized as part of the employee performance management process, where applicable and appropriate.

Management Action Plan
Agreed. Information Services will be developing performance metrics that complement and align with our business processes to be implemented throughout 2011. The following lists the metrics that will be implemented initially. As our processes mature, the reporting metrics may change.

Incident - total Heat tickets per month; total calls per month; and total calls abandoned per month.

Change - number of "Requests for Changes" forms submitted/approved/denied; number of pre-approved changes implemented; number of Emergency Change requests submitted/approved/denied; and number of Changes completed on schedule.

Problem - heat tickets category; heat tickets by location; and heat tickets by department.

Release - number of incidents caused by a release; % of releases that are completed as planned, rescheduled or delayed or require content revision.

Follow Up Comment
In Progress. Metrics were developed and compiled in 2011 for the following processes: Incident Management, Problem Management and Change Management. Metrics have not been compiled for the Release Management Process.

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3. Time Tracking
    Observation
    Time tracking is not currently being done on a consistent basis within the IS division. There is no procedure that requires staff to record their time and make them accountable for their working hours by project, task, and/or workflow.

    Work in IS is heavily project and/or incident based. Without time budgets or time tracking, the true cost of a project is difficult to accurately measure, limits management information and negatively impacts resource allocation.

    Recommendation
    That time tracking be implemented within the IS division. A timesheet template or tool should be created or purchased and staff should be required to complete and submit a weekly timesheet to their direct supervisor. Supervisors would review timesheets and perform follow up, where necessary.

    Time would be accumulated on a project basis with total cost calculated upon each project completion.

    Management Action Plan
    Agreed. IS is currently implementing processes and an application for Project Portfolio Management (PPM). The application includes a time sheet function that will allow us to create an employee specific time sheet for staff to track their work week to specific tasks. Supervisors will be responsible for creating the employee specific work/time sheet and following up with staff to ensure compliance. The application (including Time Tracking) will be in place and operational by the end of Q2, 2011.

    Follow Up Comment
    Completed. Time tracking has been implemented within the IS Division, using a PPM application called "Eclipse".

4. Work Intake
    a) *Intake Process Components*
       Observation
       IS is currently in the midst of drafting their intake process. Three of the six components of the intake process have been drafted and are in the process of being implemented. With respect to the portions that have been drafted, the following observations were noted.

       Currently, the Information Services Working Committee (ISWC) meets every other month and as needed during the year.   The ISWC is a key part of the intake process which determines how people, processes and technology are to be leveraged to meet business needs. This meeting frequency is not enough to effectively manage the intake process.

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There is no Project Advisory Board (PAB) in IS. PAB should approve operations-based project work that is to be performed either internally within IS or externally for other groups within the City of Hamilton. Without a PAB, projects may not be approved in a consistent, effective manner that is based on a standard set of criteria.

There is no Project Portfolio Management (PPM) tool to track work requests (intake database). It is difficult to determine if there is a backlog of work (and the size of the backlog) if IS is not tracking project work in one centralized database. IS could also be missing opportunities to achieve efficiencies by staff searching the database to see if any projects have been completed that contain similar work steps that can be utilized in new projects.

Recommendation
That the ISWC meet more frequently (at least monthly). If, due to scheduling constraints, physical meetings are not possible, then innovative alternatives such as teleconferencing and email commenting should be considered.

Management Action Plan
Agreed. The new ISWC monthly meeting schedule will be in place by January, 2011.

Follow Up Comment
Completed. The ISWC has been meeting on a monthly basis since 2011.

Recommendation
That a Project Advisory Board be created and meetings held at least bi-weekly.

Management Action Plan
Agreed. The IS Management Team has developed a Terms of Reference for the Project Advisory Board (PAB) and formed a PAB comprised of members of the IS extended management team and also some of the Customer Relationship Managers (CRMs). This group has standing meetings scheduled every two weeks. The first meeting was Friday, October 1, 2010.

Follow Up Comment
Completed. A Project Advisory Board (PAB) has been created and meets on a regular basis (every two weeks).

Recommendation
That IS research the cost of implementing a PPM tool and plan to include the required funding for implementation in an upcoming budget.

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Management Action Plan
Agreed. IS is currently implementing processes and an application for Project Portfolio Management which is scheduled to be fully implemented within IS by end of Q2, 2011. This is an upgrade to the existing industry standard PPM tool, Eclipse, by Solution Q. The total expected cost of software and implementation is $90,000. Additional operating funding will be required in 2012 for on-going support.

Follow Up Comment
Completed. A PPM tool, Eclipse, has been implemented in the IS Division for managing projects.

b) *Procedures*
   Observation
   Pre-approved intake requests (i.e. Standard Service Requests) including related standard times have not been formally documented for the Applications Group in an IS procedures document. Inconsistent expectations can lead to friction between the IS user community and IS division staff.

   Recommendation
   That Standard Service Requests for all IS groups be defined in a procedures document that is related to the work intake process.

   Management Action Plan
   Agreed. A list of Standard Service Requests already exists for the Infrastructure & Operations and Security sections within IS since these groups handle the majority of these requests. This list will be reviewed and updated as required by Q1, 2011.

   A similar list of Standard Service Requests will be developed for all remaining IS service delivery teams by Q1, 2011.

   All Standard Service Requests will be incorporated into a Service Catalogue that will be released to the IS user community by Q2, 2011.

   Follow Up Comment
   In Progress. The Infrastructure & Operations and Security Sections' combined standard service request listing was complete. The development of the Business Applications Section's listing of standard service requests had begun at the date of the follow up audit testing.

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c) *Estimate of Effort (Budgeting)*
Observation
The draft intake process for customer requests notes how an estimate of effort required to carry out the work be included on the Customer Request document. The budgeted number of IS hours costed out needs to be included. The Customer Request form itself is not consistently used across IS.

Currently missing on the Customer Request form is a section to be filled out at the end of the project to note the actual time spent and the actual project cost for the IS division including a variance analysis between actual and estimated numbers. Without such a section, performance management of project staff is not occurring on a consistent, supportable basis and projects are not being fully evaluated post-completion.

Recommendation
That a section for budgeted cost and actual cost and a section for variance analysis to indicate time that was over or under budget from the original plan be included in a revised version of the Customer Request form.

Management Action Plan
Agreed (in part). IS will record budgeted cost, actual cost and variance analysis for projects. However, IS does not believe that the Customer Request form is the best place for tracking this information. The Customer Request form is not a living document to be maintained throughout a project. It is a static document used in the initiation of the request. Instead, IS will be recording this information in the project and portfolio management processes and application to be implemented in Q2, 2011. This application will be used to track and report on costs and variances from budgeted costs for projects.

Follow Up Comment
Not Completed. The PPM tool, Eclipse, is being used for time tracking purposes but is not being used to monitor project costs and project cost variances. The Project Management Office (PMO) Development Project will be utilized as a pilot project for tracking project costs in Eclipse.

Recommendation
That this revised Customer Request form be implemented across IS (and therefore, across the City).

Management Action Plan
Agreed. The current version of the Customer Request form includes the estimated IS costs for implementing the project. This form is now required for all substantive IS project requests. Definitions for pre-approved or small projects will be complete by Q1, 2011. This will be implemented across the City in Q1, 2011.

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Follow Up Comment
Completed. The Customer Request Form is in use for projects across the City and now includes an estimated costs section. Additionally, definitions for pre-approved or small projects were found to have been defined by the Project Advisory Board.

d) *Customer Relationship Management (CRM)/Lead Time Policy*
Observation
In the draft intake process, a lead time policy is not included. A lead time policy would define how much notice other departments in the City would be required to give to IS to handle their intake request.

The lead time portion of the policy includes how to deal with intake requests that do not have sufficient notification and how to enforce such a rule with other departments within the City of Hamilton. Without this policy, projects of strategic importance may not be able to be accommodated due to a lack of available resources because insufficient lead time was provided to the IS division.

Recommendation
That a Lead Time Policy be drafted, implemented and enforced across IS. This Policy should define standard lead times that are required for non-standard work based on priority levels. This Policy should also contain documentation of CRM (Customer Relationship Manager) roles within IS including responsibility for the awareness of future departmental requests and needs on a more pro-active basis.

Management Action Plan
Agreed. The development of a CRM Lead Time Policy will be beneficial to both IS Clients and IS itself. A number of meetings have already taken place with departmental management teams to raise awareness of the CRM role and to promote a departmental model for project prioritization (prior to the review through the feasibility and initiation phases of the IS Intake Process and subsequently by ISWC). Completion of the remaining Intake Process components will help IS to arrive at acceptable and attainable standard lead times required to process a non-standard work request through to completion or rejection. The experience gained in practice with the IS Intake Process will allow IS to adjust for continuous improvement to the CRM Lead Time Policy. The policy will be created as a sub-set of the efforts required to complete the Intake Process and is expected to be completed by Q4, 2011.

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Follow Up Comment
Initiated. A lead time policy cannot be developed until a "Project Prioritization Methodology" has been agreed upon by the City as a whole. The development of an effective lead time policy requires defined project prioritization criteria as a first step. Without defined criteria, appropriate lead times that match the City's priorities cannot be developed. Project prioritization criteria were sent to the ISWC (Information Services Working Committee) in March 2012. Project prioritization criteria had not been agreed upon at the date of the follow up audit testing.

e) *Incomplete Process Documentation*
   Observation
   Currently, three parts of the intake process have not yet been drafted: IS-Intake 4 (Work Planning Process), IS-Intake 5 (Work Scheduling Process) and IS-Intake 6 (Work Execution Process).

   The intake process is an important aspect of the work of IS and the process should be fully documented and implemented to ensure efficient project resourcing and execution.

   Recommendation
   That IS draft and implement all three remaining portions of the intake process that have not yet been completed.

   Management Action Plan
   Agreed. This work is under way. However, the development and implementation of the work intake process for IS will be dependent on the implementation of the Project Portfolio Management (PPM) system in IS, as major aspects of the controls for these three sub-processes are intended to be built into the PPM system. This exercise is estimated to take about .25 FTE full time for a period of 12-18 months to do the background preparatory work and create the draft processes. Direction provided by CMO, SMT and the ISWC may affect delivery timelines.

   Follow Up Comment
   Initiated. The development of an IS Project Management Office has begun (i.e. a Project Charter was approved in January 2012). The implementation of an intake process and a lead time policy is dependent on the development and implementation of the "Project Prioritization Methodology" (as previously noted).

5. Procedures
   Observation
   Throughout the audit, it was observed that there is a lack of up-to-date, defined procedures for IS staff to follow and for management to maintain. A lack of procedures documentation exposes the IS group to the risk of poor staff performance due to ambiguity or uncertainty surrounding processes and workflows.

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Recommendation
That IS management create, regularly update and ensure staff compliance with procedures for all of the business processes within IS.

Management Action Plan
Agreed. The procedures identified in this Internal Audit report will be created and then regularly updated. IS Management will ensure that IS staff complies with these procedures.

Follow Up Comment
In Progress. This item is dependent on several other items identified in this report. Procedures have been developed for the Incident Management and Change Management processes. The development of the Release Management process is currently in progress and procedures for the Problem Management process have not been developed.

6. Quality Assurance
   Observation
   During the audit, it was noted that there is no formal quality assurance (QA) function within IS. Currently, QA is performed only on an ad-hoc basis, as necessary. Best practices in effective IS organizations recommend a quality assurance responsibility.

   The risk lies in that no detailed review of technical specifications is made to the production environment. No quality reviews are run on a regular basis that could detect inappropriate activity, which potentially cost the City.

   Recommendation
   That IS make quality assurance part of the job responsibilities of a current staff member.

   Management Action Plan
   Agreed. A formal Quality Assurance function is required within IS. This will be a challenge for IS to implement within the constraints of current IS complement and budget. IS will assign a staff member and support the incorporation of QA methodologies and processes by Q4, 2011. This will require the selection, purchase and implementation of quality assurance and reporting tools that integrate into the development environment. IS has already undertaken initial investigation into this requirement. Based on research by Gartner Research (the leading IT industry analyst firm) and research conducted by our staff, the industry-leading applications will cost $150,000 to implement. This funding has been requested in the 2011 capital budget. To provide ongoing support for this application, an increase will also be required in the 2012 operating budget.

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Follow Up Comment
In Progress. A multi-phase Quality Assurance project began in Q4, 2011. The objective of this project is to provide a quality assurance framework that ensures all applications are maintained, supported by IS and there are guidelines, processes and templates for this function.

Recommendation
That quality reviews for high-risk areas be run on a regular basis to deter and detect inappropriate activity.

Management Action Plan

Agreed. This is more of a security role than a QA role and the reviews will be implemented as part of ongoing security operating procedures by Q2, 2011.

Follow Up Comment
Initiated. Information Services revised their Management Action Plan to address this item through a software development quality assurance function. This item is being addressed as part of the multi-phase Quality Assurance project noted above. Guidelines for testing have been completed and a test strategy template is currently being developed. At the date of the follow up audit, quality reviews had not begun.

7. Service Level Agreements
   Observation
   There are no service level agreements with functional departments that IS staff is widely aware of that define standard service times for requests submitted to IS.

   Conflicts can (and do) occur over expectations for service which is difficult to resolve fairly and consistently in the absence of Service Level Agreements.

   Recommendation
   That IS draft and implement Service Level Agreements with other departments in the City.

   Management Action Plan
   Agreed (in part). Service Level Agreements (SLAs) can be very useful for common services which are repeated frequently such as Standard Service Requests. SLAs are not easily applied to services like business process analysis, custom application development or enterprise application upgrades where the scope of work can be vastly different from one instance to another. Furthermore, SLAs are most effective when customers pay for the services that they receive and there are set penalties (financial or otherwise) for failing to meet agreed to metrics. The current funding model for IS does not support this.

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The IS Service Catalog will be reviewed and updated as part of our 2011 work plan. IS will work with departments and agencies to raise awareness of IS service offerings, then draft and implement SLAs for core IS services, including a performance measurement component. This exercise is estimated to take about 0.75 FTE full time for a period of 12-18 months to do the background preparatory work and create a draft SLA. Consideration to direction provided by the CMO, SMT and the ISWC may affect delivery timelines.

Follow Up Comment
Initiated. The Infrastructure & Operations Security Sections' combined standard service request listing was complete. The Business Applications' listing of standard service requests was under development as at the date of the follow up audit testing. Therefore, since the standard service request listing (also known as the "Service Catalogue") has not been fully developed, no significant progress has been made towards the development of SLAs.

B. **AUDIT OBSERVATIONS BY BUSINESS PROCESS**

SECTION I – INCIDENT MANAGEMENT (INCLUDING SERVICE DESK)

8. Procedures (Service Desk)
    Observation
    Even though detailed process documents were created in 2008, the Service Desk is not using them as they have not been updated.

    There is no training guide/manual or best practices document that is currently in use by the Service Desk, especially for new Service Desk staff members. Only peer training is occurring.

    Staff may not be performing to their full potential without procedural knowledge and the Service Desk may not be aware of its true capacity. If there were ever performance management issues with staff, it would be difficult to take remedial action if there are no current written guidelines against which their actions can be held accountable.

    Recommendation
    That IS draft and implement a procedures manual adequate and detailed enough to be used as a training guide for staff.

    Management Action Plan
    Agreed. Work on this is under way with a number of procedural guides completed and stored on the IS N drive. Further development and review of these guides along with supplemental information (Service Desk scripts, etc.) will form the basis for a procedural document and training guide for IS staff. Consolidation of this information into a concise package is a task Information Services will complete in Q3, 2011. This will require one FTE for a period of three months.

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Follow Up Comment
Completed. Procedural guides have been created and implemented for the Service Desk.

9. Integration
   Observation
   The Incident Management process is not well integrated with the Change Management process. Parent/Child relationships are not being utilized to link similar closed incidents within HEAT (Incident Management Tool) which can ultimately lead to extra staff effort being utilized to resolve incidents that have already been taken care of.

   Recommendation
   That the IS Division develop and implement procedures that link the Incident and Change Management process.

   Management Action Plan
   Agreed. When numerous similar/related incidents are reported to the Service Desk and a problem is suspected, Service Desk staff currently create a "Heatboard" alert to link all these incidents together. This Heatboard alert simplifies administration of these tickets (communications, documentation and closure) from a central point. Creation of a report from the Heatboard alert table in Heat would enable the linkage between Incidents, Problems and Change Management. As a first step towards development of this process, IS will investigate this option and implement a manual integration between Incidents and the Change Management processes in Q1, 2011.

   Follow Up Comment
   Completed. Procedures have been developed and implemented to link the Incident and Change Management Processes. The output of this process linkage is a monthly report that is distributed to the relevant IS staff.

10. Process Documents
    Observation
    Within the IBM report noted earlier, several documents for Incident Management were listed as needing drafting and implementation. During the audit, it was noted that many of these documents still remain undeveloped. They include:

    - Standard service request lists and the associated resolutions/answers
    - Standard service request listing for the Business Applications group
    - Procedures for assigning work in the Incident Management Process (and defining who the owner of an incident is)
    - Service Desk scripts/standard questions to be asked to assist in diagnosing incidents and capturing accurate data

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- Procedures to monitor service requests that are assigned to other groups in IS (outside of the Service Desk)
- Procedures for detailing how Service Desk staff should respond to non-standard questions and requests

Further procedures that should be developed as per Internal Audit are:

- Procedures for prioritization, classification and types of incidents
- Process for re-assigning HEAT tickets
- Procedure for reviewing assigned tickets (supervisory review), essentially a QA process
- Process to define when an incident merits escalation to the Change Management process and when a root cause analysis is required
- Incident closure process

Without a properly implemented Incident Management process and corresponding procedures documentation, the IS division continues to function on an ad-hoc basis. Best practice processes (ITIL framework) are necessary for effective Incident Management.

Recommendation
That IS draft and implement the above-noted documents to be included in the Incident Management process documents and procedures.

Management Action Plan

Agreed. See the response to item #9 above. In addition, Information Services will develop a process flow diagram to document the integration of the above noted report to the Change Management process in Q1, 2011.

Follow Up Comment
Completed. Procedural guides have been created and implemented for the Service Desk. A standard service request is still being developed by the Applications Section.

11. Tools
    Observation
    A Knowledge Base tool is currently not being used by IS as part of the Incident Management process in order to enable Service Desk staff to look up solutions to similar incidents and problems that have been previously resolved and that have a documented solution.

    Recommendation
    That IS research and implement a Knowledge Base tool for the Incident Management process.

    Management Action Plan
    Agreed. Knowledge Base functionality is commonly included in Incident Management and Service Level Management applications. IS currently uses the FrontRange Solutions application (HEAT) for logging and reporting incidents. This application was customized to best fit the specific environment and ITIL best practices.

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While a knowledge base exists within this application, it does not provide the best fit for the IS environment. Greater value would be derived by ensuring that the selection of a Knowledge Base tool integrates seamlessly with the procedures and practices that will be implemented in 2011 and 2012. As part of this development, Information Services will research a Knowledge Base tool that best meets these requirements in Q4, 2011. Implementation would proceed with capital funding in 2012. Implementation of this tool is projected to cost approximately $90,000 and require four months of staff effort. An increase in the 2013 operating budget will be required to provide continued support for the new application.

Follow Up Comment
Initiated. The capital funding for this request was approved by Council in April 2012.

SECTION II - PROBLEM MANAGEMENT

12. Defined Process
   There is no defined Problem Management process. Analysis from a Problem Management process provides information to the Incident Management process and reduces redundant work.

   A major component of the Problem Management process is root cause analysis, which is not performed as a regular part of the IS Division's workflow.

   Therefore, incidents are resolved on an individual basis but problems go unidentified which leads to replication of work. Further, solutions implemented may not ultimately address the root cause of a situation, leading to additional work in the future that is needed to address the root cause.

   In order to have a properly implemented Problem Management process that is considered a best practice (ITIL framework), the required roles of Problem Management Process Owner, Problem Management Co-ordinator and Problem Analyst should be assigned to staff members.

   Recommendation
   That a well-defined Problem Management process be implemented by IS.

   Management Action Plan
   Agreed. See the responses to items #9-11 above.

   Follow Up Comment
   Initiated. The capital funding for a Knowledge Base tool (primary tool utilized in the Problem Management Process) request was approved by Council in April 2012.

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13. Procedures
Observation
Similar to Incident Management, the IBM report noted several procedures requiring documentation for the Problem Management process. The following documents still need drafting:

- Problem Creation Process
- Assignment/Reassignment Process
- Escalation Procedures
- Formal methodology for investigation and trouble shooting
- Problem Closure Process
- Notification Process
- Feasibility criteria and guidelines (to be used to evaluate solutions to root causes)

Without an appropriately developed Problem Management process, staff will continue to duplicate effort by creating solutions to resolve incidents that should be easily identifiable as a problem with a known solution.

Recommendation
That the above noted documents be developed by IS and included as part of the Problem Management process implementation.

Management Action Plan
Agreed. Along with process flow documentation for incidents and integration to Change Management, IS will develop a process flow diagram and associated documentation for the Problem Management process in Q3, 2011.

Follow Up Comment
Initiated. The capital funding for a Knowledge Base tool (primary tool utilized in the Problem Management Process) request was approved by Council in April 2012.

14. Tools
Observation
It was noted that IS does not have a Problem Management tool (Knowledge Base) to enable the tracking of problems/known errors and the related solutions.

Without an appropriate Problem Management tool, it will be difficult and inefficient to track, extract and link information in this process.

Recommendation
That IS investigate the capabilities of the currently used HEAT system to enable a Knowledge Base feature (currently HEAT has a Knowledge Tree function that is not being utilized on a regular basis). If this is not feasible, IS should consider the various options for a Knowledge Base tool and implement the tool that best meets the City's needs.

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Management Action Plan

Agreed. See the response to item #11 above.

Follow Up Comment
Initiated. The capital funding for a Knowledge Base tool (primary tool utilized in the Problem Management Process) request was approved by Council in April 2012.

SECTION III - CHANGE MANAGEMENT

15. Procedures
Observation
During the audit, it was noted that procedures are not current. The existing procedures were reviewed and were determined to be out of date as an annual review had not taken place during the past year. Internal Audit was provided with an updated draft but this document has not yet been fully implemented.

The current procedures are not comprehensive or defined enough to provide a strong internal control environment for the Change Management process.

The following areas need to be adequately addressed:

- Business case information to guide prioritization of change efforts
- Structured risk and impact assessment considering impacts on the operational system and its functionality
- Communication to change requesters regarding the status of their request
- Testing, as appropriate
- Appropriate generation and/or modification of related documentation and the storage of such documentation
- Adequate communication of pending changes to affected parties, including management, users, developers, security administrators, IS operations and service desk staff (occurs at CAB but not formally to affected parties)
- Appropriate segregation of development, test and production environments
- Adequate consideration of control implications throughout the change process
- Responsibilities for investigating failures, together with the incident resolution process
- Maintenance procedures (review requirements)
- Record-keeping (i.e. meeting minutes) and the level of detail required to adequately document the specifics of meetings

The Change Management process occurs currently on an ad-hoc basis. If staff are not aware of definitive work expectations, they may make changes that are not authorized due to the lax internal control environment.

Recommendation

That the Change Management procedures be revised to address the deficiencies noted above. After these procedures have been augmented, they need to be communicated to staff in order to set expectations and ensure that they are followed by all staff.

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Management Action Plan
Agreed. Change Management procedures will be revised in co-ordination with the other related IS processes that will be implemented in 2011. With the newly-implemented CRM role, IS now has the opportunity to engage City departments proactively to prioritize changes based on business cases and to provide better communication back to change requestors.

Without dedicated Change Management staff, it is a challenge to ensure formal communications, record-keeping and follow up. At this point, CAB members are relied upon to communicate planned changes to their staff. In the interim, IS will reinforce that expectation with CAB members. Implementation of this recommendation will require the addition of one FTE to oversee these change management responsibilities. IS will include this in the 2012 operating budget submission (see the response to item #20).

Some progress is being made to segregate development, test and production environments. However, the implementation of this recommendation requires the availability of adequate development, test and production server environments. If the budget for the recommended Virtual Servers is approved, the separate environments will be implemented by Q4, 2011.

Follow Up Comment
In Progress. Change Management procedures have been revised. The duties of the "Change Coordinator" role have been assigned to one individual. The duties of the "Change Analyst" role have not been assigned. The development, test and production environments have not been segregated. The IS Data Centre is currently undergoing improvements that will allow this segregation to be possible in the future.

Recommendation
That all procedures be reviewed at least annually (with evidence, i.e. sign-off) and revised, as required.

Management Action Plan
Agreed. A formal yearly review of the Change Management processes will be implemented and will involve all CAB members. The review will target deficiencies and assign responsibilities for the process revisions as necessary. Sign-off will be included. This will be implemented in Q1, 2011.

Follow Up Comment
Completed. The Change Management process was reviewed and signed off by the Change Advisory Board (CAB).

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16. Audit Trails
    Observation
    Audit trail event logs can be deleted from servers and this action can go undetected by IS's tracking program (LogRhythm). Therefore, the deletions do not appear on any reports that are reviewed by IS staff. A staff member could make unauthorized changes (IS production environment), delete the corresponding audit trail and the changes would not be detected by the IS Security group. Such changes to the IS environment could put the City's IS functionality at risk.

    Recommendation
    That LogRhythm tracking and reporting be changed to ensure that deletions of audit trails appear in reports. These reports should be reviewed by IS staff with appropriate follow up in a timely manner.

    Management Action Plan
    Agreed. This will be implemented in Q1, 2011.

    Follow Up Comment
    Completed. An upgrade to the tracking program was installed and tests were conducted by the Security Section to verify it was functioning properly. The LogRhythm tracking reports were modified and audit trails can no longer be deleted without detection.

    Currently, IS does not track changes to the IS environment in an automated manner. Changes are recorded manually by IS staff. Due to the lack of capability to track changes in an automated manner which can be achieved by using file integrity monitoring software, the City is not in compliance with PCI Requirement 11.5 - Deploy File Integrity Monitoring Software. If this non-compliance with PCI requirements continues, the City may not be able to accept credit cards as a form of payment.

    Recommendation
    That file integrity monitoring software be implemented in all IS production environments.

    Management Action Plan
    Agreed. Automated detection of changes in the production IS environment requires automated tools such as file integrity monitoring software. The selection and implementation of this is included in the PCI compliance project. However, this covers only the environment that is "in-scope" for PCI. Implementing this on all servers will be a very significant and expensive undertaking. The anticipated cost to implement this will exceed $100,000. IS will investigate this in Q3, 2011 in order to include it in the 2012 capital budget. An increase in the 2013 operating budget submission will also be required for ongoing support of this application.

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Follow Up Comment
Alternative Implemented. File integrity monitoring software has been implemented on servers assessed as being "high-risk" (including PCI servers). There are no budgetary funds available for additional implementation and management has decided not to proceed further with this item.

There are no documented procedures for reviewing security logs, specifically in the area that relates to changes that are made to the production environment. This is a component of PCI Requirement 10.6 - Review logs for all system components at least daily. If the City is not in compliance with PCI requirements, the City may not be able to accept credit cards as a form of payment.

Recommendation
That a procedure for reviewing logs relating to the security of the production environment be drafted and implemented. This procedure should specify the various types of reviews that should occur and which reports to use. The procedures should require a review frequency that is in compliance with PCI Requirement 10.6 (daily).

Management Action Plan
Agreed. This will be completed by the end of 2010 and will involve daily reviews for the in-scope PCI environment. Since this will be accomplished with existing IS security staff, reviews will be less frequent for systems outside of the PCI scope.

Follow Up Comment
Completed. A daily log review procedure has been implemented since October 2010. Corresponding procedures have also been written.

17. Security Group Testing
    Observation
    Various tests were conducted on security access granted to IS staff. For a sample of 10 IS employees, a large number of permissions for access had been granted (over 40 instances noted) where the permissions were not appropriate and/or needed for the staff member's current job position. There were also three instances noted where permission granted for a security group was out of date and the security group should have been deleted.

    In testing a specific job position, it was noted that there was not consistency in the access permissions granted to all employees in this category when though all held the same job title. The responsibility to review staff security access permissions is not currently assigned to any supervisory or managerial staff in IS.

    Recommendation
    That specific supervisory staff be assigned to review IS employee access permissions on a regular basis (e.g. quarterly) and whenever there is a change in a staff member's area of responsibility.

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Management Action Plan
Agreed. Beginning in January 2011, reports showing access permissions for each IS staff member will be distributed to IS supervisors quarterly. Procedures will be developed for supervisors outlining:

- *the response required to the quarterly reports and the timing of that response;*
- *the notification required whenever an IS staff member changes an area of responsibility; and*
- *the approval required for all changes to IS staff member access permissions.*

Follow Up Comment
Initiated. Review of access permissions was performed for the first time in Q1, 2012. Supervisors verified if their staff had appropriate permissions and provided feedback to the Security Manager of any that were considered to be unnecessary and that should be removed. However, further audit testing indicated that staff permissions had not been changed as a result of this review.

There is no segregation of duties (for access to production environment via security groups) that separates staff that perform development work from staff that implement changes into the production environment (and vice versa) as these roles are not distinguished and/or defined in IS. In particular, staff with a noted permission have access across test, development and production environments. Changes can be made, tested, reviewed and implemented by the same staff member.

Due to the lack of separation of duties between development/test and production environments, the City is not in compliance with PCI requirement 6.3.3 – Separation of Duties between Development/Test and Production Environments. The City is also not in compliance with PCI requirement 6.3.2 which stipulates access control to enforce the separation of development/test environments and the production environment.

Recommendation
That IS designate staff as either developers or implementers for specific servers and applications and the access to servers and applications be restricted to only appropriate staff members by utilizing security groups. For staff that are required to provide after hours support to all areas, an after-hours support account (that is not generic) should be assigned and their support accounts should have the usage monitored on a regular basis.

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Management Action Plan
Agreed. IS management fully endorses this recommendation as an industry best practice. It has been identified in previous external financial audits and is a requirement for the applications within the scope for the PCI compliance project. To date, IS has been unable to satisfy this recommendation for all of the City's applications because of the significant impact on the IS budget. Initial analysis of this recommendation estimates an increase of six (6) FTEs to the current complement. With additional staffing, this could be completed within 4 months of budget approval.

Follow Up Comment
Initiated. Infrastructure upgrades are currently underway in the IS Data Centre. Once implemented, these upgrades will provide the IS Division with the ability to implement appropriate segregation of duties across the test, development and production environments. However, no progress can be made on this item until the upgrades to the Data Centre have been completed.

18. <u>Change Testing</u>
   Observations
   There are three types of changes: Standard, Pre-Approved and Emergency changes. As part of the audit, testing was performed on each of the three categories.

   During testing, it was noted that RFC's are generally poorly completed. For every RFC selected for testing, at least one field was not properly filled out. Segregation of duties and access to the production environment are not addressed on the RFC form. As noted above, the responsibility for developing, testing and implementing changes is not separated. There is no indication on the form as to how an appropriate segregation of duties will be achieved for a particular change and who will ultimately be making the change to the production environment.

   Documentation related to RFC's is not stored in a central location. The current haphazard storage of supporting documentation could lead to more downtime than necessary, if any issues are encountered with the change.

   Given that RFC's are not required to have supervisory review prior to being presented to CAB, much work (including testing) may be completed for changes that may not be approved by CAB. Approval should be given to a change prior to a significant amount of work being carried out.

   CAB only provides a high-level approval and does not review, in detail, the contents of the RFC such as the testing and back out plan details. The impact is that staff members may be working on developing and testing changes that may not be of the greatest importance to the IS and City's strategic plan and that their time should be being spent on other projects.

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As time spent on each change is not tracked, there is no way to determine if the change was over budget and how much more staff time was spent than originally planned. The impact is that tradeoffs occur and other important work is not completed due to too much time being spent on changes. This could be prevented by monitoring time spent on specific changes.

CAB minutes do not demonstrate that changes implemented in the prior week were discussed at the CAB meeting. There is no post-implementation review in the revised Change Management process for all standard and emergency changes made.

The Incident Management process (HEAT Ticket) and the Change Management process (RFC form) do not interconnect to provide an adequate audit trail of changes. Recurring incidents and a lack of integration of the two processes could lead to system downtime.

Recommendation
That the Change Management procedures be revised to address the deficiencies noted above. Management must ensure that the documentation and approvals as noted in the revised process are being carried out.

Management Action Plan
Agreed (in part). IS understands that the current Change Management procedures are lacking in rigour. In part, this is the result of IS staffing levels and thereby, the inability to devote the staff time recommended by ITIL best practices (see the response to item #20). This is also the result of not having completed other processes that compliment the Change Management process.

To address some of the "Change Testing" observations, the current process and documentation will be reviewed and updated for the purpose of incorporating the following enhancements by Q1 2011:

- *Add a preliminary step to the process to ensure the completeness and accuracy of the submitted form;*
- *Modify the RFC document such that it accommodates the distinct identification of the developer, tester and person responsible for promoting the change (however, note that IS does not have separation of duties – see the response to item #17);*
- *While consolidating all documentation in the same location as the RFC form may be desirable, in many instances it may not be practical. IS will enhance the Request for Change (RFC) form by adding a section where the user will identify the location and nature of the supporting documentation;*
- *Update the CAB minutes to capture all events that take place during the CAB meetings (again, this will be dependent on having the appropriate IS staff to accomplish this task – see the response to item #20); and*

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- *Make the updates necessary to link incidents (HEAT tickets) to implement fixes which address or correct the logged incidents.*

With respect to other observations, IS disagrees. The objective of the Change Management process as it is currently implemented is defined as:

> *"The purpose of the Change Management Process is to ensure all changes to the IT production environment are properly planned, managed and reviewed prior to their implementation and release."*

The Change Management process was not implemented for the purpose of evaluating the business merits of proposed changes, prioritizing the work required to implement them or collecting development metrics of the body of work being promoted. Therefore, the implementation of such recommendations, where appropriate, will be included in other processes and in the PPM application.

Follow Up Comment
In Progress. The Change Management process has been modified and was approved by the Change Advisory Board (CAB). Appropriate segregation of duties has not been achieved and therefore, has not been addressed in the Change Management process.

19. Scheduling
    Observation
    As the Change Management process does not define the frequency of scheduled windows when standard changes are to be made, this could lead to increased risk of downtime.

    Recommendation
    That IS implement a schedule and procedure for the Change Management process that addresses the criteria that changes must meet in order for them to be implemented 'as ready' and which changes must occur in the pre-defined window. Any standard changes should go through the Release Management process unless otherwise justified and approved.

    Management Action Plan
    Agreed. It would certainly be preferable to implement changes in specific well-defined windows. Consideration must be given to the complexity of multiple changes being implemented in one window and the need for user departments to implement quickly to meet their own project timelines. Another issue to consider is the ability of IS to combine the after-hours staff time required to implement this with the need to provide normal business day support.

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Currently, CAB utilizes a Change Management schedule that is reviewed at least weekly. By the end of 2010, CAB will review the feasibility of combining changes into regular maintenance windows. Criteria will be defined to address a maintenance window opportunity for a specific application or change and when it can be performed (using CRM input from user departments).

This requirement will be reviewed in more detail as the Release Management process is being implemented.

Follow Up Comment
In Progress. The Release Management process has not been implemented and, as previously described, is still in development. CAB now considers the use of a maintenance window for all implemented changes with criteria for using the maintenance window having been documented by IS staff. These criteria were found to have been utilized during the Change Management Process (i.e. at CAB meetings). CAB continues to utilize the Change Management Schedule for all changes.

20. Roles
    Observation
    In the IBM reports noted above, there were several roles that were defined for the Change Management process. During the audit, it was noted that the roles of Change Co-ordinator and Change Analyst have not been assigned. The duties and responsibilities carried out by these positions are important aspects of the staff attention required as changes are made.

    Recommendation
    That the roles of the Change Co-ordinator and Change Analyst be assigned with responsibilities clearly defined.

    Management Action Plan
    Agreed. The Change Management roles identified in this recommendation require a broad knowledge of information technology and the capacity to carry out the duties associated with the function. To date, these have been a shared responsibility among existing IS staff. IS management is currently challenged with over-extending its current staff complement. Implementation of this will require the addition of one (1) FTE to oversee these change management responsibilities. IS will include this cost in the 2012 budget submission.

    Follow Up Comment
    In Progress. The duties of the "Change Co-ordinator" role have been assigned to an existing IS staff member and a listing of weekly procedures have been distributed to this individual. The duties of the "Change Analyst" role have not been assigned to one specific IS staff member due to resource constraints.

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21. Tools and Reporting
    Observation
    It was noted that IS does not have a Change Management database (CMDB-Configuration Management Database) to enable tracking of standard emergency changes. Thus, change information is not widely available. This situation coupled with the fact that reporting options are not fully utilized in the HEAT database could put the IS environment at risk by inappropriate and/or incorrectly implemented changes to the production environment.

    Recommendation
    That IS investigate the various options for a Change Management database and reporting tool and implement the tools that best meet the City's needs.

    Management Action Plan

    Agreed. By Q4, 2011, IS will investigate and review tools to support the Incident Management and Change Management processes. When the cost of these tools is known, IS will include them in the capital budget (likely 2012). Ongoing support costs will be included in the following year's operating budget.

    Follow Up Comment
    Initiated. An alternative, less rigorous procedure was implemented to track changes. This consists of primarily manual procedures and is not a true change management database and reporting tool. The IS Division submitted a capital request that was approved by Council in April 2012 for tools to support the processes.

    Recommendation
    That staff be reminded to accurately complete and maintain change records in order to facilitate information gathering and queries.

    Management Action Plan
    Agreed. The current Change Management documentation is lacking in many respects. As stated in the Management response to recommendation #20, Change Management roles are shared resulting in inconsistent and incomplete change documentation. Other municipal IT departments dedicate one or more resources to the co-ordination of Change Management documentation. In the context of the current environment, the following steps will be taken by the end of November, 2010:

    Advise the Change Advisory board (CAB) of this requirement;
    - *Ensure that supervisors vet all Request for Change (RFC) forms submitted to CAB; and*
    - *Enhance the Request for Change (RFC) form by adding a section where the user will identify the location and nature of the supporting documentation.*

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Follow Up Comment
Completed. The Change Management procedures have been updated and the revisions were signed off by Change Advisory Board (CAB) members. Supervisors are required to review RFC's prior to them being submitted to CAB. The location of supporting documentation is included on the RFC form. A sample of RFC forms tested indicated the forms were completed appropriately and stated where supporting documentation was located.

SECTION IV - RELEASE MANAGEMENT

22. Process
    Observation
    The Release Management process in IS has not been formalized. There is a lack of procedures and a formalized workflow. An approval policy for the Release Management process has not been drafted, implemented and enforced. No standards for the storage of supporting documentation for releases exist. Certain forms and specific evidence of testing is required to be retained. The process is being carried out on an ad-hoc basis with most release activity occurring in the PeopleSoft group. Procedures should include sign off criteria, levels and rules based on the risk and impact of requested release components.

    Given that there is no formal Release Management process, releases are not well integrated with the Change, Problem or Incident Management processes.

    Recommendation
    That the Release Management process be properly documented as noted in the IBM report and in line with industry best practices.

    Management Action Plan
    Agreed. Representatives from each section within IS will review the Release Management Process proposed by IBM. Based on this review, the process will be customized as required, to best serve the needs of IS and the departments to which IS provides service. The customized process will adhere to industry best practices and, where limitations exist (for example, due to staffing levels), compensating controls will be introduced into the documented process. This review will be undertaken in 2011.

    Follow Up Comment
    In Progress. Implementation of a Release Management process is underway. A Project Charter for the development and implementation of a Release Management Process has been created. Weekly meetings are occurring until the initial project is completed, which is expected to occur in July 2012. The initial phase for the implementation of this new process will focus on PeopleSoft Applications and Consultation Applications. Deployment to other areas to be considered once the initial phase has been completed.

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23. Test Methodology
    Observation
    There is no formal testing methodology and best practices document that has been drafted and implemented. The level of testing documentation required should be commensurate with the risk and impact of the release. Since there is no defined methodology, testing does not occur consistently. Testing is also not likely to be occurring at a high level that meets the expectations of the IS division. Impact is that releases may be implemented without adequate testing, putting the City at risk for exposure to potential downtime.

    For example, the test environment is not always used for testing purposes. A recent copy of the production environment is occasionally used. Also, the test environment is not being updated on a regular basis. If the test environment does not mirror the production environment, problems could be encountered when the release is implemented due to the fact that testing may not have caught all potential issues.

    Recommendation
    That a testing methodology be drafted and implemented. It should include sign-off and approval levels depending on the risk and impact of the proposed release.

    Management Action Plan
    Agreed. IS agrees with this recommendation. However, the implementation of this recommendation requires the availability of adequate development, test and staging server environments. If the budget for the recommended Virtual Servers is approved in Q1, 2011, IS will implement the separate environments by Q4, 2011.

    As explained in item #6, IS is implementing a testing and QA process. IS will review, design and implement a plan for development and test server refresh processes. Expected analysis and recommendations will be completed by Q3, 2011.

    Follow Up Comment
    Initiated. A multi-phase QA project has begun. A Project Charter has been written to guide the project. The first stage of this project includes a testing methodology. Guidelines for testing have been completed and a test strategy is currently being developed.

24. Implementation
    Observation
    It was noted during the audit that IS has not yet committed to fully implementing a Release Management process (including the items recommended above), assigning the required roles to staff members (Release Management Process Owner, Release Management Co-ordinator and Release Analyst), tracking and reporting Release Management information to management and integrating the process with the other ITIL processes.

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A properly implemented Release Management process is considered a best practice (ITIL framework).

Recommendation
That IS commit to implementing a Release Management process by implementing the recommendations noted above.

Management Action Plan
Agreed. IS will engage the services of an external consultant to assist in the implementation of the release Management process. The consultant will participate in training the staff that will assume the roles of Release Management Co-ordinator and Release Analyst and will also develop the documents used to monitor and control the Release Management process. Target date – Q1, 2012 with an expected consultant cost of $60,000.

Follow Up Comment
In Progress. Implementation of a Release Management process is underway. A Project Charter for the development and implementation of a Release Management Process has been created. Weekly meetings are occurring until the initial project is completed, which is expected to occur in July 2012. The initial phase for the implementation of this new process will focus on PeopleSoft Applications and Consultation Applications. Deployment to other areas to be considered once the initial phase has been completed.