Audit Follow-up

As of March 31, 2009

Sam M. McCall, Ph.D., CPA, CGFM, CIA, CGAP
City Auditor

Gas Infrastructure

(Report #0727 issued September 13, 2007)

Report #0914 **May 22, 2009**

Summary

Twenty-five of the 26 action plan steps due for completion as of March 31, 2009, have been completed or resolved. Completion of the remaining action plan step has been deferred until a vacant position is filled.

In audit report #0727 we noted that, overall, the City has adequate and proper processes and procedures to ensure a safe and reliable infrastructure. We also noted significant improvements and enhancements had been and were being made in regard to accounting for and tracking infrastructure. We reported installations of new infrastructure met federal and state requirements and expansions and replacements were planned and funded. We reported an effective public protection program was established. However, we also identified areas where improvements and enhancements were needed. Accordingly, recommendations were made to install an additional isolation valve, accurately designate critical valves in the Gas Utility geographic information system (GIS), develop a project management plan for refinement of the Gas Utility's GIS, protect stored pipe from environmental elements, ensure timely repair of non-critical leaks, and enhance monitoring of system pressures at a satellite utility facility. Recommendations were also made to improve documentation in several areas, including infrastructure testing and inspection, leak identification and repair, emergency notifications and responses, and other areas.

Twenty-seven action steps were developed to address the identified issues, for which 26 were due for completion prior to or as of March 31, 2009. In our two prior follow-up reports, we reported 21 of those 26 action plan steps had been completed (i.e., as of September 30, 2008). During this follow-up engagement, we found four of the five remaining steps were completed. Management has deferred completion of the fifth action plan step until a vacancy in a key position is filled.

Actions completed during the six-month period addressed by this follow-up engagement included:

- Protecting stored pipe and fittings from direct sunlight to preclude ultraviolet degradation (involved two action plan steps).
- Formally documenting procedures for identifying, reporting, and monitoring for atmospheric corrosion.
- Revising language to clarify a performance measure relating to emergency response times.

The one deferred action plan step involves development of a project management plan for refinement of the Gas Utility's GIS.

We appreciate the cooperation and assistance provided by Underground Utility and MSC staff during this audit follow-up.

Scope, Objectives, and Methodology

We conducted this audit follow-up in accordance with the International Standards for the Professional Practice of Internal Auditing and Generally Accepted Government Auditing Standards. Those standards require we plan and perform the audit follow-up to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit follow-up objectives.

Report #0727

The scope of report #0727 included a review of the Gas Utility's processes established to install (construct), maintain, protect, and account for the City's gas infrastructure. The objectives were to determine whether:

- Adequate and complete records were maintained to enable the Gas Utility to effectively and efficiently track, monitor, and manage the City's gas infrastructure;
- The Gas Utility had a process in place to ensure additions (expansion and replacement) meet federal and state standards;
- The Gas Utility had a process in place to ensure gas infrastructure is safely and appropriately maintained;
- An adequate public protection program was maintained; and
- The Gas Utility had an adequate process for planning and funding gas infrastructure expansion and replacement.

The audit focused on programs and processes in effect during the time of our initial audit fieldwork in winter and spring 2007.

Report #0914

This is our third follow-up on action plan steps identified in audit report #0727. The purpose of this follow up is to report on the progress and status of efforts to complete action plan steps due for completion as of March 31, 2009. To determine the status of the action plan steps, we interviewed staff, made observations, and reviewed relevant documentation.

Background

The City's Gas Utility was established in 1956. Effective April 1, 2008 (subsequent to the initial audit), the Gas Utility was combined with the Water Utility into a new City department, Underground Utilities. The "Gas Utility" as referred to throughout this report is now a division within that new department.

At the time of our initial audit, the City's gas infrastructure was comprised of:

- Four gate stations;
- 780 miles of gas mains;
- 18 regulating stations;
- 27,925 service points;
- Approximately 6,900 gas valves; and
- Other miscellaneous components such as test stations and anodes, odorizing equipment, etc.

The City's gas pipelines (mains and service lines) are made up of either coated steel or polyethylene plastic. Polyethylene plastic is generally used for medium and low pressure lines while steel is used for all high pressure lines. Polyethylene plastic and steel pipe used for gas pipelines must be manufactured in accordance with specifications provided in governing federal regulations.

At the time of our initial audit, an independent contractor performed the vast majority of infrastructure expansion and replacement. Occasionally, City staff installed or replaced gas mains or other infrastructure for minor jobs or projects.

The primary authority controlling and regulating the City's gas infrastructure is the United States Department of Transportation, Office of Pipeline Safety. The State of Florida, Public Service Commission establishes additional regulations.

For fiscal years 2002 through 2006 (five-year period), the City incurred costs of approximately $7.9 million to maintain and operate the City's Gas Utility (exclusive of fuel costs). During that same five-year period, the City expended approximately $14.5 million through 10 capital projects for infrastructure expansion and replacement.

Previous Conditions and Current Status

In report #0727, we noted that, overall, the City has adequate and proper processes and procedures to ensure a safe and reliable infrastructure. We also noted significant improvements and enhancements had been and were being made in regard to accounting for and tracking infrastructure. We reported installations of new infrastructure met federal and state requirements and expansions and replacements were planned and funded. We reported an effective public protection program was established. However, we also identified areas where improvements and enhancements were needed. As a result, we recommended that:

- A project management plan be developed to assist in the refinement of the Gas Utility's geographic information system (GIS) as part of the on-going "Automation Implementation" capital project;
- Pipe stored at the City's Municipal Supply Center (MSC) be better protected from environmental elements;
- An additional isolation valve be installed at one of the City's 18 regulating stations, and the integration of other regulating station isolation valves into the GIS;
- The cathodic protection system (protects underground metallic pipe and components from corrosion) be tested at the required frequencies and intervals, and records of those tests be better documented;
- Training be enhanced for non-Gas Utility staff inspecting gas service lines for atmospheric corrosion;
- Grade 2 and 3 gas leaks (which do not represent immediate threats to public safety) be timely repaired, and better records be maintained to track and monitor the status of leaks and related repairs;
- Critical infrastructure valves be designated in the GIS;
- Upon completion of a system upgrade, Station 21 staff (satellite City utility facility) be trained in their expected roles in monitoring system pressures, and system alarms at the facility be reestablished;
- Emergency notification dispatches and responses be better documented; and
- Documentation be improved in other areas, including, for example, pipe specifications, reorder points and quantities, atmospheric corrosion, and valve inspections.

Twenty-seven action plan steps were developed to address the identified issues. Of those 27 steps, 26 were due for completion as of March 31, 2009. As shown below in Table 1, 21 of those 26 steps were completed prior to the current follow-up period (October 1, 2008, through March 31, 2009). For the five additional steps due for completion as of March 31, 2009, Table 1 shows four have been completed and the other step deferred until a key employee position is filled.

Table 1
Action Plan Steps from Audit Report #0727
Due as of March 31, 2009, and Current Status

Action Plan Steps Due as of March 31, 2009	Current Status
Enhance records used to account for and manage gas infrastructure	
Gas Division within the Underground Utility	
• With the assistance of ISS, a project management plan will be established for the GIS that (1) identifies tasks and actions remaining to be completed, (2) prioritizes those tasks and actions, (3) establishes completion goals (dates), and (4) identifies and allocates resources needed to complete those tasks/actions.	♦ In the initial audit, we described various planned and ongoing refinements to enhance the accuracy, completeness, and usefulness of the GIS, as well as enhance staff's ability to manage and monitor gas infrastructure. We acknowledged these refinements were ongoing and being funded through the "Automation Implementation" capital project. Examples of those planned and/or on-going refinements included: – Identifying and adding to the GIS existing valves and mains not reflected in that system. – Recording additional attribute data in the GIS for infrastructure components. – Referencing and/or linking applicable construction, inspection, and engineering documents to gas mains reflected in GIS. – Adding non-primary infrastructure components (e.g., test stations) to GIS.

	To facilitate completion of the refinements, we recommended a formal, documented project management plan be developed to help staff ensure appropriate tasks and actions are identified, prioritized, and timely completed, and necessary resources identified and allocated. To date, no project management plan has been developed. Management responded that development of that plan has been delayed until the currently vacant position of "Manager of Underground Utilities Technical and Business Development" is filled. When filled, that position will address not only this issue, but also other issues and tasks applicable to the Underground Utility Gas, Water, and Sewer Divisions. Accordingly, management indicated this action plan step likely would not be completed prior to the end of this calendar year (2009). We acknowledge these circumstances and will follow up on this action plan step in a subsequent follow-up engagement.
Ensure proper materials are obtained and safeguarded	
Gas Division within the Underground Utility	
• In conjunction with the Municipal Supply Center (MSC), a cost efficient method will be identified to protect stored polyethylene pipe and related fittings from direct sunlight.	✓ In the prior audit follow-up, we acknowledged applicable fittings were now being stored inside and a new roof was placed over the shed used to store coils of polyethylene pipe. We also acknowledged most stored lengths of pipe were primarily "black" polyethylene that is resistant to degradation from direct sunlight. However, we noted the 6-inch diameter polyethylene pipe currently in inventory and stored uncovered in the open yard was "yellow" pipe, which is susceptible to degradation from direct sunlight. In the prior follow-up, we recommended management replace that 6-inch pipe with black pipe, or if replaced with yellow pipe, the pipe be stored in a manner that protects it from direct sunlight. In our current follow-up, we found the 6-inch yellow pipe stored in the open yard had not been replaced. Discussions with knowledgeable Underground Utility staff indicate because of the prolonged exposure to direct sunlight, that 6-inch yellow pipe is no longer acceptable for use in the City's gas infrastructure system. Underground Utility and MSC staff indicated this pipe would not be used for the City's gas infrastructure. They indicated pipe ordered in the future will be black pipe or, if yellow pipe, will be adequately covered to protect it from direct sunlight. We recommend the Underground Utility and MSC follow through with those plans.
• Updated pipe specifications will be provided to the MSC for all pipe materials and sizes.	✓ Completed in a prior period.
• Appropriate reorder points and quantities will be determined and provided to MSC.	✓ Completed in a prior period.

Municipal Supply Center (MSC)	
• In conjunction with Gas Utility staff, a cost beneficial method for protecting stored polyethylene pipe and fittings from direct sunlight will be determined. Upon that determination, the pipe and fittings will be stored accordingly.	✓ This action plan step is considered completed as described in the second step in this table.
• The PeopleSoft Financials system will be updated upon receipt of updated pipe specifications from the Gas Utility.	✓ Completed in a prior period.
• Upon receipt of recommended quantities from the Gas Utility, reorder points, quantities, and suggested maximum inventory levels will be adjusted in the PeopleSoft Financials system.	✓ Completed in a prior period.
Ensure proper valve placement and records for regulating stations	
Gas Division within the Underground Utility	
• For the one regulating station, constructed subsequent to 1974 and identified on audit as not having an isolation valve located no more than 500 feet upstream from the station, an additional valve will be installed in accordance with PSC requirements.	✓ Completed in a prior period.
• The Gas Utility will ensure isolation valves for other regulating stations (i.e., stations not selected for audit) are properly located in accordance with PSC regulations. Additional valves will be installed at those other stations if warranted.	✓ Completed in a prior period.
• The three applicable regulating station isolation valves will be incorporated into the Gas Utility GIS.	✓ Completed in a prior period.
Ensure proper cathodic protection for metallic mains and service lines	
Gas Division within the Underground Utility	
• Testing of the sacrificial anodal system, rectifiers, and interference bond will be conducted at the required frequencies. All testing and related actions will be properly and adequately documented (i.e., test dates and results and repairs when applicable).	✓ Completed in a prior period.
• Gas Utility Maintenance Division management will periodically obtain and review records of tests performed to ensure applicable staff is performing and documenting required testing of the sacrificial anodal system, rectifiers, and interference bond.	✓ Completed in a prior period.
• Complete and accurate records of each test station established for the cathodic protection system will be prepared and maintained. Those records will clearly identify for each test station the area and system component (interconnected main, isolated main, rectifier, etc.) covered.	✓ Completed in a prior period.

Properly and timely identify and address atmospheric corrosion	
Gas Division within the Underground Utility	
• In the event non-Gas Utility staff continues to be assigned responsibility for identifying and reporting instances of atmospheric corrosion, additional and appropriate training will be provided to that staff in regard to proper identification of corrosion. As a quality control measure, knowledgeable Gas Utility staff will selectively follow up on efforts by the non-Gas Utility staff in their identification of corrosion.	✓ Completed in a prior period.
• The PeopleSoft Customer Information System (CIS) will be used to document and track all instances of identified atmospheric corrosion.	✓ Completed in a prior period.
• The processes and methods employed to identify, report, and monitor atmospheric corrosion will be documented in formal written procedures. Those procedures will address, at a minimum: (1) definitions of atmospheric corrosion and examples of instances that should be addressed and repaired, (2) staff assigned responsibility for conducting the inspections and making needed repairs, (3) frequency of inspections, (4) methods and timing of inspections, (5) time standards for addressing and repairing or otherwise disposing of reported instances, and (6) methods for recording and tracking identified corrosion and related dispositions.	✓ In December 2008, the Gas Division of the Underground Utility finalized the "Corrosion Control" portion of its Gas Utility Operations Manual. In regard to atmospheric corrosion, we found the procedures addressed: – Explanations and examples of where atmospheric corrosion is most likely to occur. – Methods for detection (i.e., primarily visual inspection) and methods to access areas to conduct appropriate visual inspections. – Staff responsible for conducting the inspections (staff assigned to the corrosion control and leak survey functions, with potential assistance from other employees such as meter readers). – Frequency of inspections (every three years the entire system should be inspected). – Timing of inspections (primarily during cathodic protection surveys, which is a leak detection process). – Methods for recording and tracking identified instances of corrosion. Overall, these procedures appear comprehensive and adequate.
Ensure gas leaks are timely and properly addressed	
Gas Division within the Underground Utility	
• Applicable staff will be reminded that all gas leaks will be repaired in a timely manner. To facilitate repair, Gas Utility Maintenance Division management will obtain and review periodic reports that reflect the status of all identified leaks.	✓ Completed in a prior period.
• PeopleSoft CIS field activities and orders will be used to document, track, and record the repair of all identified leaks. Actions taken (e.g., repairs) will be timely recorded in that system.	✓ Completed in a prior period.

Ensure other required inspections are performed	
Gas Division within the Underground Utility	
• Upon completion of applicable hydraulic modeling, critical valves (including isolation, key, and other critical designations) will be accurately and clearly designated in the Gas Utility GIS.	✓ Completed in a prior period.
• Valve and regulating station inspection records will be properly and adequately completed and imaged into the City's Electronic Data Management System (EDMS) for storage. The imaged documents will be adequately indexed so as to allow efficient identification and retrieval of inspection documents for a specific valve(s) or regulating station(s).	✓ Completed in a prior period.
Ensure adequate monitoring of system pressurization	
Gas Division within the Underground Utility	
• Upon completion of the Supervisory Control and Data Acquisition (SCADA) system upgrade, Gas Utility staff will (1) provide appropriate training to Station 21 staff as to their expected roles and assigned responsibilities and (2) reestablish meaningful system alarms at Station 21 that indicate potential system over or under pressurizations. (NOTE: Station 21 is a satellite utility facility that, among other things, receives and dispatches emergency calls after normal working hours. Station 21 staff is also available to monitor gas flows on behalf of the Gas Utility.)	✓ Completed in a prior period.
Ensure appropriate and timely emergency responses	
Gas Division within the Underground Utility	
• Gas Utility staff responding to reported gas emergencies will be reminded of the requirement to properly and timely document their responses and actions taken in regard to the emergencies. Those responses/actions will be recorded in the PeopleSoft CIS through completed field activities/orders and also recorded in the new MOBILE Work Management System through a system interface.	✓ Completed in a prior period.
Station 21	
• Station 21 staff will be reminded of the requirement to create and dispatch a PeopleSoft CIS field activity/order to the Gas Utility for each gas emergency notification received, regardless of whether a verbal dispatch was also made. In addition, CIS reports will be periodically generated and reviewed by supervisors to ensure the accuracy and documentation of field orders created by Station 21 staff and to assess staff performance.	✓ Completed in a prior period.

Ensure accurate and clear performance measure reporting	
Gas Division within the Underground Utility	
• Appropriate support for reported performance measures will be retained for a minimum of three years after the measures are initially reported.	✓ Completed in a prior period.
• Calculations and determinations of performance measures will be reviewed by independent staff to ensure measures are proper and accurate.	✓ Completed in a prior period.
• Appropriate language will be used to clarify what the "emergency response" performance measure represents.	✓ The Gas Division and DMA Budget Office provided evidence that the name of the performance measure has been revised to "emergency leak for cut lines." That renamed measure more clearly demonstrates it pertains just to response times resulting from accidental cuts (as measured by standard "cut line" reports), and not response times relating to other leak emergencies not included in this measure (e.g., response times to potential or suspected leaks as called in by customers).

Table Legend:

- • Issue to be addressed from the original audit.
- ✓ Issue addressed and resolved.
- ♦ Issue not addressed to date.

Conclusion

Table 1 above shows 21 action steps were completed in a prior period, and management completed four of the five additional action plan steps due as of March 31, 2009. As described in the table, completion of the one remaining step has been deferred until a vacancy in a key position is filled.

One additional remaining action plan step, which is not due for completion until a subsequent period, is incorporation of the City of Midway gas infrastructure into the SCADA system.

We will follow up on those two remaining action plan steps in our subsequent follow-up engagement.

We appreciate the cooperation and assistance provided by Underground Utility and MSC staff during this audit follow-up.

Appointed Official's Response

City Manager:

I am pleased with the results of this audit follow-up. The compliance rate reflects management's commitment to internal control and enhanced efficiency and effectiveness. I thank the audit staff for their assistance in improving our operations.

Copies of this audit follow-up #0914 or audit report #0727 may be obtained from the City Auditor's website (http://talgov.com/auditing/index.cfm) or via request by telephone (850 / 891-8397), by FAX (850 / 891-0912), by mail or in person (Office of the City Auditor, 300 S. Adams Street, Mail Box A-22, Tallahassee, FL 32301-1731), or by e-mail (auditors@talgov.com).

Audit follow-up conducted by:
T. Bert Fletcher, CPA, Sr. Audit Manager
Sam M. McCall, Ph.D., CPA, CGFM, CIA, CGAP, City Auditor