JACOBS CONSULTANCY

Puget Sound Energy
Gas Safety Audit
Section 7 - Auditability of Records

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JACOBS Consultancy

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Auditability of Records

7.1 Introduction

7.1.1 Objective and Scope

The objective of this task was to conduct a review of Puget Sound Energy's (PSE) methods for tracking and documenting work for compliance auditing by both PSE and the Washington Utilities and Transportation Commission (UTC or "Commission"). This effort focused on the records that are required to be maintained to demonstrate compliance with all requirements of PSE Gas Operating Standards (GOS), Washington Administrative Code (WAC) and the Code of Federal Regulations (CFR). This review involved an examination of PSE and their service providers' (SP) records management policies, procedures and systems. Specifically, we reviewed how PSE documents work for maintenance programs and compliance programs as well as the quality assurance audits conducted to ensure proper records management. Our findings are listed under the following headings:

PSE Records Management Practices

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- Maintenance Programs
- Compliance Programs

Service Providers Records Management Practices

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- Locating Service Providers

Records Management Systems

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- Leak Management System
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- PCAD
- Meter Data Warehouse

- Access/Excel Databases
- PSE Maps
- Paper Records

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- PSE QA&I Audits of Records
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7.1.2 Background

On March 3, 2008, PSE and the staff of the Washington Utilities and Transportation Commission reached a settlement agreement in which PSE concurs there were violations of PSE's standards manual by certain Pilchuck employees which constituted violations by PSE of Commission rules regarding accuracy of records.

As part of the settlement agreement, PSE was required to establish auditable records of each PSE employee and each PSE contractor employee who performs leak repair or leak surveillance work. This may include recording on their timesheets each PSE leak number they performed work on or other such means to establish supporting documentation to the completed leak work order.

PSE was also required to implement procedures to assure its leak work orders are numbered sequentially, whether those leak work orders are completed by a PSE employee or a PSE contractor. Finally the UTC mandated PSE to make changes to its leak records system to implement fraud prevention measures, and PSE agreed to investigate use of a paperless system.

PSE and UTC have contracted Jacobs Consultancy Inc. to conduct a third-party audit of PSE's mandated gas safety program. Since inaccurate or unclear records can adversely impact the safety of the gas system, the UTC included, in the safety audit, a review of the methods PSE employs to track and document work that allow for auditing of such work for compliance by both PSE and UTC.

Auditability: The Definition Used in this Report

For the purpose of this report, “auditability” is defined as the ability to maintain records that can be examined for accuracy and verification. The records should not only be clear, consistent, current and accessible, but there should also be a structured record keeping methodology to meet compliance requirements.

In short, the UTC is interested in how PSE determines what was done, who did it and was it done correctly. PSE and its service providers have various practices and systems for documenting work for compliance and auditability. The following sections address these practices and identify certain findings.

7.2 PSE Records Management Practices

7.2.1 Background

Maintaining records is a CFR, WAC and PSE requirement. The Commission adopted by reference various provisions of 49 CFR 191, 192, and Chapter 480-93 WAC, pertaining to records management practices.

There are many sections of 49 CFR, part 192 that require records to be kept. However, these requirements will be enhanced with the pending Distribution Integrity Management (DIMP) regulations. Consequently, we present the DOT final rule on transmission Pipeline Integrity Management subpart 49 CFR §192.947, as a surrogate for what may be required for distribution piping in the near future:

An operator must maintain, for the useful life of the pipeline, records that demonstrate compliance with the requirements of this subpart. At minimum, an operator must maintain the following records for review during an inspection.

(a) A written integrity management program in accordance with 192.907;

(b) Documents supporting the threat identification and risk assessment in accordance with 192.917;

(c) A written baseline assessment plan in accordance with 192.919;

(d) Documents to support any decision, analysis and process developed and used to implement and evaluate each element of the baseline assessment plan and integrity management program. Documents include those developed and used in support of any identification, calculation, amendment, modification, justification, deviation and determination made, and any action taken to implement and evaluate any of the program elements;

(e) Documents that demonstrate personnel have the required training, including a description of the training program, in accordance with 192.915;

(f) Schedule required by 192.933 that prioritizes the conditions found during an assessment for evaluation and remediation, including technical justifications for the schedule.

(g) Documents to carry out the requirements in 192.923 through 192.929 for a direct assessment plan;

(h) Documents to carry out the requirements in 192.931 for confirmatory direct assessment;

(i) *Verification that an operator has provided any documentation or notification required by this subpart to be provided to OPS, and when applicable, a State authority with which OPS has an interstate agent agreement, and a State or local pipeline safety authority that regulates a covered pipeline segment within that State.*

Although these regulations refer to transmission pipelines, these guidelines are indicative of the nature and scope of distribution records which are to be kept by gas utilities in order to enable them to manage their facilities in accordance with Federal and state safety requirements.

The records requirements from WAC 480-93-018 are:

1) *Each gas pipeline company must maintain records sufficient to demonstrate compliance with all requirements of 49 CFR §§ 191, 192 and chapter 480-93 WAC.*
2) *Each gas pipeline company must give the commission access to records for review during an inspection and must provide the commission copies of records upon request.*
3) *Each gas pipeline company must maintain a list of forms and data bases, including examples where applicable, that specify what records the company maintains. Each gas pipeline company must make this list available to the commission upon request.*
4) *Each gas pipeline company must record and maintain records of the actual value of any required reads, tests, surveys or inspections performed. The records must include the name of the person who performed the work and the date the work was performed. The records must also contain information sufficient to determine the location and facilities involved. Examples of the values to be recorded include, but are not limited to, pipe to soil potential reads, rectifier reads, pressure test levels, and combustible gas indicator reads. A gas pipeline company may not record a range of values unless the measuring device being used provides only a range of values.*
5) *Each gas pipeline company must update its records within six months of when it completes any construction activity and make such records available to appropriate company operations personnel.*
6) *If a gas pipeline company believes a record provided to the commission is confidential as that term is defined in WAC 480-07-160(2), the gas pipeline company must follow the procedures in WAC 480-07-160 for designating and treating that record as confidential.*

As for gas leak records, WAC 480-93-187 specifies:

Each gas pipeline company must prepare and maintain permanent gas leak records. The leak records must contain sufficient data and information to permit the commission to assess the adequacy of the gas pipeline company's leakage program. Gas leak records must contain, at a minimum, the following information:

1) *Date and time the leak was detected, investigated, reported, and repaired, and the name of the person conducting the investigation*
2) *Location of the leak (sufficiently described to allow ready location by other qualified personnel)*
3) *Leak grade*
4) *Pipeline classification (e.g., distribution, transmission, service)*
5) *If reported by an outside party, the name and address of the reporting party*
6) *Component that leaked (e.g., pipe, tee, flange, valve)*
7) *Size and material that leaked (e.g., steel, plastic, cast iron)*
8) *Pipe condition*
9) *Type of repair*
10) *Leak cause*
11) *Date pipe installed (if known)*
12) *Magnitude and location of CGI readings left*
13) *Unique identification numbers (such as serial numbers) of leak detection equipment*

UTC's investigation of PSE's leak records has caused them to issue the following research question in association with this audit: Do the methods that PSE employs to track and document work allow for auditing of such work for compliance by both PSE and the UTC? (Research Question D: Executive Summary) This section discusses the PSE records management requirements and their current practices for some of the major maintenance and compliance programs.

7.2.2 Findings

7.2.2.1 PSE Requirements

- PSE Operating Standard 2500.0500 - Map and Records Requirements, which establishes the requirements for PSE's maps, drawings, and records of gas facilities, adopts the WAC records requirements discussed above. In addition to any records required to be maintained by other operating standards, maps, drawings, written procedures, and records that document the following information should be maintained:
    - Reporting of gas releases in accordance with Operating Standard 2525.1100
    - Design, construction, and testing of gas pipelines
    - Operations and maintenance of gas pipelines
- PSE Operating Standard 2425.1100 – Reporting Requirements to State and Federal Agencies describes reporting requirements to state and federal agencies, including telephonic and written notifications in the event of accidents, incidents, or hazardous conditions associated with the operation of PSE's facilities and Annual Reports on the Company's distribution and transmission systems.
- PSE Gas Operating Standards 2625.1300, Section 5 states: *permanent gas leak records shall be maintained for all pipeline facilities.* This is achieved by entering leak information into the LMS database and also by retaining paper records.
- In addition, most of PSE's gas operating standards has a Records Section, which specifies the records requirements pertaining to that standard, including what specific records should be maintained and where they should be stored. Although requirements to maintain sufficient records were added to many of the operating standards in the last revision of the Puget Sound Energy's 2008 Gas Operating Standards manual, it is not a standard section in every GOS.
- During the field observation portion of the project, it was observed that in certain instances service provider crews treated the standards book carelessly with little consideration or consistent placement in the vehicle. In addition, it was noted that some service provider crews kept standards updates and changes in the back of the book rather than the deleting old standards and replacing them with the revisions.

7.2.2.2 Maintenance programs

PSE maintenance programs are primarily managed by the Maintenance programs (MP) group. These programs are typically routine activities such as calibrations, patrols, surveys, and inspections to assess the performance of components of the natural gas delivery system. PSE provided a list of over 100 individual O&M activities in its Gas 2009 Budget Planning Document Draft. The maintenance programs fall under Group 1 of the budget, this is defined as "Routine

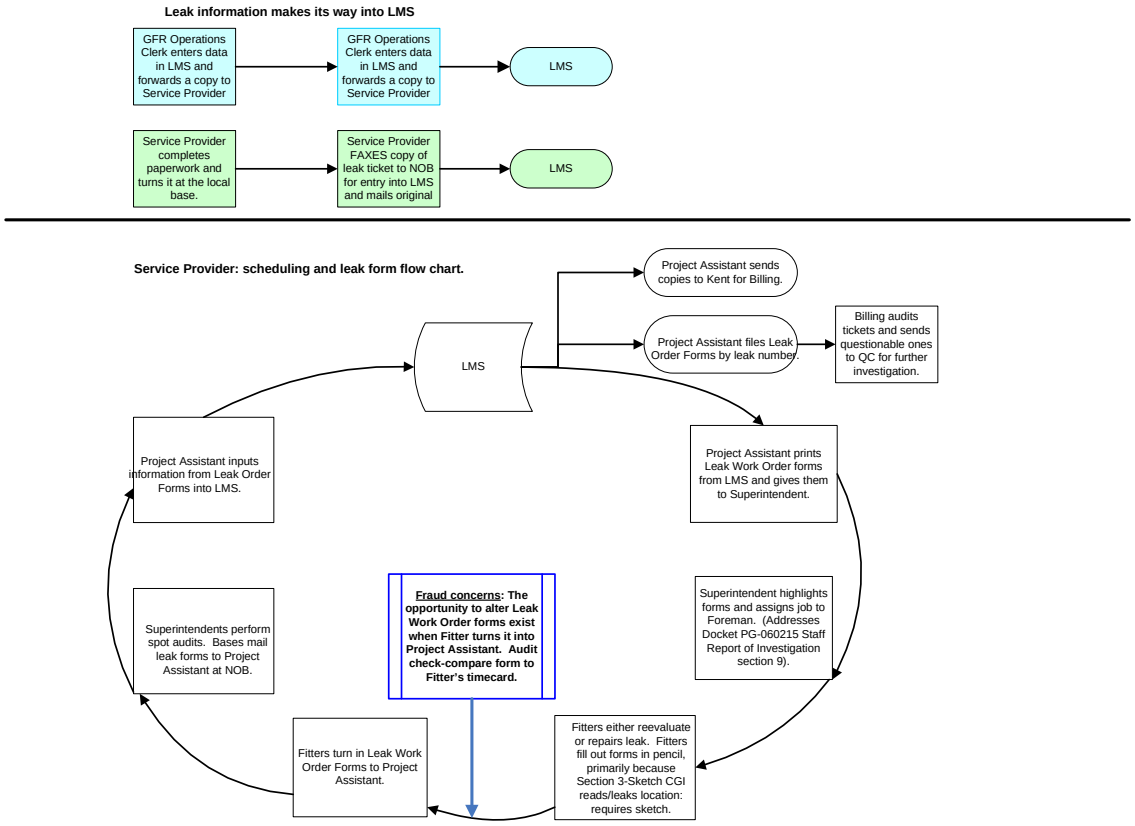
inspection and maintenance performed by gas operations, Heath, and Pilchuck. This work is required per state and federal code and/or PSE gas operating standards. Examples include: leak survey, cathodic protection (CP) system maintenance, and valve locate and operate activities[1]." The auditability of the records for the major maintenance programs is summarized in the categories below.

Leak Survey and Leak Management

- The leak management process involves multiple hands-offs and relies on manual recordkeeping, making it difficult to audit the process for compliance. The process flow chart below shows how leak information makes its way into the Leak Management System (LMS) and how the service providers manually process leak work order forms.

[1] Document Request 026

Figure 1 - Leak Information Flow Chart



Source: Document Request 118

- The leak-related work flow process, from the initial finding through the resulting monitoring or remediation action, was recently formalized in 2008. More readily traceable data processing for data integrity was an intended benefit of this formalized process. The resulting work process flow showed that not only are there hand-offs between PSE and the service providers, but there are ten different departments within PSE that can be involved in the complicated process[2]. A copy of this process flow chart can be found in Appendix A. Due to the compressed size viewing the process flow chart is difficult; however, it is immediately apparent that the complexity associated with the process as designed and implemented could present transaction difficulties and be prone to errors.
- As part of the 2008 Settlement Agreement with the UTC[3], PSE implemented a process improvement initiative in 2008 to modify its leak records system to implement fraud prevention measures and investigate the use of a paperless compliance system. PSE,

[2] Document Request 068
[3] Docket PG-060215

however, decided to not invest in a paperless system until it completes its assessment of Geographic Information System (GIS) technologies.

- The gas leak records system review resulted in the following implemented recommendations:
  - Improve process to schedule phantom leak assignments, enabling compliance with the “different person” requirement.
  - Improve managerial oversight by verifying the employee’s name, time and date of phantom leak evaluations.
  - Improve managerial oversight by identifying improper, after-the-fact modifications to leak work order forms.
  - Improve managerial oversight by verifying the proper maintenance of records.
  - Provide a sustainable employee training program regarding gas safety regulations, as outlined in the contractor quality control program.
- The recommendations resulting from the gas leaks process review and their implementation status are shown in Figure 2.

Figure 2 - Gas Leaks Process Improvement Recommendations

	Recommendation Description	Status
1	Retrain LMS users assigning leak order numbers.	Implemented
2	Analyze "canceled leak"/ duplicate leak metrics.	Implemented
3	Retrain LMS "pop up"/ information verification tool.	Implemented
4	Develop maintenance planning template.	Implemented
5	Superimpose leak data onto PSE system maps.	Implemented
6	Improve maintenance planning/ field staff communication.	Implemented
7	Develop field guide Process Flow Chart.	Implemented
8	Remove B (2) leaks from Operating standards.	Not Accepted
9	Manage data in PCAD with aid of access report.	Implemented
10	Retrain GFR on leak completion codes.	Implemented
11	Manage data in CLX and LMS.	Implemented
12	Develop early warning signals in LMS.	Implemented

Source: Document Request 118

The recommendation to remove grade B2 leaks from the gas operating standards was not accepted because the majority of grade B leaks are B2 and re-evaluation costs would increase if PSE managed them to B1 gas operating standards.

- To establish auditable leak records, employees of PSE and its contractors are required to document leak work on submitted timesheets, including the individual leak numbers. For PSE employees, this information is documented in the mobile workforce tool (PCAD). For Heath Consultants employees, this information is documented on the leak resume submitted each week by the survey personnel. For Pilchuck Contractors' employees, each leak number worked on is documented on the daily timesheet submitted[4].
- The PSE Quality Assurance & Inspection (QA&I) leak record audits are conducted quarterly to measure compliance. These audits also provide an avenue for analyzing the leak management process and detecting deficiencies in the recordkeeping practices. See Section 7.5.3 PSE QA&I Audits for further details.
- According to PSE personnel, the call hand-off and the hand-off from First Responder to Second Responder carry difficulties, e.g. information received regarding escape/leaks is not always accurate. Although PSE does not leave discovered Class A leaks unattended, this is exacerbated in other leak classes as the information has to be passed to the Second Responder through the Gas Operations Dispatcher and not directly. Given the information that has to be passed, there is sometimes a sense that the information accuracy has not been up to par.
- All leak records are maintained in the Leak Management System (LMS). Leak data was recently superimposed on PSE Maps to enhance leak visibility, provide material type and improve knowledge of all leak status. However, combining data without a GIS is very challenging. The corrosion engineers do maintain a separate log of information related to corrosion leaks, but the records are referenced by address and plats instead of by pipe segments.

Pipeline Marker Patrols

- All locations for the Pipeline Marker Patrols, as of 2003 requirements, were identified on operations maps and located with a Geographic Positioning System (GPS). These initial locations were added to an Access database and loaded onto PSE Maps as a mapping layer. Per WAC requirements, installations due to new pipeline installed by the SP are recorded on Form 3360, and the locations are recorded into the Access database by maintenance programs.
- The locations are patrolled by county on a five-year cycle by Heath Consultants, and any markers missing or damaged are replaced, re-GPS, and marked on the plat map. GPS

[4] Document Request 118

information is downloaded by Maps and Records and added to the Pathfinder software, Access database, and PSE Maps.

- There are no current plans to move this Access database to SAP, but maintenance programs agrees it is one of the databases that should be moved to SAP where it can be better managed.

Hard to Reach Locations (H2RL)

- Another name for the inside meter survey is the Hard to Reach Location (H2RL) survey, which includes a leakage survey, atmospheric corrosion inspection, service valve inspection and pipeline maker patrol (services). The locations of these surveys are identified through CLX, the Isolated Facilities Project, Gas First Response employees through inspection process, and Heath during atmospheric corrosion inspection.
- Locations are added to the Access database by maintenance programs. The surveys are printed and assigned by zip code by maintenance programs and given to Gas First Response (GFR) to complete the surveys in the field. Repairs are made on site by GFR or written up for GFR or SP. GFR office staff completes the survey ticket in the Access database and creates a SAP notification for the SP, if necessary.
- Maintenance programs pulls locations identified as “can’t get in” (CGI) from the Access database and sends access letters to customers; performs any cancellation of tickets; sends any high cost, non-immediate jobs to System Maintenance Planning via SAP; and monitors the Access database for due dates and compliance.
- Based on the data in the Access database, maintenance programs cannot query what type of work was done. If there was a leak repair, it is tracked in Leak Management System (LMS) but not tied to the H2RL database. This is one reason why the H2RL database has been requested to be moved to SAP.

Mobile Home Community Encroachment Surveys

- Mobile Home Community Encroachment Surveys is a multi-year maintenance program to assess the extent that mobile homes are encroaching on buried natural gas lines and to remediate pipeline encroachment and other maintenance issues such as idle risers.
- Maintenance Programs initiates and tracks the three-year patrol for each park, and GFR performs the actual patrol. Maintenance Programs forwards the patrol results to System Maintenance Planning to plan any necessary remediation activity.
- The data for the Mobile Home Community Encroachment Surveys are stored in SAP and included in the monthly compliance report generated by SAP. Maps are updated, if necessary, after the survey is conducted. Maintenance Programs reviews the survey

records when they receive requests for new services within mobile home communities and will process the request if the surveys show no maintenance/safety issues. Otherwise, maintenance programs forwards the request on to System Maintenance Planning to decide whether or not to approve the request.

Bridge and Slide Patrols

- This program addresses maintenance needs identified through ongoing patrols of pipeline facilities on bridges or near slide areas. For bridges, Quarterly Patrol reports of approximately 270 sites are reviewed for maintenance needs such as coating failures, missing hangers, and valve issues. These issues are investigated, prioritized, and re-mediated as necessary. For slides that may impact pipelines, Quarterly Monitoring reports are reviewed. An assessment is made and an Action Plan is implemented to ensure the stability of the area or the relocation of the pipeline based on these monitoring reports.
- Maintenance Programs initiate and tracks quarterly patrols for each site. GFR performs the actual patrol. Maintenance Programs documents the results of each patrol in SAP. System Maintenance Planning (SMP) regularly reviews SAP patrol records looking for maintenance/safety issues associated with bridge and slide locations. If Maintenance Programs is made aware of an unsafe condition (e.g. level 4 atmospheric corrosion), they will contact System Maintenance Planning immediately via phone or e-mail. This generally occurs up to five times per year. If there are questions about a particular patrol or the results documented in SAP, System Maintenance Planning will follow-up with the individual who performed the patrol (GFR), not maintenance programs.
- If, through review of site specific data and field observations, SMP feels a new patrol location needs to be created or an existing location should be patrolled more/less aggressively, that information will be communicated to Maintenance Programs, so they can adjust the patrol frequency. This occurs fewer than five times per year and is generally communicated via phone or e-mail.

Atmospheric corrosion inspections

- Outside (non-H2RL) atmospheric corrosion inspections are coordinated by Maintenance Programs, but are performed by Heath Consultants as of January 2009.
- Atmospheric corrosion inspections are performed at the same time as leakage surveys are conducted by Heath. Leakage Survey Plat and Operations Maps are provided to Heath and any atmospheric corrosion inspections needed to be performed prior to due date and not on the provided map will be issued in a list format with address, meter number and due date.

- The atmospheric corrosion inspection data is processed as follows:
    - Any location found to be a H2RL location is skipped and recorded on form provided.
    - Any location that Heath cannot get to is recorded on the "CGI" form.
    - Any location with level 3 or higher corrosion is recorded on a form and turned into Maintenance Programs weekly.
    - Level 3, 3SAI and 4 corrosion is recorded in Meter Data Warehouse (MDW) by Maintenance Programs.
        - CLX auto-generates an order via MDW.
        - Gas First Response Coordinator issues order out to GFR field employees prior to due date via PCAD.
    - Level 4 SAI corrosion is recorded into SAP by Maintenance Programs.
        - Service provider performs repair by due date.
- This program is in the development stages for processes, so it is still a paper-driven process. Compliance dates are monitored via the Business Warehouse (BW) and Gas Operations Compliance Database.

Valve Maintenance and Inspections

- Pilchuck conducts the service valve inspections that are required annually, not to exceed 15 months. These work orders are electronically generated yearly and Pilchuck prints their own work order.
- The inspection locations are identified through North American Industry Classification System (NAICS) codes in CLX, SP identification during the inspection process, GFR identification during H2RL inspection process, and various maps that identify locations facilities occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate per GOS 2575.1200 Section 3.2.6.1. The program data is added to the Access database by Maintenance Programs.
- The UTC Pierce County Audit last year included an audit of the valve records. The audit revealed there were a large number of valves past their due dates, and Pilchuck was not performing the inspections on time, due to lost paperwork and a lag in data entry. Since these inspections are managed by Pilchuck, it is difficult for PSE to monitor the timeliness of the inspections or determine if they are in the stack of completed inspections not entered into the database. To improve this process, service valve inspections have now been added to the monthly compliance report.
- Another major issue is that the information is stored in an Access database. The service provider pulls the work from the Access database, performs the inspections, performs

any repairs necessary prior to inspection, and enters completed data into the Access database. There has been a request for the database to be moved to SAP, but it has not received approval.

Pressure Regulator and Device Inspection and Testing

- The annual inspection and testing of pressure-regulating station and pressure-relief devices includes a thorough inspection to assess the proper operation of the regulators and overpressure protection, as well as an examination for atmospheric corrosion. The SAP system is used to schedule these maintenance activities. The pressure control technician performing the inspection notes the results on the paperwork and hands it over to an engineering assistant. The engineering assistant updates the facility in SAP and if necessary assigns a G1 notification to the SP to perform maintenance or repairs[5].
- It was reported that although design data sheets are available for district regulators, these are usually incomplete, or contain inaccurate (or superseded) data, particularly pipeline maximum allowable operating pressure (MAOP). The same is true of schematic drawings for district regulators; although a project was run in the mid 1990s to update all district regulator schematics; these have not been kept up-to-date since. These issues both cause difficulties in properly setting up regulators and/or protective devices. It was not clear where ownership of these items, or responsibility for their updating lay.
- As-built files are also not sent back to pressure control as requested and schematics are not kept properly on-site and not available on the laptop. Engineering has been having difficulties trying to get as-built schematics from contractors.

Continuing Surveillance

- As mentioned in the Continuing Surveillance report, continuing surveillance is an ongoing process performed during the course of construction, operations and maintenance activities, and the Blue Card form is used to report abnormal or unusual operating conditions on gas facilities.
- Depending on the facility, Blue Card work may either go to a specific maintenance program and is maintained by that program manager or the work is entered into SAP and tracked by Maintenance Planning. The Senior Engineering Specialist maintains a Web page where field people can check on the status of a Blue Card. There is no information that goes back to the person who initiated the Blue Card.
- After the Blue Card is submitted, the Senior Engineering Specialist reviews it to determine if it is an unsafe condition that needs to be reported immediately before

[5] Document Request 068

entering it into SAP. The Blue Card review is used to help with trending and determining if it is a nonstandard condition or requires additional attention. Then a notification with the scope, schedule, and budget is created to send to the service provider or Gas First Response (GFR). The Senior Engineering Specialist tracks the completion of the work.

- System Maintenance Planning is responsible for reviewing completed work orders (including leak repairs, maintenance, and other work), patrol records, leakage survey records, leakage history, and inspection records for abnormal or unusual operating and maintenance conditions on unprotected steel and polyethylene pipelines. This records review is part of the process conducted by the Senior Engineering Specialist to identify trends on the number and severity of issues. It is an on-going review to categorize work for budgeting purposes.
- Having maintenance data in numerous different formats and tracking systems working in silos makes it difficult to fully examine the overall system trends and monitor the integrity of the system for continuing surveillance.

7.2.2.3 Compliance Programs

Compliance programs fall under Group 2 of the Gas 2009 Budget Planning document, which is defined as "Work budgeted and planned for by System Maintenance Planning (SMP) typically in the form of formal compliance programs and commitments to the UTC. This work may be performed by gas operations, Pilchuck, or other third-party contractors. Examples include: Wrapped Steel Service Assessment Program (WSSAP), Isolated Facilities, and Integrity Management. Compliance programs also include new programs that are still in development such as Double Insulated Flange Mitigation[6]. The auditability of the records for the major compliance programs and compliance-related work requests is summarized in the categories below.

Wrapped Steel Service Assessment Program

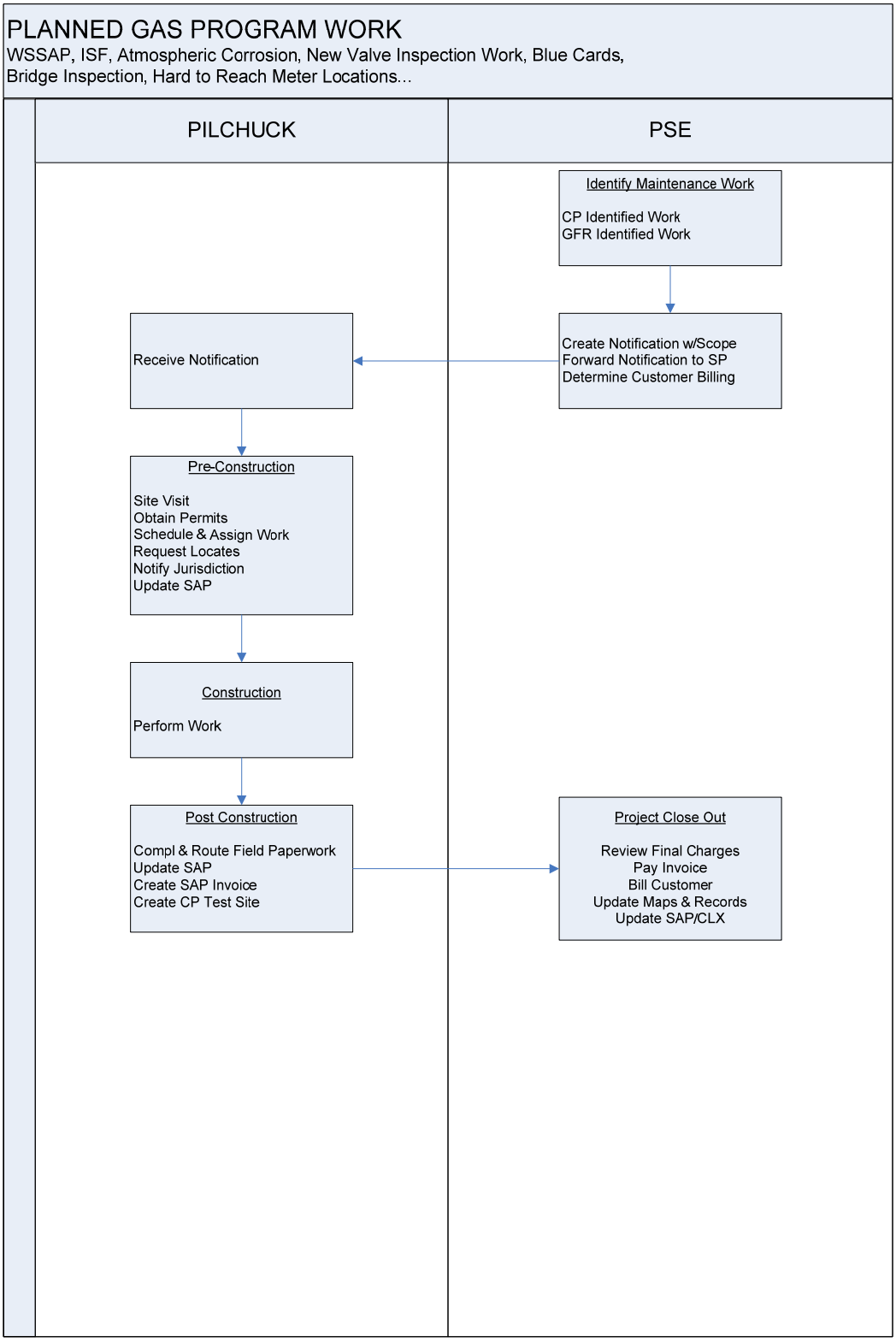
- The Wrapped Steel Service Assessment Program (WSSAP) is part of an agreement with the UTC to assess the condition of all wrapped steel services in the gas distribution system installed prior to 1972. System Maintenance Planning enters the assessment information into a risk model that classifies each service into a remediation category. Remediation may include replacement, additional leak survey, or standard operation and maintenance practices.
- WSSAP is a risk-based model that scores the probability of failure for each service. The database is made up of approximately 100,000 services of which, there are about 10,000 services that need to be replaced. PSE should finish Phase I of this initiative by

[6] Document Request 026

December 2010, but the program will continue to monitor and update the database into the future.

- Planned gas program work, such as WSSAP, is managed using SAP. The flowchart below shows the interface between PSE and the SP performing the work.

Figure 3 - Planned Gas Program Work Flowchart



Source: Document Request 054

Isolated Facilities

- The Isolated Facilities Program is part of a 2004 agreement with the UTC to identify all electrically isolated steel facilities that require cathodic protection to prevent them from corroding. This includes services, mains, extended utility facilities (EUF), and casings. After these facilities are identified, this program will ensure they are being monitored to verify the on-going effectiveness of the cathodic protection.
- Time-consuming maps and records reviews were required to identify the various isolated facilities. For example, there was an initial map review to identify known and candidate casing installations. Based on this assessment, PSE reviewed cathodic protection records for known casing installations and to ensure these sites are monitored as required. Then for candidate casing installations, PSE reviewed as-built records and other information to conclude whether a casing was installed and to ensure any locations with a casing was monitored as required.
- Any inaccuracies or discrepancies found during the maps and records reviews are forwarded to the Maps, Records, and Technology group.
- The three-year isolated facilities project also helps identify more hard to reach locations for the H2RL program, but the databases for the two programs are not linked.

Integrity Management

- Not only is PSE Integrity Management Program subject to periodic reporting to the DOT and regular audits by the UTC, but continual improvements are also a DOT regulatory requirement. Effective management of the Integrity Management Program will ultimately provide PSE with a systematic pipeline integrity management process that can be clearly demonstrated to any agency or the public.
- Based on risk profile data, PSE pipelines were segmented according to the different risk attributes along the pipeline. Each segment was then scored, and a corrosion assessment scheduled starting with the higher risk segments. A baseline schedule was established to inspect all 9.5 miles in HCAs (high consequence areas) over the subsequent seven years. During this schedule, each HCA is evaluated annually, possibly affecting the inspection schedule.
- Additionally, the concepts developed used by the Integrity Management Program are being applied to other areas of the gas system, such as the Wrapped Steel Service Assessment Program and the development of PSE's Distribution Integrity Management Program.
- PSE personnel would like the ability to better manage the data provided by vendors associated with Pipeline Integrity Management.

Work Requests

- Work requests submitted by Customer Field Service (CFS) representatives generally follow one of two paths. They are either processed by GFR or addressed by a combination of gas operations personnel and Pilchuck (simple, routine maintenance), or they are categorized under an existing maintenance program and forwarded on to System Maintenance Planning (SMP) for scoping, budgeting, and prioritization (complex, costly remediation).
- Over the past 15 months, SMP has worked to develop and implement new processes and tools for documenting, tracking, and communicating status of work requests that come in from CFS representatives and other gas operations personnel. This has been part of a larger effort to improve the visibility and status or work submitted by gas operations to SMP. These processes and tools do not include requests that are specifically addressed between GFR/Gas Operations and Pilchuck. Work requests (non-Blue Card) that come into SMP from CFS representatives/GFR primarily apply to three different programs: Mobile Home Community patrols, H2RL (Inside Meter Set survey), and Bridge and Slide patrols. Once a work request is submitted, SMP does the following[7]:
    - Reviews the request and follows up with individual who made the request, if more information is needed.
    - Logs the request into appropriate tracking spreadsheet or database.
    - Develops scope, schedule, budget, and SAP notification required to remediate the maintenance issue(s). This is typically done through discussions and meetings with multiple groups at PSE and its service providers. These groups typically include Gas System Engineering, CFS/GFR representative who submitted the request, and Pilchuck.
    - Communicates project details back to stakeholders including individual who submitted request.
    - Periodic updates to System Planning Website for projects currently in construction or for those set to go to construction in the next budget year. The intent of this step is to ensure Gas Operations personnel can see the current status of any active projects. Training on how to find project specific information was provided to GFR in 2008.
    - Communicates back to stakeholders when project is complete.

[7] Document Request 095

7.2.3 Conclusions

Various PSE operating standards establish the requirements for PSE's maps, drawings, and records of gas facilities, identify reporting requirements to state and federal agencies and describes how permanent gas leak records shall be maintained in the LMS database. Most Operating Standards have a records section which specifies the records requirements pertaining to that standard; however, some do not. During the field observation portion of the project, it was observed that some service provider crews treated the standards book carelessly with little regard to managing updates and change revisions. (See Recommendations 7.2.4.1 and 7.2.4.2)

Maintenance Programs

Maintenance programs are primarily managed by the Maintenance Programs group; and the associated work being completed by Gas Operations, Heath, and Pilchuck. The data connected with the various programs can be electronic or paper driven and the data stored in Access or SAP databases. A summary of the maintenance program data and related issues follows.

As part of the 2008 Settlement Agreement with the UTC, PSE implemented a process improvement initiative to modify its leak records system to implement fraud prevention measures and investigate the use of a paperless compliance system. The current Leak management process is complicated and involves multiple hand-offs between PSE and SP; in addition, up to 10 different departments within PSE can be involved, making it difficult to audit and more prone to errors. According to PSE personnel, the information received regarding escape/leaks from the call hand-off and the hand-off from First Responder to Second Responder is not always accurate.

Corrosion leak records are logged in a SAP database and are referenced by address and plats as opposed to pipe segments. To enhance visibility, leak data was recently superimposed on PSE maps to enhance visibility and knowledge. However, combining the data without a GIS is very challenging.

Pipeline Marker Patrols populate an Access database and are loaded onto PSE maps as a mapping layer. As new pipeline marker locations are added they are recorded into the Access database. Currently, there are no plans to move this Access database to SAP, where it can be better managed.

Hard to Reach Locations (H2RL) are maintained in an Access database. This inside meter survey includes leakage survey, atmospheric corrosion inspection, service valve inspection and pipeline marker identification services. However, the Access database can not be queried as to what type of work was done. For example, if there was a leak repair it is tracked in the Leak Management System. This database has been requested to be moved to SAP.

Mobile Home Community Encroachment Surveys data is stored in SAP and is included in the monthly SAP compliance report. When requests for service within the mobile home community are received they will be processed, if the survey shows no maintenance issues or if there are issues, they are forwarded to System Maintenance Planning for further review.

Bridge and Slide Patrols Survey results are maintained in SAP. System Maintenance Planning reviews the patrol records for maintenance and safety issues. System Maintenance Planning works closely with Maintenance Programs on changes to patrol frequency and directly with the GFR on questions concerning a particular site.

Since January 2009, atmospheric corrosion inspections are performed in combination with leakage surveys conducted by Heath. Depending on the level of atmospheric corrosion observed, the work required can either be a CLX-generated work request to be performed by PSE or a SAP-generated work request to be completed by a service provider. The Atmospheric Inspection Program is still a paper-driven process with compliance dates monitored through the Business Warehouse and Gas Operations Compliance Database.

Valve Maintenance and Inspections information is stored in an Access database. The service provider pulls the work from the Access database, performs inspections, completes any repairs necessary prior to the next inspection and enters the data into the Access database. The UTC Pierce County Audit in 2008 revealed a large number of service valve inspections performed past their due date as a result of lost paperwork and a lag in data entry.

Pressure Regulator and Device Inspection and Testing data are stored in the SAP system. It was also noted that district regulator design data sheets are usually incomplete or inaccurate and there are difficulties in getting the as-built schematics.

Continuing surveillance or Blue Card program data structure is difficult to fully examine due to the number of tracking systems and silos. Depending on the facility involved, Blue Card-generated work may either go to a specific maintenance program, where it is maintained by that programs manager or the work is entered into SAP and tracked by Maintenance Planning.

Compliance Programs

Compliance programs is work budgeted and planned for by System Maintenance Planning and the associated work being completed by Gas Operations, Pilchuck and other third-party contractors. The data connected with the various programs can be electronic or paper-driven and the data stored in Access or SAP databases. A summary of the compliance program data and related issues follows.

The Wrapped Steel Service Assessment Program, which is focused on wrapped steel services installed prior to 1972, utilizes a risk model to identify the probability of failure and designates services into specific remediation categories. The data connected with this program is maintained in SAP and LMS.

As part of the 2004 Settlement Agreement with the UTC, PSE implemented the Isolated Facilities Program. Data connected with this program is maintained in SAP.

Integrity Management for transmission pipelines, as required by the Pipeline and Hazardous Materials Safety Administration (PHMSA), requires segmenting pipelines according to different risk elements. Each segment is then scored and a corrosion assessment scheduled. PSE has extended the concepts developed in its Integrity Management Program to other areas of the gas system such as the Wrapped Steel Service Assessment Program and the development of the Distribution Integrity Management Program.

Work requests, if simple and/or routine, are processed by GFR and addressed by a combination of Gas Operations and Pilchuck, or if more complex are categorized under an existing maintenance program and forwarded to System Maintenance Planning. System Maintenance Planning will develop the scope, schedule, budget, prioritization and the SAP notification required to remediate the maintenance issue. For about the last year System Maintenance Planning has worked to develop and implement new processes and tools for documenting, tracking, and communicating the status of work requests. The data in connection with work requests is maintained in SAP.

7.2.4 Recommendations

7.2.4.1 Convert procedures and standard manuals to an electronic field format, or collect and redistribute manuals with current information and standardized bindings. Develop employee accountability and audit process for procedures and standards revision accuracy.

7.2.4.2 Create a Records Section in every Gas Operating Standard. If no records are required for the operating standard, clearly indicate no records required.

7.3 Service Providers Records Management Practices

7.3.1 Background

PSE's service providers are required to follow the records management practices mandated by PSE. Since so much of PSE's work is performed by its service providers, it is important that they document work for compliance and auditability as well. This section will discuss some of the findings pertaining to the service providers' records management policies, procedures, and processes.

Please see the Field Observation Section located in the Appendix for details regarding the findings associated with the records and documents resulting from the field reviews.

7.3.2 Findings

7.3.2.1 Construction Service Providers

- Most of the work performed by the service providers is paper-driven. The figures below show the typical forms/paperwork required for each work type, such as simple service, complex service, main and service replacements, and main leak repairs.

Figure 4 - Typical Forms/Paperwork Required For Simple Service Installation

Form	Who Completes	Action
Gas Field Order – Capital	Foreman	Data entered into SAP. Form is scanned and original remains in the Job Folder, filed in MRT.
Gas Service Order – D-4	Foreman	Form is scanned and filed in MRT.
Meter Information Tag	Foreman	Data entered into CLX. Original form sent to Meter Shop.

Source: Document Request 054

Figure 5 - Typical Forms/Paperwork Required For Complex Service Installation

Form	Who Completes	Action
Gas Field Order – Capital	Foreman	Data entered into SAP. Form is scanned and original remains in the Job Folder, filed in MRT.
Object List	Foreman	Data entered into SAP. Form is scanned and original remains in Job Folder, filed in MRT.
Gas Service Order – D-4	Foreman	Form is scanned and filed in MRT.
Meter Information Tag	Foreman	Data entered into CLX. Original form sent to Meter Shop.
As-Built Drawing	Foreman	Drawing is scanned and original remains in the Job Folder.

Note: A project may contain multiple of each of the above forms, depending on the scope of the work.
Source: Document Request 054

Figure 6 - Typical Forms/Paperwork Required For Main and Service Replacement

Form	Who Completes	Action
Gas Field Order – Capital	Foreman	Data entered into SAP. Form is scanned and original remains in Job Folder, filed in MRT.
Object List	Foreman	Data entered into SAP. Form is scanned and original remains in Job Folder, filed in MRT.
Gas Service Order – D-4	Foreman	Form is scanned and filed in MRT.
Meter Information Tag	Foreman	Data entered into CLX. Original form sent to Meter Shop.
As-Built Drawing	Foreman	Drawing is scanned and original remains in the Job Folder.
Exposed Pipe Condition Report	Foreman	Data entered into SAP. Original filed in MRT.
Continuing Surveillance Form	Foreman	Form routed to maintenance planning for development of remediation plan.
Leak work order	Foreman	Data entered in LMS. Original filed with leak folder.

Source: Document Request 054

Figure 7 - Typical Forms/Paperwork Required For Main Leak repairs

Form	Who Completes	Action
Gas Field Order – O&M	Foreman	Data entered in SAP. Original filed with leak folder.
As-Built Drawing	Foreman	Filed with leak folder.
Leak work order	Foreman	Data entered in LMS. Original filed with leak folder.
Exposed Pipe Condition Report	Foreman	Original filed with leak folder.

Source: Document Request 054

Figure 8 - Description of Typical Forms

Form	Description	Comments
Gas Field Order – Capital	Generated from SAP. Provides scope of work for capital work performed and reporting of material usage and property units installed/retired.	A single project may have multiple capital and O&M orders, depending on the scope of work.
Gas Field Order – O&M	Generated from SAP. Provides scope of work for O&M work performed. Captures materials usage.	
Object List	Reports meter information	
Gas Service Order – D-4	Generated from SAP. Records information specific to each service installation, including material, size, test information, tie-in location, and other dimensions associated with the service. A small diagram is also provided.	Each address served requires a separate D-4.
Meter Information Tag	Records information specific to the meter being set (meter number, initial read, date, pressure, etc.). Information required for customer account in CLX.	Each individual meter requires a separate Meter Information Tag.
As-Built Drawing	For more complex installations (complex services, main extensions, main replacements) a detailed design drawing is prepared. The as-built drawing records key dimensions, material usage, test information, etc., about the installation.	
Exposed Pipe Condition Report (EPCR)	Form required whenever buried metallic piping is exposed. Records condition of coating and surface of pipe, if exposed.	
Continuing Surveillance Form (Blue Card)	Form used for reporting abnormal or unusual operating conditions on gas facilities.	
Leak work order	Generated from Leak Management System (LMS). Documents the monitoring/repair of leaks.	For main replacement projects, there may be multiple Leak work orders to be completed, depending on the number of identified leaks on the section of pipe being replaced.

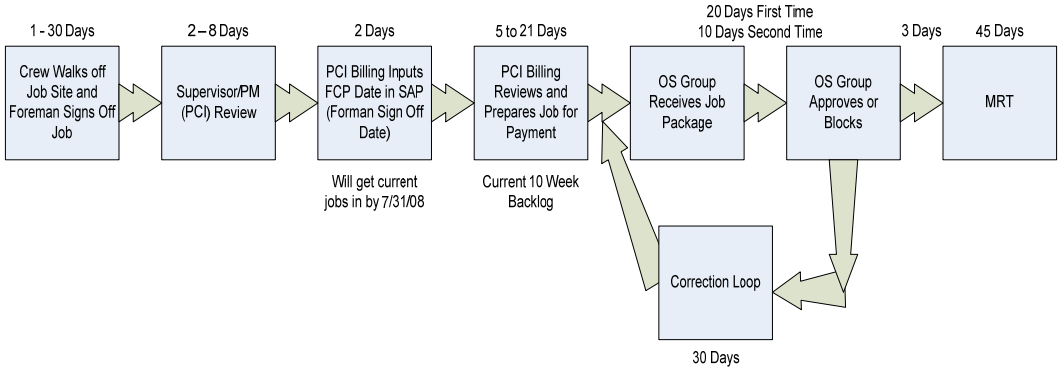
Source: Document Request 054

- Although the service providers have Internet access to some PSE systems, they do not have access to the same level of system information and mobile technology that is provided to PSE field resources. This appears inconsistent with the aims of the service provider model and due to the additional time required to obtain system information potentially has safety implications.
- Pilchuck uses an Access database for tracking projects and has a PSE-owned computer connected to PSE's SAP program. Other technology includes AutoCAD, cell phone, and radio communications.
- Paperwork is received from the foreman. It is then passed to materials for tracking and returned to Pilchuck's Billing group where it is checked and reviewed against PSE standards for compliance, i.e. they check the D-4 card and the as-built drawings. They then complete the compilation of the bill for dispatch along with the work package to PSE.
- The PSE Operations Specialists (OS) audit and check the bills and associated documents for completeness and accuracy when they come in from the SP. The system involves paper copies of all documents, including those inputted via electronic systems, and is reviewed against a checklist that the OS has to ensure that all expected is there and is complete and that materials used are checked against the as-builts for accuracy.
- Billing and accompanying documents can be held up from approval, processing and payment because of the service provider's failure to provide all required information. Recently, PSE has instituted a requirement that where errors or omissions appear on the paperwork, these have to be sent back to the crew in the field to have the correction made and initialed by the foreman. PSE believes it is necessary to do this in all cases to be sure that the correction could be relied on as it came directly from the person who made the error in the first place. This sometimes delays new facilities from being input into PSE's records including Mapping. Additional information regarding the required paperwork for billing can be found in the contracts report.
- For the typical OS process, PSE uses different size folders to distinguish gas from electric. Most information is entered into SAP by job number, budget type number of billing units, etc. This is checked against the paperwork. Most of the errors encountered involve lengths of pipe and materials issued as opposed to those shown on the as-builts. There is periodic reporting based on error codes which is shared with the SPs to let them know where the problems are and to help them deal with trends.
- Delays associated with as-built drawings create risk for those who need the information, for example:
- The GFR technician, when responding to incidents near a newly installed pipeline for which there is no record.

- The third-party excavator when the pipeline locator cannot properly mark facilities out because he/she is unfamiliar with a recent system expansion.
- In late 2008, a team of stakeholders was formed to review and improve the gas construction records (as-built) processes and comply with WAC 480-93-018 (5): *Each gas pipeline company must update its records within six months of when it completes any construction activity and make such records available to appropriate company operations personnel.*
- The Gas Pipeline Construction Records initiative team has verified the current process shown below and is analyzing the process using available metrics.
    - Prior to this initiative, metrics did not exist.
    - Mapping Records and Technology Department (MRT) and SAP support created a report to serve as a job tracking mechanism. After several iterations, the current report lists projects by field completion date (FCD) and maintenance activity type (MAT) code- 107 (new construction) and 109 (system improvement).
    - While the process logically flows: 1. field work, 2. operations specialist's review and 3. MRT, the team will work backwards when analyzing it. It will measure and improve performance in MRT first, then operations specialist's review next, and field work last.
    - For example, MRT recognized that while completed work was not recorded in SAP, it was recorded in the Map Tracking System. This was corrected, and now they are able to measure WAC 480-93-018 compliance.

The next step in this initiative is for MRT and operations specialist to review SAP report data to identify root causes of process weaknesses.

Figure 9 - Gas Pipeline Construction Records (As-Built) Process



Source: Document Request 048

- In an effort to control the above process and reduce the risk of unapproved designs being implemented, SAP is now being used to control design approval. This is intended to track changes and provide an audit trail of their approval. This system is currently being trialed, in a coordinated effort between north and south corrosion control teams, and the construction SP Pilchuck, who provides associated excavation services.
- Another significant area of interface with service providers is information flowing back on pipe condition. On any occasion that PSE pipework is exposed, either incidentally or as part of a planned scheme of work, an 'exposed pipe condition report' should be completed. The accuracy/completeness of these forms and whether a report is generated in all appropriate circumstances is an area of concern – it is also not clear whether this is part of the service provider QC program. This information should provide a good source of continuing surveillance of the system.
- The service providers believe recordkeeping has improved but can get better. Some "growing pains" have been experienced in collecting data to make sure it is "accurate and correct." Tracking data and recordkeeping can be improved to derive more accurate and correct information more consistently throughout the organization.
- From our field observations, we noted:
    - Service provider crews have repetitive information on their paperwork. In some instances this repetitive work can amount to requiring nine signatures from the crew leader for a single job.
    - Existing as-builts have location and pipe-size errors that cause construction time loss in the field.

7.3.2.2 Locating Service Providers

- PSE reports that the situation with line marking /surveillance shows a continuing pattern of risk, with a poor audit trail, and a lack of improvement over time. Problems with the locating services have led to a poor relationship and there appears to be a lack of interest from the service providers in engaging in finding ways to improve the situation.
- As mentioned in the Continuing Surveillance report, damages due to the locating service providers' performing inaccurate locates over the last three years have increased. Outdated or inaccurate maps could be contributing to the high number of inaccurate locates.

7.3.3 Conclusions

The service providers' records are still very paper-driven, which makes it more difficult to verify what was done, who did it, and was it done properly. The technology used by the service providers is also out-dated compared to what is available for PSE employees. This appears to contradict the service provider model.

Service providers initiate numerous documents to collaborate their time, materials and work completed. Once received it passes through several groups within Pilchuck and eventually along with the invoice, gets entered into SAP. PSE Operations Specialists audit and check the invoices and associated documents for completeness and accuracy. The verification system involves paper copies of all documents, including those included via electronic systems. Where errors or omissions are encountered, the paperwork is sent back to the foreman in the field to have the correction made. The process for auditing Potelco is essentially the same as that for Pilchuck. PSE states its audit of Heath did not focus on these relationships between construction documentation and billing, as it was not an issue with leak surveying. (See Recommendations 7.3.4.1 and 7.3.4.2)

Late in 2008 a team of stakeholders was formed to review and improve the as-builds process. After analyzing the process using available metrics several improvement initiatives are underway.

7.3.4 Recommendations

7.3.4.1 Review construction service provider foreman generated paperwork for streamlining opportunities and implement recommendations.

7.3.4.2 Review all paper forms used by PSE field operations staff and the service providers to determine if they are still relevant and reduce the amount of manual recordkeeping.

7.4 Records Management Systems

7.4.1 Background

PSE and its service providers use numerous data collection systems to document work for compliance and ensure its gas system operates safely. This section discusses some of the major IT systems used to store the pertinent records.

7.4.2 Findings

7.4.2.1 SAP

- PSE uses Systems Applications Products (SAP) software program for its financial accounting, property accounting, human resources management, and work order management, including aspects of its pipeline safety maintenance programs. Compliance-driven work orders for inspection or maintenance are automatically queued to field personnel on a batch basis in advance of the required compliance date. It is up to the field personnel to prioritize their own workload.

- As part of the King/Pierce County Settlement Agreement in 2005, PSE implemented changes to its SAP work management system to enhance PSE's ability to identify potential missed inspection intervals before they happen. The SAP process improvements focused on the SAP modules which are used for managing gas system work orders. According to the SAP Process Improvement Final Report[8], changes were implemented in the following areas:

    - Identify Equipment and Functional Locations That Are Difficult to Inspect – This SAP enhancement added a special flag and associated task description field to each equipment and functional location entry to identify inspections that require significant lead time due to municipal requirements, traffic issues, geographic issues or special equipment. Previously, if the employee does not realize the extended lead-time issues, then it is possible to miss the compliance date.

    - Equipment Re-classification – This SAP improvement developed a periodically generated report that identified equipment that does not have the appropriate maintenance plan associated to it and a warning message was added that remind the user to update the maintenance plan when the equipment classification is changed. Previously, re-classified equipment may not have the correct associated maintenance plan, which specifies compliance-driven inspection requirements.

[8] Document Request 107

- Required Retirement Date – This SAP enhancement required the "Retirement Date" field to be completed in order to save a "Removed from Service" change to the equipment record and SAP can be queried to provide a report of any maintenance plans that are associated with retired equipment. Prior to this SAP enhancement, inspection work orders for retired equipment created the appearance of non-compliance during audits.
- Emergency Section Valve Status – This enhancement provided better tracking of emergency section valves status within SAP by tracking changes to the emergency section valves status field. During audit activities, it was sometimes difficult for PSE to show whether a valve was or was not in emergency section valves status during a particular time frame.
- Work Order Notification Required End Date Monitoring – This SAP enhancement resulted in reports being generated for each supervisor to use to flag jobs that will be coming due in the near future. Although these reports have already proven useful to supervisors to improve their ability to consistently complete inspections and remediation work on time, PSE continues to experience challenges that are the result of the difficulty in obtaining certain long lead permits, increasingly burdensome permit requirements in many municipalities, complex and length CP troubleshooting and remediation, and other issues.
- Gas Facility Audit Reporting – This SAP enhancement resulted in the creation of an automated report that queries all equipment and functional locations for a variety of issues that can create compliance challenges, including new equipment not inadvertently left in "Design" status after construction is complete but rather changes to "Construct" status. Maintenance plans for equipment in "Construct" status are not only created but also activated as required to begin the automatic work order generation that drives compliance-mandated Inspections and maintenance.

- The Delivery Asset Data Management Optimization (DADMO) project during 2004-2006 helped manage and improve the decision processes for maintenance and capital work. As part of this project, some of the maintenance and inspection systems were migrated to SAP. The existing systems at the time were stand alones and did not share information. The one system approach allowed the following[9]:
  - Duplicate data entry reduction
  - Consistent data
  - A common source for data reporting
  - Better IT application support
  - Knowledge and training on one system (SAP)

[9] Document Request 028

  - Allows access to data for more users
  - Proven maintenance software system

- SAP's Business Warehouse (BW) was also designed and implemented as part of the DADMO project. BW is a SAP reporting tool that report and analyze data from SAP and other sources and produce reports on asset performance. One of the reports generated by BW is a monthly compliance report showing the number of overdue repairs/inspections, the percentage in compliance by due date, and a list of outstanding repairs and the status with the responsible group.
- The following figure shows a list of the compliance activities with records stored in SAP.

Figure 10 - Compliance Activity Records Stored in SAP

Compliance Activity	System
Cathodic Protection Power Source Inspections	SAP
Cathodic Protection Test Site Inspections	SAP
Cathodic Protection Corrective Maintenance	SAP
Locate & Operate Main Valves: Annually locate and operate critical main valves. Perform corrective maintenance as required by inspections.	SAP
Main valve maintenance & repair: corrective maintenance of distribution and transmission main valves as required	SAP
Atmospheric Corrosion Remediation: As Needed, Repair atmospheric corrosion found on all meters within 90 days of detection	MDW / CLX /SAP/ ACCESS
Odor Level Testing/Odorant Injection	SAP
Test Gauge Inspection & Calibration: Checked in the field, using various shop-calibrated instruments. A calibration check is required to ensure the instruments are operating within allowable tolerances. Calibration of gas control instruments is required when the results of the calibration check fall outside allowable tolerances. Per Operating standards, ensure correct measurement of pressures, volumes and temperatures of gas in distribution system.	SAP
Test Gauge Maintenance / Repair	SAP
Continual Patrols- Bridge and Slide: Monitor pipelines crossing bridge and slide areas to discover and address minor issues in order to avoid facing major issues. / Minor CM is included but the majority of CM is done by Pilchuck. This includes unplanned $ for earthquake, slides, WSDOT requests.	SAP
Maintenance resulting from Continual Patrols- Bridge and Slide - Valves: Pilchuck corrective maintenance of valves associated with bridges or slide areas. This is where SMP includes specific O&M projects associated with valve repairs.	SAP
Mobile Home Park: Conduct mobile home park Patrols and Operating Rights Reviews to identify and document encroachments for further action. Some minor CM is done on O&M but the majority of the CM is either at the expense of the customer or a capital solution.	SAP
Distribution Regulator Station Inspection & Routine Maintenance: Annual, tear down and inspection of defined distribution Regulator Station regulators, relief valves and other related equip.	SAP
Maintenance: Non-routine maintenance resulting from inspections.	SAP
Transmission Gate Station Inspection & Maintenance: Annual, full tear down and inspection of gate station regulators, relief valves and other related equip.	SAP
Farm Tap Atmospheric Inspections: Inspect farm taps for atmospheric corrosion and remediate as necessary. The Inspection includes minor remediation of Farm Taps that can be done simultaneously.	SAP
Master meter inspection and routine maintenance: Annual inspection and routine maintenance of Master Meter (customer meter)	SAP
Master meter maintenance: maintenance resulting from inspections of Master Meter (customer meter)	SAP
Exposed Pipe Condition Reports	Hardcopy/SAP
Continuing Surveillance Reports	SAP

Source: Document Request 068

7.4.2.2 Leak Management System

- The Leak Management System (LMS) is a client/server application that keeps track of leaks for regulatory reporting. The purpose of this system is to allow documentation, storage, prioritizing and scheduling of leak transactions and information in accordance with the specifications of the UTC. At the nucleus of the LMS is the leak project which is the official set of data pertinent to a specific leak. For each project, one or more leak work orders is generated and scheduled for completion. Data collection relies on manual recordkeeping. Data quality is managed in the LMS, which limits user access. The Leak management program is managed in the following systems: ConsumerLinX (CLX), Leak Management System (LMS), PragmaCAD (PCAD) and Microsoft Office[10]. LMS is maintained by IT. Users include Gas Operations and the SPs.
- To address the sequential leak numbering requirement from the UTC Settlement Agreement, PSE made several changes to the LMS, including a programming change to the LMS that added a pop-up dialogue box confirming the information entered into the system. If the information was incorrect, the data entry personnel would either re-enter the information if a mistake was made, or update the hardcopy leak work order with the proper computer assigned leak work order sequence number[11].
- The LMS is undergoing several modifications to ensure consistency of data entry and data integrity[12]. Available mapping and database tools will be utilized to display regularly updated leak information and locations, enabling for better planning through more visible data trends. This will enable more proactive leak remediation strategies to be utilized in the future.
- The following figure shows a list of the compliance activities with records stored in LMS.

Figure 11 - Compliance Activity Records Stored in LMS

Compliance Activity	System
Leak repairs: Repair active leaks as required. / This also includes unplanned leak repairs. These are repairs done by GFR only. (STW)	LMS
Leak monitoring: Monitor active leaks as required. / This also includes leaks monitored by Heath	LMS
Leak repairs: Repair active leaks on STW pipe as required. / This also includes unplanned leak repairs. These are repairs done by Pilchuck	LMS
Above ground pipe and fittings associated to residential and small industrial meter	LMS / CLX

Source: Document Request 068

[10] Document Request 118
[11] Document Request 118
[12] Document Request 029

7.4.2.3 ConsumerLinX

- ConsumerLinX (CLX) is the PSE customer information system used primarily by PSE Access Center personnel to track customer information and descriptions of facilities. For emergency calls either received by the PSE Access Center or Gas Dispatch, the person determines the service code and uses CLX to initiate a service ticket.
- Non-emergency work resulting from customer calls comes in through the CLX system and is assigned directly through the mobile PragmaCAD (PCAD) system.
- There is also a number of noncompliance maintenance activities tracked in CLX, such as periodic meter change, select sample meter change, failed family meter change, Heath leak Class "C," Heath leak Class, install horizontal relief vent, replace PVC regulator vent "Y," replace weather cap "Y," and track pressure check on "Fixed Factor" meters.
- The CLX system interfaces with SAP, LMS, PCAD and various Access databases.
- The following figure shows a list of the compliance activities with records stored in CLX.

Figure 12 - Compliance Activity Records Stored in CLX

Compliance Activity	System
Atmospheric corrosion inspections	MDW / CLX/Heath
Atmospheric Corrosion Remediation: As Needed, Repair atmospheric corrosion found on all meters within 90 days of detection.	MDW / CLX /SAP/ ACCESS
Above ground pipe and fittings associated to residential and small industrial meter	LMS / CLX

Source: Document Request 068

7.4.2.4 PCAD

- As a result of PSE's mobile workforce initiative, field technicians use PragmaCAD (PCAD) technology to record work. The application is installed in the vehicles of approximately 300 service representatives at Gas Dispatch but is not available for the service providers due to the type of work they perform, cost and support issues.
- The PCAD mobile computer system includes GPS information, which allows for Gas Dispatch to see where GFR people are to help ensure timely leak response and efficient coordination of work.
- The PCAD system has helped improve customer service and introduced efficiencies; however, occasional outages have caused issues for the users in the field. The mobile system is up 24/7 and has 99% uptime so most of the issues are caused by the middleware, BizTalk, interface between CLX and PCAD, which prevents work orders in

CLX from transferring to PCAD. When this problem occurs, the radio can be used to dispatch work or a manual order can be created in PCAD.

- The field personnel's interpretation of the PCAD system being down is usually lost of connection because they are outside the Wi-Fi coverage area. PSE recently provided a completion-code refresher training course to PCAD users to improve data quality and distributed wallet-sized, laminated reference cards.
- Gas First Response representatives also use PCAD when they respond to meter leaks. IT recently developed an Access database to manage PCAD leak data and provide reports to create consistent tracking mechanisms and early warning signals.

7.4.2.5 Meter Data Warehouse

- Meter Data Warehouse (MDW) is where meter information for Automatic Meter Reading (AMR), Atmospheric Corrosion Data, and Isolated Facilities Data is stored. The MDW system is linked to the customer information in CLX.
- The following figure shows a list of the compliance activities with records stored in MDW.

Figure 13 - Compliance Activity Records Stored in MDW

Compliance Activity	System
Atmospheric corrosion inspections	MDW / CLX/Heath
Atmospheric Corrosion Remediation: As Needed, Repair atmospheric corrosion found on all meters within 90 days of detection.	MDW / CLX /SAP/ ACCESS

Source: Document Request 068

7.4.2.6 Access/Excel Databases

- As compliance maintenance programs are in both SAP and Access databases, it is difficult or impossible to simply aggregate all compliance maintenance program results for analysis. Although DADMO did convert some of the Access databases to SAP, there are still many compliance programs managed using Access.
- As previously mentioned, there has been an information service request submitted to move all of the maintenance databases from Access to SAP. Preliminary discussions with SAP and IT support personnel occurred in late 2008 to determine the appropriate scope and system to move these databases. An annual capital project request was generated for consideration on the 2009 budget process. However, the request was not funded in 2009 and remains on the five-year IT project list[13].

[13] Document Request 115

- Access databases are generally stand-alone database management systems created to capture small data sets for a given amount of time and a limited number of users. Access security, performance, and disaster recovery features are not robust enough to manage some of the enterprise-level applications PSE is using them for. Since each Access database is customized, a deep understanding of the underlying tables is often required to create reports to extract and display information.
- Each month the Supervisor of Maintenance Programs will query the appropriate ACCESS database for information to be contained in the compliance report. Currently, there are 4 databases used to generate this information. The databases are listed below. Once the query has been performed, the information is downloaded to EXCEL to be formatted for the monthly report[14].
- The following figure shows a list of the compliance activities with records stored in Access/Excel.

[14] Document Request 151

Figure 14 - Compliance Activity Records Stored in Access/Excel

Compliance Activity	System
Locate & Operate Service Valves: Annually locate and operate service valves at buildings of major assembly (School, Hospital, Church, etc.) to evaluate the reliability of the valve. Work is performed by Heath.	ACCESS
Service valve maintenance & repair: Pilchuck corrective maintenance of service valves as required based on L&O and IMS inspection or as problems is found during operations. A small portion of this work is "unplanned", but this does not include all unplanned work on service valves.	ACCESS
Inside meter survey (H2RL): Inside meter survey (leak test, accessibility, presence of shut-off valve, assess surrounding area), atmospheric corrosion inspection of service and regulator. Locate and operate valve and corrective maintenance. Work is performed by GFR.	ACCESS
Inside meter survey resulting maintenance associated to service valves done by GFR only.	ACCESS
Atmospheric Corrosion Remediation: As Needed, Repair atmospheric corrosion found on all meters within 90 days of detection.	MDW / CLX /SAP/ ACCESS
Pipeline Marker (PLM): Inspect and maintain pipeline markers on distribution mains. This includes replacing damaged or missing markers and getting locations for newly installed markers. This reflects work that will be done by Heath only.	ACCESS / PATHFINDER / PSE MAPS
Underwater Crossings Surveying	ACCESS / Excel
Underwater Crossings Maintenance	ACCESS / Excel
Leak Survey & Patrol: Conduct leak survey and patrol of all Transmission mains every year. The patrol looks at factors affecting safety and operation of the pipeline. Note: these two separate tasks are together since they are done simultaneously by the same resource. (This work is done by Heath)	ACCESS / (MAP Paperwork)

Source: Document Request 068

7.4.2.7 PSE Maps

- The Maps, Records, and Technology (MRT) group maintains facilities in the mapping system – mapping both services and mains. There are two types of maps - operation maps and plat maps.
- Map Guide by Autodesk is used to view maps that are layered together online. An application called MapViewer is used to view individual maps online. The maps are maintained using Autodesk's AutoCad Map and raster designer. Access to the maps is as follows:
    - PSE field personnel can access maps through ImageSite using wireless via a laptop or view the maps stored on their hard drive and updated monthly by CD. They can also use some as-builds through ImageSite, while scanned images of D-4's can be viewed through ImageSearch.
    - Service providers can view and access the maps on the network.
    - Locating service providers receive a monthly CD of the map updates and view them on their laptops.

A project is underway to enable updates to be done on the network.

- The MRT Department mission statement is to "Accurately record PSE's facilities, making them available to those who need them." MRT is not staffed to conduct ongoing map data research. Consequently, whenever there is a need to look for data on maps, PSE personnel in other departments have indicated they have to hire temporary staff to collect the data due to the fact that the maps are not GIS-based[15].
- The following figure shows a list of the compliance activities with records stored in PSE Maps.

Figure 15 - Compliance Activity Records Stored in PSE Maps

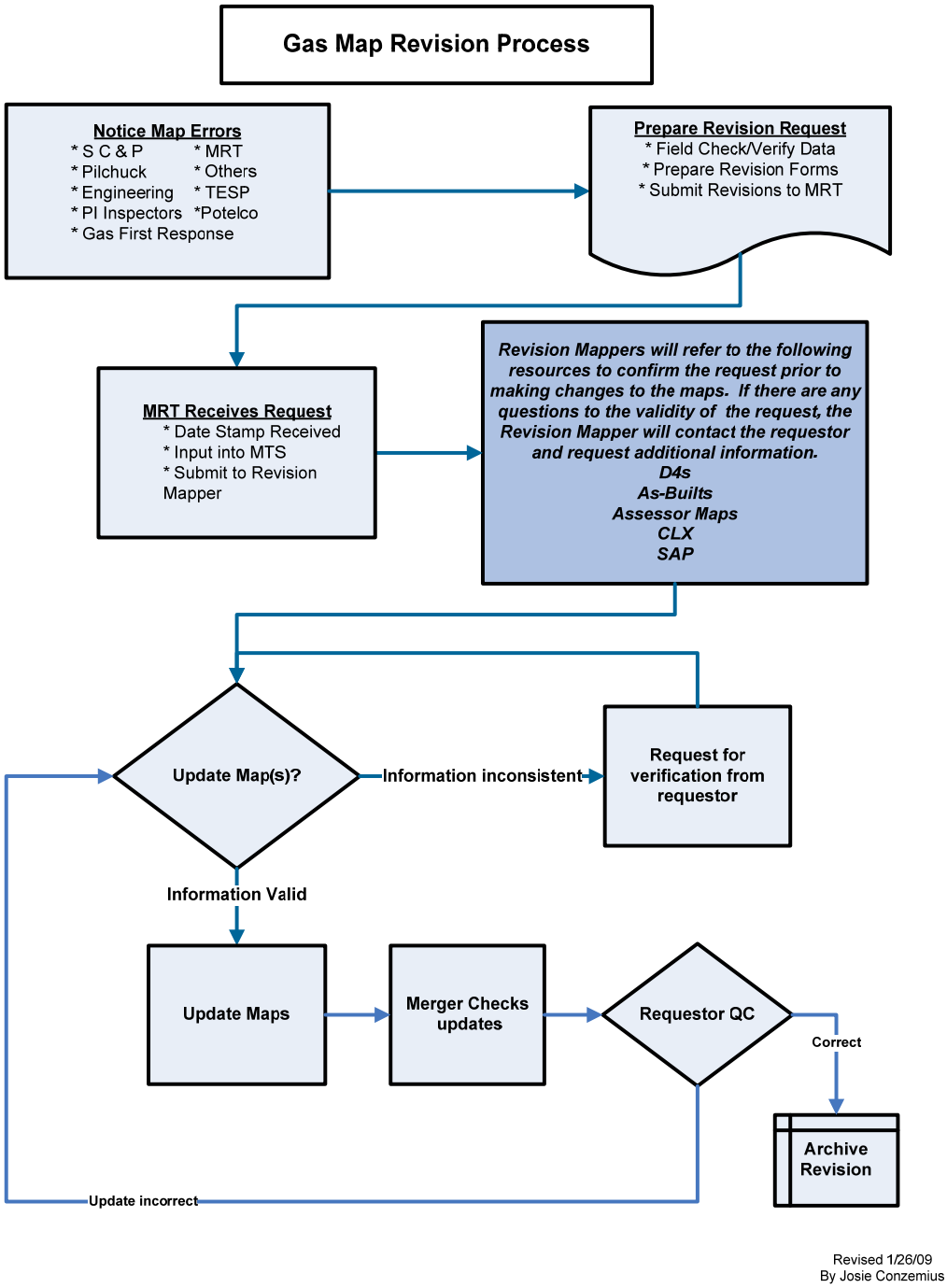
Compliance Activity	System
Pipeline Marker (PLM): Inspect and maintain pipeline markers on distribution mains. This includes replacing damaged or missing markers and getting locations for newly installed markers. This reflects work that will be done by Heath only.	ACCESS / PATHFINDER / PSE MAPS

Source: Document Request 068

- Map revisions should be prepared for any changes to PSE distribution maps, aside from as-builts and D-4's, such as mapping errors or missing map information. The map correction process start with a map revision form called Gas Map Revision Request and is completed and a copy of the D-4 plat map marked-up is attached to the form to illustrate the change. Once the form is submitted, the MRT Mapper reviews the suggested changes on the map revision form and compares to existing maps, as-builts, D-4s and information contained in CLX and SAP to determine whether a change is supported. Additional information may be requested of the person submitting the suggested change or an additional field review performed to support the requested changes. All changes made to maps are double-checked by another MRT Mapper as part of the process. The figure below shows the basic map revision process flow.

[15] Interview 42

Figure 16 - Map Revision Process Flow



Source: Document Request 056

- The map revision request has a goal of being resolved within twenty days[16]. Over the last three years, excluding revisions from isolated gas facilities, map corrections have varied from a low of 1200 to a high of 1800 revisions, annually. Below is a description of the typical types of revision requests received from the various activities:
    - Heath – Address changes and new service lines that have not been mapped.
    - Cathodic Protection – Mapping of newly installed anodes, installed test leads, and changes in configuration of cathodic protection system.
    - Instrumentation – Mapping of newly installed and existing RTU/pressure-recording devices.
    - General – Correction to pipe material, size and location discovered as a result of normal construction or maintenance activities. Also address changes or service retirements.
    - Isolated Gas Facilities – Correction of pipe material and services not previously mapped that were discovered through the detailed review of service records and as-built records performed as part of the one-time isolated gas facilities review.

Figure 17 - Map Revision Request Categories for 2008

	Quantity			Source		
	Received	Completed	In Progress	Service Provider	MRT	Other PSE
Heath	344	310	34	344		
Cathodic Protection	468	465	3	0		468
Instrumentation	79	79	0	0		79
General	923	910	13	20	414	489
Isolated Gas Facilities	2210	1875	335	0	2210	
Total	4024	3639	385	364	2624	1036

Note: Map revision request Forms are not received directly from Locate contractor personnel; however, as part of field clarification where locate personnel call MRT directly, MRT personnel may create a revision request (included in 414 identified above)[17].

[16] Document Request 18, letter to UTC dated June 29, 2006
[17] Document Request 062

- Heath uses their own map revision form and gives it to Maintenance Programs for processing. Locators give map corrections over the phone to MRT group, who fills out a map revision request. About half of the 414 revision requests generated in MRT are from locators.
- PSE did not explicitly track the percentage of map change requests received that were accepted in 2008, but believe the number accepted to be very high (greater than 80%)[18].
- If the main is on the wrong side of the street, they research the job folders and review as-built and SAP records. It is documented as "No Record" as they cannot find backup for the field report. Provided below are the number of gas main damages as a result of the facility not being on the plat map (and by extension, the locator not knowing there was a facility to locate). Only a small subset of these damages would be attributable to "No Record" being available. The data is not readily available to distinguish between mains and services[19].

Figure 18 – Third-Party Damages Due to Facility Not Platted

	2006	2007	2008
Total Third-Party Damages	1955	1802	1438
Total Due to Facility Not Platted	22	27	18

Source: Document Request 150

- The map revision request form rolled out in early 2006 was an update of a previous form that had last been revised in December of 2001. Although the previous form had been published in the map books, there was no formal document published to support the current map request form. The standards manual does not reference the map revision request form either. However, we did discover a draft document outlining the process called the Gas Map Revision Guidelines. PSE personnel agree that PSE needs to revisit the service providers and re-introduce the map revision request form.
- Most of the map corrections are a result of address changes. PSE has developed and implemented a process to ensure MRT has a more comprehensive and automated processes for identifying address changes. Implemented in 2006, the process reports out of CLX through MDW address changes. The process generates a report that lists those addresses which need to be updated on the plat maps and service records (D-4's)[20]. It was reported the application generated 9065 address changes resulting in 2894 changes to plat maps and 2424 updates to D-4 cards.
- PSE identified in their Map Accuracy Assessment that there are additional opportunities to improve map accuracy by reviewing the processes associated with capturing and

[18] Document Request 057
[19] Document Request 150
[20] Document Request 018

maintaining maps and records information for more unique services such as services to mobile home communities, business parks, and campus-type installations.

- The existing Raster Mapping System, similar to the previous Manual Map System, does not store history as it is simply a raster image. MRT does maintain CD copies of the maps as they existed by year for the last several years, so they can somewhat recreate a piece of the history, if required. A GIS system can be designed to capture history on going forward basis.
- From Jacobs' field observations, we noted mapping errors were reported as "fairly common" by the various service providers including: locators, leak surveyors, and construction crews.

7.4.2.8 Paper Records

- The MRT group is responsible for storing as-builts, service cards (D-4's) and other paper records. The group also manages document management systems. Service records are scanned and stored, and available for records since mid-1990; however, PSE personnel are not sure whether all services have been scanned.
- MRT also maintains the engineering design library, including high-pressure and pressure-regulator station facilities. In addition, all completed records from capital projects come to this group. The group also provides maps for locating and leak survey.
- Once the as-built is received in Mapping, it is first scanned (and made available to users in this format) and is then mapped and stored. To ensure accuracy from the as-built, there are two people involved in the process. One maps the as-built and the other saves to the system. This provides a check as to the content. PSE personnel do not know of any method used for checking the accuracy of the as-built from the field but said that the as-built does not get any more accurate than when it leaves the field.
- Service provider personnel indicated that they do encounter discrepancies or inconsistencies in the as-builts and the prints. In the past, they would make corrections on the as-built and mark it for the attention of MRT. They only recently found out that these notations never reached the attention of MRT so the needed correction could not be made by Mapping. They now use a gas map revision request form, which enables the corrections to be noted. The form is dated January 2006, but has only recently come to the attention of some service provider personnel.
- PSE does not have all main and service records in an "intelligent" format nor does PSE have the ability to integrate operating, maintenance, customer service data, etc. geo-spatially. This undermines PSE's ability to identity, prevent, mitigate and eliminate in a proactive manner hazards to the public, employees and the system.

The following figure shows a list of the compliance activities with paper records.

Figure 19 - Compliance Activity Records Stored on Paper Records

Compliance Activity	System
Exposed Pipe Condition Reports	Hardcopy/SAP
Leak Survey & Patrol: Conduct leak survey and patrol of all Transmission mains every year. The patrol looks at factors affecting safety and operation of the pipeline. Note: these two separate tasks are together since they are done simultaneously by the same resource. (This work is done by Heath)	ACCESS / (MAP Paperwork)

Source: Document Request 068

7.4.3 Conclusions

PSE has many maintenance and compliance programs to track; however, they are managed in different databases that work in silos, making it difficult to analyze trends and monitor the integrity of the system. The following is a summary of the various databases employed by PSE to track compliance activities.

SAP is the software program PSE uses for work order management and some aspects of its pipeline safety maintenance programs. When a compliance-driven program is in SAP, work orders for inspection and maintenance are automatically queued to field personnel on a batch basis in advance of the required compliance date. As part of the King/Pierce County Settlement Agreement in 2005, the utility implemented a number of changes to its SAP software enhancing its ability to identify potential missed inspection intervals. In addition, during the 2004-2006 time frame PSE had a project, called Delivery Asset Data Optimization, which resulted in some of the maintenance and inspection systems being migrated to SAP. The migration of these essential maintenance and inspection programs are steps in the right direction and need to be continued.

The Leak Management System (LMS) allows for documentation, storage, prioritizing and scheduling of leak transactions in accordance with UTC specifications. However, data collection still relies on manual recordkeeping. As a result of a settlement agreement, PSE made several changes to address the sequential leak numbering requirement. In addition, the system is undergoing several modifications that will enable more proactive leak remediation strategies to be utilized in the future.

ConsumerLinX (CLX) is PSE's customer information system. In addition to tracking some noncompliance maintenance activities, it also maintains a number of compliance-related activities. The system interfaces with SAP, LMS, PCAD and various Access databases.

PragmaCAD (PCAD) is PSE's mobile workforce system. The system provides a paperless way for GFR employees to input their work electronically. In addition, through the use of GPS information, the gas dispatcher has the means to ensure timely leak response and efficient coordination of the work.

Meter Data Warehouse (MDW) is the system where meter information for automatic meter reading (AMR) is managed. In addition, the system also maintains atmospheric corrosion inspection and remediation compliance activities.

Access/Excel databases are used to maintain numerous compliance activities. Since these databases are generally stand-alone systems created to capture small data sets for a given amount of time and a limited number of users, PSE is using them far beyond what they were originally intended to do. When using Access as an enterprise-level application as PSE is, Access limitations in security, performance, and disaster recovery are noted. (See Recommendation 7.4.4.1)

Paper records are maintained for exposed pipe condition reports and transmission & distribution system leak surveys and patrols.

Map Guide by Autodesk is used to view maps that are layered together online. Since the maps are Raster design there is no intelligence behind a map image, so if there is a need to amass any data for analysis purposes, temporary staff is hired. This is due to the maps not being GIS-based and linked to a facilities management system. Map revisions, initiated by Heath, Cathodic Protection, Instrumentation Isolated Gas Facilities, and other groups, are common. However, the use of the map revision request form has been inconsistent and to some extent unknown to construction service providers. When construction service providers wanted to correct a PSE map they made a notation directly on the map; however, these changes were not consistently recognized by the Maps, Records, and Technology group. Information gathered from interviews and data requests indicated that the map revision request form was rolled out in early 2006 without any formal documentation and introduction plan. Our field observations of locators, leak surveyors and service provider construction crews confirmed that mapping errors were fairly common. (Recommendation 7.4.4.2)

Once the as-builts are received by the Maps, Records, and Technology group, they are first scanned and made available to users and then mapped and stored. PSE does not have the ability to integrate operating, maintenance, customer service data, etc. geospatially, undermining PSE's ability to identify, prevent, mitigate and eliminate potential hazards to the public, employees and the system. Despite recent advances in web applications and adoption of broad band networks, making it possible to integrate GIS with other business processes, PSE is still in the process of evaluating the many benefits offered by enterprise-wide GIS.

PSE states that its IT Department must be responsive to many needs across the utility. IT manages or sets project priorities through its business case justification process to allocate available budget dollars to projects. (Recommendation 7.4.4.3)

7.4.4 Recommendations

7.4.4.1 Utilizing the IT Business Case Justification process, elevate the priority of the initiative to move compliance maintenance programs managed in Access, such as H2RL, atmospheric corrosion inspections, and service valve inspections, to SAP.

7.4.4.2 Increase awareness of map revision request form for both PSE and service provider employees and establish metrics to hold employees accountable for compliance.

7.4.4.3 Commit to establishing a firm target date to conclude evaluating the cost benefits associated with an enterprise-wide GIS. Assuming positive evaluation results, further commit to establishing an aggressive implementation plan with appropriate funding.

7.5 Internal Audits of Records

7.5.1 Background

As part of the settlement agreement for Docket PG-060215, PSE was required to submit a gas safety quality assurance plan that documents PSE's current quality assurance practices. It also added audit practices relative to gas pipeline records review for work performed by Pilchuck as well as the PSE's other service providers performing gas safety activities and PSE's own field personnel performing gas safety activities.

7.5.2 Findings

7.5.3 PSE QA&I Audits of Records

7.5.3.1 PSE Quality Assurance Plan

- According to the PSE Quality Assurance Plan, the Quality Assurance and Inspection Department (QA&I) evaluates the effectiveness of the quality control process by inspecting a sample of work performed by PSE employees and service providers. As part of the typical QA review process, QA&I staff note in their audit report whether data is captured at an appropriate level and in a retrievable format. All reports are stored on the sever QA&I database.
- Presently, review of O&M activities performed by both contractors and PSE personnel is handled through Targeted Audits, which are designed to observe a specific aspect of work. The Annual Targeted Audit schedule is published by the end of the first quarter of each year. Targeted Audits include but are not limited to the following[21]:
    - Locating Procedures
    - Leak Survey Procedures and Documentation
    - Operations and Maintenance Inspections
    - Operator Qualification Records
    - Leak evaluations and repair review of procedures and records
    - Job Documentation

[21] Document Request 007

A couple of the recent Targeted Audits pertaining to how work is tracked and documented are discussed later in this section.

- The 2008 Quality Assurance Plan (page 3, paragraph 2) does specifically include a review of records and documentation. However, the Site Audit Inspection Manual included in the 2008 Quality Assurance Plan does not specifically include a review of records and documentation. The lone exception to this is found in the PSE QA&I Conformance Audit Checklist, which includes a review of completed leak work orders and compares with other documents available to verify accuracy (See Appendix 2).
- The following changes were adopted or proposed for the 2009 QC/QA programs for PSE and each of the service providers[22].

  In 2009, PSE's Quality Assurance Plan will be updated to reflect audit processes initiated by PSE Gas Operations Quality Control Program. As Gas Operations initiates their audit processes, QA&I will develop a trailing audit process that will verify success of the program.

  - QA&I have drafted its 2009 Audit Plan. The plan is in draft form currently and will be approved by the Compliance Steering Committee. The plan incorporates input from Standards, Compliance and PSE Gas Operations prioritizing which audits will be conducted in 2009. Any changes to the plan will be approved by the Compliance Steering Committee.
  - QA&I have set a goal to increase the number of SP crew-on-site audits to 50% of site audits conducted. In 2008, audits were conducted of Pilchuck work while a crew was on-site 32% of the time. For Potelco, the crew-on-site audits occurred 20% of the time. This addresses the concern from Jacobs on the lack of crew-on-site observations being audited by QA&I.
  - Jacobs' observation from rides with QA&I staff is that it is often difficult to locate service provider crews as they frequently change location during the day. Reaching the 50% goal for crew on site audits may prove to be challenging.

7.5.3.2 Quarterly Leak Record Audits

- Quarterly leak record audits are one of the audits on the Annual Target Audit schedule for 2007 and 2008. PSE has not moved the leak records audit to the routine audit category.
- Starting in March 2007, QA&I began performing quarterly quality assurance audits to review Pilchuck's (PCI) leak re-evaluation and recordkeeping process. The first audit focused on the leak work order process and completed leak work orders currently filed at PCI North Operating Base. The audit revealed records are being filed as committed to

[22] Document Request 060

the UTC and as stated in PCI policy; however, there were still concerns with the assignment of phantom leak work orders and the documentation of changes to submitted leak records.

- Subsequent PCI leak record audits consisted of two main areas:
    - General Review: review and evaluate a random sample of leak work orders selected from PCI work completed that quarter.
    - Phantom Review: review and evaluate a random sample of phantom leak work orders selected from PCI work completed during that quarter.

The percentage of work orders included in the audits and the results of the audits are shown in the figures below. These percentages represent adequate sample size and no larger audits were required. The percentage of leak records with complete and accurate information improved with time. However, both the general and phantom reviews revealed little improvement when the leak records were reviewed for modified work order information. Modified leak ticket information is to be initialed, dated, and an explanation provided, but leak evaluators were not consistently following PCI procedures. The intent of this procedure is to provide a paper trail that explains any changes made on the original leak ticket once the evaluator has turned it in for entering into the LMS system.

Figure 20 - Leak Record Audits General Review Results

General Review Checks	4th Qtr 2007	1st Qtr 2008	2nd Qtr 2008	3rd Qtr 2008	4th Qtr 2008
Percentage of Work Orders in Audit Sample	**19.5%**	**10%**	**10%**	**10%**	**9.8%**
Is added leak ticket information initialed and dated?	79%	100%	100%	95%	100%
Is modified leak ticket information initialed, dated, and an explanation provided?	8%	60%	55%	6%	50%
Is the ticket WO completed in ink?	NA	NA	52%	98%	100%
Signature on ticket appears to match sample writing on verification sheet?	100%	100%	100%	100%	100%
Completion date appears original and unaltered?	99%	NA	NA	NA	NA
Completed on or before due date?	98%	99%	100%	100%	99%
Are all applicable fields completed?	95%	99%	94%	94%	100%
Does the leak ticket information appear to be accurate?	96%	99%	91%	100%	100%
When applicable, is the PSP read written as a negative number?	97%	100%	82%	100%	100%
Was the perimeter of the leak area, including zero reads, recorded on the ticket?	75%	58%	79%	98%	86%
When applicable, is the distance to relevant features recorded on the sketch?	4%	NA	NA	NA	NA
When applicable, do the comments sufficiently describe the location of the leak?	NA	99%	88%	98%	91%
Does the ticket (as filed) show the correct WO number?	NA	NA	99%	NA	NA
When pressure test info was added later by someone other than the person who did the test, did the pressure test info match the information written in the original document?	NA	NA	58%	NA	NA

Source: Document Request 106; NA = Item was not reviewed during audit

Figure 21 - Leak Record Audits Phantom Review Results

Phantom Review Checks	4th Qtr 2007	1st Qtr 2008	2nd Qtr 2008	3rd Qtr 2008	4th Qtr 2008
Percentage of Work Orders in Audit Sample	**6.8%**	**11%**	**16%**	**14%**	**14%**
Is added leak ticket information initialed and dated?	100%	NA	100%	100%	100%
Is modified leak ticket information initialed, dated, and an explanation provided?	0%	33%	13%	0%	75%
Is the leak ticket completed in ink?	NA	NA	NA	95%	100%
Signature on ticket appears to match sample writing on verification sheet?	100%	100%	100%	100%	100%
Completion date appears original and unaltered?	98%	100%	100%	100%	100%
Was the follow-up inspection completed within 30 days?	94%	100%	100%	100%	100%
Are all applicable fields completed and accurate?	80%	NA	NA	NA	NA
Is the name of the previous evaluator written on the current leak ticket?	2%	100%	100%	NA	NA
If applicable, was the name made to standout (for example: highlighted, written in different color ink, or circled)?	22%	NA	NA	71%	80%
Was the phantom leak assigned to a different evaluator?	100%	100%	100%	100%	100%
Does PCI timesheet for this person on this day confirm leak related work?	NA	95%	100%	NA	NA
If WO is the second Phantom visit, (and the first was PCI) is the first and last name of #1 Eval written?	NA	NA	17%	100%	80%

Source: Document Request 106; NA = Item was not reviewed during the audit

- QA&I discuss the audit results and recommendations with PCI each quarter and PCI responds with either why they disagree with the recommendation or how they plan to address the issue. These audits identified that, while improvements have been made to PCI's leak record management processes, opportunity exists for further improvement to ensure PCI is consistently meeting PSE's expectations, standards requirements and commitments made to the UTC.

7.5.3.3 D-4 Audits

- D-4 Audits were also listed on the Annual Target Audit schedule for 2008. PSE GOS 2500.1800 establishes how to complete a D-4 card to record gas service information. The purpose of this audit was to review a small sample of completed D-4 records to determine the accuracy of the information being captured. For this audit, QA&I reviewed a sample of D-4 cards completed within the last two years by both Pilchuck and Potelco.

- A main component of this audit is to compare the information written on a D-4 record with measurements taken on site. The D-4 audits for Pilchuck and Potelco reveal similar findings, including recorded measurements that are significantly different than what was found during the audit; inaccurate plat numbers, and omitted existing facility documentation.
- Since platting, locating and future maintenance problems can occur if measurements are inaccurate, QA&I suggest similar recommendations for both service providers:
    - Perform re-check of the tie-in measurements that are found to be significantly different and provide PSE Maps & Records with any updated information.
    - Periodically incorporate D-4 Review and Measurement Verification as part of routine QC inspections to ensure accuracy.
    - Invite, at least once a quarter, a representative from PSE Maps & Records to the monthly QC/QA meeting to discuss issues pertaining to D-4 and as-built records.

All the recommendations are either in the process of being implemented or will be incorporated by the service providers. Going forward, D-4 and as-built issues will be discussed at the monthly QA/QC meeting.

7.5.4 Conclusions

The Quality Assurance and Inspection Department (QA&I) evaluates the effectiveness of the service provider quality control process by inspecting a sample of work performed by service providers. In 2009, PSE's Gas Operations will initiate its own quality control program and QA&I will develop a trailing process to verify the success of that program. Currently, the only quality control of PSE personnel is through Targeted Audits. Audit reports focus on whether data is captured at an appropriate level and in a retrievable format. Also in 2009, QA&I plan to increase for the construction service providers the percent of crew on-site audits.

It is often difficult to locate service provider crews as they frequently change location during the day. Consequently, reaching the 50% goal for crew on site audits may prove to be challenging. (See Recommendation 7.5.5.1)

Quarterly target audits on leak records and D-4s in the last couple of years have been very beneficial in identifying areas of weaknesses and improving the leak record management and D-4 process. However, opportunities exist for further improvement to ensure the service providers are consistently meeting PSE's expectations, standards, requirements and commitments made to the UTC. Since this is an area of continued concern, conducting these audits randomly as opposed to quarterly, along with establishing metrics for enhanced accountability, should minimize deviations from standard. (See Recommendation 7.5.5.2)

7.5.5 Recommendations

7.5.5.1 In order to support the efficient use of QA&I staff, develop an improved tracking system that will aid in locating service provider crews.

7.5.5.2 Move the quarterly leak audits and D-4 audits from the target audit list to the routine audit list to continue to randomly inspect records for compliance.

7.6 Service Providers QC of Records

Each contractor performing work for PSE is required to prepare and follow a written Contractor Quality Control Plan (CQCP). This section highlights how each contractor includes work documentation and record reviews in their quality control program. More details regarding the CQCP can be found in the Contracts Report.

7.6.1 Pilchuck QC

- Documentation preparation and control begin with input from the designer and crew foreman self-inspecting and certifying the work that has been completed. Specific documents are prepared according to the type of work being performed. QC inspections are formally recorded and reported.
- The service provider quality control organization is responsible for verifying that the work packages accepted for construction are complete prior to construction. The SP has developed a comprehensive work package checklist of items found to be important while preparing designs in a quality manner. This checklist and an associated cover sheet are used by the SP to record the results of the work package review. The QC inspector verifies the Complex Work Package Checklist and coversheet have been completed and that the required documents are included in the work package.
- The procedures included in the CQCP define the documentation required to demonstrate to the PSE's satisfaction the effective functioning of this quality control program. Quality records and documentation should be accumulated, identified and made available in the format described in the CQCP. The documentation and records ensuring the completion of the required activities should be stored, indexed and readily retrievable. Documentation is to be available to the PSE's authorized representative on request. The quality control manager is responsible for assuring that QC activities are documented as required and that the documentation is adequate. Activities affecting quality are to be documented by those responsible for the activities.
- It is reported that Pilchuck's focus is mostly on completion of documents and on meeting standards. QC inspectors are not concerned with the accuracy of information, like the location of the pipe, because they believe peer-pressure would ensure the information is correct. It appears that it would not be difficult to use as-built drawings to locate pipes as an audit function.
- Pilchuck is currently reviewing a proposal with PSE to add a QC person at each base to review documents as they come in to try and catch any misses/errors.
- Pilchuck's Quality Control Department has made many changes and improvements in the first year of existence, from creating the new QC Plan, having quality control inspectors, and the reporting of issues at the monthly QA/QC monthly meetings, to

where they are today. A few changes that have taken place in the last few months of 2008 are[23]:

- Improved communication with PSE QA Auditors. There is great communication between the PCI and PSE Auditors in dealing with interpretations of GOSs and GFPs.
- Increased the number of repaired leak audits conducted each month. Now, PCI's QC inspector's call PSE Auditors to monitor their audits on leakage.
- Defined trends from audits and conducted training reviews to correct the situation.
- Added the audits on D-4's to verify locations and measurements to their QC inspector's monthly responsibilities.
- Worked with PSE contract management on leakage issues, such as ways to improve the flow of leak tickets from PSE to PCI and corrections required on PSE completed leak tickets.
- Recently started to field audit red-lined job prints, as-builts, to verify measurements of installed facilities.

7.6.2 Potelco QC

- Potelco's Contractor Quality Control Plan is similar to Pilchuck's. According to the CQCP, job close-out is done along the way by multiple groups, and audits are also conducted throughout the work process. The QC program defines each group's responsibility, and the process flows/interface documents outline the interaction between the various PSE groups and the service provider. There is a checklist sheet that shows a summary of activities that has to be done for each type of work. A certain percentage of the checklists and job packages are audited by contract management. In addition, PSE conducts four types of audits that occur during the work process: (1) Engineering Up Front Audit, (2) Field Audit, (3) Operations Analyst Audit for Billing, and (4) Maps and Records Audit. As a result, Potelco has put a department together to make sure all the necessary paperwork is there.
- Potelco recently added a paperwork oversight process into their quality control program and their quality control staff regularly monitors D-4 cards as part of their oversight[24].
- All of the necessary information related to a project is to be included in a work package, including: work sketch, permits, engineering information, material pick list, and associated documentation.

[23] Document Request 060
[24] Document Request 106

- The procedure to track documentation of design changes and field revisions indicates that a change order, where required by the contract, is used to document changes which direct or authorize the SP to:
    - Perform work not included in the scope of work.
    - Omit work that is included in the scope of work.
    - Do work in a different manner from what the work sketch directs.
    - Perform work in variance to PSE's standards or practices.

The change order is to be completed and signed by the SP and PSE before the work is performed. A copy of the change order is included in the work package.

- "Paperwork/Documentation Verified" is one of the items on the Potelco Site Inspection form for Natural Gas Facility Construction.

7.6.3 Central Locating Service QC

- Central Locating Services (CLS) believes that Quality Audits (QA) are the most effective way to proactively identify deficiencies in performance and correct those deficiencies before they result in damages to facilities. CLS track all QA's and their results in their Quality Database which provides management reports to monitor compliance and trends.
- In order to provide an overview of quality performance, many performance metrics are tracked and reported on an individual, crew, district, and company levels. These include but are not limited to:
    - Number of QA's performed by individual
    - Results of QA's by individual
    - On-time percentage of locate tickets completed
    - Damage ratios indicating number of tickets completed per CLS "AI" (at issue) damage
    - Percent of overall damages attributable to CLS issue
    - Breakdown of "Cause Codes" of damages (root causes)

All reports are maintained by CLS but available to PSE contract management upon request.

- When a facility is damaged, CLS completes a thorough investigation to determine the root cause and utilize that information to prevent future damages. Complete documentation including pictures is provided to the customer to aid in collecting from the damager if not the fault of CLS.

- Reports provided to PSE on a routine basis include:
  - On-time Report
    - Provided daily
    - Details late locate requests and includes ticket number, customer contact information, and applicable field remarks
    - Late locate requests categorized by the following:
      - Late, customer contacted
      - Late, customer not contacted
  - Damage Ratio Report
    - Monthly Report
    - Reports ratio of locates completed per damage occurrence, i.e. “1 in 1500”
  - At Issue Damage Causes
    - Monthly Report
    - Shows root causes of damages
- To document work, locator procedures require digital photos taken at EVERY locate site as follows:
    - Low-Profile Locates = 5 photos minimum
    - Clear Locates = 2 photo minimum – Photo should show clear flag
    - High-Profile Locates = 10 photos minimum
    - All digital photos are attached to the ticket electronically when the ticket is closed out with the use of the Photo Management System.
    - The camera is automatically cleared of all photos during this process so it is ready for the next locate site.
- In conjunction with routine audits and through separate, independent photo audits, supervisors ensure that the locators are attaching quality photos to the locate tickets. Office photo audits are conducted on a routine basis by personnel designated by the district manager or DQC. The Corporate Quality group routinely audit tickets for photos as well.

7.6.4 Locating Inc. QC

- In order to effectively communicate daily ticket status, the Locating Inc. Quality Control Manager sends PSE a daily ticket report that shows all tickets that are open past their due date. This report provides the ticket number, area, and the reason the ticket remains open. In most cases, the tickets on this report are on-going. This means that the project may be long, and the locator has made an agreement to work with the contractor daily until their project is complete. This ticket report helps Locating Inc. and PSE to keep track of these tickets to ensure that locators are effectively communicating with contractors, and making sure the tickets are being closed on time.
- The Locating Inc. QC team tracks the progress of locate tickets using the Regional Ticket Tracking Database. This internal database helps Locating Inc. keep track of ticket quantities based on region. It shows the total number of tickets, the number completed on time, tickets that have passed their due date but have been rescheduled, and late tickets. It also shows completion and late ticket percentages. This enables Locating Inc. to quickly identify and correct late ticket issues in specific areas. These reports are updated and reviewed daily by the management team.
- High-profile notifications are reviewed each day by the ticket specialist. Each high-profile ticket is reviewed to ensure that PSE's PI's are notified in a timely manner. Each high-profile ticket is entered in the High-Profile Notification Database. This database helps to keep track of the date, region, and the specific locators that are working with high-profile tickets.
- The damage claim team reviews damages as the claims are received. They are recorded into the Damage Investigation Tracking Database in order to track their current progress, and to make sure all necessary steps are taken to resolve the issue. The database tracks the customer's claim number, the QC manager ticket number, the amounts, and the dates at which the claim is processed.
- Locating Inc. uses a Corrective Action Database and a Preventive Action Database to track areas for improvement. These databases help them track the progress of any identified areas that are in need of corrective or preventive action.
- Requests or inputs shall be recorded as a CAR (Corrective Action Request) or a PAR (Preventive Action Request). audit reports resulting in a corrective action or preventive action shall be assigned a CAR number but does not need a corresponding form to track initiation or result. The CAR & PAR number is recorded on the Preventive/Corrective Action Register along with the audit report number where applicable. The report initiates action and the results and closure are recorded on the audit document and in the action register. This procedure generates three quality records: CARs, PARs, and Customer Complaints.
- Data regarding the performance of the locating contractors is discussed in Section 8.3.3: Continuing Surveillance Damage Trends.

7.6.5 Heath QC

- Heath Consultants Inc.'s supervisory staff performs QC inspections to ensure proper procedures for leak survey, atmospheric corrosion monitoring and cathodic protection monitoring are completed in accordance with PSE requirements. The inspections consist of the following:
    - QC tags placed in selected field locations prior to work being performed
    - Follow-up QC inspections
    - Walking or riding with an employee in the field to evaluate work is performed using proper policies and procedures. This is referred to as a QC field ride.
- Prior to the follow-up QC inspection, the Heath supervisor must ensure the following items are verified:
    - Completed scope of work is documented with: employee name, completion date, accurate counts and/or footages, found deficiencies (leaks), facility types, severity, daily production, and reports are complete and accurate and all paperwork is up-to-date daily.
    - Equipment manuals used to complete scope of work are in employee's possession, employee is familiar with the contents of the equipment manual, equipment calibration of all units in employee's possession to include documentation of last calibration, test equipment to determine functional responses and asset and serial numbers are documented.
    - Production times compared to documented time reported is accurate to include any scope of work investigations.
    - All field and client standards manuals are in employee's possession, maintained and accurately followed to include all information and guidelines used to perform scope of work. Verify the employee is currently operator qualified to perform covered tasks required to complete scope of work.
    - Company vehicle maintenance records are complete and up-to-date. Vehicle is clean and professional in appearance. Verify documentation of valid driver's license, auto insurance, registration and company documents and forms are in the vehicle.
    - Attendance of monthly safety meetings. If employee was unable to attend, the supervisor will review with the employee at an appropriate time.

- If deficiencies (leaks) are found during the QC inspection, the following actions are taken:
    - Document and classify any leak detected.
    - If during the follow-up inspection, the cause of the discrepancy (ies) is determined to be equipment or mapping error, re-work only that portion of the scope of work discrepancy (ies) that was affected by the identified cause.
    - Heath will review performance circumstances internally. The employee is subject to suspension of performing work on PSE facilities until they are re-qualified or re-trained, unless termination is warranted.
    - Performance circumstances will be reviewed with PSE Maintenance Programs Coordinator.
    - Heath will also perform follow-up random sampling (to be determined after conferring with PSE Maintenance Programs Coordinator) of the employees scope of work performed since the last QC date. Results will determine if further action is needed.
    - Re-completion of scope of work by Heath personnel will be performed at no charge to PSE. All follow-up actions will be conveyed electronically to PSE supervisor, maintenance programs and copied to the Maintenance Program Coordinator.
    - Follow-up reporting will include remedial actions taken to correct all deficiencies and discrepancies.

7.6.6 Conclusions

Pilchuck's Quality Control (QC) Department has made many changes and improvements since the first year of its existence; however, several additional changes coincidental with Jacobs' audit have recently taken place. These changes range from improved communications with PSE QA Auditors defining trends from audits and conducting training reviews to correct the situation. Potelco's Contractor Quality Control Plan is similar to Pilchuck's.

The remaining service providers, Central Locating Services, Locating Inc. and Heath Consultants each have quality audits to proactively identify deficiencies in performance and correct those deficiencies before they result in either damage to facilities or improper leak survey methods. PSE states several audits of both locating service providers have been performed since 2007. This was in direct response to subpar performance regarding timeliness and accuracy of locates. Currently, weekly audits of completed locates are performed. (See Recommendation 7.6.7.1)

Audits of locate contractors are discussed further in Section 8.3:3: Continuing Surveillance Damage Trends.

7.6.7 Recommendations

7.6.7.1 Initiate PSE QA audits on locating service providers to minimize the likelihood of non-compliance. Include in the audits, metrics that measure near-miss as well as inaccurate locates.

7.7 Industry Comparison

7.7.1 Background

In support of continuous improvement and performance comparison, PSE participates in several proprietary industry benchmarking programs. This data helps PSE understand where they are in comparison to other utilities for use in determining whether focused improvement efforts are needed or desired. However, we question the process in place to bring best practices into the work environment.

To determine how PSE compares to its peers in the area of auditability of records, a high level comparison of PSE's records management practices with industry standards was conducted. The findings related to this comparison are discussed below.

7.7.2 Findings

- It was reported the UTC has expressed concerns regarding PSE's ability to parse the data needed to meet their routine inspection related questions. Since PSE maintains multiple operational information systems, data extracts from various systems or customized queries are needed to be run. Filling these routine UTC requests creates, for the UTC, delays and additional trips to where the records are stored. From the UTC's perspective the extra effort involved in obtaining this data from different sources indicates that PSE must not be using the data and they question whether or not this is also a PSE information issue[25].
- Despite similar business conditions, the gas side of the business is lagging behind the electric side in improvements that aggregate and manage information.
- Many PSE employees would like to see improvements in the aggregation of information in one system.
- Getting data from the numerous systems in place now is very difficult and time consuming.
- PSE is adopting xEM, an improvement added to and working with SAP, which provides reminders to PSE managers when SAP reports should be run to meet compliance and operations and maintenance schedules.
- It is already in place on the electric side of the business.
- The xEM system is planned to be in place by summer 2009, but will be limited to tracking compliance items only.

[25] UTC Staff Comments to Jacobs draft report on Audibility of Records, dated May 22, 2009

The lack of a unified records management system linked to a GIS system is a problem that is recognized by PSE personnel as a safety concern. GIS systems can help save money by maximizing safety because it provides utilities the ability to monitor the system as required by the regulator via records of reasonable quality, adequacy and accuracy. PSE is aware that most comparable utilities in the industry have a GIS system and has recently formed a team to develop a business case for GIS.

PSE sought a third-party high-level assessment of its enterprise-wide GIS needs, its current approach to the use of geospatial data and recommendations on potential benefits and implementation strategies for GIS. The following findings[26] support a definite need for a GIS system:

- Manual and labor intensive processes abound
    - There was consensus from across the business that the existing manual and labor intensive processes that support the capture, maintenance, dissemination and use of geospatial asset data for operational and strategic decision making are unsustainable.
- Proliferation of 'home grown' tools has led to complexity
    - There has been a proliferation of 'home grown' tools, workarounds and manual interventions across PSE as a result of the historical manual approach to recording asset location, condition, descriptive and connectivity data.
    - Rudimentary silo pockets of geospatial capability already exist within PSE, although these are tactical in nature and duplicate effort, cost and limit opportunities for data sharing and cross-functional collaboration.
- Duplication of asset data stored in multiple places and formats causes confusion
    - Asset data is duplicated in multiple platforms/sources and is known to conflict. This leads to confusion, re-work and manual interventions.
- Limited awareness of data stewardship or ownership impacts data integrity
    - Perception amongst PSE staff is that there is not a consistent strong culture of data stewardship, information management or data ownership. This compounds the challenge of capturing and maintaining accurate asset data.

[26] Document Request 027

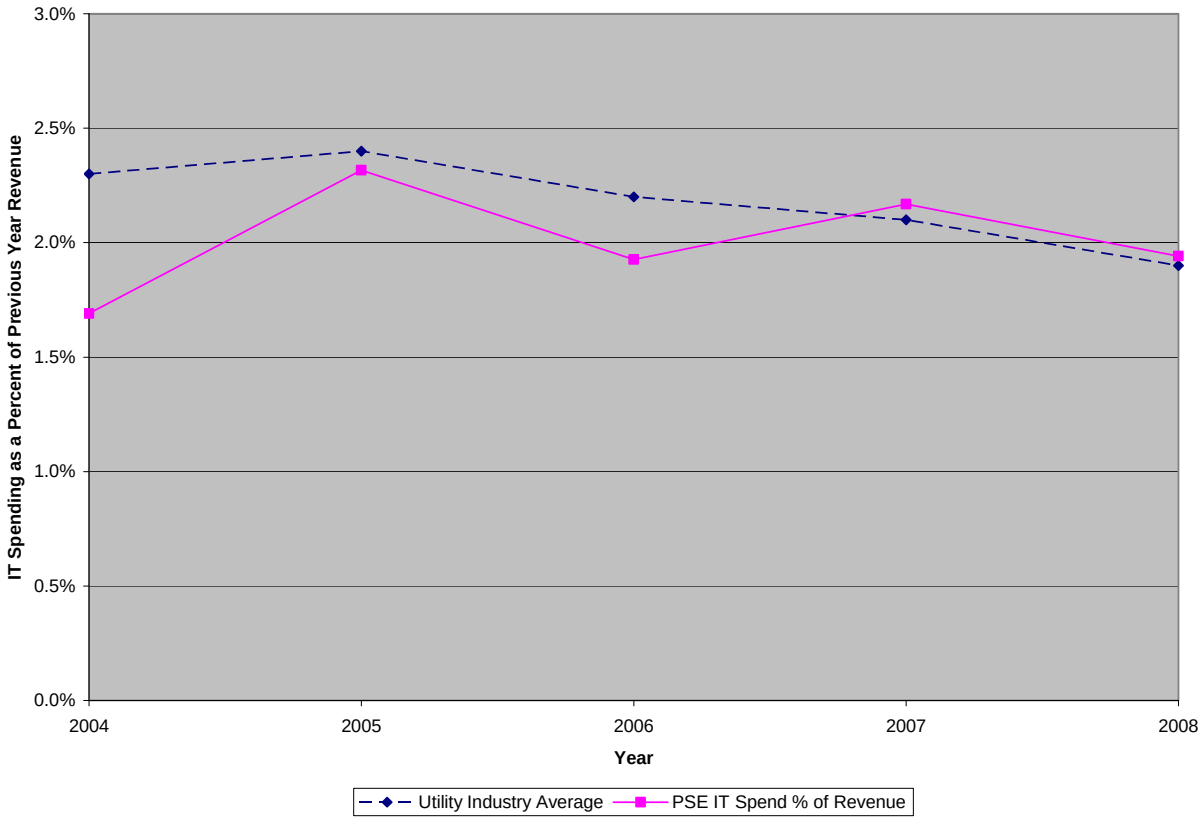
- Northwest Natural Gas Company's (NW Natural) system was reviewed during PSE's investigation into a paperless compliance process. NW Natural uses Advantica's *Essentials StonerSoftware* as its compliance system. The system provides several benefits:
    - Field users receive up-to-date mapping and system information, which reduces field travel time and enhances user operational knowledge
    - Field inspections are paperless, reducing the need for clerical data entry
    - The system provides a single, common application for all field users, eliminating multiple databases and files

NW Natural's system integrates two technologies: GIS and mobile workforce. However, PSE does not possess GIS capabilities at the moment and seeks to complete its assessment of GIS technologies before committing to invest in a paperless system[27].

- A lack of funding for gas IT enhancement is one of the reasons why the various compliance databases have not been moved to SAP and PSE has not invested in a GIS system. The figure below compares PSE's IT spending against the industry average.

[27] Document Requests 118 and 160

Figure 22 – Gas IT Spending as a Percent of Revenue



Source: Gartner 2008 benchmarking for energy utility industry; PSE 10-K 2007 and 2008; Document Request 136

7.7.3 Conclusions

Since PSE's maintains multiple operational information systems, data extracts from various systems or customized queries are needed to be run to produce the UTC required reports. Given the extra effort involved in obtaining this data, PSE must not routinely use the data in the same manner as the UTC. Getting data from the numerous systems in place is very difficult and time-consuming. PSE is adopting xEM, a program related to SAP, which will become a tool for tracking compliance items. While xEM will allow PSE to better manage its compliance related commitments, such as when a status report is required, it will not replace the numerous reports generated from the various individual databases, such as SAP, LMS and MDW.

Despite recent advances in web applications and adoption of broad band networks, making it possible to integrate GIS with other business processes, PSE is still in the process of evaluating the many benefits offered by enterprise-wide GIS. (See Recommendation 7.7.4.1)

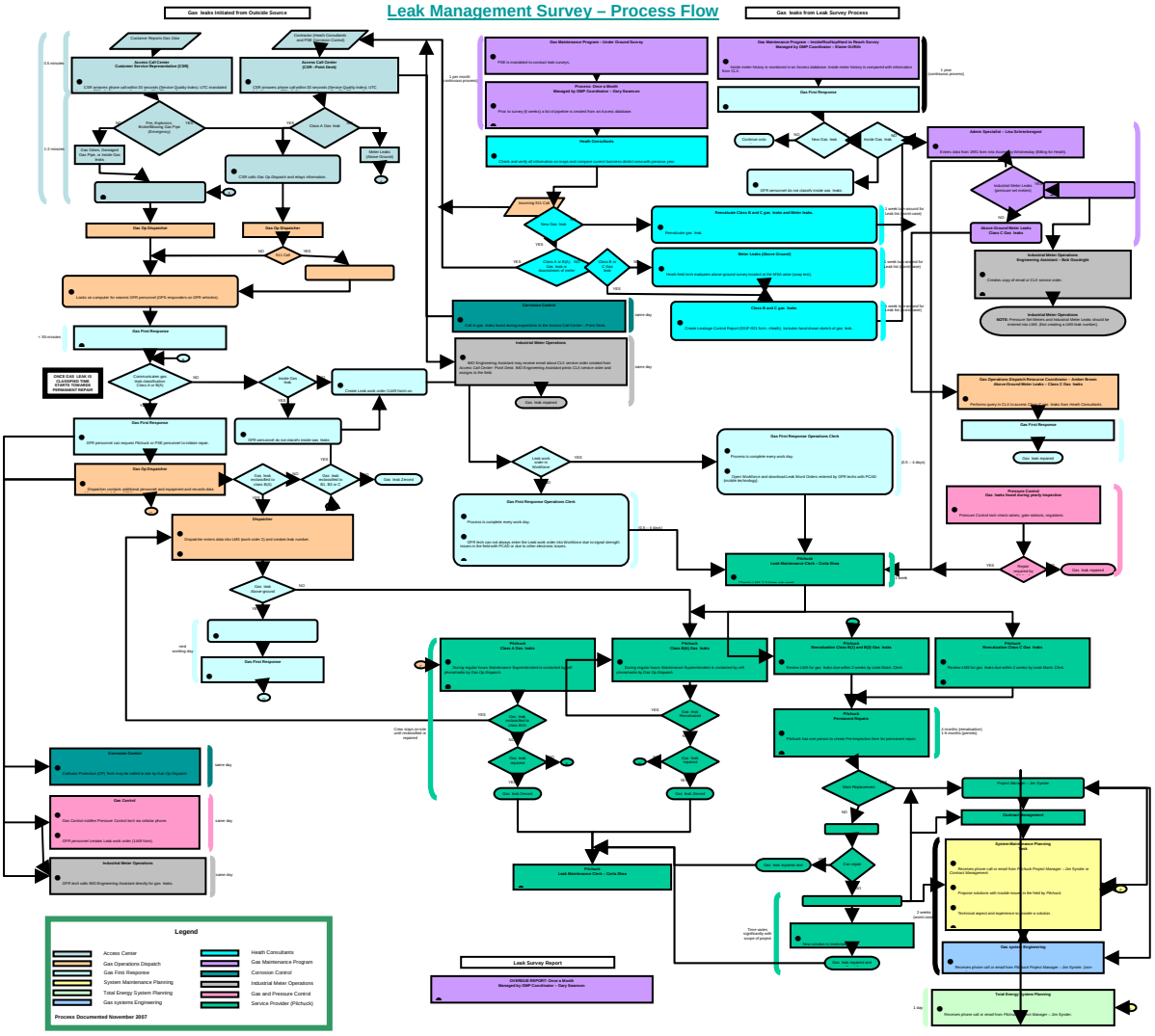
PSE gas IT spending has lagged the industry in the three years prior to 2007; however, it has been in line with the industry average since 2007.

7.7.4 Recommendations

7.7.4.1 Commit to establishing a firm target date to conclude evaluating the cost benefits associated with an enterprise-wide GIS. Assuming positive evaluation results, further commit to establishing an aggressive implementation plan with appropriate funding.

Appendix A

Leak Management Survey Process Flow



Source: Document Request 118

Please note that each color on the flow chart represents a different PSE department or group, and this process flow encompasses all sources of leaks.

Appendix B

PSE QA&I Conformance Audit Checklist

PSE QA&I Conformance Audit Checklist

Audit Title	Checklist Number	Date Conducted
PCI Leak Record Audit (Part 1)	07-04c01	March 14, 15, 16, 2007
Auditor's Name(s)		**Audit Location**
Dean Krebs		NOB (maybe other locations)
Auditee's Name(s)		**Auditee's Company**
Jerry Engel, Corla Ann Shea		Pilchuck
Other Information		
Audit Scope: Part 1 will focus on the follow through and effectiveness of recent process changes. Examine office administration processes and procedures. Audit should also review completed leak work orders and compare with other documents available to verify accuracy.		

Yes	No	N/A	1. Are all completed leak work orders from 2002 to present filed by completion year, leak number? (PCI Policy, WUTC Commitment)
			Notes:

Yes	No	N/A	2a. As of 9/7/06 are any changes to submitted leak documentation initialed by the person making the change and an explanation provided (attached note) as to the reason for the change? (PCI Policy, WUTC Commitment)
			Notes: Criteria documents indicate applicable to any, all, changes, modifications, alterations. Original evaluator not stated as exempt. Look for different hand writing, writing instruments etc.

Yes	No	N/A	2b. Has PCI developed a quality control process to allow PCI management to identify when this documentation procedure is not being followed? (WUTC Commitment)
			Notes:

Yes	No	N/A	2c. Was the process implemented as of 12/1/06?
			Notes:

Yes	No	N/A	2d. If it was implemented, is the process effective?
			Notes:

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Yes	No	N/A	2e. Is a copy of the changed or altered leak evaluation ticket being sent to the billing department? (PCI Policy)
			Notes:

Yes	No	N/A	2f. Is the billing department confirming that any alterations have been initialed and noted? (PCI Policy)
			Notes:

Yes	No	N/A	3a. As of 5/31/06, is PCI clerical staff reviewing within the Leak Management System all scheduled leak evaluation work to identify leaks classified as phantom? (PCI Policy, WUTC Commitment)
			Notes:

Yes	No	N/A	3b. Are phantom leaks being flagged? (PCI Policy, WUTC Commitment)
			Notes:

Yes	No	N/A	3c. Is the previous person that checked the leak being noted on the printed work order? (PCI Policy, WUTC Commitment)
			Notes:

Yes	No	N/A	3d. Are the local superintendents consistently assigning the work to another individual? (PCI Policy, WUTC Commitment)
			Notes:

Yes	No	N/A	4. Do completed leak tickets have the required data (circumstances permitting) recorded in sections 1 and 2? (GOS 2625.1300 section 5.1)
			Notes: e.g. serial number of CGI

Yes	No	N/A	5. Do completed leak tickets have the required data (circumstances permitting) recorded in section 3? (GOS 2625.1300 section 5.1 & GFP 4625.1160)
			Notes: i.e. Sketch CGI Reads/Leak Location. Verify perimeter of leak clearly indicated, magnitude & location of reads as found, and the distance to relevant features shown (GOS 2625.1300 section 5.1.1.6.1.

Yes	No	N/A	6. Verify copy of PSE 2007 GOS and GFP available at location (GOS 2425.1000)
X			Notes: Jerry Engel has 2007 version of PSE GOS and GFP

Yes	No	N/A	7.
			Notes:

Yes	No	N/A	8.
			Notes:

Questions and Comments
Review each step of the Pilchuck Leak Record Management Procedure. Does the procedure work in all instances? Clerical Staff have responsibilities in 6 of the 10 actions listed. Review procedure steps and determine if there are certain tasks designated to specific individuals. Do the same with the Superintendent position who is listed under 3 actions. For all positions, do the individuals have training and/or experience in performing the action? Can their abilities be verified? Procedure step 8, how are modified tickets being flagged for review by the Superintendent because step 7 (the only post completion QC review) does not state this as a requirement?

02/02/07

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Source: Document Request 007