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Puget Sound Energy
Gas Safety Audit
Section 9 - Sufficiency of Resources

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Sufficiency of Resources

9.1 Introduction

9.1.1 Objective and Scope

This task's objective was to conduct a review of the sufficiency of resources Puget Sound Energy (PSE) provides for its gas safety compliance program. The review entails two distinct activities. The first activity is to explore the adequacy of the resources PSE devotes to its mandated safety programs. The second activity is to assess how effectively PSE monitors its mandated safety programs for compliance. The review of the sufficiency of resources is intended to be independent of whether the safety activities and programs are implemented by PSE or service provider (SP) employees.

Our findings are listed under the following headings:

System Programs

- Maintenance Programs
- Safety Compliance Program

Adequacy of Resources

- Budget
- Workforce
- Vehicles
- Tools and Equipment

Monitoring Effectiveness

- Staff
- Compliance Oversight Process
- Information Systems
- Performance Improvement Efforts

Safety Compliance Program Status

- Discussions

9.1.2 Background

Historically, Puget Sound Energy (PSE) and the staff of the Washington Utilities and Transportation Commission (UTC) have entered into frequent settlement agreements concerning the safety of PSE's gas distribution system. Each settlement agreement placed certain obligations on PSE to insure that adequate resources be dedicated to mandated safety programs and that the mandated safety programs be effectively monitored to ensure compliance. Refer to Section 4 - Safety for a listing of settlement agreements. Moreover, since September 7, 2007, PSE and UTC have been collaborating to address improvements to work processes, quality of service and system performance for aspects of PSE's operations, including gas operations and service provider (SP) oversight.

PSE and UTC have contracted Jacobs Consultancy Inc. to conduct a third-party audit of PSE's mandated gas safety program. The results of this audit are intended to enable PSE and the UTC to possess and work with an authoritative assessment of PSE's mandated gas safety activities. Subsequently, an associated implementation plan involving mutually agreed upon recommendations will be available to PSE and the UTC.

Basically, PSE and the UTC prescribed this section of the safety audit to conduct a review of the sufficiency of resources Puget Sound Energy (PSE) provides for its gas safety compliance program. The gas safety compliance program involves a collection of system maintenance, inspection and facility replacement activities stemming from requirements in State and Federal Code and/or PSE's Gas Operating Standards, formal compliance programs and settlement agreement commitments to the UTC. The review entails two distinct activities. The first activity is to explore the adequacy of resources PSE devotes to its mandated safety programs. The second activity is to assess how effectively PSE monitors its mandated safety programs for compliance. The review is intended to be independent of whether the safety activities are implemented by PSE or SP employees.

Adequacy: The Definition Used in this Report

For the purpose of this report, "adequacy" is defined as being able to satisfy a requirement[1]. Adequacy is a quality of being able to meet a need sufficiently for the desired outcome. Thus the resources PSE provides must be of sufficient quantity and quality in order to ensure essentially full compliance with all minimum safety requirements without UTC intervention.

[1] The American Heritage Dictionary, Second College Edition

Effectively: The Definition Used in this Report

Similarly, for purpose of this report "effectively" is defined as having the intended or expected effect[2]. Thus when this definition is applied to monitoring mandated safety activities and programs, it implies the existence of staff, business processes and information systems to review and examine Mandated Safety activities from inception through completion.

The following sections address the sufficiency of resources PSE and their service providers devote to safety compliance; how effectively PSE monitors its mandated safety programs for compliance; and identifies certain findings, draws specific conclusions and contains several recommendations.

[2] ibid

9.2 Gas Safety Compliance Programs

9.2.1 Background

In total, PSE identified 25 specific gas safety compliance programs. These programs can be directly related to requirements in State and Federal Code and/or PSE's Gas Operating Standards, formal compliance programs and UTC settlement agreement commitments also require by rule. Of the 25 identified programs 18 are active, 4 are in various stages of development and 3 are complete. In addition, 10 are a direct result of various UTC findings and settlement agreements and the remaining 15 stem from requirements in State and Federal Code and/or PSE's Gas Operating Standards.

9.2.2 Findings

- Referring to Figure 1 Existing Gas Safety Compliance Programs, we see a summary of the various active condition programs PSE has initiated to properly maintain its natural gas distribution system. The table contains the program's name, scope, work type, start date, completion date, target date, if any, and what's driving the program[3].

[3] Document Request 75 and 181

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Figure 1 - Existing Gas Safety Compliance Program

Compliance Program - Active

Program Name	Program Scope	Work Type	Start Date	Completion Date	Target Date	Program Driver
Bare Steel Replacement	Accelerated replacement of bare steel main per 10 year schedule.	Capital	2005	Ongoing	2014	49 CFR 192 subpart I, WAC 480-93-110
Bridge and Slide Remediation	Remediation of maintenance issues discovered during quarterly bridge and slide patrols. Maintenance issues may be associated with supports, atmospheric corrosion, leakage, land movement, access problems, etc.	Capital and O&M (70/30)	Ongoing	Ongoing	Ongoing	49 CFR 192.481, WAC 480-93-110
Continuing Surveillance	Remediation of unsafe, unsatisfactory, and non-standard conditions discovered in PSE's natural gas system (See PSE GOS 2575.2700). Conditions are reported via PSE Form 3704 and do not overlap with other maintenance programs driven out of System Maintenance Planning. Commonly reported maintenance issues include buried meters and risers, insufficient traffic protection, shallow services and mains, and pipeline encroachments.	Capital and O&M (50/50)	Ongoing	Ongoing	Ongoing	49 CFR 192.613
Converted Single Service Farm Tap Remediation	Remediation of former single service farm taps that are currently operating as district regulators. Work typically includes adding inlet and outlet valves, rebuilding stations, or retiring stations where the system will allow for it.	Capital and O&M (95/5)	2008	Ongoing	2013	49 CFR 192.739
HVAC Mitigation	Investigation, assessment, and mitigation of areas where high voltage alternating current (overhead transmission lines) may pose a safety risk to field operations employees. Current work is limited to investigation and assessment. Future work will include mitigating areas of concern and potential replacement work.	O&M	2007	Ongoing	Ongoing	WISHA
Increased Leak Survey Frequency	...accelerated, three-year interval schedule. Asses whether back fill practices of the late 1990's have resulted in increased leakage on PE pipe installations.	O&M	2006	Ongoing	Ongoing	WAC 480-93-188, UTC Settlement
Inside Meter Set Remediation	Remediation of maintenance issues discovered during annual IMS survey. Includes remediation of atmospheric corrosion, encroachments, access issues, venting issues, etc.	Capital and O&M (50/50)	2008	Ongoing	Ongoing	49 CFR 192.353, 192.355, 192.481, WAC 480-93-110
Isolated Facilities	Investigation and remediation of electrically isolated facilities. Facilities impacted by this program include mains, services, risers, stubs, EUFs, and casings.	Capital and O&M (70/30)	2005	Ongoing	2014	49 CFR 192 subpart I, WAC 480-93-110, UTC Settlement
Leakage Action	Elimination of active leaks not associated with other programs driven out of System Maintenance Planning. These are typically complex projects requiring engineering and project management resources. For the most part, this does not include more routine repair work managed by Gas Operations and PCI. Exceptions may include areas with past leakage history (excessive leak clamps) or areas where active leaks may point to underlying maintenance concerns (e.g. corrosion, disbonded coating)	Capital	Ongoing	Ongoing	Ongoing	49 CFR 192.723, WAC 480-93-18601
Mobile Home Community Remediation	Remediation of maintenance issues discovered during 3-year mobile home community patrol. Maintenance issues are typically associated with main and service encroachments as well as idle risers.	Capital	2003	Ongoing	TBD	N/A
Regulator Overpressure Protection Remediation	Remediation necessary to ensure regulator stations with relief valves pass their relief review. Work may be associated with piping, valves, regulators, and/or control lines.	Capital and O&M (70/30)	2003	Ongoing	Ongoing	49 CFR 192.743
Service Regulator Relief Vent Program	Identify PVC and horizontal relief vents by inspecting all MSA's.	O&M	2006	Ongoing	2010	UTC Settlement
Sidewalk Regulator Remediation	Remediation of maintenance issues discovered during sidewalk regulator inspections. Maintenance issues may be associated with equipment malfunction, atmospheric corrosion, leakage, access problems, and venting.	Capital and O&M (unknown)	2009	Ongoing	2014	N/A
Transmission Integrity Management	Annual assessment and investigation of PSEs transmission lines. Work includes patrols, leak surveys, electrical surveys and direct examinations. Depending on results of assessment some capital remediation work may be involved, but this has not occurred to date.	O&M	2004	Ongoing	Ongoing	49 CFR 192 subpart O

Unmaintanable District Regulator Remediation	Remediation of maintenance issues discovered during annual regulator station inspections. Includes gate and limit stations, district regulators, and farm taps. Maintenance issues may be associated with equipment malfunction, atmospheric corrosion, leakage, access problems, vaults, etc.	Capital and O&M (95/5)	2003	Ongoing	Ongoing	49 CFR 192.739
Unmaintanable MSA Remediation	Remediation of MSAs under the responsibility of Industrial Meter Operations (IMO). Maintenance issues may be associated with equipment malfunction, atmospheric corrosion, leakage, access problems, etc. Also includes change out of R5000 meters.	Capital	2003	Ongoing	Ongoing	N/A
Valve Remediation	Remediation of maintenance issues discovered during valve inspections. Common maintenance issues may include valve that are inoperable, leakage, and access concerns.	Capital and O&M (90/10)	2006	Ongoing	Ongoing	49 CFR 192.747
Wrapped Steel Service Assessment	Remediation of pre-1972 STW services. Includes replacement activities, increased leak surveys, and electrical surveys.	Capital and O&M (97/3)	2007	Ongoing	2010	UTC Settlement

- Of the 18 active programs 11 are ongoing, 6 have specific targeted end dates and 1 end date has yet to be determined.
- In addition, PSE has a number of other system condition programs under development and in some instances with certain remediation work currently taking place. These are summarized in Figure 2 Gas Safety Compliance Programs - Under Development. Similar to Figure 1, the table contains the program's name, scope, work type, start date, completion date, target date, if any, and what's driving the program[4].

Figure 2 - Gas Safety Compliance Programs Under Development

Compliance Program - In Development

Program Name	Program Scope	Work Type	Start Date	Completion Date	Target Date	Program Driver
Atmospheric Corrosion Mitigation at Pipe Supports	Remediation and mitigation of pipe supports that prevent a full atmospheric corrosion inspection. The program is limited to piping associated with gate stations, limit stations, and town border stations. Work will involve use of guided wave technology, station rebuilds, and pipe support modification/removal.	Capital and O&M (unknown)	2009	Ongoing	TBD	49 CFR 192.481, WAC 480-93-110
Distribution Integrity Management	Development and Implementation of PSE's new DIMP. Post development, work will include replacement activities, modified maintenance activities, risk analysis, and periodic reevaluation of program metrics.	Capital and O&M (unknown)	2008	Ongoing	TBD	In the process of a rule making by PHMSA, 49 CFR 192 Subpart M
Double Insulated Flange Mitigation	Investigation and remediation of electrically isolated steel valves. This is a combination of replacement, maintenance, and inspection work.	Capital and O&M (50/50)	2008	Ongoing	TBD	WAC 480-93-110, 49 CFR 192 Subpart I
Pre-1985 PE Pipe Mitigation	Mitigation of maintenance/safety concerns associated with older polyethylene pipe with a focus on DuPont PE. Current work is limited to replacement activities. Future work may include increased leak surveys or patrols.	Capital	2005	Ongoing	Ongoing	N/A

[4] Document Request 75 and 181

- Of the 4 compliance programs under development PSE considers 3 are to be either federally and/or state code mandated and 1, pre-1985 PE Pipe Mitigation, is to be somewhat more discretionary nature.
- The need for these programs can be in response to UTC audit findings such as the Sidewalk Regulator Remediation Program that resulted from the Pierce County Audit or from findings of other existing Continuous Surveillance programs such as the Double Insulated Flange Mitigation Program.
- Also, PSE has several other system condition programs completed. These are summarized in Figure 3 Gas Safety Compliance Programs Completed. Similar to Figure 1 and 2, the table contains the program's name, scope, work type, start date, completion date, target date, if any, and what drove the program[5].

Figure 3 - Gas Safety Compliance Programs Completed

Compliance Program - Completed

Program Name	Program Scope	Work Type	Start Date	Completion Date	Target Date	Program Driver
Cast Iron Pipe Replacement	Accelerated replacement of Cast Iron piping per 15 year schedule	Capital	1992	2007	2007	UTC mandated
Critical Bond Program	Ensure adequate number of test sites exist to properly monitor Cathodic Protection systems.	Capital	1996	2007	2007	WAC 480-93-110, 49 CFR 192 Subpart I, UTC Settlement
Pipeline Marker Program	In response to 2005 WAC rule; developed a process for identification and installation of pipeline markers at specified locations. The program also addresses the annual inspection and maintenance of installed markers.	O&M	2005	2007	2007	WAC 480-93-124

- Of the 3 compliance programs completed, PSE considers 2 to be either federally and/or state code mandated and the other UTC mandated.

9.2.3 Conclusions

PSE identified 25 specific gas safety compliance programs of which 18 are active, 4 are in various stages of development and 3 are complete. Most of these compliance programs are mandated via UTC consent agreements or settlements. Of the 25 programs identified, PSE believes 4 are discretionary. These include: Mobile Home Community Remediation, Pre-1985 PE Pipe Mitigation, Sidewalk Regulator Remediation and Un-maintainable Meter Set Assembly Remediation.

The 25 compliance programs range from projects completely charged to capital like a Mobile Home Community Remediation program to those charged completely to O&M expense like assessments associated with the Transmission Integrity Management Program. In addition, a

[5] Document Request 75 and 181

number of the programs like Double Insulated Flange Mitigation split their costs between capital and O&M.

We find the high number of mandated settlement agreements between PSE and the UTC staff to be unusual and not typical of the relationship that exists between the regulator and the utility in other states and jurisdictions. In our experience, utilities want to be proactive and take the lead in maintaining the safety of its gas distribution system – not just follow the regulator's mandates. The historical frequency of needed settlement agreements is an indication that PSE should examine its strategic perspective, goals and objectives directed at maintaining the safety compliance of its gas distribution system. Consequently, we examined PSE's Corporate Goals to determine if gas safety compliance was reflective of the company's settlement experience[6]. The only 2009 Corporate Goal that somewhat relates is the goal dealing with Optimized Generation and Delivery, which states "... build or replace infrastructure in a way that meets our customer's needs…" In light of PSE's settlement agreement history, we find this goal inadequate. PSE needs to develop a goal with supporting objectives, actions and measures to fully communicate senior management's intentions. This goal will help set the tone and cascade throughout the organization PSE's system safety intent, as well as the company's desire to become more proactive with regards to system safety compliance issues (See Recommendation 9.2.4.1).

9.2.4 Recommendations

9.2.4.1 Develop and implement a Corporate Goal concerning gas system safety. Goal should include supporting objectives, actions and measures to fully communicate and demonstrate senior management's gas system safety intent. Implementation of this goal should result in cascading a gas system safety proactive approach throughout the organization.

[6] Document Request 84

9.3 Adequacy of Resources

9.3.1 Budget

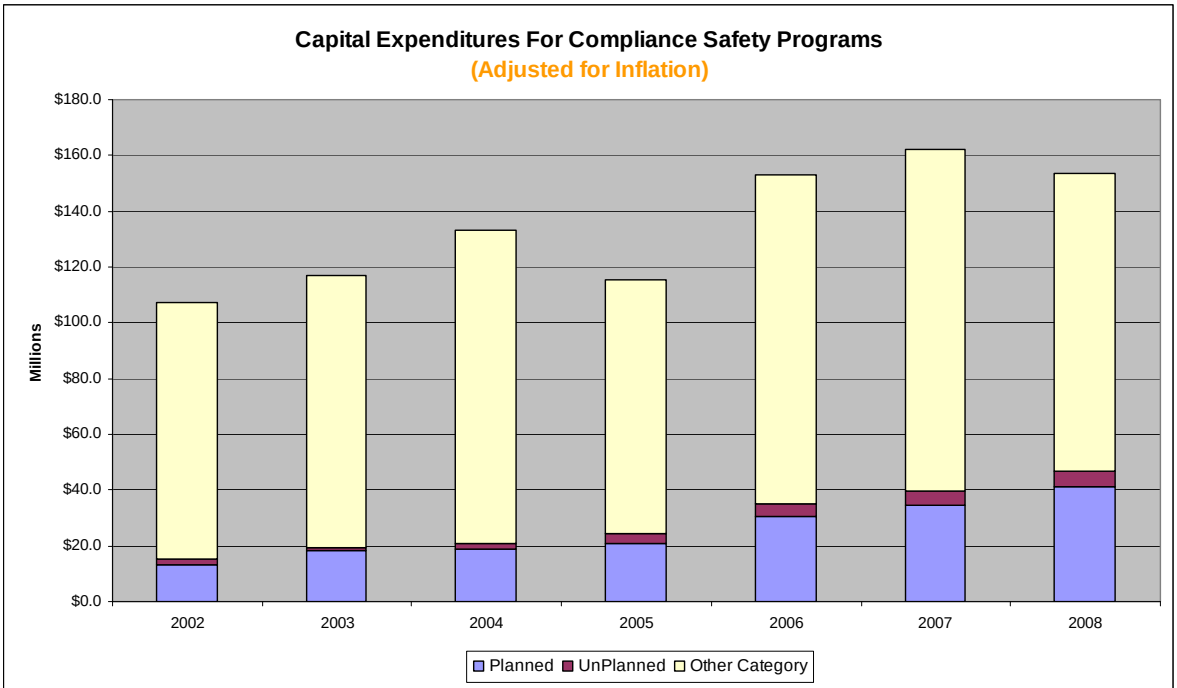
Consistent with FERC accounting rules, the funding for gas safety compliance programs is a combination of Capital and O&M expense. For example, as can be seen from the table in Figure 1 Existing Gas Safety Compliance Programs, 10 of the active compliance programs split their costs between capital and O&M, while 4 are charged directly to O&M and 4 directly to capital. Those compliance programs splitting their costs between capital and O&M vary from a high of 97% capital to an even 50-50 capital O&M split. In order to assess adequacy of budget, we reviewed the historical and budgeted capital and O&M budgets both individually and combined, made inquiries regarding budget constraints during formal interviews and informal field interviews. We then supplemented this information with numerous field observations.

9.3.1.1 Capital Expenditures

- Overall PSE's gas system-related capital expenditures can be divided into certain categories including: customer reimbursed, external commitment, increased capacity, new service electric, new service gas, planned and unplanned. Of direct interest to us with regard to safety compliance programs are the last two categories. While not just representing safety compliance program work, these categories are a strong indicator of compliance-related capital activity and expense. Planned and unplanned capital work are defined as follows:
    - Planned capital is work with known units and/or stop-and-start dates. Since the work is known it is budgeted and scheduled ahead of time. An example of this type would include bare steel replacement.
    - Unplanned capital is work that is unknown at the time the budget is developed. This type of work is driven by customers, leaks, damages to distribution system, inspection surveys, and issues discovered during annual programs. An example of this type of work would include leak remediation that due to its nature becomes more complex than requiring a routine repair.
- Figure 4 Compliance Safety Programs - Capital expenditures is a bar chart comparing the planned and unplanned capital work to the total gas operations capital budget[7].

[7] Document Request 144

Figure 4 - Compliance Safety Programs - Capital Expenditures

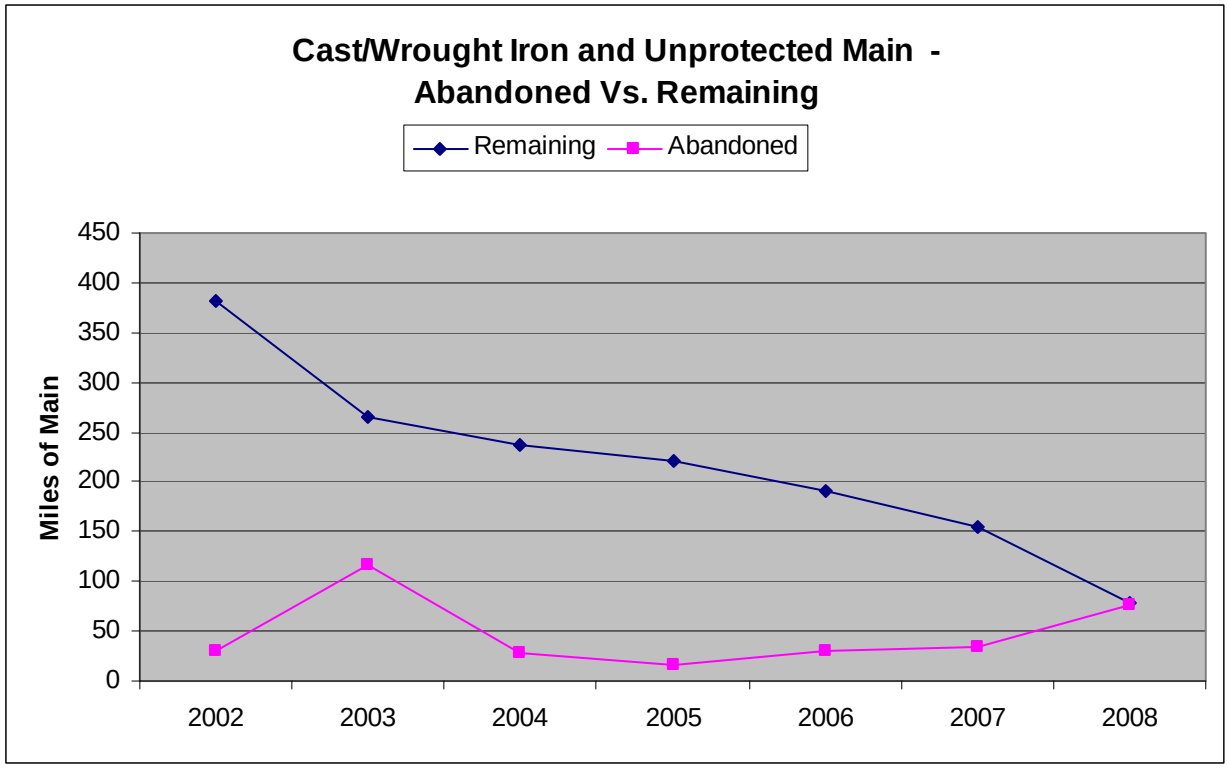


Note: Adjusted for inflation. Source: Bureau of Labor Statistics, Investopedia.

- The data in this chart, which has been adjusted for inflation, indicates the overall gas capital expenditures have grown from 2002 and 2008. The total budget expenditures increased by $46.5 million or 30.2%, while the amount spent on planned and unplanned capital work has grown dramatically by $27.3 million or 141%. Also, planned and unplanned capital work when compared to the total budget has doubled. In 2002, planned and unplanned capital work accounted for 14.2% of the total budget and in 2008 these two categories accounted for 30.4% of the budget.
- Reliability projects, along with other construction work, are prioritized based on the Total Energy System Planning process. This process measures the benefits of a given project and allows that project to be compared with other projects. Gas and electric projects are compared against each other, with an emphasis on maximizing the benefits, while meeting budget targets for spending.
- A review of Figures 4 shows the vast percentage of capital expenditures are planned, meaning that PSE is able to focus on removing targeted/defective pipe from its system in an orderly way.
- Over or under budget projects are tracked and a project change request is prepared and processed for approval when significant variances from the estimate are encountered.
- Based on the definitions provided both planned and unplanned capital work are independent of system growth, as they are the funds expended on removing targeted/defective pipe from PSE system. This pipe would include: cast/wrought iron

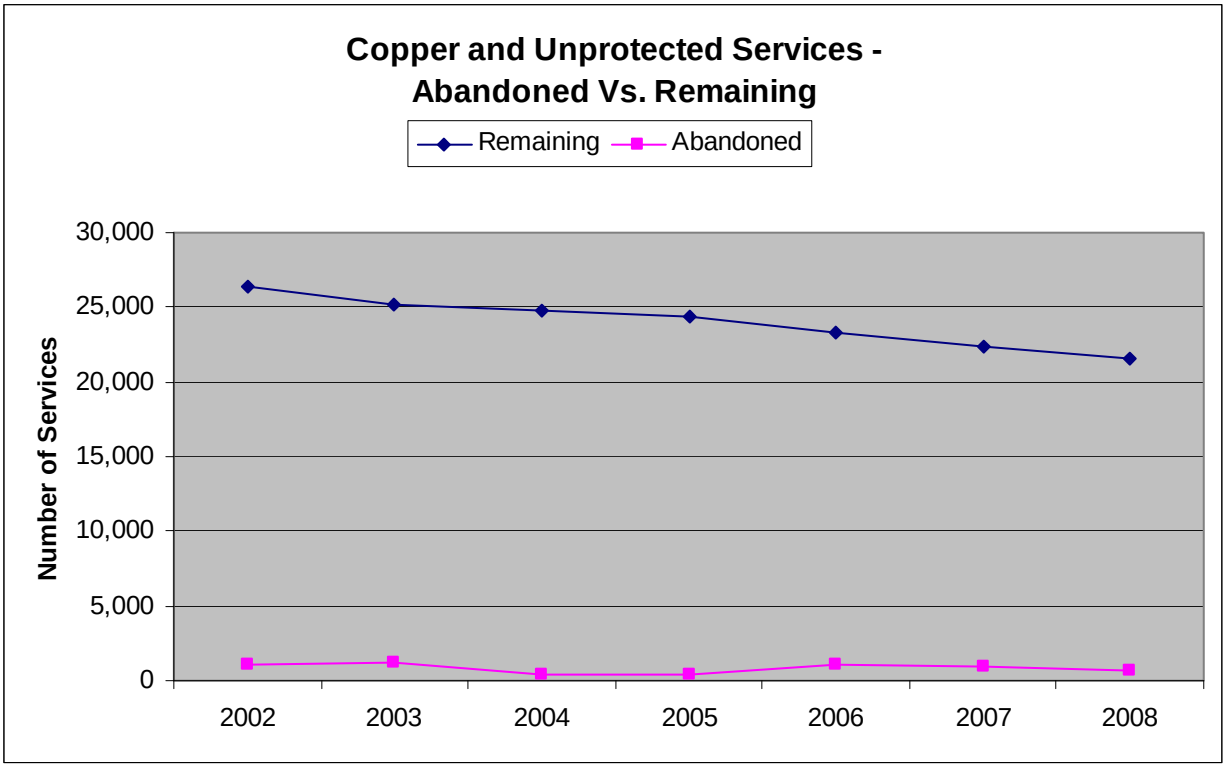
main, unprotected main, certain cathodically protected main, copper service, unprotected service and certain service. Figure 5 Select Main Pipe Remaining and Abandoned describes the amount of targeted/defective miles of main cast/wrought iron and unprotected pipe removed and remaining from PSE system between the years 2002 and 2008. Figure 6 Select/Service Pipe Remaining and Abandoned describes the number of copper and unprotected services removed and remaining from PSE system between the years 2002 and 2008[8].

Figure 5 – Select Main Pipe Remaining and Abandoned



[8] Document request 189

Figure 6 – Select/Service Pipe Remaining and Abandoned



- It is clear from Figure 5 that PSE was able to fully remove cast/wrought iron from its system as well as a significant portion of unprotected pipe. In 2002 the system contained 236 miles of cast/wrought iron and 146 miles of unprotected steel pipe. As of 2008 only 78 miles of unprotected bare and coated mains remain in PSE system.
- It is also clear from Figure 6 that PSE continues to work at removing unprotected and copper services from its system but at a much more selective rate. As of 2008 the number of unprotected and copper services was reduced from 28,872 in 2002 to 21,615.
- Of the 2007 actual planned and unplanned capital work, Pilchuck completed $29.3 million or approximately 65% of the work. Potelco does not perform planned and unplanned capital work[9].

9.3.1.2 Operations and Maintenance Expense

- Maintenance Programs (MP) and System Maintenance Planning (SMP) meet in the spring of each year to develop the O&M portion of the next year's budget for gas operations. Over the course of several months, MP and SMP will get together to exchange budget-related information. MP is tasked with determining unit counts for the

[9] Document Request 13

various patrols, surveys, and inspections they manage and delivering that information to SMP. SMP then compiles unit cost information and works with other stakeholders to develop the overall O&M budget for gas operations[10].

- PSE performs a large variety of inspection and maintenance work to help maintain the condition of its gas distribution system. These O&M funded activities, all of which are detailed in its Gas 2009 Budget Planning Document Draft, have been divided by PSE into three groups with the following designations[11]:
  - **Group 1 --** Work budgeted and planned for by Maintenance Programs, part of Gas Operations, consists of routine inspection and maintenance performed by Gas Operations, Heath, and Pilchuck. This work is required per state and federal code and/or PSE's Gas Operating Standards. Examples include: leak survey, cathodic protection (CP) system maintenance, and valve locates and operation activities.
  - **Group 2 --** Work budgeted and planned for by System Maintenance Planning, part of System Planning Department, 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) and isolated facilities.
  - **Group 3 --** Specific O&M budgets driven by System Maintenance Planning. Includes: O&M projects related to bridge and slide locations, regulator stations, and valves. These projects keep PSE on cycle with maintenance issues reported by field personnel and eliminate safety concerns and compliance risks.

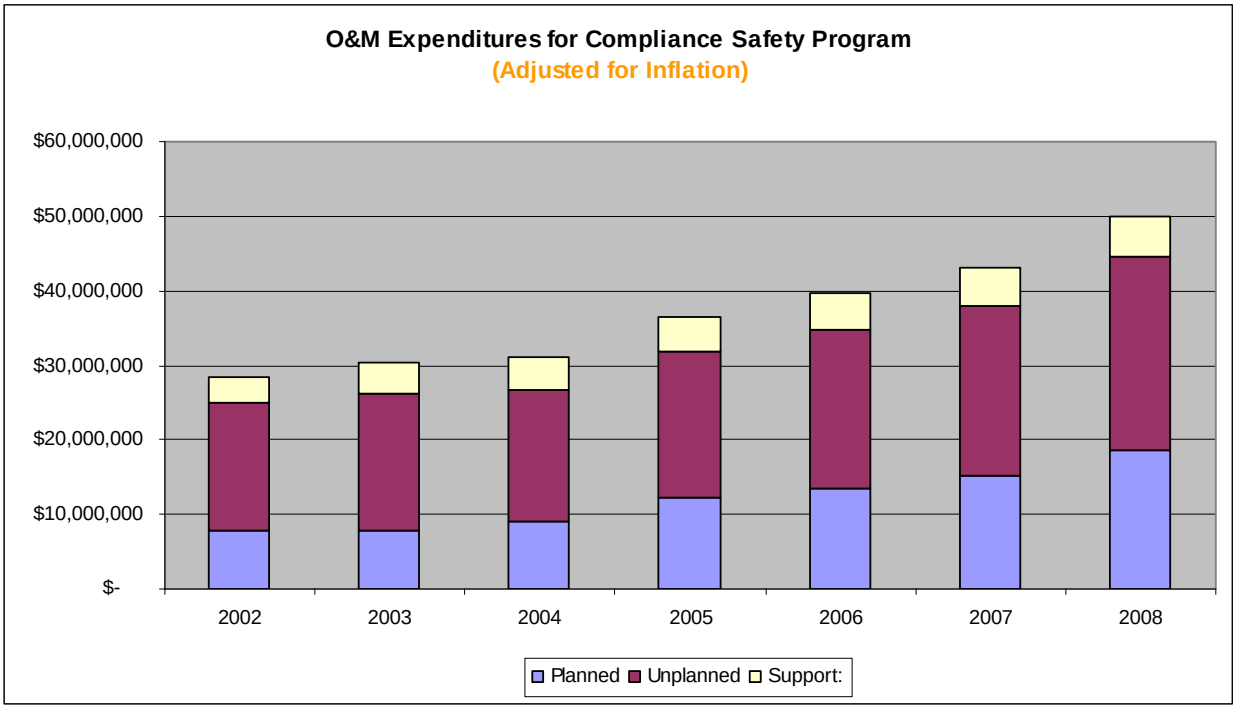
- In total, within the 3 groups are 128 activities for budgeting purposes. These activities can also be categorized as planned and unplanned. Planned and unplanned O&M work are defined as follows:
  - Planned O&M is work activities with known units and/or stop-and-start dates. Since the work is known, it is budgeted and scheduled ahead of time. An example of this type would be the Pipeline Marker program.
  - Unplanned O&M is work activities that are unknown at the time the budget is developed. Similar to capital work, this type of activity is driven by customers, leaks, damages to distribution system, inspection surveys, and issues discovered during annual programs. An example of this type of work would be basic leak remediation.

[10] Document Request 87
[11] Document Request 26

While not just representing safety compliance program work, these categories are a strong indicator of compliance-related O&M activity and expense.

Figure 7 Compliance Safety Programs – O&M Expenditures is a bar chart comparing the planned and unplanned O&M work to total gas operations O&M expenditures budget[12].

Figure 7 - Compliance Safety Programs - O & M Expenditures[13]

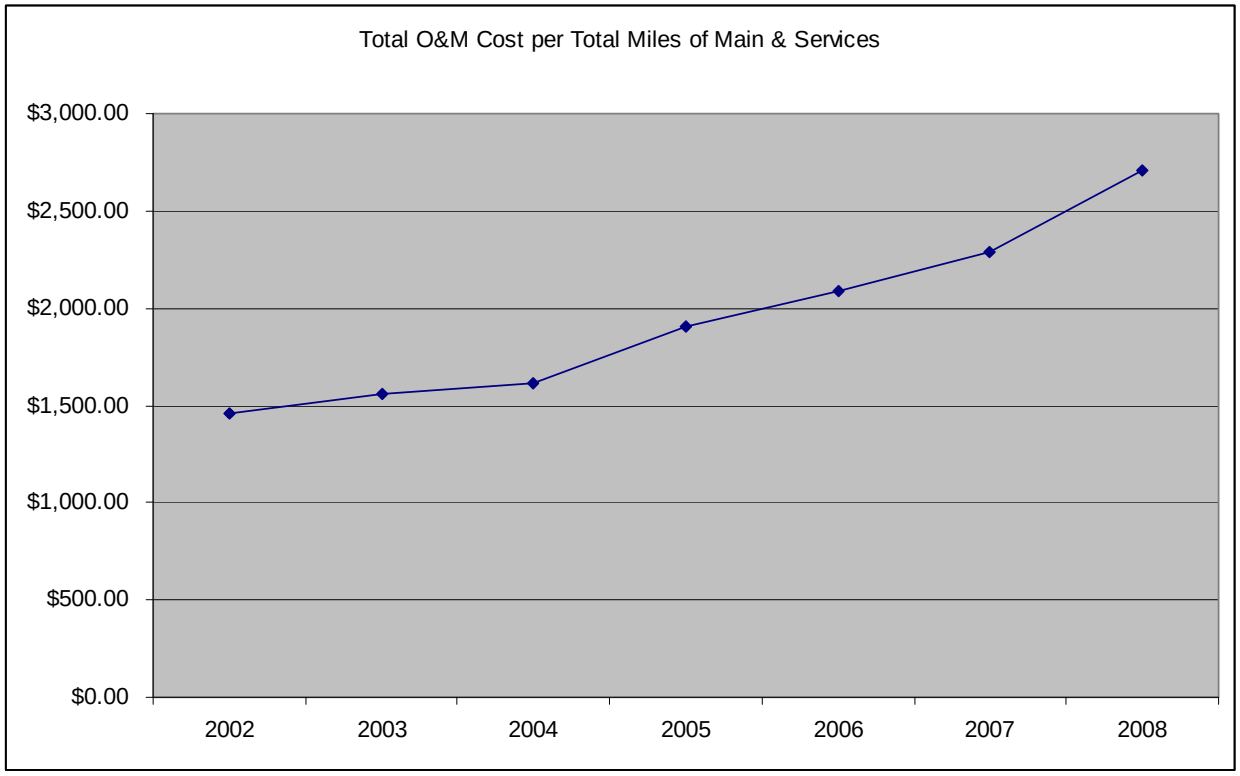


- The data in this chart, which has been adjusted for inflation, indicates the overall gas O&M expenditures have grown consistently from 2002 and 2008. The total expenditures increased by $12 million slightly over 42.5%, while the amount spent on planned and unplanned O&M work has grown by $19.6 million or 78.6%.
- To help put the gas O&M expenditures budget increase in perspective during the same period of time the gas main system has grown from 10,944 miles in 2002 to 11,925 miles in 2008 an increase of 8.9% or almost 1.5% per year. While the number of service installations has grown from 705,325 in 2002 to 805,636 in 2008 an increase of 14.2% or almost 2.4% per year.
- Figure 8 O&M expense for pipe in service shows the escalation of the O&M budget as compared to the amount of pipe and service. In order to make this comparison, Jacobs assumed the average service length was 65 feet. Figure 8 clearly shows that the amount

[12] Document Request 144
[13] Support is the O&M cost split .originating from centers such as Purchasing & Engineering.

of O&M expenditures per mile has increased dramatically between 2002 and 2008. In 2002 the approximate average O&M per mile was $1457 and in 2008 this average grew to $2712 per mile for an average increase of over 86%.

Figure 8 – O&M Expense for Pipe in Service

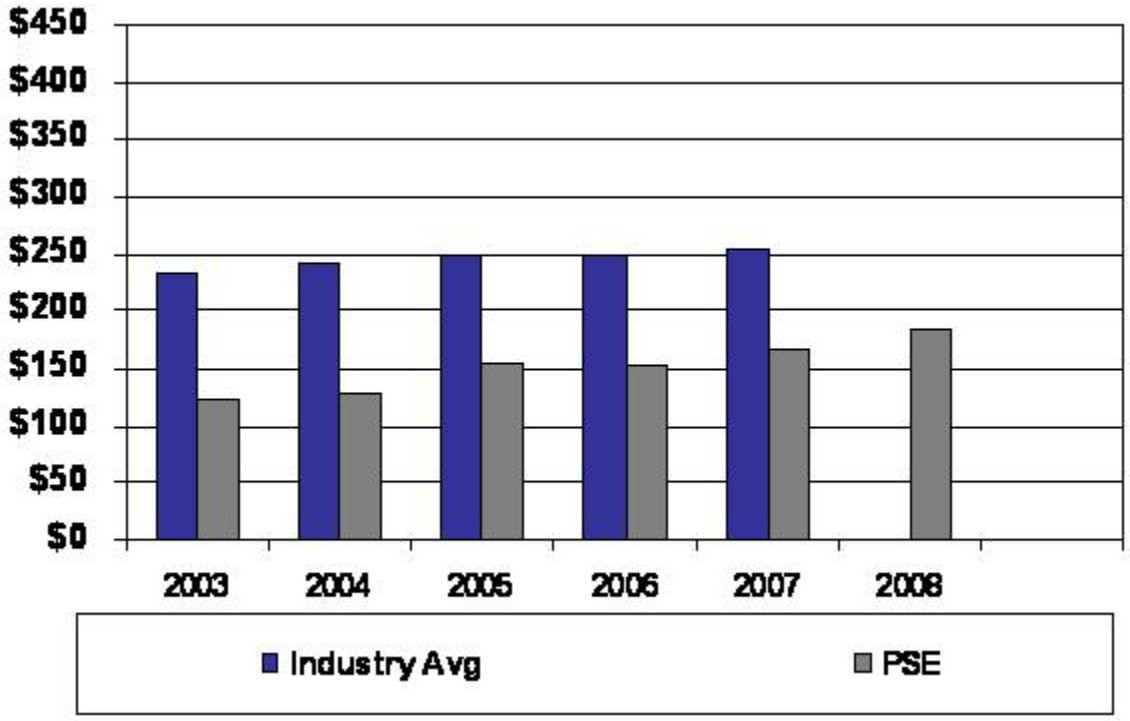


- Planned and unplanned O&M work when compared to the total O&M expenditures has consistently been about 88% of the overall expenditures. Thus the O&M budget is substantially compliance or mandated program driven and there is little funding available for discretionary O&M work[14].
- Of the 2007 actual planned and unplanned O&M budget, payments to Pilchuck amounted to $7.8 million or approximately 18% of the budget. Potelco does not perform planned and unplanned O&M work.
- In order to provide a broader perspective on O&M expenditures, PSE routinely produces charts showing they are amongst the most efficient gas distribution companies in terms of gas non-production/generation O&M cost per customer. Figure 9 Gas Non-Production/Generations O&M Cost per Customer[15] provides a comparison of O&M costs between 2003 and 2007 for PSE to the industry, as well as PSE's actual O&M costs for

[14] Interview Number 42
[15] State Regulatory filings from SNL Financial Database (supplied by PSE)

2008. Comparison information with other gas distribution utilities in 2008 is not yet available.

Figure 9 - GAS Non-Production/Generation O&M Cost per Customer



- Between 2003 and 2007 industry gas non-production/generation O&M cost per customer has grown from approximately $234 to $255 for an overall increase of 8.9% or 2.2% per year. Similarly, PSE's O&M cost per customer has grown from approximately $122 to $166 for an overall increase of 36% or 9% per year. Thus between 2003 and 2007, PSE increased its O&M cost per customer at a rate four times the industry average, although it's still significantly lags behind the industry average.
- The relative expenditures displayed in Figure 9 can be viewed from at least two perspectives, first that PSE is more efficient than other utilities, or second, PSE has historically underfunded its gas system. From our field observations and interviews with employees we did not see evidence of gas system underfunding, we did see an effort to efficiently manage O&M expenditures.

9.3.2 Workforce

Our approach to assessing workforce adequacy consisted of two distinct steps. First, collecting, rationalizing and performing an initial analysis of the workforce size and trends and second, assessing the workforce adequacy through formal interviews, informal discussions and field observations.

Since workforce adequacy implies sufficient in-house staffing and outside contractors to satisfy workload requirements in a timely manner, we examined the existing mix of In-house and service provider workforce. Consequently, we judge the adequacy of the overall workforce on the basis of system performance, levels of in-house overtime, workforce plans, customer satisfaction statistics and workload backlog.

Jacobs Consultancy's study of PSE workforce adequacy focused on a number of discrete assessments:

- Staff Support - includes organization structure for maintenance planning, capital planning and monitoring.
- Maintenance and Operations - includes workforce planning, the dispatch function, shift and call-out procedures, field coordination between PSE and service providers, maintenance planning, backlogs, and technology enablers.
- In the Training and Safety Sections, we provided in-depth reviews of safety and training. These sections reviewed the importance of safety in PSE's organization while relating training to the safety results achieved.
- Quality was reviewed in the Contracts and Audibility of Records Sections where we provided discussions and assessments of PSE's quality assurance program as well as the service provider's quality control activities.

9.3.2.1 PSE

Organizationally, gas safety compliance programs impact on multiple organizations within PSE. However, two groups, Total Energy System Planning (primarily System Maintenance Planning) and Gas Operations (primarily System Control and Protection, and Gas First Response) have the major gas safety compliance program responsibilities. In addition, gas safety compliance program metrics are communicated upwards in the organization to the COO level. In connection with these metrics various senior management have certain accountabilities.

In this next section, we discuss the organizations that are impacted by gas safety compliance program responsibilities as well as the metrics that senior management is held accountable for.

Total Energy System Planning

- Total Energy System Planning consists of approximately 60 employees of whom one-third is focused on gas and two-thirds on electric. The department includes: System Maintenance Planning, Capital Planning and Engineering Options Planning groups[16].

- System Maintenance Planning is responsible for budgeting the O&M operations and projects. The group is also responsible for the compliance programs, which are coordinated through contract management, as most of the related work completed by Pilchuck. In addition, the group is responsible for trending information from continued surveillance or audits to determine future program management opportunities.

- Not all compliance programs have designated program managers and are just tacked onto other people's workload. Certain interviewees felt that without clear organizational responsibilities some compliance programs “might fail” without the dedicated oversight.

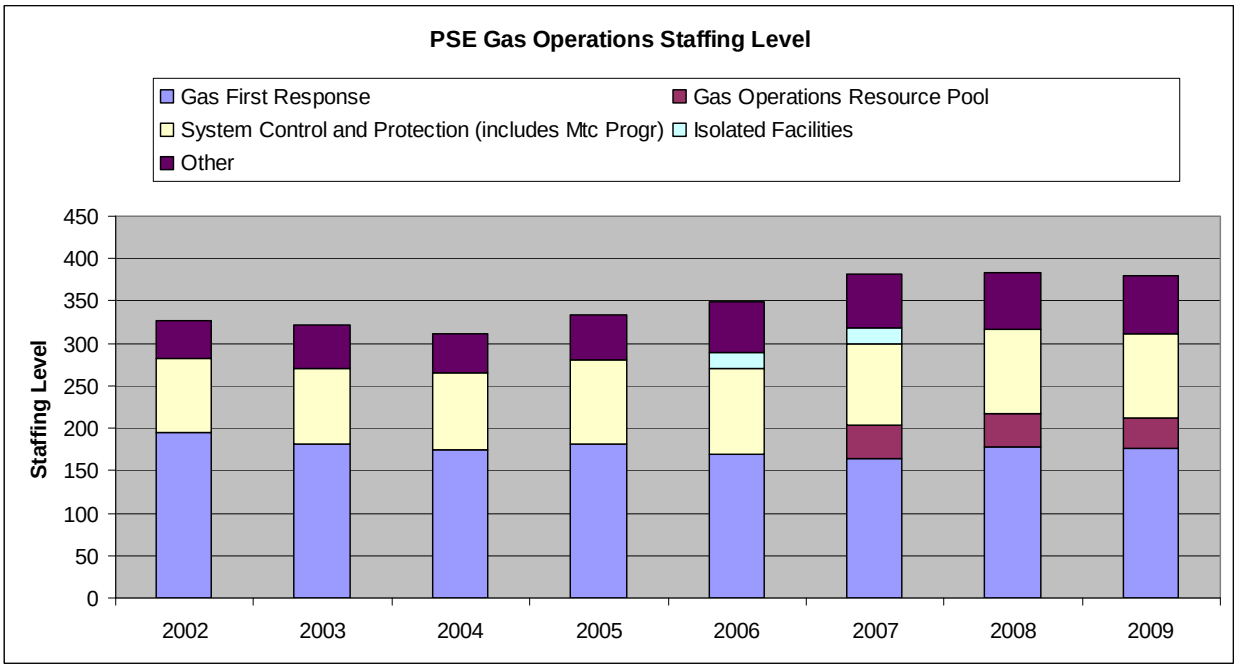
- Capital Planning is responsible for the capital budget. Capacity is the biggest driver and this group is responsible for system monitoring to keep-up with growth. Growth is measured by new customer load information from new business additions. Other types of capital projects include: public improvement projects, paving projects and facility replacements.

Gas Operations

- Figure 10 PSE Staffing- Gas Operations describes the historical fulltime equivalent staffing for PSE gas operations between 2002 and 2007. The chart breaks out Gas First Response, Gas Operations Resource Pool, System Control and Protection, Isolated Facilities, and Other. Included in the Other category are: Director Gas Operations, Gas Dispatch, Gas Control, Gas Operations Manager/Training, Alternative Fuels, Energy Measurement, Instrumentation and in 2002 only, staff available because of the service provider reorganization.

[16] Interview Numbers 42 and 51

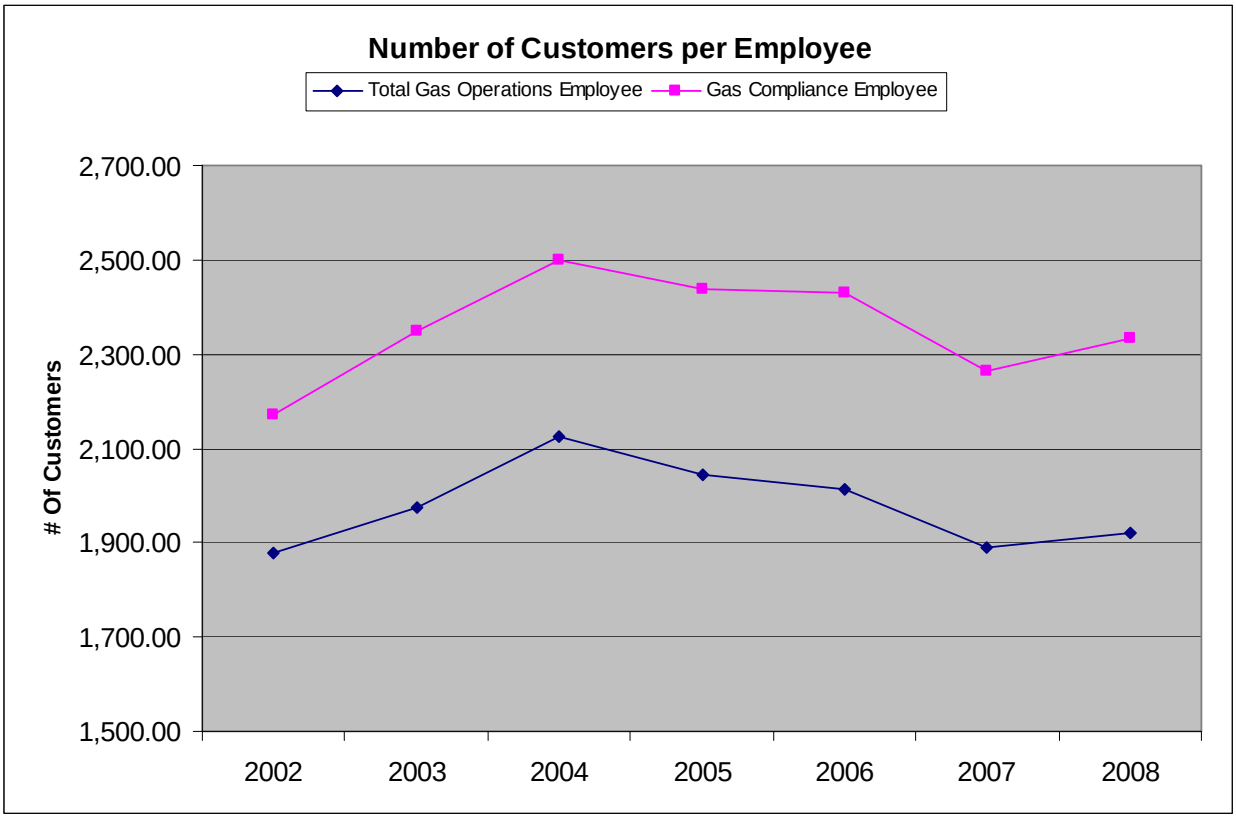
Figure 10 - PSE Staffing-Gas Operations



- Excluding open positions, which are not shown in the chart, Gas Operations total fulltime equivalent staffing from 2002 through 2009 has increased by over 13%. The job category with the largest increase was the Gas Operations Labor Resource Pool with 40 fulltime equivalent positions. The Gas Operations Labor Resource pool was created in 2007. In addition to the actual fulltime equivalent staff of 385 shown in the chart, as of April 28, 2009 there were an additional 20 open positions. A number of these open positions will eventually be filled by staff presently in the Gas Operations Labor Resource Pool. Of the 20 open positions, only 3 are related to the group performing most of the compliance work. These 3 openings recently resulted from GFR personnel accepting positions in System Control and Protection. Jacobs does not consider the 20 open positions as a deficiency in resources, but rather the normal level of vacancies that would be associated with a workgroup of this size.
- To help put the overall growth of employers in prospective Figure 10 Number of Customers per Gas Operations Employee (blue line) shows the ratio of average number of customers served including: residential, commercial firm, industrial firm, interruptible, and transportation to the year-end PSE employee count. Between 2002 and 2008 the total number of customers grew by 20% while the number of PSE employees grew by only 13%. In 2004 the ratio of customers to employees spiked at 2125, since then it has come down and appears to be leveling off at approximately 1900 customers per employee. However, little can be drawn from this finding as a variety of factors such as

use of service providers to augment PSE staff greatly influences any observations in this area.

Figure 11 - Number of Customers per Employee



- The Gas Operations organizations most critical to the gas compliance programs are Gas First Response and System Control Protection. When viewing the total fulltime equivalent staffing for these groups, we must include the Gas Operations Labor Resource Pool. The staffing for this consolidated group from 2002 through 2009 has increased from 283 to 311 positions, which represents a growth of 10% or 28 employees.
- Once again looking at Figure 11 Number of Customers per Employee, the pink line shows the ratio of average number of customers served including: residential, commercial firm, industrial firm, interruptible, and transportation to the year-end count of PSE employees most critical to gas compliance. Over the period analyzed the number of customers to gas compliance employee's parallels the curve for the total number of gas operations employees. The same spike occurs in 2004, and since then the trend has improved and appears to be leveling off at approximately 2300 customers per employee. Again, little can be drawn from this finding as a variety of factors such as use of PCAD

can greatly improve employee effectiveness and such compliance program criteria as leak and emergency response.

- Interviews with Gas First Responders indicated that for a number of years minimum recruiting for new employees took place; however, this situation was addressed starting in 2007. These observations can be confirmed by reviewing the reduced number of Gas First Responders between 2003 and 2006. In general, interviewees felt present staffing was adequate[17].
- Within the System Control & Protection Department, which totals approximately 80 employees, are a number of groups directly associated with the gas safety compliance programs. These groups include: Corrosion Control, Pressure Control, Industrial Meter Operations, and Maintenance Programs.
- There are approximately 50 people in Corrosion Control consisting of corrosion technician's, fitters and utility workers. In addition, within the Engineering Department, there is a supervisor, three corrosion engineers and an analyst. A strong working relationship between the office and field corrosion workforce was observed.
- An interview with a corrosion control supervisor revealed that certain corrosion-related work has shifted from the service provider to the in-house workforce over the two years. While the service provider role is more focused on construction type work; for example, installing new anode beds[18].
- A supervisor within pressure control indicated concerns over his aging workgroup and knowledge transfer. Interviewee cited incomplete records potentially contributing to system safety concerns. The example raised concerned maximum allowable operating pressure (MAOP)[19].
- The Supervisor of Maintenance Programs with a staff of eight employees is responsible to coordinate a variety of compliance programs including: leakage survey program, hard to reach locations, service valve inspections, mobile home patrols, bridge and slide area patrols, atmospheric corrosion inspections, and pipeline marker patrols[20].
- Figure 12 PSE Overtime-Gas Operations describes the historical overtime in terms of actual hours worked for PSE gas operations field personnel between 2002 and 2008. The chart describes overtime for Gas First Response, System Control Protection, Gas Dispatch and other. Included in the other category are: gas control, instrumentation, isolated facilities, energy management, system controls and protection, alternative fuels, gas resource pool, gas operations training and gas operations quality control.[21]

[17] Interview Numbers 17 and 58
[18] Interview Number 37
[19] Interview Number 29
[20] Interview Number 47
[21] Document Request 111, 37

Figure 12 - PSE Overtime-Gas Operations

PSE Gas operations Overtime Hours							
	2002	2003	2004	2005	2006	2007	2008
Gas First Response							
Overtime Hours	10,734	15,367	17,811	30,355	25,548	34,337	28,750
Number of FTE's	195	182	175	181	169	164	159
Percent Overtime	2.6%	4.1%	4.9%	8.1%	7.3%	10.1%	8.7%
Gas Dispatch							
Overtime Hours	6,171	6,353	4,534	6,195	3,249	4,936	4,050
Number of FTE's	15	16	16	18	18	18	19
Percent Overtime	19.8%	19.1%	13.6%	16.5%	8.7%	13.2%	10.2%
System Controls and Protection							
Overtime Hours	7,241	6,897	8,762	12,440	16,956	19,854	12,305
Number of FTE's	88	88	90	99	101	95	97
Percent Overtime	4.0%	3.8%	4.7%	6.0%	8.1%	10.0%	6.1%
Other							
Overtime Hours	2,071	2,474	5,236	6,398	5,248	5,913	6,212
Number of FTE's	24	33	29	34	60	104	117
Percent Overtime	4.1%	3.6%	8.7%	9.0%	4.2%	2.7%	2.6%

- Based on individual group staffing levels and overtime hour's work, the overall overtime levels appear to be reasonable. For example, for the Gas First Response (GFR) group, the overtime rate in 2007 was approximately 10%. In Jacobs' experience many utilities will design and build into their major group staffing plans an overtime rate of between 10 and 15% from an efficiency and effectiveness perspective.
- For smaller rotating shift groups like Gas Dispatch overtime tends to run higher as short-term vacancies are frequently filled with overtime.
- The 2007 Gas First Response and System Control Protection spikes in overtime are attributable to the considerable level of cold weather in January as well as a variety of other unusual factors varying from increased standby for road projects to close out of the Critical Bond Program[22].
- In both our formal and informal interviews with union personnel, we did not hear any concerns regarding a high level of overtime, in fact if anything we heard was they wished there was more overtime available[23].
- In order to determine staffing requirements, PSE utilizes several different approaches to establish needs. These approaches include:

[22] Document Request 182
[23] Interview Numbers 17 and 58

  - Attrition data, including retirements, resignations, and involuntary separations, is collected and summarized.
  - Detailed work unit and cost information is tracked and analyzed to identify anomalies which may be an indicator of staffing needs.

- Work is also underway to develop a five-year plan that incorporates both staffing and budgeting needs. This plan will take into consideration various business and cost drivers to get the clearest view of what the future needs of the organization may be. Currently, the plan is in its "infancy"[24].

Gas Worker Program

- In order to provide well-trained ready replacements for known attrition and anticipated vacancies as needed by Gas Operations, PSE developed and implemented in 2006 the Gas Worker Program. The Gas Worker Program addresses the large number of personnel within operations that are anticipated to retire in the next 10 years. The Gas Worker Program is designed to provide necessary training and the opportunity for knowledge transfer for senior journey level positions[25].
- The Gas Worker trainees can perform various tasks depending on the level of training and time on the program. The program consists of three 6-month phases with tasks added in each phase. No trainee can perform tasks on their own during the first 6 months. Other than utility worker, there is no position a trainee can be considered a replacement for until satisfactorily completing the journey-level technical school at the end of the Gas Worker training.
- Once the trainee has completed Gas Worker training, they are eligible to attend the journey-level school that becomes available as necessary to prepare for replacements identified or anticipated vacancies. The positions that can be filled out of each class are customer field service technician, fitter (Gas First Response and Corrosion), and dispatcher.
- Staffing vacancies or surpluses can vary based on higher or lower retirement rates than anticipated and can leave PSE either under-prepared or over-staffed. To effectively plan and balance this process PSE must anticipate the retirement rate two years in advance to have necessary personnel ready to cover both the entry-level journey positions as well as the senior journey positions. This can lead to either an under- or over-budget staffing situation.
- From a short-term staffing perspective, Gas Operations uses the graduation of each gas worker class as an opportunity to adjust staffing in each of the service bases. Analyzing

[24] Document Request 112
[25] Document Request 116

data such as location, date, time, etc. originating from the Mobile Workforce System (PCAD) provides good past information as to where new customer field service technicians should be deployed.

Staffing Adjustments

- In addition, near-term staffing needs across different service areas are readily addressed through the flexibility that is provided in the labor agreement with Locals 32 and 26 of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada (UA). PSE provided three examples of this flexibility including:
  - To help balance out work in one service area versus another, the utility has the ability to move its personnel across boundaries. PSE reported this occurs on a weekly basis.
  - Flexibility to move personnel when there is a large emergency particularly in off-hours situation when local employees may not be available.
  - Leave a larger pool of available employees in the Gas Worker Program by extending the training timeframe[26].
- As an instance where this flexibility was utilized, PSE suggested the recent large-scale local flooding emergencies were easily addressed using the UA labor agreements flexibility by assigning various types of work to different worker classifications and by temporarily assigning workers to different locations.
- The recent slowdown in new construction activities does not impact the Utility's UA workforce as new capital work is provided exclusively by service providers.
- On a real-time basis, PSE adjusts staffing to meet customer-originated workload. The resource planner in Dispatch Operations monitors workload in each Customer Field Service area to make sure appropriate levels of work is being taken by the Access Center. Should it become necessary to reduce or increase customer work, the dispatcher can immediately react by using customer-related work as a cushion to balance daily work levels.
- Gas Operations believes it has adequate staff to address both safety compliance and customer-originated work. As appropriate, staffing adjustments are made to meet the observed and anticipated work levels. PSE cited three recent examples to illustrate this[27]:

[26] Document Request 183
[27] Document Request 112

- Two fitters were added to the IMO group to keep up with meter replacements and leak repairs.
- Two temporary positions were also added to the Alternative Fuels group so they had the staffing necessary to operate and maintain the propane/air and the LNG peak shaving facilities during the cold weather months.
- With the implementation of PCAD they were able to reduce administrative staff due to efficiency gains in processing work orders.

Shift Work

- The majority of customer field service technicians and fitters work the Monday through Friday, 8:00 a.m. to 4:30 p.m. shift. However, to provide proper geographic coverage to emergency response work orders, PSE has instituted a wide variety of shifts both for during the week and weekends. In the 2006 contract negotiations, PSE worked with the UA to establish 3-day 12-hour shifts and 4-day 10-hour shifts to reduce the number of employees working evening and weekend shifts[28].
- Current staffing for customer field service technicians and fitters by base location area are described in the next two figures, Figure 13 Staffing for Customer Field Service Technicians and Figure 14 Staffing for Fitters.

Figure 13 - Staffing for Customer Field Service Technicians

Staffing for CFS Technicians

Area	Total Techs	6:30am to 3pm	8am to 4:30pm	10am to 6pm	1pm to 9pm	3pm to 11pm	4pm to 12am	Weekends +1day 3-12s fri-sun or sat-mon	weekend 8am to 4:30pm	weekend 3pm to 11pm	weekend 4pm to midnight
EVT	13	0	11	0	0	0	2	0	2	0	1
NOB	11	1	8	0	0	0	2	0	1	0	1
FAC	18	1	9	0	1	0	2	0	2	0	2
KIT	1	0	1	0	0	0	0	0	0	0	0
GTO	18	1	14	1	0	0	2	0	2	0	1
SKC	14	1	9	0	0	0	2	2	0	0	0
TAC	11	0	9	0	0	1	1	0	2	1	0
OLY	8	0	6	0	0	0	0	0	1	1	0

[28] Document Request 091

Figure 14 - Staffing for Fitters

Staffing for Fitters

Area	Total Fitters	Weekday Shifts	Weekend	Weekend Shifts
EVT	3	(two, 8am-4:30pm) & (one, 4pm-12am)	One North End	(one, 8am-4:30pm) rotated by fitters who live in the north end.
NOB	2	(one, 8am-4:30pm) & (one, 4pm-12am)		
FAC	4	(two, 8am-4:30pm) & (two, 4pm-12am)		
KIT	0	use call - outs or volunteers		
GTO	3	(two, 8am-4:30pm) & (one, 4pm-12am)	One South End	(one, 8am-4:30pm) rotated by fitters who live in the south end.
SKC	2	(one, 8am-8pm) & (one, 10am-10pm)		
TAC	3	(two, 8am-4:30pm) & (one, 3pm-11pm)		
OLY	2	(one, 8am-4:30pm) & (one, 3pm-11pm)		

- PSE reports the number of individuals covering daytime Monday through Friday shifts will fluctuate slightly during the course of the year based on employee staffing counts, personal time off (particularly in summer), attendance at training classes and special projects.

Employee Callout Process

- Historically, personnel were called out by dispatchers based on their home location, willingness to take the call, and proximity to the call. However, this process resulted in unequal participation placing a burden on some employees. Recently, PSE management and UA leadership used a collaborative approach to develop a new process for callouts. The new process calls for all personnel participating, equal distribution of the responsibility and resulting overtime pay, a reduced number of calls to obtain personnel, and utilizing additional personnel in other Gas Operations organizations to respond to emergencies.
- Prior to the new callout process, Callout Response was estimated by PSE to be 60% of the personnel responded at the level required and 6% did not respond at all. Since the new Callout Guidelines were instituted in September of 2008 employee response has improved significantly.
- Consistent with the Callout Guidelines, employees who do not meet the minimum criteria of responding to at least one of every three or 33.3% of the requested callouts on average during the 3-month period were penalized by not being allowed to take their vehicles home for 90 days. For the first 90-day period between September 1, 2008 and November 30, 2008 there were 14 personnel (approximately 15%) that did not meet the criteria and were required to park their vehicles for 90 days. For the latest period December 1, 2008 to February 28, 2009 only one person did not meet the criteria (approximately 1%)[29].

[29] Document Request 089

- During the interviews with various customer service field personnel general dissatisfaction with the new Callout Guidelines were expressed.

Customer Surveys

- A review of recent customer surveys indicates that the PSE field workforce consistently receive high marks for being courteous, respectful of the customers property and taking the precautions to perform proper restoration.
- Also, a review of SQI #8 Field Service Operations Transactions Customer Satisfaction, similarly indicates positive results for responding to customer gas equipment problems. Properly functioning gas equipment is directly related to Indoor customer safety and security.

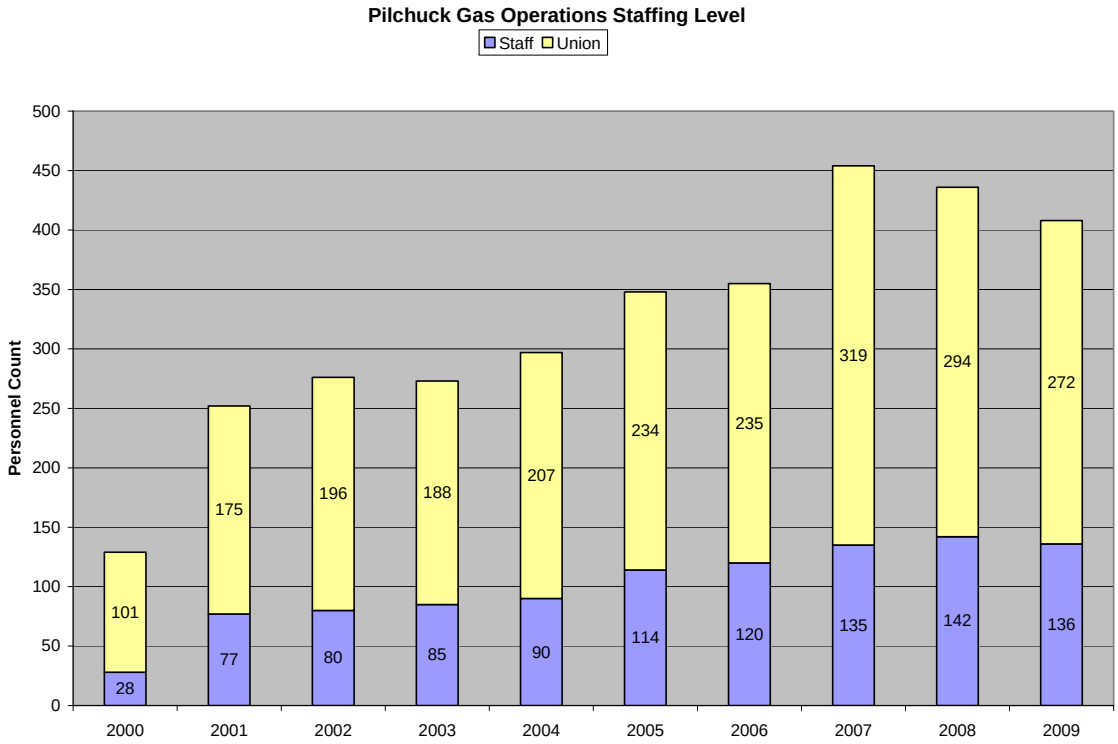
9.3.2.2 Service Providers Staffing

Given PSE's predisposition to utilize service providers as an extension of their workforce it is essential that any discussion on PSE staffing include an analysis of service provider staffing. This is particularly true for Pilchuck who, in addition to new construction, basically serves as an extension of PSE's workforce with regard to safety compliance activities.

Pilchuck

- Figure 15 Service Provider Staffing -Pilchuck describes the historical staffing for Pilchuck gas operations between 2002 and 2008. The chart breaks out union and staff employees. As can be seen for Pilchuck, Gas Operations' overall staffing has increased by over 60%. While union workers account for approximately 60% of the increase, staff employees make up the remaining 40%.
- Between 2002 and 2008 the percent of the organization made up of staff employees has grown from 29% to 33%. The prime reasons for the union worker growth is additional capital and O&M workload increases; while staff increases were required to support planning and proper job documentation.

Figure 15 - Service Provider Staffing-Pilchuck



- Service Provider Pilchuck estimates those approximately 80 employees or 27% of its union-staff works on gas compliance program activities.

Service Providers - Other

- The remaining service providers were only able to provide their current number of employees. Figure 16 Service Provider Staffing - Other describes for Potelco, Locating Inc., Central Locating Inc. and Heath Consultants current employment levels.

Figure 16 -Service Provider Staffing - Other

Service Provider Gas Operations Staffing - Coverage of PSE Area

Service Provider	Crew	Count
Potelco Gas Operations	Gas Crew	14
Heath Consultants, Inc.	Survey Technician Count	26
Central Locating Services	Locate Technician Count	67
Locating Inc	Locate Technician Count	21

- In reviewing the above data, it should be noted that the number of crews for Potelco Gas Operations, which includes its subcontractor Pipeline, is restricted to new business in North King, South King Puyallup and Olympia. In addition, Locating Inc., Central Locating Inc. and Heath Consultants tend to assign their technicians by specific areas.

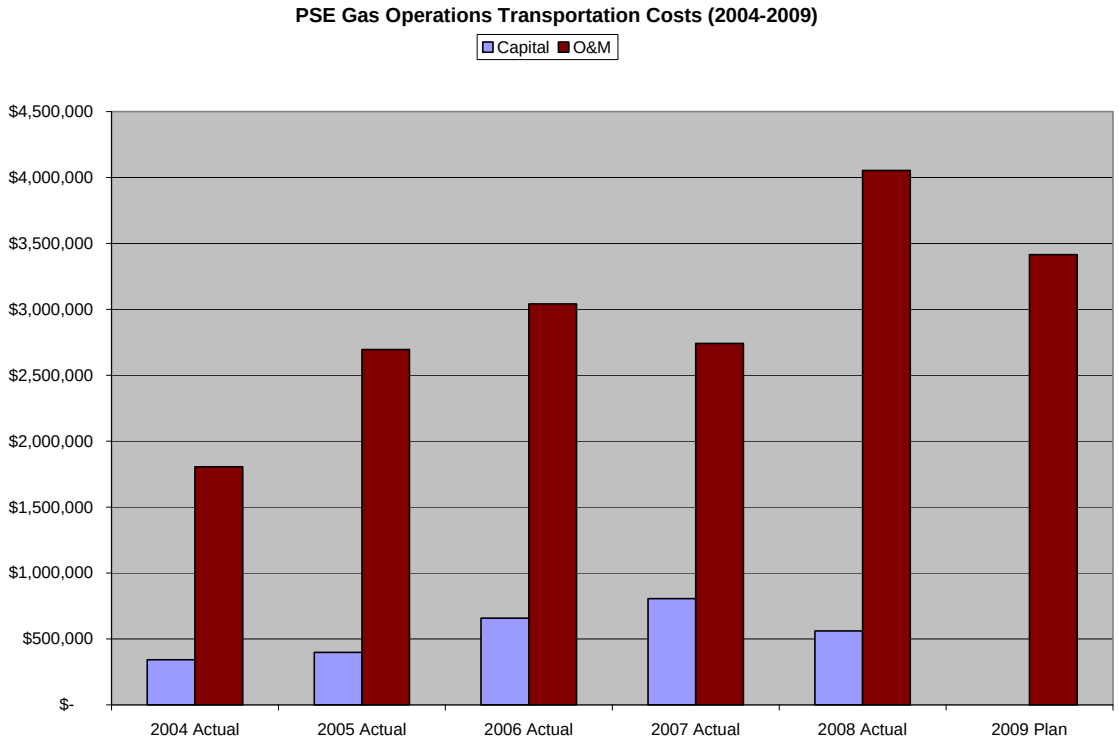
9.3.3 Vehicles

Given PSE's predisposition to utilize service providers as an extension of their workforce it is essential that any discussion on vehicles and automotive type construction equipment include an analysis of PSE and their Service Provider, Pilchuck. Service provider vehicles are used for second response, gas safety compliance work as well as new construction.

9.3.3.1 Puget Sound Energy

- Figure 17 PSE Gas Operations Transportation Costs describes by year for PSE the total fleet expenditures, in terms of both capital and O&M.

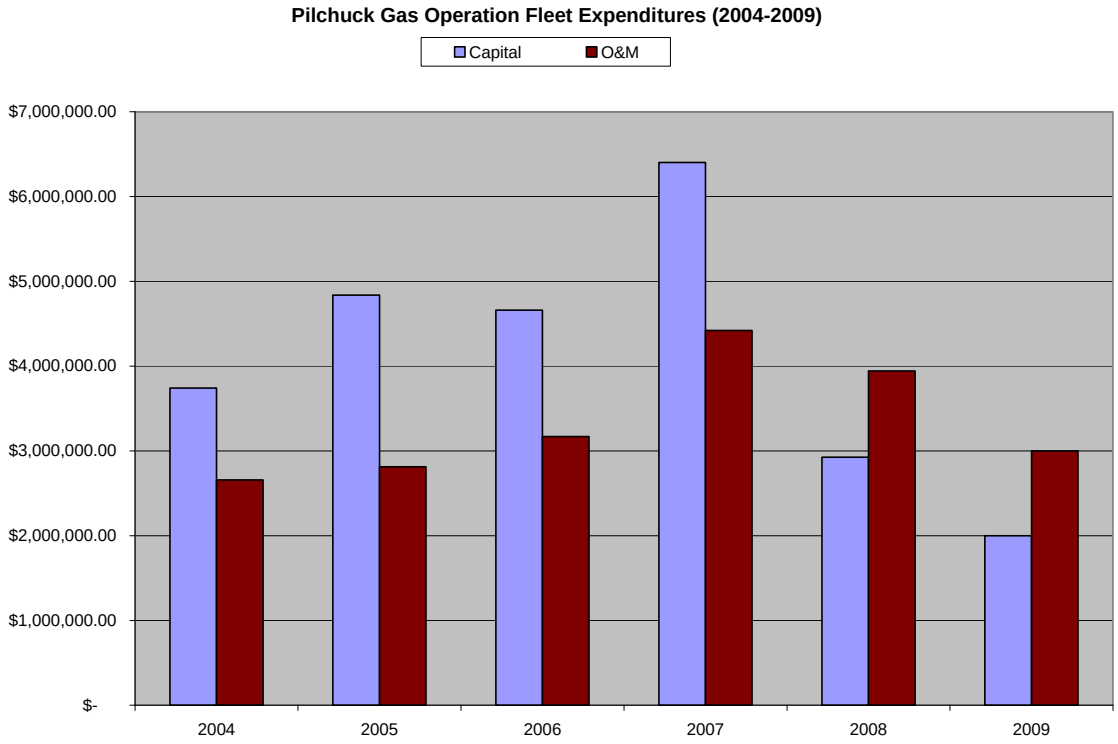
Figure 17 -PSE Gas Operations Transportation Costs



- Of the 393 vehicles used in Gas Operations, 384 are leased accounting for the relatively high O&M expense. PSE reports it has determined it is less expensive to lease vehicles that accumulate high mileage in a short period of time than it is to own the vehicles outright[30]. Leased vehicles include: company cars, mini trucks and vans, small to medium SUVs, three-quarter ton trucks and vans, a 5th-wheel trailer, half-ton trucks and vans, 1-ton truck and van, a medium-duty truck, boom and vacuum trucks, trailers, backhoes and trenchers. The nine-owned vehicles include: mini trucks and vans, small to medium SUVs, and 1-ton trucks and vans.
- Most employees take vehicles home so they can respond to emergencies. Employee vehicles are equipped with MDT's and most work is electronically dispatched.
- At least one supervisor interviewee expressed dissatisfaction with certain problematic trucks and expressed his opinion that they were beyond their useful life. He further indicated the lack of availability these vehicles due to frequent repairs occasionally resulted in doubling of crews[31]. The expressed dissatisfactions were substantiated by several union interviewees.
- Upon specific questioning, the company indicated it does not keep records regarding vehicle breakdowns, nor does it maintain records as to when there is a need to double-up journeyman workers due to lack of available vehicles. The company is of the belief that the need to double-up workers occurs infrequently.
- The average age of Gas Operations vehicles by vehicle class is as follows:
  - Cars-four years
  - Light-duty trucks-four years
  - Medium-duty trucks-seven years
  - Heavy-duty trucks-eight years[32]
- Figure 18 Pilchuck Gas Operations Fleet Expenditures describes the capital expenditures for both licensed and unlicensed vehicles and equipment as well as the O&M expenditures over a similar timeframe.

[30] PSE's Sufficiency of Resources - Draft Report review, dated June 5, 2009
[31] Interview number 57
[32] Document request 185

Figure 18 - Pilchuck Gas Operations Fleet Expenditures



- Figure 19 Pilchuck Gas Operations Fleet Count shows the number of units by various vehicle classes.

Figure 19 -Pilchuck Gas Operations Fleet Count

Pilchuck Gas Operation Fleet Count

	2004	2005	2006	2007	2008	2009
Pick-ups & Cars	45	53	69	63	65	65
Backhoes & Excavators	96	135	158	167	182	152
Dump Trucks	58	66	75	86	98	93
Crew Trucks, Foreman Trucks & Welding/Fusion Trucks	102	121	145	158	179	171
Gas Service Covered Wagons	14	14	14	13	13	13
Trailers	146	174	190	208	216	210

- Review of the data shows clearly that Pilchuck vehicle fleet has gradually grown and that significant maintenance expenditures have occurred consistently throughout the last five years.
- Our numerous field observations confirm that numerous vehicles are deployed and that in general both the PSE and Pilchuck fleets are well-maintained.
- In addition, our field observations noted that every service provider employee drove a company vehicle which sometimes added to existing street congestion.

9.3.4 Tools and Equipment

- Figure 20 Tools and Equipment shows the capital and expense tools and equipment for PSE's Gas Operations. The data shows small tool and equipment (non-motor vehicle) expenditures for both Gas Operations and Pilchuck[33].

Figure 20 -Tools and Equipment Expenditures

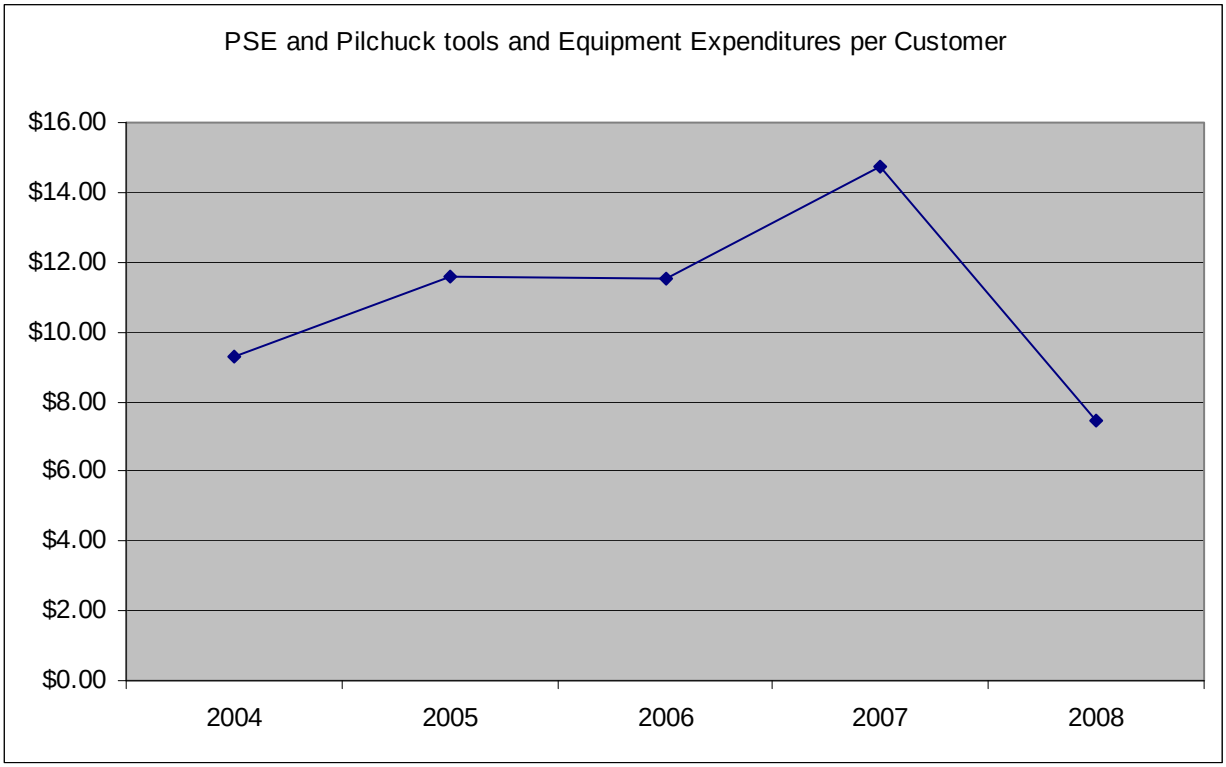
Gas Capital Expenditures for Tools & Equipment

	2004	2005	2006	2007	2008	2009
PSE Capital Small Tools	$ 285,174	$ 766,323	$ 329,526	$ 974,466	$ 519,609	$ 618,000
Pilchuck Capital Tools	$ 3,742,155	$ 4,836,666	$ 4,659,947	$ 6,402,271	$ 2,926,791	$ 2,000,000
Pilchuck Expensed Small Tools	$ 2,128,971	$ 2,316,322	$ 3,109,721	$ 3,260,487	$ 2,061,709	$ 1,500,000
Total	$ 6,156,300	$ 7,919,311	$ 8,099,194	$ 10,637,224	$ 5,508,109	$ 4,118,000

- From the annual totals and detail it can be seen that both organizations have consistently funded tools and equipment purchases. The peak in 2007 expenditures relates to the high new business construction activity.
- To help further put the use totals into perspective Figure 21 Tools and Equipment Expenditures per Customer plots the ratio of total capital expenditures for tools and equipment as compared to the number of customers. In 2004, capital expenditures for tools and equipment average $9.20 per customer. This was reduced to $7.46 per customer in 2008. The reduction could be a direct result of the peak activity in 2007 when additional tools for required to manage the high level of new business construction activity.

[33] Document Request 146

Figure 21 - Tools and Equipment Expenditures per Customer



- Pilchuck expenses all small tools with a cost of less than $5000. Expense small tools and expendables would include: tools, gauges, wrote plays, signage, welding supplies, gases and other supplies.
- From our numerous field observations we conclude that both PSE and Pilchuck workers have ample small tools, equipment and supplies. All observed equipment had the required safety devices installed and these devices were in operating condition. Examples would include: back up alerts, flashers, and compressor hose ties.
- For the most part, service provider equipment was newer but not modern. For example, the largest part of the excavating equipment utilized by the service providers tends to be backhoes. Service providers do not use mini drills, mini excavators, or vacuum excavating equipment.

9.3.5 Conclusions

Budget

The funding for gas safety compliance programs is a combination of capital and O&M expense.

Within capital expenditures there are a number of categories including: customer reimbursed, external commitment, increased capacity, new service electric, new service gas, planned and unplanned. Of direct interest to us with regard to safety compliance programs are the last two categories. These categories are a strong indicator of safety compliance-related capital activity and expense. Planned capital is work with known units and/or stop-and-start dates while unplanned capital is work that is unknown at the time the budget is developed. Overall gas capital expenditures have grown from 2002 and 2008. The total capital expenditures, after being corrected for inflation, increased by $46.5 million or 30.2%, while the amount spent on planned and unplanned capital work has grown dramatically by $27.3 million or 141%. Planned and unplanned capital work accounted for 14.2% of the total budget and in 2008 these two categories accounted for 30.4% of the budget. Planned and unplanned capital expenditures have actually grown 3.8 times faster as compared to the rest of the capital budget. Clearly from a capital budget perspective PSE has dramatically ramped up its safety compliance program related expenditures.

PSE performs a large variety of inspection and maintenance work to help maintain the condition of its gas distribution system. These O&M funded activities have been divided by PSE into three groups with the following designations: work budgeted and planned for by Maintenance Programs; work budgeted and planned for by System Maintenance Planning and specific O&M budgets driven by System Maintenance Planning. In total, within the three groups are 128 activities for budgeting purposes. These activities can also be categorized as planned and unplanned. Planned and unplanned O&M work is defined similar to capital work. Overall gas O&M expenditures have grown consistently from 2002 and 2008. The total expenditures, after being corrected for inflation, increased by $12 million slightly over 42.5%, while the amount spent on planned and unplanned O&M work has grown by $19.6 million or 78.6%. To account for growth in PSE's system, the O&M level of expenditure was compared to miles in service from 2004 through 2008. The average O&M per mile in 2004 was $1457; and in 2008 this average grew to $2712 per mile an increase of over 86%. Once again, although not nearly as dramatic as capital expenditures, we see a steady increase in maintenance and inspection work to maintain the safety compliance program.

Between 2003 and 2007 both industry and PSE gas non-production/generation O&M cost per customer has grown, however PSE's rate of growth was approximately four times faster. Yet PSE still significantly lags the gas industry O&M cost average. This could mean PSE is more efficient than other utilities or PSE has historically underfunded its gas system. From Jacobs' field observations and interviews with employees we did not see evidence of gas system

underfunding, we did see an effort to efficiently manage O&M expenditures. We believe PSE's O&M expenditures are consistent with a utility's obligation to balance maintaining a safe gas distribution system in a cost-effective manner.

Workforce

Our approach to assessing workforce adequacy consisted of collecting, rationalizing and performing an initial analysis of the workforce size and trends and assessing the workforce adequacy through formal interviews, informal discussions and field observations. We judge the adequacy of the overall workforce on the basis of system performance, levels of in-house overtime, workforce plans, customer satisfaction statistics and workload backlog.

Organizationally, Total Energy System Planning (primarily System Maintenance Planning) and Gas Operations (primarily System Control and Protection, and Gas First Response) have the major gas safety compliance program responsibilities. Total Energy System Planning consists of approximately 60 employees of which one-third focus on gas and is responsible for budgeting the O&M operations and projects. The group is also responsible for the compliance programs, which are coordinated through contract management, as most of the related work completed by Pilchuck. In addition, the group is responsible for trending information from continued surveillance or audits to determine future program management opportunities.

Gas Operations' total fulltime equivalent staffing from 2002 through 2009 has increased by over 13%. However, to help put the overall growth of employers in prospective between 2002 and 2008 the total number of customers grew by 20%. In 2004, the ratio of customers to employees spiked at 2125, since then it has come down and appears to be leveling off at approximately 1900 customers per employee. However, little can be drawn from this finding as a variety of factors such as use of service providers to augment PSE staff greatly influence any observations in this area. We then examined the level of employees most critical to gas compliance, over the period analyzed the number of customers to gas compliance employees parallels the curve for the total number of gas operations' employees. The same spike occurred in 2004, and since then the trend has improved and appears to be leveling off at approximately 2300 customers per employee. Again, little can be drawn from this finding as a variety of factors such as, use of PCAD, can greatly improve employee effectiveness in areas as such compliance program criteria as leak and emergency response. Interviews with Gas First Responders indicated that for a number of years minimum recruiting for new employees took place; however, this situation was addressed starting in 2007. These observations can be confirmed by reviewing the reduced number of Gas First Responders between 2003 and 2006. In general, interviewees felt present staffing was adequate; however, concern was expressed regarding knowledge transfer.

Based on individual group staffing levels and overtime hour's work, the overall overtime levels appear to be reasonable. For example, for the Gas First Response (GFR) group the overtime rate in 2007 was approximately 10%. In Jacobs' experience, many utilities will design and build

in to their staffing plans an overtime rate of between 10 and 15% from an efficiency and effectiveness perspective. In both our formal and informal interviews with union personnel, we did not hear any concerns regarding too high a level of overtime, in fact if anything we heard they wished there was more overtime available.

In order to determine staffing requirements, PSE utilizes several different approaches to establish needs. These approaches are based on attrition data and detailed work unit and cost information. Work is also underway to develop a five-year plan that incorporates both staffing and budgeting needs. Jacobs was advised the plan will take into consideration various business and cost drivers to get the clearest view of what the future needs of the organization may be. So as to provide well-trained ready replacements for known attrition and anticipated vacancies, PSE developed and implemented in 2006 the Gas Worker Program. The Gas Worker Program addresses the personnel anticipated to retire in the next 10 years. The Gas Worker Program is designed to provide necessary training and the opportunity for knowledge transfer for senior journey-level positions.

Near-term staffing needs across different service areas are readily addressed through the flexibility provided in the labor agreement with Locals 32 and 26 of the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada. Some of this flexibility manifests itself in having a wide variety of shifts both for during the week and weekends. Also, this flexibility was noted in a new process for callouts which was agreed to between PSE management and UA leadership. The new process has successfully required all personnel to participate, equal distribution of responsibility and resulting overtime pay, a reduced number of calls to obtain personnel, and utilizing additional personnel in other Gas Operations' organizations to respond to emergencies. (See Recommendation 9.3.6.1)

Service Providers Staffing

Given PSE's predisposition to utilize service providers as an extension of their workforce, it is essential that any discussion on PSE staffing include an analysis of service provider staffing. Between 2002 and 2008 Pilchuck's Gas Operations' overall staffing has increased by over 60%. While union workers account for approximately 60% of the increase, staff employees make up the remaining 40%. The percent of the organization made up of staff employees has grown from 29% to 33%. The prime reasons for the union worker growth is additional capital and O&M workload increases; while staff increases were required to support planning and proper job documentation. The high level of staff support required is directly related to the relatively low level of information technology in use, while the increase in required staff support reflects the additional emphasis on recordkeeping.

Service provider, Pilchuck, estimates that approximately 80 employees or 27% of its union staff works on gas compliance program activities.

Vehicles

Any discussion on vehicles and automotive type construction equipment must include an analysis of PSE and their service provider, Pilchuck. Service provider vehicles are used for second response, gas safety compliance work as well as new construction. Most of the vehicles used in Gas Operations are leased accounting for the relatively high O&M expense. PSE reports it has determined it is less expensive to lease vehicles that accumulate high mileage in a short period of time than it is to own the vehicles outright. Most employees take vehicles home so they can respond to emergencies. Employee vehicles are equipped with MDT's and most work is electronically dispatched.

Dissatisfaction with certain problematic trucks was expressed and the fact that there lack of availability could occasionally result in doubling of crews. Upon specific questioning the company indicated it does not keep records regarding vehicle breakdowns; nor does it maintain records as to when there is a need to double-up journeyman workers due to lack of available vehicles. The company is of the belief that the need to double-up workers occurs infrequently.

A review of the Pilchuck vehicle fleet data shows clearly that it has gradually grown and that significant maintenance expenditures have occurred consistently throughout the last five years. Our numerous field observations confirm that in general both the PSE and Pilchuck fleets are well-maintained. (See Recommendations 9.3.6.2 and 9.3.6.3)

Tools and Equipment

Tools and equipment annual totals for both Gas Operations and Pilchuck demonstrate both organizations have consistently funded tools and equipment purchases. From our numerous field observations we conclude that both PSE and Pilchuck workers have ample small tools, equipment and supplies. All observed equipment had the required safety devices installed and these devices were in operating condition. For the most part, service provider equipment was newer but not modern. For example, the largest part of the excavating equipment utilized by the service providers tends to be backhoes. Service providers do not use mini drills, mini excavators, or vacuum excavating equipment.

9.3.6 Recommendations

9.3.6.1 PSE should expedite the development of a strategic workforce planning study to define the work force required to implement company business strategies and identify actions needed to meet those requirements. The analysis should reveal gaps between the work- force needed and the workforce supply forecasted to be available and identify critical positions as well as certain key employees.

9.3.6.2 The company should initiate vehicle recordkeeping that includes maintaining a history of vehicle breakdowns and repair costs. This history should be periodically reviewed to determine vehicle replacement needs.

9.3.6.3 The company should initiate recordkeeping of employee double-ups required as a result of a shortage of functional vehicles. These records should be periodically reviewed to determine the appropriate number of spare vehicles in any given location.

9.4 Monitoring Effectiveness

9.4.1 Staff

9.4.1.1 Responsible Groups

There are numerous organizational groups within PSE that have responsibilities to either, review records, identify trends, and initiate follow-up work, or observe and report the condition of gas facilities during construction, operation and maintenance activities[34]. These groups and their specific gas safety compliance program related responsibilities are as follows:

Manager Total Energy System Planning

- Conduct an annual review of completed work order records
- Determine the general status of pipeline facilities based on this review
- Review unsafe, unsatisfactory, and nonstandard conditions to identify trends and required follow-up
- Develop remediation plans

Consulting Engineer Corrosion Control

- Conduct an annual review of completed work order records
- Determine the general status of pipeline facilities with respect to corrosion control
- Generate remedial work orders and required follow-up

Company and Service Provider Personnel

- Observe pipeline facilities during the normal course of their activities and report unsafe, unsatisfactory, or nonstandard conditions

Manager Gas First Response

- Respond to and remediate unsafe conditions
- Communicate re-mediated unsafe conditions to the manager total system planning
- Determine if unsatisfactory conditions need to be monitored
- Initiate monitoring until unsatisfactory condition is resolved
- Oversee employee classification of reported pipeline conditions

[34] PSE Operating Standards for Continuing Surveillance 2575.2700

Manager System Control Protection

- Communicate unsatisfactory conditions resulting from patrols, surveys and other maintenance activities to the manager total system planning

Manager Gas Compliance and Regulatory Audits

- Report safety-related conditions to the regulatory authorities

Manager Contract management

- Responsible for ensuring safety-related remediation work gets scheduled and completed

Manager Engineering

- Oversee employee classification of reported pipeline conditions

Not specifically included in PSE Operating Standards for Continuing Surveillance 2575.2700, but playing a significant observation role is the QA/QC group, which reports to the manager quality assurance and inspections.

- In order to assess whether the responsibility for obtaining the needed gas compliance outcomes was well communicated, Jacobs requested the position descriptions of each manager/supervisor with gas safety compliance responsibilities and an explanation as to how those responsibilities were measured. In total we received 11 position descriptions and were advised by the company that 2 position descriptions were not available, specifically the job descriptions for the manager, Gas First Response and the Manager of Gas System Operations. In addition, we were provided with a job title to Standard Number Cross-Reference Guide, which is contained in the Gas Operating Standards manual. This guide contains a cross-reference of responsibilities of every operating standard in which each specific job title is mentioned.
- A review of the position descriptions indicated they were typically generic with exact gas compliance responsibilities either not fully described or specifically stated. The 14-page cross-reference list was complete, but overwhelming. For example, the Manager of Engineering had 69 cross-references to specific standards, while the Manager of Contract Management had 81 cross-references to specific operating standards.
- With regard to how gas safety compliance responsibilities are measured we were advised that operations have several goals related to compliance and the performance of the responsible managers is measured against the company's overall performance relative to these goals. Furthermore, the individual's contribution to the goal successes is evaluated through the annual performance appraisal and goal process[35].

[35] Document Request 187

9.4.1.2 Accountability for Programs

Section 9.4.1.1 identified the broad organizational responsibilities for gas safety compliance and continuing surveillance activities within PSE's organization and Section 9.2 identified the various gas safety compliance programs. The accountability for programs involving gas safety compliance, however, resides within four organizational units. These organizational units and the programs they are accountable for are as follows[36]:

System Maintenance Planning

- Wrapped Steel Service Assessment
- Isolated Facilities
- Bridge and Slide Remediation
- Buried Meter/Riser Remediation
- Inside Meter Set Remediation
- Casings on Steel Services
- AC Mitigation at Pipe Supports
- Continuing Surveillance (Blue Cards)
- Converted Single Service Farm Tap Remediation
- Double Insulated Flanged Valve Mitigation
- Increased Leak Survey Frequency
- Leakage Survey/Action
- Mobile Home Community Remediation
- Service Regulator Relief Vent Program
- Sidewalk Regulator Remediation
- Transmission Integrity Management Program
- Un-maintainable District Regulator Remediation
- Un-maintainable Meter Set Assembly (MSA) Remediation
- Valve Remediation

[36] Document Request 88

Maintenance Programs

- Inside Meter Sets
- Valve Remediation
- Pipeline Markers
- Atmospheric Corrosion at Meter Set Risers

Gas System Engineering

- Cathodic Protection
- Transmission Integrity Management Program
- Atmospheric Corrosion
- Active Corrosion (Corrosion Leak Assessment)

System Planning

- Bare steel replacement
- While there is some overlap in the programs and different groups may be involved with the overall responsibilities, in general, accountabilities within any given program are well-defined. An example where multiple groups may be involved would be: Pipeline Integrity Management which involves both System Maintenance Planning and Gas System Engineering.
- In order to track how it is doing with regard to gas capital and O&M work, PSE provided the metric, a definition for the metric and an example of how it is used. Figure 22 Metrics Used in Gas Compliance summarizes this information by the categories of leakage statistics, damage prevention, customer care, compliance, and employee safety[37].

[37] Document Request 188

Figure 22 -Metrics Used in Gas Compliance

Metric	Definition	Use
Leakage Statistics		
Active Leaks	Total number of above ground and below ground active leaks in the system at the end of the month.	Identify trends in new leaks found vs. repairs.
New Leaks Reported	Number of new leaks reported each month by grade and service area.	Identify trends in new leaks found by service area.
Repaired Leaks	Number of leaks repaired/reevaluated each month.	Identify progress in lowering the number of active leaks.
Past Due Leaks	Leak Repairs/Reevaluations Completed After Due Date	Assess performance in meeting compliance deadlines.
Grade “B” Leak Repair Time	Number of days before a grade “B” leak is repaired.	Assess the timeliness of leak repairs.
Grade “B” Leak Repair Solutions	Percent of grade “B” leaks whose solution is started in less than 4 visits.	Assess the timeliness of repair/replace decisions for grade “B” leaks.
Damage Prevention		
Utility Dig-ups	Number of buried utility facilities damaged by excavators each month.	Assess the effectiveness of locates and “call before you dig” communications.
Damage Prevention Presentations	Number of damage prevention and public awareness presentations given each month.	Evaluate the outreach level of effort.
Damage Prevention Statistics	Number of locate requests and third-party damages incurred each year.	Assess the effectiveness of damage prevention messaging and identify root cause of damages (i.e. failure to call, inaccurate locate, etc.).
Customer Care		
% Satisfaction with Gas Field Services	Monthly survey of customers to measure their satisfaction with the service provided by gas field technicians.	Measure of how satisfied customers are with visits from gas field technicians. Survey encompasses timeliness of appointment, work performed and employee professionalism.
UTC Complaints	Number of customer complaints per 1000 customers filed with the UTC.	Measure of company’s ability to address customer concerns without the need to escalate to UTC.
Gas Response Time	Average number of minutes for PSE employee to arrive on site to a gas emergency call.	Measure of service quality. By agreement with UTC, average response time must be less than 55 minutes.
% Response to Gas Emergency within 60 Minutes	Percentage of total number of gas emergency	Measure the distribution of gas response times.

	responses that occur in less than 60 minutes.	
Compliance		
Contractor Compliance	Number of items inspected by QA personnel found to be in compliance with company standards.	Measures contractor compliance with PSE standards.
Gas operations Compliance	Number of inspections and remediation activities completed by due date.	Measures Gas operations timeliness in completing Mandated gas safety activities by required deadlines.
Employee Safety		
Near-miss Ratio	Number of near-miss reports submitted for every recordable incident.	A leading indicator metric. Assesses the awareness employees have of their surroundings and shares others experiences.
Recordable Injuries – Total Incident Rate	*# of recordable cases x 200,000) / # hours worked*	Traditional safety metrics.
Lost Time Injuries – Lost Workday Case Rate	*# of lost workday cases x 200,000) / # hours worked*	
Severity Index	*# of days away from work x 200,000 / # hours worked*	

- For a detailed discussion of the current PSE Continuing Surveillance programs, please refer to Section 8.2 Current PSE Continuing Surveillance programs in the Continuing Surveillance report.

9.4.1.3 Senior Management

- Gas safety compliance program metrics are communicated upwards in the organization to the COO level. Initiated in early 2008, PSE utilizes an executive dashboard of metrics and operational balance scorecard metrics to communicate important information. These monthly reports include gas items such as: safety, compliance - PSE, compliance – Pilchuck, compliance – Potelco, financial and employee development. A sample operations metrics report for the year 2008 is included in the Appendix as item A[38].
- Since the operations metrics report was first produced in 2008, certain metrics related to gas safety activities have changed, been added or removed with the January, 2009 report. These are:

[38] Document Request 184

- Changed - bare steel-miles retired/replace changed to bare steel-percent of milestones on track
- Added - average number of customers, utility dig-ups, percent response to gas emergencies within 60 minutes, gas compliance, gas compliance-Pilchuck, gas compliance Potelco, severity index (for safety)
- Removed - project book completed-PSE, Pilchuck, and Potelco[39]

- Performance of the direct reports to the COO, are tied into these balance scorecard monthly reports. Monthly, operations directors and managers receive the metric scorecard, which are shared with their respective direct reports to monitor progress and accountability. Quarterly the COO's direct reports and directors meet to review the overall quarter's progress and develop corrective actions needed or review actions that have been taken in order to meet the goal. Jacobs reviewed the goal setting for certain key managers to verify they are being measured for gas safety program compliance. In each instance they are appropriately being held accountable in the goal setting and reporting process[40].
- Senior managers cascade this accountability throughout the organization by holding management within their respective organization responsible for gas safety program compliance[41].

9.4.1.4 Gas Compliance Steering Committee

- In order to identify areas of concern with regard to gas compliance programs, initiatives and proceedings, PSE initiated in August of 2005 the Gas Compliance Steering Committee. Meeting monthly, the group discusses commitments made to the UTC with regard to audit findings and settlement agreements. In addition, this group is also used as a way for various program coordinators to get director-level guidance and approval for decisions made in managing their programs. For example, at the February 2009 meeting, which Jacobs Consultancy attended, an extended discussion regarding failed welds completed by Potelco's pipeline company subcontractor took place. The discussion centered on several failed welds visually inspected by PSE QA inspectors and the extent to which previous welds needed to be excavated and examined.
- We reviewed the agenda and minutes of the nine Gas Compliance Steering Committee meetings held in 2008[42]. A typical agenda, which is established by the Manager, Quality Assurance, had a number of topics for discussion including: review and approval of the prior meeting minutes, discussion of any special gas distribution system compliance-related topic, a review of QA target audits and routine QA audits, various gas

[39] Document Request 184
[40] Document Request 173
[41] Interview Number 76
[42] Document Request 98

compliance programs and their status, commitments made to the UTC with regard to audit findings and settlement agreements and other compliance-related items.

- Typical meeting attendees included: Manger, Quality Assurance and Inspection; Manager, Compliance and Regulatory Audits; Gas Manger, Quality Control Gas Operations; Director, Gas Operations, Director, Operations Services and Director, Compliance and Safety.

9.4.1.5 Role of Gas First Responder and Dispatch Operations

- Gas First Response operations represent the group that initially responds to gas emergencies. Once the initial condition is made safe, the First Responder hands off the repair to the Second Responder, Pilchuck.
- Various interviewees report that the First Responder to Second Responder handoff regarding gas emergencies occasionally has some difficulties. Specifically, when the information received is passed to the Second Responder through the dispatcher. Second Responder's believe person-to-person communications with the First Responder to be a more accurate form of information transfer[43].
- A portion of the safety compliance programs is coordinated by Dispatch Operations. Specifically atmospheric corrosion, non-critical atmospheric corrosion, corrosion on risers and horizontal vents programs.
- Dispatch Operations have a real-time view of the location of the field worker and the work location as they make their dispatching decisions. They have the ability to monitor the status of the work, such as whether jobs have been accepted or not. Dispatchers have the ability to monitor the field worker, such as whether they are in connected status, and if so, the progression of work status such as en-route, onsite, offsite, or reporting. However, they are currently able to only control a portion of the workflow. This is due to the fact that certain task types are currently not viewed. This includes the following task types: OQ training, meetings, vehicle inspections, part runs and special projects[44].
- Supervisors in the Gas First Responder organizations have a variety of responsibilities that prevent them from spending time out in the field. Three supervisors indicated that less than 5% of their workday is spent in the field and this time is usually confined to gas emergency oversight.
- On three occasions, in response to gas emergencies, Jacobs had the opportunity to observe PSE employees collaborating with Pilchuck employees. In each instance it was difficult to decipher who was actually in charge, even though PSE's procedures clearly identify their incident command role.

[43] Interview Number 9
[44] Document Request 089

9.4.2 Compliance Oversight Process

In approximately 2002, an effort was made to pull together various compliance maintenance activity work units, and budgeting and tracking information. Gradually these compliance maintenance activities are becoming part of SAP. However, there are still a number of compliance maintenance activities that are in Access systems. There is also a number of compliance maintenance activities tracked in CLX. Various compliance oversight process findings and Issues follow:

- The gas safety compliance programs managed by the Maintenance Program group utilize both SAP and Access databases. To schedule work, work orders are driven and given out by region. Some work orders are sent over the computer and others are physically given to the supervisor. Jacobs observed numerous boxes filled with paper orders. Examples of orders that are paper include: hard to reach, mobile home patrols, and bridge and slide surveys.
- Reports generated by Maintenance Programs includes:
  - A Business Warehouse report from SAP is sent out every Monday to show what compliance work is due.
  - Monthly compliance reports for emergency valve inspections, pressure-control regulator and valve inspections, and corrosion-control inspections.
- There is also a new database under development in xEM, a software program related to SAP. This database will provide electronic reminders to alert designated individuals when certain reports or actions in response to regulatory requirements are required. The compliance reports will still be produced from individual databases where the data resides, such as SAP and LMS. Indications are xEM functionality will be in place late in 2009[45].
- The distribution corrosion test results are kept in SAP, while leak information is maintained in LMS. Corrosion CP records are referenced by address and plats as opposed to segments. There is no formal process for trending corrosion leaks[46].
- There is no status report showing the number of current outstanding, completed, and initiated Blue Cards.
- The Annual Records Review process required by PSE Operating Standards for Continuing Surveillance 2575.2700 is part of an informal process conducted by Maintenance Planning. The process is ongoing and seeks to identify trends based on number and severity of issues.

[45] Interview Number 52
[46] Interview Number 41

- Data entry into leak management system occasionally has issues. Monthly, the Program Coordinator runs the report to check for possible errors. In addition, every three years a self audit of LMS is conducted.
- Monthly reports are generated from the leak management system showing the number of new leaks, canceled leaks, active leaks, corrosion leaks, and overdue leaks by grade.
- Recently, within the past 6 to 8 months, Maintenance Planning has been using PSE maps to plot leaks. They are seeking to plot leak data as far back as 2002. The maps also show the material type which can be useful for further analysis[47].
- The Hard to Reach Locations (H2RL) Survey encompasses work tickets issued by location, typically one ticket per meter. Once an inspection is completed the paperwork is turned in and manually entered into a database. The H2RL Survey encompasses four types of inspections: leakage, atmospheric corrosion, service valve, and pipeline marker inspection for above-ground exposed facilities. One issue with the program is they cannot query what type of work was done. For example, if a leak was repaired it is tracked in the Leak management system and not tied to the H2RL Survey.
- Service valve inspections are managed by Pilchuck; however, as a result of an audit in Pierce County, it was recognized that inspections were not being performed on time or are experiencing a lag in data entry. It is difficult for PSE to monitor the timeliness of the inspections if the actual inspections are completed and not entered into the database. To improve the process, service valve inspections have now been added to the monthly compliance report.
- Bridge and Slide Patrol Program Surveys include inspections of bridges and slide prone areas, and inspection for atmospheric corrosion and pipeline markers at bridges. Hard to Reach Locations on bridge crossings are coordinated with the service provider. The paperwork is sent back to maintenance programs and entered into SAP. Any required work orders are issued by Maintenance Planning.
- Mobile Home Park Patrol Program compliance oversight process is performed similar to the Bridge and Slide Patrol Program. Maintenance Programs enters the data into SAP and Maintenance Planning issues any required work orders.
- Atmospheric Corrosion Inspection's compliance oversight process is also similar to the Bridge and Slide Program. While the work is done by Heath, the data entry into MDW is performed by Maintenance Programs. MDW is the Meter Data Warehouse that stores meter information for AMR, atmospheric corrosion data, an isolated facilities data.
- Emergency section valves and odor test locations are maintained in SAP.
- Maintenance Planning meets with Pilchuck monthly to help ensure that the work associated with the various compliance programs assigned to the service provider is complete and is on track.

[47] Interview Number 51

- For certain compliance programs, PSE creates a project manager to help provide program oversight; however, the service provider charged with doing the work does not. One interviewee cited the Critical Bond Program as an example where he felt that the program would have gone smoother if the service provider had created a project manager similar to what PSE had done[48].
- Gas compliance and regulatory audits job responsibilities include being a team asset and advocate to other PSE departments to help keep PSE in compliance with the various safety programs.

9.4.3 Information Systems

A variety of information systems, including paper, are used to keep track of gas safety compliance program information. Figure 22 Information Systems Utilized describes the compliance program and the information system within which the data resides.

Figure 23 -Information Systems Utilized

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
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.	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: 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. Includes corrective maintenance by GFR.	ACCESS
Inside meter survey resulting maintenance associated to service valves done by GFR only.	ACCESS
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

[48] Interview Number 60

Odor Level Testing/Odorant Injection	SAP
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
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
Underwater Crossings Surveying	ACCESS / Excel
Underwater Crossings Maintenance	ACCESS / Excel
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
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)
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
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 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
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
LNG Gig Harbor Satellite Inspections	Plant DATABASE
LNG Gig Harbor Satellite Repairs	Plant DATABASE
Above ground pipe and fittings associated to residential and small industrial meter	LMS / CLX
Exposed Pipe Condition Reports	Hardcopy/SAP
Continuing Surveillance Reports	SAP

Gathered from DR 068

- Numerous interviewees indicated it was often difficult to collect and integrate certain information. An example offered was time consuming plat map reviews required to populate the WSSAP and bare steel databases[49].
- SAP is customized for each group and there is no one person that covers the entire program. Some of SAP's outputs include contractor notifications, inspection reports, work orders, G1 notification for initial inspection, G2 notification to notate failed inspection and M5 notification to respond to a failed inspection. Some interviewees would like to see SAP have the ability to interface with other systems.
- Several interviewees recommended getting all compliance programs out of the Access databases and into SAP.

9.4.4 Performance Improvement Efforts

- Recently, performance improvement efforts for enhanced gas safety compliance programs have been initiated by PSE's Performance Excellence group.
- The Performance Excellence group's mission is to identify opportunities and develop all-encompassing solutions that improve compliance, safety, and reliability by reviewing processes end-to-end.
- Performance Excellence has worked or will be working with operations management on several related gas safety compliance program issues including :

[49] Interview Number 42

- Reducing the number of gas leaks out of compliance due to time
- Improve Gas Operations efficiencies in the area of continuing surveillance
- Improve map records cycle time

- Jacobs conducted a more in-depth review of the intervention initiative to reduce the number of gas leaks that go out of compliance. Our review included a synopsis of the problem, the date the initiative was started and completed, the approach taken to resolve the issue, and the results achieved to date.
- In summary, the gas leak process was managed in separate systems, involved numerous handoffs and tracking mechanisms that were in-complete. Over a 6-month period the process was analyzed using root-cause analysis to address weaknesses, recommended solutions were implemented and measurement was put in place to sustain improvement. The results are impressive as the number of noncompliant leaks at the end of 2007 was 104, and by March of 2009 was reduced to two[50].
- Another major initiative to address compliance was the formation of the Director of Compliance and Safety Organization. Prior to the group's formation in 2007, there was no specific PSE organizational group focused or accountable for compliance. The relatively new organization has helped to improve the visibility of compliance requirements and holding people more accountable[51].

9.4.5 Conclusions

Responsible Groups

There are numerous organizational groups within PSE with specific gas safety compliance program-related responsibilities. These responsibilities include: review records, identify trends, and initiate follow-up work, or observe and report the condition of gas facilities during construction, operation and maintenance activities. These groups involved are as follows:

- Manager Total Energy System Planning
- Consulting Engineer Corrosion Control
- Company and Service Provider Personnel
- Manager Gas First Response
- Manager System Control Protection
- Manager Gas Compliance and Regulatory Audits

[50] Document Request 169
[51] Interview Number 76

- Manager Contract management
- Manager Engineering

Not specifically included in PSE Operating Standards for Continuing Surveillance 2575.2700, but playing a significant observation role is the QA/QC group, which reports to the Manager of Quality Assurance and Inspections. (See Recommendation 9.4.6.1)

In order to assess whether the responsibility for obtaining the needed gas compliance outcomes was well communicated, Jacobs reviewed the position descriptions of each manager/supervisor with gas safety compliance responsibilities and a job title to standard number cross-reference guide, which is a cross-reference of responsibilities of every operating standard in which each specific job title is mentioned. The review of the position descriptions indicated they were typically generic with exact gas compliance responsibilities either not fully described or specifically stated. The 14 page cross-reference list was complete, but overwhelming and not particularly practical as a means of communicating safety compliance responsibilities. (See Recommendation 9.4.6.2)

With regard to how gas safety compliance responsibilities are measured we were advised that Operations has several goals related to compliance and those performances of the responsible managers are measured against the company's overall performance relative to these goals. Furthermore, the individual's contribution to the goal successes is evaluated through the annual performance appraisal and goal process.

Gas safety compliance program metrics are communicated upwards in the organization to the COO level. Since 2008, PSE has utilized executive and operational metrics to communicate important information. These monthly reports include gas items such as: safety, compliance - PSE, compliance – Pilchuck, compliance – Potelco, financial and employee development.

In order to identify areas of concern with regard to gas compliance programs, initiatives and proceedings, PSE initiated in August of 2005 the Gas Compliance Steering Committee. Meeting monthly, the group discusses commitments made to the UTC with regard to audit findings and settlement agreements. Jacobs attended a monthly meeting and a reviewed of minutes of meetings held in 2008, both of which clearly demonstrated the Gas Compliance Steering Committee serves a useful purpose.

Gas First Response operations represent the group that initially responds to gas emergencies. Once the initial condition is made safe, the First Responder hands off the repair to the Second Responder, Pilchuck. Interviewees report that First Responder to Second Responder handoff occasionally has some difficulties with accuracy of information. The handoff is made more difficult when the information is passed to the Second Responder through the dispatcher and not directly.

Dispatch Operations have a real-time view of the location of the PSE field worker, the work location and the status of work as they make their dispatching decisions. However, they are currently able to only control a portion of the workflow. This is due to the fact that certain task types are currently not viewed. Supervisors in the Gas First Responder organizations have a variety of responsibilities that prevent them from spending time out in the field. Three supervisors indicated that less than 5% of their workday is spent in the field and this time is usually confined to gas emergency oversight. Supervisors it seems must depend on others to assess how well their direct reports perform. Potentially having supervisors without a strong knowledge of their employees could negatively impact compliance safety. (See Recommendation 9.4.6.3)

On three occasions, in response to gas emergencies, Jacobs had the opportunity to observe PSE employees collaborating with Pilchuck employees. In each instance it was difficult to decipher who was actually in charge, even though PSE's procedures clearly identify their incident command role. (See Recommendation 9.4.6.4)

Compliance Oversight Process

In 2002, an effort was made to pull together various compliance maintenance activity work units, and budgeting and tracking information. Gradually these compliance maintenance activities are becoming part of SAP. However, there are still a number of compliance maintenance activities in Access systems. There is also a number of compliance maintenance activities tracked in CLX. To schedule work, work orders are driven and given out by region. Some work orders are sent over the computer and others are physically given to the supervisor. Jacobs observed numerous boxes filled with paper orders.

Reports generated by Maintenance Programs include a Business Warehouse report from SAP that shows what compliance work is due and monthly compliance reports for emergency valve inspections, pressure-control regulator and valve inspections, and corrosion-control inspections. There is also a new database under development in xEM, a software program related to SAP. This database will provide electronic reminders when certain actions in response to regulatory requirements are required. The compliance reports will continue to be produced from individual databases where the data resides such as SAP and LMS.

PSE employs a variety of approaches and schemes in managing gas safety compliance. These approaches include: various databases, electronic screens and paper work orders, electronic and paper completion of work, and electronic and manual data entry. All of which makes it difficult for consistent and systematic review and analysis of the data required to assure gas safety compliance programs. Various examples of the diversity of approaches include:

- The distribution corrosion database is in SAP, but the records are referenced by address and plats instead of by segments. There is no formal process for trending corrosion leaks.
- There is no status report showing the number of current outstanding, completed, and initiated Blue Cards.
- The annual records review process required by PSE Operating Standards for Continuing Surveillance is part of an informal budgeting process conducted by Maintenance Planning.
- Data entry into leak management system occasionally has issues and monthly the Program Coordinator has to run the report to check for errors.
- Recently, within the past 6 to 8 months, Maintenance Planning has been using PSE maps to plot leaks as far back as 2002. The maps also show the material type which can be useful for further analysis.
- The Hard to Reach Locations (H2RL) Survey encompasses work tickets issued by location; once an inspection is completed the paperwork is turned in and manually entered into a database. An issue with the program is they cannot query what type of work was done.
- Valve inspections are managed by Pilchuck; it was recognized that inspections were not being performed on time or are experiencing a lag in data entry. It is difficult for PSE to monitor the timeliness of the inspections if the actual inspections are completed and not entered into the database.
- For both the Bridge and Slide Patrol and Mobile Home Park Patrol Program Surveys paperwork is sent back to Maintenance Programs and entered into SAP. Any required work orders are issued by Maintenance Planning.
- Atmospheric corrosion inspection's compliance oversight process is also similar to the Bridge and Slide program. While the work is done by Heath, the data entry into MDW the Meter Data Warehouse is performed by Maintenance Programs.
- Emergency section valves and odor test locations are maintained in SAP.
- Maintenance Planning meets with Pilchuck monthly to help ensure that the work associated with the various compliance programs assigned to the service provider is complete and is on track.
- For certain compliance programs PSE creates a project manager to help provide program oversight; however, the service provider charged with doing the work does not.
- Gas compliance and regulatory audits job responsibilities include being a “team asset and advocate” to other PSE departments to help keep PSE in compliance with the various safety programs.

Information Systems

A variety of information systems, including paper, are used to keep track of gas safety compliance program information. Numerous interviewees indicated it was often difficult to collect and integrate certain information. SAP is customized for each group and there is no one person that covers the entire program some of SAP's outputs include: contractor notifications, inspection reports, work orders, G1 notification for initial inspection, G2 notification to notate failed inspection and M5 notification to respond to a failed inspection. Some interviewees would like to see SAP have the ability to interface with other systems. Several interviewees recommended getting all compliance programs out of the Access databases and into SAP. (See Recommendation 9.4.6.5)

Performance Improvement Efforts

Recently, performance improvement efforts for enhanced gas safety compliance programs have been initiated by PSE's Performance Excellence group. Performance Excellence has worked or will be working with operations management on several related gas safety compliance program issues including:

- Reducing the number of gas leaks out of compliance due to time
- Improve Gas Operations efficiencies in the area of continuing surveillance
- Improve map records cycle time

9.4.6 Recommendations

9.4.6.1 Revise the Operating Standards for Continuing Surveillance 2575.2700 to reflect the significant observation role the Manager of Quality Assurance and inspections has in continuing surveillance.

9.4.6.2 Add clarity in how compliance activity responsibilities are delegated and how individuals are held accountable throughout the organization.

9.4.6.3 Conduct a study of how and where first-line supervisors spend their time. Determine which existing supervisory and administrative tasks can be reassigned and/or appropriate staffing needs, so that first-line supervisors have the ability to routinely spend 50% of their time with field crews and service personnel. Develop a list of appropriate field related responsibilities along with the means to ensure supervisor accountability.

9.4.6.4 Review and communicate the criteria for incident command with all PSE and SP staff so that the PSE leadership role is clearly understood; consider incorporating incident command observations into the quality assurance program.

9.4.6.5 Elevate the priority of the initiative to move compliance maintenance programs managed in Access, such as H2RL, atmospheric corrosion inspections, and valve inspections to SAP.

9.5 Safety Compliance Program Status

To complete our analysis of resource adequacy we attempted to determine for each safety compliance program the number of units to be completed, the actual number of units completed and an estimate of the year-end backlog for each year between 2002 and 2008. However, we were advised that "the historical number of maintenance activities was not easily assembled, if available at all"[52].

PSE was able to provide a year-end summary for 2008. This summary is compiled in Figure 24 2008 Safety Compliance Program Status.

Figure 24 -2008 Safety Compliance Program Status

2008 Gas Compliance Summary

Compliance Inspection	Total Due	Total Completed	Incomplete-Past Due	Percent of Compliance
Gas First Response Department - Compliance Inspection Group				
Bridge & Slide Patrol	1307	1307	0	100.00%
ES Valve	311	311	0	100.00%
Mobile Home Park Patrol	2293	2293	0	100.00%
Odor Test Location	1283	1283	0	100.00%
Total	**5194**	**5194**	**0**	**100.00%**
Gas First Response Department - Compliance Repairs Group				
Compliance Repair	5	5	0	100.00%
Total	**5**	**5**	**0**	**100.00%**
Atmospheric Corrosion Department - Compliance Repairs Group				
4SAI Remediation	322	312	10	96.89%
Total	**322**	**312**	**10**	**96.89%**
Pressure Control Department - Compliance Inspection Group				
District Regulator	555	555	0	100.00%
Farm Tap	34	34	0	100.00%
Gas Odorizer Bypass	351	351	0	100.00%
Gas Odorizer Wick	24	24	0	100.00%
Gate Station	32	32	0	100.00%
Limiting Station	20	20	0	100.00%
Master Meter	9	9	0	100.00%
Odorizer Inject	135	135	0	100.00%
Town Border Station	13	13	0	100.00%
Valve	2058	2053	5	99.76%
Total	**3231**	**3226**	**5**	**99.85%**
Pressure Control Department - Compliance Repairs Group				
Compliance Repair	3	2	1	66.67%
Total	**3**	**2**	**1**	**66.67%**
Corrosion Control Department - Compliance Inspection Group				
Power Source	1746	1746	0	100.00%
Test Site	13279	13278	1	99.99%
Test Site IndSvc/Mn	3203	3203	0	100.00%
Total	**18228**	**18227**	**1**	**99.99%**
Corrosion Control Department - Compliance Repair Group				
Compliance Repair - Down System	1252	1235	17	98.64%
Total	**1252**	**1235**	**17**	**98.64%**

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This year-end summary shows the number required, number completed and the number outstanding for each of the compliance-maintenance activities performed by gas operations. The number outstanding becomes the backlog that would be carried over into the next year, in this case 2009. In 2008, PSE performed in excess of 33,000 compliance inspections and repairs[53]. When including what will be due in 2009, only 34 compliance inspections and repairs were completed pass due. For the year ending 2008, all compliance programs were completed on time except for 10 atmospheric corrosion 4SAI re-mediations, 5 pressure-control valves, 1 corrosion-control test site, 17 corrosion-control compliance repairs downstream, and 1 corrosion-control compliance repair.

9.5.1 Conclusions

PSE was able to provide a year-end summary for each of the compliance-maintenance activities performed by gas operations in 2008. In total PSE performed in excess of 33,000 compliance inspections and repairs. Only 34 inspections and repairs were completed pass due achieving a compliance rate of better than 99.99%. Almost half of the past due activities were a result of exceeding the 90-120 day remediation requirement for cathodic protection readings.

Clearly in 2008 excellent results were achieved in meeting the maintenance and inspection compliance schedule; however, we are concerned that PSE was unable to document performance in previous years.

9.5.2 Recommendations

9.5.2.1 Expedite the xEM database under development. This software will provide electronic reminders to designated individuals when compliance reports or actions in response to regulatory requirements are necessary.

[53] Document Request 186

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Appendix A

Operations Metric Report			
	Reporting Period	**Benchmark**	Description
Customer			
% calls answered w/in 30 seconds (SQI # 5)	YTD	Annual target	Actual = YTD Average % of calls answered within thirty seconds or less. Target = Annual target 75%
% satisfaction with call to Access Center (SQI #6)	YTD	Annual target	% of respondents answering 5-7 on a 7-point satisfaction scale to the following question:"Overall, how would you rate your satisfaction with this call to Puget Sound Energy?" Actual = YTD average % of customers surveyed who were satisfied with recent interaction with PSE telephone center Target = Annual target 90%
Call volume	YTD	'07-'08 Average TD	Actual = YTD number of calls made to the Access Center
Abandoned calls	YTD	'07-'08 Average TD	YTD calls dropped prior to being answered at the Access Center
Average # of Customers	Apr-09	Forecast by Finan Plan	Average number of active customers in CLX
% satisfaction with gas field service (SQI # 8)	YTD	Annual target	% of respondents answering 5-7 on a 7-point satisfaction scale to the following question: "Thinking about the entire service, from the time you made the call until the work was completed, how would you rate your satisfaction with PSE?" Actual - YTD average satisfaction percentage Target - Annual target 90%
% appointments kept (SQI # 10)	YTD	Annual Target	PSE provides customers with a variety of services that can be scheduled. This SQI measures the percentage of appointments kept as scheduled (certain exceptions apply.) Actual - % of appointments kept for gas and electric service Target - Annual target 92% or more. This includes gas services, electric, and new construction.
Average lead time for new complex service		Annual Target	Average time from when a customer contacts CCS to when the job is Field Completed.
# of complex service jobs completed	Rolling 12 @ Apr 09	Rolling 12 month	Number of New Construction Complex jobs field completed
# new customers connected (excl area lighting)	Rolling 12	Rolling 12 month	Number of new meters set in the field
Utility Dig-ups - Elec and gas combined	YTD	LYTD	
% of Meter Billing Standard Timeline Met	YTD	100% by 6/1/09	Timelines met for Regulators on Meter project (lost meters, stopped meters, etc)
% Customers Disconnected (SQI # 9) - Annual Target 3.0%	YTD	LYTD	% disconnections per customer for non-payment of amounts due when UTC disconnection policy would permit service curtailment. Actual = YTD % of customers disconnected Target = Cumulative allocation of annual target based on 2004-2008 actual experience Annual Target - 3% or less
# Complaints/1,000 Custmrs (SQI # 2) - YE Target 0.40	YTD	'04-'08 Average TD	WUTC complaints/1000 customers
Complaints - WUTC	Apr-09	LYCM	Monthly Amount of complaints registered with the WUTC
Complaints - WUTC	YTD	LYTD	YTD # of complaints registered with the WUTC
Cust Constr Svcs - Complaints Received - 835 YE Target	YTD	2008 less 10%	YTD # of complaints related to New Construction
Compliance and Safety - Operations only			
Gas response time minutes (SQI # 7)	YTD	Annual Target	Average number of minutes from customer call to arrival of gas field technician. Actual - YTD average response time Target - Annual target, 55 minutes or less
% Response to Gas Emergency within 60 minutes	YTD	TD proposed, PSE evaluating	% Response to Gas Emergency within 60 minutes
Gas compliance	YTD	Annual Target	% compliance - Data provider: Helge Ferchert
Gas compliance - Pilchuck	YTD	Annual Target	% compliance
Gas compliance - Potelco	YTD	Annual Target	% compliance
Near-miss ratio	Mar 09-1 mo lag	2009 Corporate Goal	Ration of number of near-miss reports submitted to the number of recordable injuries
Recordable injuries - Total Incident Rate	Mar 09-1 mo lag	2009 Corporate Goal	
Lost Time injuries - Lost Workday Case Rate	Mar 09-1 mo lag	2009 Corporate Goal	
Severity Index	Mar 09-1 mo lag	2009 Corporate Goal	
Reliability and System Status			
# Active underground leaks	YTD	LYTD	LYTD number of acitve underground gas leaks

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Operations Metric Report for month-ending December 31, 2008								
	Reporting Period	Combined		Gas		Electric		Benchmark Period
		Actual	Benchmark	Actual	Benchmark	Actual	Benchmark	
Customer								
Overall Customer Satisfaction (SQI # 1)	Ave 2008	83.5%	90%					Annual target
% calls answered w/in 30 seconds (SQI # 5)	YTD	76.8%	75%					Annual target
% satisfaction with call to Access Center (SQI #6)	YTD	93.0%	90%					Annual target
Call volume	YTD	3,938,249	4,595,026					'06-'07 Average TD
Abandoned calls	YTD	69,256	120,734					'06-'07 Average TD
% satisfaction with gas field service (SQI # 8)	YTD	91.4%	90%					Annual target
% appointments kept (SQI # 10)	YTD	99.9%	92.0%					Annual Target
Average lead time for new complex service	Rolling 12			76.3	88.2	73	76.5	2007 less 10%
# of complex service jobs completed	Rolling 12			359	671	895	1,654	2007
# new customers connected (excl area lighting)	Rolling 12 Nov	33,430	42,278	15,549	19,218	17,881	23,060	LY Rolling 12
% of Meter-to-Cash Backlog Complete	YTD	93%	75%					75% by 12/31/2008
% Uncollectible Accounts to Revenue (APUA)	YTD Nov-08			0.83%	0.62%	1.12%	0.85%	December 2007
% Customers Disconnected (SQI # 9) - Annual Target 3.0%	YTD	2.4%	3.0%					'03-'07 Average TD
Mo. Ave # of cust. w/Pymnt Arngmnts ("good" rating)	Mo Avg YTD	1,010	484					Mo Avg LYTD
Mo. Ave $ in Payment Arrangements ("good" rating)		$ 973,168	$ 432,905					Mo Avg LYTD
# complaints/1,000 Customrs (SQI # 2) - YE Target 0.50	YTD	0.25	0.50					'05-'07 Average TD
Complaints - WUTC	YTD			10	8	26	22	LYCM
Complaints - WUTC	YTD			176	109	269	376	LYTD
Customer Construction Services - Complaints Received	YTD	928	971					Annual Target
Compliance and Safety - Operations only								
Gas response time minutes (SQI # 7)	YTD			35	55			Annual Target
Electic response time minutes (SQI # 11)	YTD					55	55	Annual Target
Near-miss ratio	YTD	5.87 : 1	>3.00:1	6.84:1	>3.00:1	4.90:1	>3.00:1	2008 Corporate Goal
Recordable injuries	YTD	5.92	<4.98	5.27	<4.98	6.74	<4.98	2008 Corporate Goal
Lost Time injuries	YTD	2.49	<1.9	1.94	<1.9	3.19	<1.9	2008 Corporate Goal
Reliability and System Status								
# active underground leaks	YTD			2,843	2,834			LYTD
Number of outages (incl storm)	Final					13,949	14,460	LYTD
Number of EOC days	YTD	6.6	11.5					LYTD
SAIDI (minutes) (SQI # 3) - Annual Target - 136	Final					163.48	136.00	SQI
SAIFI (frequency) (SQI # 4) - Annual Target - 1.30	Final					1.01	1.30	SQI
Crew Availability - Electric	Dec-08					50	n/a	
Maintenance, Construction & Technology Infrastructure								
Substation Planned Maintenance - O&M	YTD	342	341					Forecast
Substation Planned Maintenance - Capital	YTD	60	63					Forecast
Commissioned Substations	YTD	6	8					Forecast
SCADA - Commission units/Engineering units	YTD	15	18					Forecast
Bare Steel - Miles retired/replaced	YTD	21.3	20.7					Forecast
Intolight Services 100-watt lamp installations	YTD	2,138	2,100					Annual target
Intolight Services - 3-Day corrective maintenance	YTD	99.3%	≥ 98%					Annual target
"Project book" complete - PSE	YTD	13	19					Forecast
"Project book" complete - Pilchuck	YTD	48	82					Forecast
"Project book" complete - Quanta (Potelco)	YTD	47	55					Forecast

Original benchmark targets changed to YE forecast due to project deferrals for reasons such as budget management and community coordination.

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		Valdman - All	IT	Customer Service	Operations	Comm& Gov Rel	
Employees							
Number Days of PTO forfeited	Jun - Dec 08	180.6	12	34.3	111.7	22.6	
Attrition rate	YTD	7.67%	6.15%	9.70%	6.76%	9.85%	
Employees hired	YTD	318	31	125	127	35	
Employees involuntary termination	YTD	32	2	16	14	0	
Employees voluntary termination	YTD	118	9	33	63	13	
Open Positions	Dec-08	58	4	40	14	0	
Financial ($ in millions)		**Valdman - All**	**IT**	**Customer Service**	**Operations**	**Comm& Gov Rel**	**Variance Drivers**
O&M Budget	Annual	$ 271.0	$ 23.9	$ 85.2	$ 146.5	$ 15.3	The primary drivers of the overrun are: Higher AFUA write-offs, rent expense for PSE building-purchase buyout settlem't proceeds and the unplanned lease of the 4th flr PSE building, FTEs hired to achieve SQIs, Riser Replacement Project, unplanned costs-pipeline safety audit, higher trended costs for EFR, System Ops, Substations, consultants assisting w/municipalization & surveys.
O&M Budget YTD	Annual	$ 271.0	$ 23.9	$ 85.2	$ 146.5	$ 15.3	
O&M Actual	Annual	$ 286.4	$ 23.7	$ 86.9	$ 158.8	$ 17.0	
O&M Forecast - Corporate	Annual	$ 290.4	$ 23.9	$ 92.1	$ 157.2	$ 17.2	
O&M forecast (overrun) underrun	Annual	$ (19.4)	$ (0.0)	$ (6.9)	$ (10.7)	$ (1.8)	
O&M Actual to Forecast (overrun) underrun	Annual	*$ 4.1*	*$ 0.2*	*$ 5.2*	*$ (1.6)*	*$ 0.2*	
Capital Budget	Annual	$ 481.5	$ 44.0	$ 1.0	$ 420.0	$ 16.5	The primary drivers of overrun are: permitting contraints for the Ebey Slough project and Bellevue Braids project, high estimate for Covington-Berrydale project, projects planned for 2007 completed in 2008, pole replacement scope added to the Talbot - Berrydale project, transfer material & labor for 12/06 storm & Rocky Reach transm line, higher repair costs for Novelty Hill 230kV project, Fleet, and an increase in forecast costs for new North Operating Base facility. Overrun partially offset by forecasted NCC underruns and revised major project forecast due to project deferrals to 2009.
Capital Budget YTD	Annual	$ 481.5	$ 44.0	$ 1.0	$ 420.0	$ 16.5	
Capital Actual YTD	Annual	$ 490.9	$ 40.5	$ 5.7	$ 429.0	$ 15.8	
Capital Forecast - Corporate	Annual	$ 474.7	$ 40.0	$ 4.5	$ 413.0	$ 17.2	
Capital forecast (overrun) underrun	Annual	$ 6.8	$ 4.0	$ (3.5)	$ 7.0	$ (0.7)	
Capital Actual to Forecast (overrun) underrun	Annual	$ (16.2)	$ (0.5)	$ (1.1)	$ (16.0)	$ 1.4	
Overtime hrs w/ storm	YTD	241,916	15,090	22,807	200,935	3,085	
Overtime hours w/o storm	YTD	226,201	14,944	19,857	188,629	2,770	