BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Docket Nos. UE-090704 and UG-090705
Puget Sound Energy, Inc.'s
2009 General Rate Case

PUBLIC COUNSEL DATA REQUEST NO. 234

PUBLIC COUNSEL DATA REQUEST NO. 234:

Please provide the following regarding the Mobile Workforce Gas First Response system:
   a. All studies underlying the decision implement the system.
   b. Date each phase of the system/program was rolled out by location or division.

Response:

   a. Attached as Attachment A to Puget Sound Energy, Inc.'s ("PSE") Response to Public Counsel Data Request No. 234, please find a copy of the business case underlying the decision to implement the Mobile Workforce Electric and Gas First Response system.

   b. The table below provides the date each phase of the Mobile Workforce Gas First Response system commenced:

Location	Go Live Date
Factoria	August 6, 2007
South King, Georgetown South	August 20, 2007
Olympia, Tacoma	August 27, 2007
Everett, Georgetown North	September 10, 2007

PSE's Response to Public Counsel Data Request No. 234
Date of Response: August 7, 2009
Person who Prepared the Response: Todd House, Mark Maass, Dave Trimble
Witness Knowledgeable About the Response: Bertrand A. Valdman

ATTACHMENT A to PSE's Response to Public Counsel Data Request No. 234

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Business Case:

Mobile Workforce Management

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Executive Summary

The Mobile Workforce Management (MWF) initiative employs state of the art technology in hardware, networking, database, and application software to increase productivity and improve customer service. A MWF system will provide real time access to information in the field, the capability of updating information from the field, and new tools for the management of field forces which provide real time scheduling and dispatching.

The project will phase in over a two to three year period. The current work groups identified to have a need for this solution are Gas First Response (GFR), Electric First Response (EFR), System Controls and Protection (SC&P), Substations (Sub), Metering Network Services (MNS) and Gas System Operations. Phasing of the groups may include an initial partial rollout of handheld devices with simple wireless access before the mobile application is available.

Interfaces to existing applications will be required for accurate data tracking and project completion. The systems affected have been identified as; ConsumerLinX (CLX), SAP, Leak Management System (LMS), Meter Data Warehouse (MDW) PSEMaps. Specifically, this includes service orders generated from the Access Center to Gas and Electric First Response from CLX, emergency leak orders for GFR from LMS, maintenance orders for SC&P and Substations from SAP in the recent DADMO project and miscellaneous orders from MDW. Additionally, access may be provided to the PSE network including e-mail and the other MSOffice products.

We anticipate the capital cost of this project to be 10 million dollars, of which $1,300,000 is for interfaces to CLX. Recurring O&M costs will be $850,000 per year. The benefits will be a combination of hard cost reductions of $1.9M per year, productivity improvements, estimated to be, at $4.2M per year and increased revenue from gas service orders, $500,000 per year.

1. Project Summary

1.1. Summary of the Business Goal (BU)

The business units mentioned perform needed and necessary work for PSE, predominately in the field. The goal of this project is to increase their efficiencies and the amount of work completed every day. In addition, PSE will improve its ability to react, real time, to changing workload demands, and by doing that, improve our service to our customers. We believe we can do this by providing a solution that manages field operation employees and workloads and provides the field employee real time access to work orders and customer and plant data while in the field.

1.2. Project Description

❑ What we do today.

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Our current method of operation is manual based dispatching and scheduling over radio and telephone for first response departments. Orders are created in CLX, SAP and LMS and printed in dispatch offices to then be distributed via fax, radio or telephone to field personnel. A comprehensive view of all work is unavailable to the various dispatch groups and departments through one common system. This limited view of work creates inefficiencies in the workforce and does not allow for combined work order completion at specific locations.

Manual entry of completed orders by clerical staff can occur days after the orders are completed causing delays in billing, account adjustments and customer information updates.

For departments such as SC&P and Substations (after DADMO), maintenance orders and notifications will be created in SAP, for Metering Network Services they are created through CLX, Gas System Operations Instrumentation group receives their maintenance work partially from CLX and the rest from various Access databases. These orders are manually scheduled and distributed as paper copies. No effective means exists for effective routing of work and for management of work and workforces after they leave the office. Manual completion of this compliance work by the field is then handed off for entry into the systems after the fact, not always in a timely manner.

Since most of the work is done with paper, there are data inaccuracies that often require additional work effort to complete properly. The current environment is not real-time. Field personnel do not have ready access to new service orders that come in after their workday starts. Paper based processes also require field personnel to regularly visit the operating bases to pick up and turn in paper work, and making job site reporting difficult.

❑ What the solution will do:
A MWF project will bring together the business units with mobile workers and IT to develop an enterprise wide solution to more effectively manage our mobile workforce and provide superior customer service. It will include system hardware and software, mobile hardware and wireless communication. New functionality will include Computer Aided Dispatch for managing mobile workers and real time access to systems and data for the mobile workers. Specifically the solution will:

❑ Interface to existing systems such as CLX, SAP, MDW and the Leak Management System, so that dispatchers and management can view and manage all the work in one system.
❑ Provide dispatchers a tool to assign work from multiple systems which will allow them to dispatch in real time over a wireless network.
❑ Provide the tool for field employees to receive and complete in real time, all work that is required at a location. This will reduce multiple trips to the same location.

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- Provide a state of the art scheduling, optimization and routing tool that will increase the number of orders completed per day. It will have the capability to automatically schedule predefined orders.
- Provide dispatchers a real time view of where personnel are in the field and their work status, improving response to emergencies and better resource management.
- Provide supervisors and management an overview of where work and personnel are located.
- Provide performance measurements through system KPI's that can be analyzed by management to determine changes in business direction, scheduling, process improvements, performance management, etc.
- Provide a user-friendly system for office and mobile workers.
- Provide mobile workers with laptops or other appropriate devices in the field to receive and complete orders in the field.
- Establish an architecture for secure wireless connectivity for mobile workers.
- Improve data quality and timeliness.
- Provide field employees with mission critical data for safer response to emergencies.
- Allow Access Center personnel to schedule more work, providing improved service to our customers through smaller appointment windows and better visibility of field activities.
- Improve inventory management on parts and other warehouse items.
- Provide PSE's Fleet Mgmt with information on vehicle usage and location and potentially reduce mileage on vehicles. (This solution will not cover all PSE fleet).
- Collect timesheet information based on jobs, increasing accuracy and reducing time entry costs.
- Provide emergency notification and location of PSE personnel for fastest possible response to medical emergencies in the field.
- Reduce overtime hours by First Response personnel by properly balancing workload.
- Help retain existing appliance repair customers and attract new customers by providing high level of customer service.
- Eliminate lost or mishandled orders.
- Improve overall productivity among field workers.
- Provide tangible cost savings and higher revenue for PSE.

- Identify and describe which Strategic Theme this project would support:
  - System Performance
    - Helps PSE operate in a least cost manner by improving efficiency of field forces
    - Helps PSE manage its personnel resources and measure performance
    - Improves decision making with improved and timely data
  - Workplace Environment
    - Improves safety of PSE personnel with tracking of current work location and emergency notification capability
    - Improves coordination of PSE departments with a tool to manage enterprise workload

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- o Customer Service
  - ▪ Improves resource scheduling and planning, providing more accurate appointments and fewer missed appointments. After an adjustment period to the new system and analysis of potential scheduling possibilities, increased timed appointments may be possible.
  - ▪ Provides the capability to respond to electric outages, gas leaks and emergencies in a more timely manner
  - ▪ Real time dispatch and field completion of collections and reconnects will provide more timely and accurate service to our customers.
- o Business Process
  - ▪ Allows PSE to streamline and improve business processes, both within departments and between departments.
  - ▪

1.3. Cost / Benefit Summary

The MWF project will cost roughly 10 million dollars in one-time costs and $850,000 in yearly O&M dollars. The capital costs are to be spread over 2 to 3 years. The capital costs include software, system and mobile hardware, vendor configuration and customization, interface costs to PSE legacy systems, project management and PSE labor. Project O&M costs of $250,000 are anticipated for user training. Ongoing O&M costs are made up of software licenses, hardware and software maintenance FTE's and communication charges. Some of the O&M increases offset existing expenditures. In addition, like all other hardware, there will be a need to replace mobile devices every 3-4 years depending on their use and condition. Overall, the replacement cost of 1.5 million dollars will be spread over 3-4 years as the devices age.

The total benefits of a MWF system are estimated to be $6.6M per year based on our estimates, on Gartner Group research and actual results from other utilities. The resulting 15 year NPV for the project is $22,000,000. Hard benefits, nearly $2.5 million, will be measured in reduced non storm overtime, reduced paper and printing expense and increased revenue due to ability to perform increased gas appliance work.

Soft cost savings or productivity increases will be realized due to the implementation of this system of approximately $4.2 million per year. All estimates are based on very conservative numbers. Elimination of much of the paper work orders will result in orders being completed online. This will result in some of the operating clerk and completion clerk time being freed up for other duties. There are currently 50 clerk FTEs spending approximately 40% of their time on entering completion information. Improved routing and scheduling will result in greater predicted efficiencies for our field forces of up to 10%. This is compared with Gartner research of up to 30%. This improved efficiency will allow more orders to be completed by each tech in the field. For our purposes, we included 173 Gas First Response, 75 Electric First Response and 80 Metering Network Services, 58 substations and 74 SC&P

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personnel in these savings. More orders per day translates into less overtime and less pressure to hire more personnel as our system continues to grow.

Soft cost savings which have not been quantified relate to improved customer service. There are numerous examples that can be sited, here are but a few. There will be the opportunity to create appointments for more customer generated orders than possible before. As orders are completed in the field, Access Center personnel will have the ability to access order status information to relate to the customer. Emergency response will be improved as we are able to quickly determine the closest and most appropriate responder. Field technicians will have historical service order information that will assist them in analyzing current problems or customer concerns. Reconnect orders will be able to be dispatched in a more timely manner to the best field resource. All of the above will have a positive impact on ou r ability to service our customers better, but were not quantified in this business case.

2. Current State Problems/ Limitations

❑ **Describe current situation**

Work is processed within each individual system and is scheduled and dispatched manually. It is then completed on paper copies of work orders to be later handed off to others to enter in each respective system. Field workers often do not have access to real time, accurate data that they need to do their jobs in a productive manner, the field workers location is often unknown during the day and the status of the workload is unknown during the day.

❑ **Identify the current processes and technologies in question (servers, apps, interfaces, etc)**

- GFR processes: emergency work orders, scheduled service orders, scheduled maintenance orders through CLX, SAP, LMS and other departmental databases.
- EFR processes: emergency work orders, scheduled service orders, scheduled maintenance orders through CLX and SAP.
- SC&P CP process: Capital work orders, maintenance work orders, scheduled test site read notifications through SAP.
- SC&P PC process: Capital work orders, maintenance work orders, scheduled regulator preventive maintenance through SAP.
- Gas Operation Instrumentation process: Scheduled instrument reads, instrument maintenance orders through CLX and other departmental databases.
- Meter Network Svc's processes: disconnects and reconnect orders through CLX.
- Substation processes: Capital work orders, corrective maintenance work orders, preventive maintenance work orders and readings, eventually through SAP after DADMO is complete.

Current systems include service order processing from CLX, order and notification processing from SAP, leak orders from LMS, miscellaneous orders from MDW. Previously, substation and SC&P maintenance orders were converted into SAP during DADMO, but LMS was left as a stand alone system. All these orders are processed today through the use of paper copies of orders, which may be printed

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in the office, faxed or in some cases received through radio or cell phone communication.

❑ **Describe the current costs of hardware, software, interfaces, etc.**
Costs relevant to this proposal are the labor costs related to generating, physically completing the work and the subsequent completing of the work in the system. This may include dispatchers, resource coordinators or technicians generating paperwork for orders, routing themselves during the day to order locations, filling in the paperwork after work is complete, then returning the paperwork to a clerk in the office for entry into the generating system, along with a time sheet. Costs also include things such as duplicate trips to same location because of lack of coordination, increased travel time and cost because of inefficient routing, time entry correction time, paper form management time, overtime due to inability to manage resources effectively.

Current hardware and software costs could be described as the capital costs for installing both SAP and CLX, and the ongoing maintenance of each, which will not be reduced with this project. There is one interface between CLX and the MDSI scheduling tool, which would be eliminated with this project, and be replaced with a new interface to the tool selected for workforce scheduling. No existing systems would be eliminated here, but this project would add another enterprise system that would create additional interfaces to our other major systems.

3. Future State
❑ **Describe the recommendation, vendor, software, hardware, etc.**
The future state consists of a system that incorporates the legacy work order generating systems of PSE, interfaced to a mobile application communicating real time to mobile devices in the field. The system will enable network access to field personnel and access to plant data and will be engineered to use the most cost effective communication network available. There are various vendors that provide mobile systems and mobile devices that meet PSE needs, and various vendors providing wireless data networks. The selection and implementation team will be made up of IT and the operation departments touched by the system, including:

- Gas First Response (GFR)
- Electric First Response (EFR)
- System Controls and Protection (SC&P)
- Substations (SUB)
- Gas System Operations
- Metering Network Services (MNS)
- Maps, Records and Technology (MRT)

The solution will be coordinated with any future PSE owned radio/communications system. Conceivably, the MWF system could utilize a combination of public and private networks, including WI-FI and satellite for specific situations. In the wake of the 2005 hurricanes, where public telephone

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and cell phone infrastructure was heavily damaged, satellite communication and private networks may become a serious option.

The project team will be responsible for the selection of an application vendor and the appropriate hardware form for each operating group, as well as the manufacturer. Purchasing will assist in any negotiations and contract development. The implementation team may also include vendor consultants and potentially a third party integrator if needed.

The current plan is for a 4 phase implementation.
Phase 1: Gas First Response would be rolled out with only CLX orders. This would involve developing an interface with CLX and replacing the current appointment booking system.
Phase 2: Electric First Response, with CLX orders and SAP orders, this will involve a new interface to SAP and additional CLX order types. An interface with LMS will also be developed for Leak orders which will complete the GFR work.
Phase 3. Meter Network Services, with CLX and a new interface to MDW for orders.
Phase 4. Substation and SC&P, this would involve maintenance orders from SAP.
Potential Future Phases: Inclusion of the Service Providers into the Mobile Workforce architecture. Many of the benefits that relate to PSE are also applicable to our partners.

❑ **Describe the process changes.**
As a high level review of the process, standard work would continue to be generated within PSE's legacy applications, such as CLX and SAP. That work would be visible through the MWF system, where a dispatcher or scheduler can manage it, regardless of the generating system. Field personnel would view and complete the work through the MWF system real time with a mobile device. They would also have the capability to create work in the field if the need arose. Dispatchers would maintain the work queues of the personnel throughout the day as order volumes and conditions change. Supervisors would have access to workload information and personnel location information which will allow them to manage their resources more efficiently. This information will be available to them wirelessly on their mobile devices.

Mobile Workforce applications provides rich functionality, and promise to provide great benefits to PSE. But like any application or major change to processes, it will also produce many challenges. Work practices that have been developed over many years will be revamped and individuals will need to learn new skills, potentially a painful process. We are convinced however, that the personnel at PSE will successfully incorporate the new tools provided into their daily work and ultimately master them.

For the field technician, deploying a MWF solution will change the way they process information. This is a highly trained and paid workforce that receives and provides information on paper, over the radio and phone. With MWF, much of the information exchange will be through their mobile device. They

can receive their optimized orders remotely, complete the orders real time and have time sheets automatically calculated. Multiple trips to the base to receive and drop off paperwork can be reduced, and as a result, they can complete more of the work they are trained for. Our challenge will be to clearly communicate the benefits of this application to this group, because it will have a huge impact on them. Most use a laptop today though, accessing map information successfully in the field. By providing ample training and support, we are confident this group will embrace the technology.

Managers and supervisors will also be impacted by this technology. This system will provide them with new tools that will assist them in managing their workforce. Starting with kpi reports, performance information will be available that will help in coaching their employees to better performance and to clearly identify exceptional performers. They will be able to determine easily where their personnel are, what orders are assigned to each and to determine if adjustments are needed in the schedule. This tool will give the supervisors and manager more flexibility in managing if used appropriately. The key will be for them to use it in a positive way to manage and coach, not to constantly track and monitor employee whereabouts. The supervisors will also need to be very proficient in the use of the mobile devices and application to assist their personnel in the field.

Dispatchers will gain a powerful new tool. With automatic scheduling functionality based on business rules, optimization logic, vehicle tracking, wireless access to the field and consolidated orders from multiple system, the dispatchers will have many new tools at their disposal. Time that was once spent printing, sorting, faxing and calling, can be spent fine tuning the schedules, managing emergencies and changes to the schedules based on real time access as to where everyone is and what they are currently working on. Time spent managing orders in multiple systems can be reduced as most work can be managed and completed within the mobile application. The dispatchers are already very knowledgeable users of CLX and other systems, this will be one more system that they will need to master.

Some of the work the operating and completion clerks are responsible for today will be reduced due to a MWF application. Currently there are 41 clerks that will be impacted. Today on average they spend up to 40% of their time entering completion information from paper work orders into various systems. Since the tech's will be completing these real time through MWF, clerk time will be freed up to perform other duties. Operating clerks will be able to perform other data management functions and in some cases PSE may see a potential reduction in the numbers of completion clerks required.

Functionality that may affect many groups will be appointment booking. Today, appointment booking is available only on gas orders through CLX and an MDSI application. As a new MWF application is deployed, appointment booking may be available to others, such as EFR and in more defined time windows. This affects not only the field organizations, but also dispatch and the Access Center. The Access Center will not only have access to new functionality but also real time order status information, which will assist them

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as they communicate with customers. As the tool is chosen and the design refined, this functionality will be looked at to determine the benefits and challenges this may pose for each work group.

Work processes for Metering Network Services personnel will change dramatically as a result of the MWF solution implementation. The automated routing capability will reduce or possibly even eliminate work queue management by technicians, real time completion in the field will streamline service order data entry while minimizing errors which may reduce the number of completion clerks required, additional and enhanced tools for Resource Coordinators will enhance their ability to manage planned compliance work on an annual basis. Collectors will have local printing capabilities for payment receipts and door hanger inserts, and possibly even Point-Of-Sale credit card processing. Service orders for meter exchanges and other work will be processed in or near real-time rather than days or weeks later, improving work and performance tracking abilities of Supervisors and Managers.

The IT department will be affected long term by this project. With 500 users, mostly mobile users, desktop support will be substantial. These devices will be critical tools for operations and must be kept working. We anticipate the need for 3 additional FTEs to maintain these devices. The system hardware and software will require maintenance, and we anticipate the need for 2 additional FTEs for the application and the multiple interfaces, plus configuration for a total of 5.

❏ **Describe the impact to other users or systems that use/feed information for this system.**
CLX, SAP, LMS and potentially the Meter Data Warehouse system will require an interface to the MWF system. It may use the Mercator/MQ Series or BizTalk technology already in place at PSE or another technology as specified by IT for the transfer of data between systems. Orders would be completed in the MWF system and then completed real time using the interfaces to the generating systems. Information will become more reliable and timely. Mobile workers will also have access to selected plant and customer data while in the field through the interfaces created.

❏ **Tangible/Quantifiable Benefits**
The benefits derived from implementing mobile computing applications have been measured by a variety of independent research groups such as the Gartner Group and have been reported by other utilities after implementation. The Gartner Group is the world's leading provider of research and analysis about the global information technology industry. PSE, along with 45,000 other clients worldwide contract with Gartner to provide data, advice and opinions. They are an unbiased source of information about a wide range of IT topics. As part of this project, we have had numerous discussions with Gartner at different phases to review our work and to gain their insights into possible vendors and results of other like projects.

The Gartner Group states that mobile computing applications improve productivity on the order of 30%. Specifically, increased productivity, a

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MWF system will provide the tool for field personnel to complete additional orders per day, will allow for additional compliance work to be completed which is not attended to today, will allow for the potential increase in revenue because of the increase in orders performed each day, will allow for response to emergencies in a more timely fashion, will allow for more analysis being performed by office staff now performing completion work, will reduce overtime, reduce printing costs. These figures are mirrored in the results of many utilities who have recently implemented their own mobile applications, notably Excelon, Centerpoint, Pacificorp and Northwest Natural.

❑ **Intangible/Non-Quantifiable Benefits**
Increased customer satisfaction due to better response to emergency situations, more opportunity for appointment booking, more accurate and timely connect and reconnect order processing and access to more timely data from the field. Improved reputation with the WUTC as additional emphasis is given to timely compliance work. Improved safety of field personnel because of vehicle tracking. Better decision making because of access to more and accurate data, and in general better data quality. Improved public safety due to our improved ability to dispatch the closest and most appropriate personnel to gas emergencies and electric outages.

In addition, as PSE continues to grow, and add new customers, to maintain our current level of service additional first response and customer field service employees would be required. This solution will mitigate the requirement to hire additional employees as current employees become more efficient with their time. Combined with our aging workforce and need to replace retiring personnel, any increase in efficiency will help PSE deal with the replacement of our workforce.

❑ **Describe alternatives. Describe the alternative solutions to the proposal**
Different alternatives include:
- Phasing the project differently to spread costs out over a longer period of time
- Continuing to use the current processes and level of automation
- Eliminate the Computer Aided Dispatch portion and implement strictly wireless access to existing applications
- Reduce scope by eliminating various business units from the scope of this project,
- Provide a handheld data terminal without the real time access to network and data sources, and dispatch functionality.

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4. Project Justification
4.1. Project Cost Elements

Describe the detailed costs of the project:

Total Capital Costs

System hardware	$ 312,000	
Mobile hardware	2,439,000	
System Software & Licenses	2,352,000	
PSE labor	1,625,000	Includes PSE user and IT personnel
Consulting labor	3,387,000	Includes CLX interface development
	10,116,000	

Project Capital Costs per year
2005 $ 260,000
2006   4,881,000
2007   4,975,000

Capital Mobile Hardware Replacements
$1,750,000 On 4 year replacement cycle
$437,500 per year

Project O&M Training Costs
2006 $100,000
2007   150,000

O&M Costs per year in full production

Software Maint 2 FTE	$100,000	Based on IT O&M/Capital split
Hardware Maint 3 FTE	300,000	
Software Licensing 18%	200,000	
Communications charges	210,000	
Infrastructure Maint 10%	30,000	
	840,000	

Cost Savings/Financial Benefit

Potential Annual Tangible Benefits

Printing Cost Reduction	$ 245,000
Overtime Reduction, 25% of non-storm OT	1,665,000
Reduction in missed appointments	25,000
Increased Gas Service Order Revenues per year	500,000
	2,435,000

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<u>Potential Annual Productivity Improvements</u>

|	FTE	Savings range	Used	Savings
Operating Clerks	30	10% - 40%	20%	$ 354,000
Completion Clerks	20	20% - 70%	40%	472,000
Dispatchers	60	0% - 15%	5%	281,000
Resource Coord	4	0% - 10%	0%	0
Field Techs	460	5% - 20%	10%	3,128,000

4,235,000

4.2. Net Result – NPV (Finance - only after an Officer approves)

We have estimated the cost savings, as seen above, with a combination of hard and soft savings. The hard savings is made up of reduced printing costs, reduced non storm overtime, and reduced penalty charges. The soft savings come from the productivity increases of the various groups that will utilize the system. The soft savings used in the NPV calculations are within a range that are to be expected with a mobile system, as experienced from other utilities and documented in recent Gartner studies. The increase in productivity is expected to result in 1) a reduced need to add FTEs as our system grows, 2) an increase in our ability to accept and complete revenue generating orders and 3) an increased ability to perform regulatory work as required.

Summary Results 10 year

Net Present Value of Cash Flows (NPV)	$11,349,454	Levelized Revenue Requirement Rate	0
Present Value of Regulated Revenues	0	Present Value of Capital Investments	$11,072,338
Present Value of Unregulated Revenues	0	Capital Recovery Factor	
Present Value of Total Revenues	0	Internal Rate of Return	31%

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Cumulative PV of Cash Flows
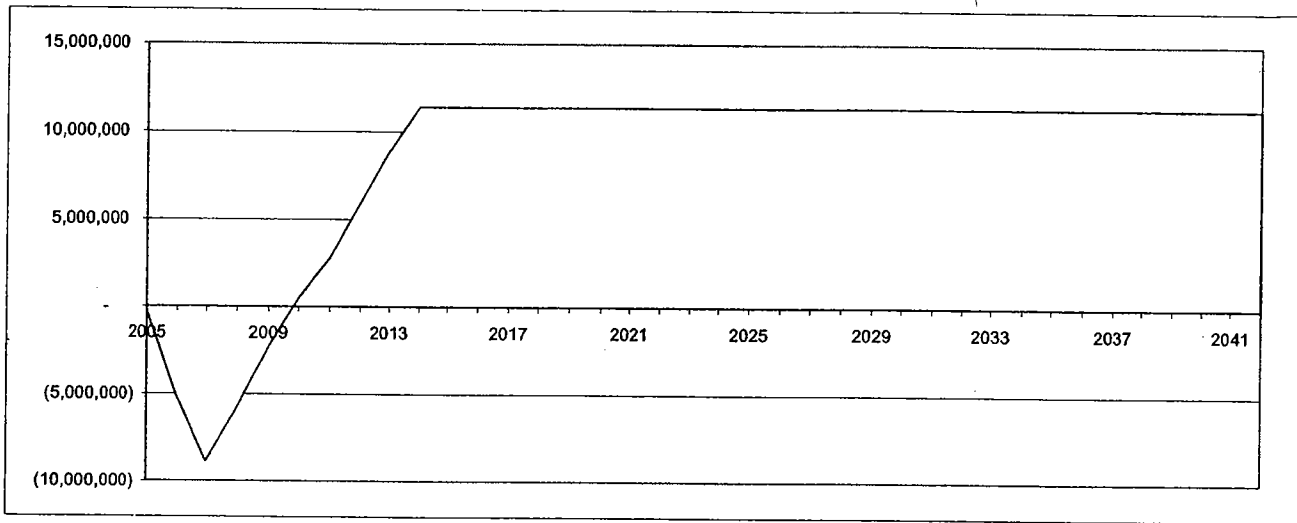
Summary Results 15 years

Net Present Value of Cash Flows (NPV)	$22,286,675	Levelized Revenue Requirement Rate	0
Present Value of Regulated Revenues	0	Present Value of Capital Investments	$12,551,623
Present Value of Unregulated Revenues	0	Capital Recovery Factor	
Present Value of Total Revenues	0	Internal Rate of Return	35%

4.3. Capitalization (Finance only after approval by Officer)

❑ Work with the Finance team to determine the Capitalization of major projects

4.4. Mission Critical Benefits

❑ Describe the critical benefits
   Increased productivity and efficiency of field personnel
   Increased productivity of dispatchers and schedulers
   Improved data integrity and timeliness
   Improved response to emergencies and outages
   Increased customer satisfaction through improved customer service
   Reduced overtime
   Reduced need to hire additional employees due to customer growth.
   Increased safety of PSE field personnel
   Improved performance management tools for supervisors
   Increased revenue from CFS parts and repair work

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5. Project Assumptions

5.1. General Project Assumptions

❑ Assume no additional BizTalk licenses are required
❑ Assume no additional Mercator/ MQ series licenses are required
❑ Assume replacement of field devices every 4 years
❑ Assume mounting devices in vehicle have no replacement schedule
❑ Assume communication charges of $100/month per field employee over public systems
❑ Assume personnel in operations, IT and ADS are available
❑ Assume DADMO remains on schedule and is completed prior to the deployment of Phase 1 of MWF
❑ Deployment of network and laptop security infrastructure to meet corporate security requirements will not be included in the scope of this project
❑ ADS will create a web services environment for interfacing to CLX, the costs will be shared with current PSE.com projects
❑ Any solution will be coordinated with planning for a future radio/communications system. Conceivably, the MWF system could utilize a combination of public and private networks, including WI-FI and satellite for specific situations. In the wake of the 2005 hurricanes, where public telephone and cell phone infrastructure was heavily damaged, satellite communication may become a serious option.
❑

5.2. Assumptions Used for NPV Analysis

General Assumptions	
Base Year	2005
Forecast Period	10 and 15 years
FIT Tax Rate	35%
Levy Rate	100%
Assessment Rate	0.68%
Revenue Taxes	4.50%
Insurance	0.050%
O&M Inflation	3.00%
Capital Inflation	3.00%
Regulated Scenario	No
AFUDC	No

Capital Structure			
		Cost	WACC
Long Term Debt	47.53%	6.88%	3.27%
Short Term Debt	3.11%	4.81%	0.15%
Capital Trust	6.32%	8.60%	0.54%
Preferred	0.04%	8.51%	0.00%
Common	43.00%	10.30%	4.43%
Total	100%		8.40%
	Structure	Cost	After-Tax
Long Term Debt	48%	6.88%	2.13%
Short Term Debt	3%	4.81%	0.10%
Capital Trust	6%	8.60%	0.35%
Preferred	0%	8.51%	0.00%
Common	43%	10.30%	4.43%
Total	100%		7.01%

6. Risks

6.1. Project Dependencies (Team)
- ❑ Electric and gas M&I applications will be converted to SAP before the completion of the MWF project, not including the gas LMS.
- ❑ ADS technical resources will be available and allocated for this project in 2005
- ❑ BizTalk technology will be used for interfaces and the current hardware/software infrastructure will be sufficient for MWF needs
- ❑ DADMO will be completed before MWF is deployed
- ❑

6.2. Resource Dependencies (Team)
- ❑ IT resources for the evaluation, selection and installation of application.
- ❑ IT resources will be required for interface design, construction and testing between MWFM and SAP, CLX, MDW and LMS. This may require BizTalk and web services expertise and knowledge of SAP, CLX and LMS.
- ❑ IT resources will also be required for any required server installations.
- ❑ IT resources will be required for any and all communication infrastructure needs and decisions involving data and voice communication.
- ❑ IT and/ or ADS resources will be required for any configuration changes required of SAP or CLX.
- ❑ IT resources will be required to assist in the selection, installation of the mobile hardware.
- ❑ IT resources for ongoing maintenance of hardware and software.
- ❑ Business experts from both the electric and gas operations dispatch will be required throughout the entire project and after implementation to help maintain and manage the system.

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❑ Business system experts will be required from the GFR, EFR, MNS, SC&P and SUBs departments during the design, construction, configuration, testing and training phases.

❑ A full time project manager will be required to manage the project.

❑ MRT and IT resources will be required during all phases to incorporate PSE's mapping system into the final product.

❑ ADS resources will be required throughout this project for extensive enhancements to CLX.

❑ Summary:

IT resources during project: - 15,000 man hours over 2 years

IT resources ongoing maintenance – 4 FTE

Business core team resources during project – 15,000 man hours over 2 years

Business PM during project – 1 FTE

❑

6.3. Hardware/Software Dependencies (Team)

❑ Application and database servers will be required, for development, testing, and production

❑ Additional storage may be required depending on availability of existing PSE storage.

❑ Local WI FI capability may be required at specific operating bases for communicating the mobile devices for system updating capability.

❑ Access to either a private radio, cellular network or a public wireless data network is required with sufficient size, speed and coverage.

❑ Ruggedized laptops or handheld devices will be sufficient for our workplace environment.

❑ BizTalk is available and sufficient for the interface architecture.

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Mobile Workforce Initiative

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                    ┌─────────────────────┐
                    │ Executive Sponsors  │
                    │    Sue McLain       │
                    │    Darren Brady     │
                    └─────────────────────┘
                              │
              ┌───────────────────┐        ┌──────────────────────┐
              │    Steering       │        │     Advisory         │
              │    Committee      │        │     Committee        │
              │   Bob Collins     │        │    Mark Maass        │
              │   Mike Hobbs      │        │    Bob Bisschoff     │
              │  Dave Deluhery    │        │   Carol Wallace      │
              │     Duane         │        │    Julia Green       │
              │   Henderson       │        │   John McClaine      │
              │  Harry Shapiro    │        │  Turushia Thomas     │
              │   Greg Zeller     │        │   John Klippert      │
              └───────────────────┘        │    Holly Lewis       │
                        │                  └──────────────────────┘
              ┌───────────────────┐
              │  Project Manager  │
              │      Vacant       │
              └───────────────────┘
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IT Lead Vacant	Functional Lead Vacant	Vendor PM	Change Management

IT Lead:
Wireless
Interfaces
Security
Hardware
Configuration

Functional Lead — Subject Matter Experts:
GFR
EFR
SUBS
SC&P
MNS
Gas Ops
ESO
MRT

Testing Lead

Training Lead

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6.4. Dependencies on Other Projects (Team)

❏ This project depends on the DADMO project coming to successful completion, the M&I applications need to be converted to SAP for simplification of system interfaces. PSE does not want to build and maintain multiple interfaces to multiple legacy systems.

❏ This project does not depend on a new radio project, but will be looking to the future in the design of the architecture and communications, to provide the flexibility to tie into any future system PSE chooses.

❏ ADS development of a web services architecture for interfacing with CLX. This has already been done for the PSE.COM web self service project

6.5. Project Risks/Concerns (Team)

❏ Multiple interfaces are required to operate in a real time mode. This causes additional complexity and the risk of some aspect failing is greater than batch processes.

❏ ADS resources are required, risk of them not being available or other CLX projects taking priority will greatly impact this project.

❏ DADMO project will impact resources across the company, both business and IT, without support from both the success of the project will be affected.

❏ Selection of standard ruggidized mobile hardware where appropriate. Without the proper equipment installed in the field, there is a risk that ongoing maintenance and breakage of devices will cause the project to fail.

❏ A standard I.T. interface technology/architecture should be in place, installed and stable before the start of this project.

❏ Ongoing monitoring, maintenance and management of selected systems will be required for success of the project long term.

❏ Ongoing I.T. personnel assigned to maintain the system will be required.

❏ Ongoing maintenance and management of the mobile devices and developing a method for performing ongoing system maintenance will be required. Current desktop and MRT support personnel are not sufficient.

❏ Communication infrastructure, whether public or PSE's internal will be required to be robust and available.

❏ Sufficient resources and time for training of PSE personnel. There must be enough time reserved for training of all personnel effected, and for on-going support. Training will be required for field personnel as well as IT help desk personnel.

❏ The selected mobile product vendor will do mobile application development work. This work will have to be well managed to avoid the risk of overrunning the project budget

❏ Automated and administrative processes and procedures will have to be developed to ensure that all data synchronizes properly. Otherwise data loss and data corruption can occur.

❏ Detailed requirements have not yet been developed and no software solution has been selected. The project costs and schedule are to some extent dependent on the completion of these items once the project is formally approved and underway.

❏ The project has a requirement to include a store and forward capability so that field personnel can work while out of wireless network coverage. This

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capability requires a robust capability to detect update conflicts. Without this capability, data can be lost and/or corrupted

6.6. Risks if Project is Not Done (Team)
- ❏ PSE will continue to operate the best they can with available tools, continuing to fine tune the existing processes, but never achieving the results and savings offered with this proposal.
- ❏ If nothing is done on an enterprise wide basis, each department will begin to develop their own unique project, without the synergies of an enterprise wide system. This will result in many different devices, operating systems and applications in the field without support.
- ❏ To be an effective asset manager, data integrity becomes more and more important at PSE. Data entry completed at the source, in as close to real time as possible, is the most accurate. Without a mobile system, where the entry is done in the field by those doing the work, our data will always be suspect, late and insufficient.

7. Project Plan

7.1. Key Milestones & Approximate Dates (Team)

Project plan follows

This will depend on the final budget and how it is spread over 2 to 3 years. Following are key milestones and the order of department implementations.

RFP development
Project Manager and team selection
Mobile vendor selection and contract negotiation
Basic system design and configuration
CLX web services and interface development
SAP interface development
Other legacy system interface development
Communication design
Public Network communication supplier selection and contract negotiation
System hardware selection and negotiation
Mobile hardware selection and negotiation
Testing of system, interfaces, hardware and communications
Training of users and IT support personnel

Order of implementation
Gas First Response
Electric first Response
Meter Network Services
Substations
SC&P

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ID	Task Name	Duration	Start	Finish	2006				2007				2008
					Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1
1	PSE Mobile Workforce M	485 days	Mon 2/27/06	Fri 1/25/08									
2	Phase 1	165 days	Mon 2/27/06	Wed 10/18/06									
3	Design	40 days	Mon 2/27/06	Fri 4/21/06									
4	Dev and Test	80 days	Mon 4/24/06	Tue 8/15/06									
5	Deployment	45 days	Wed 8/16/06	Wed 10/18/06									
6	Phase 2	125 days	Thu 9/14/06	Wed 3/14/07									
7	Design	30 days	Thu 9/14/06	Wed 10/25/06									
8	Development	60 days	Thu 10/26/06	Tue 1/23/07									
9	Deployment	35 days	Wed 1/24/07	Wed 3/14/07									
10	Phase 3	125 days	Thu 2/22/07	Fri 8/17/07									
11	Design	30 days	Thu 2/22/07	Wed 4/4/07									
12	Development	60 days	Thu 4/5/07	Thu 6/28/07									
13	Deployment	35 days	Fri 6/29/07	Fri 8/17/07									
14	Phase 4	125 days	Mon 7/30/07	Fri 1/25/08									
15	Design	30 days	Mon 7/30/07	Mon 9/10/07									
16	Development	60 days	Tue 9/11/07	Wed 12/5/07									
17	Deployment	35 days	Thu 12/6/07	Fri 1/25/08									

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7.2. Estimated Project Duration (Team)
Describe the length of the project and completion date.
We estimate this project to last 2-3 years from the time a budget is approved. It can be phased in over time, with role outs of the different business units at varying times. Some of the work depends on availability of resources at PSE and ADS, plus the completion of the DADMO project.

8. Project Measures & Milestones

Following are project benefits that will be measured by the date provided:

Measurement of Success, measured after system implementation has reached stability
1. Number of orders completed per day
2. Amount of revenue generated by GFR
3. Improved timeliness of connects/disconnects
4. Vehicle miles reduced per call
5. Reduction in printing costs
6. Reduced non storm related OT for field personnel
7. Improved response time in emergency situations

9. Sign-off

For business case approval, sign off is required from the following individuals:

Business Unit Sponsor   _____

IT Sponsor   _____

Finance sponsor (ROI)   _____

PMO/Architecture   _____

Dir. IT   _____

10. Appendices and Supporting Documentation

Supporting documentation available:

☐ Cost, savings and personnel background