

*Review of PacifiCorp's  
Storm Response Report  
Utah Holiday Storm – December 2003*



**STATE OF UTAH**  
DEPARTMENT OF COMMERCE  
DIVISION OF PUBLIC UTILITIES

*May 13, 2004*

 **PACIFICORP**

 **UTAH POWER**

**Making it happen.**

**WCI** *Williams Consulting, Inc.*

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# 1 Executive Summary

## 1.1 Introduction and Objectives

Williams Consulting, Inc. (WCI) was retained by the Utah Division of Public Utilities (DPU) to review and comment on a series of reports prepared by PacifiCorp, doing business as Utah Power (the Company), in response to widespread outages caused by a major snowstorm that began on December 26, 2003. The series of reports was compiled into one document titled, "Utah Holiday Storm Inquiry – December 2003" (the report). WCI has performed an independent assessment of the report with the following objectives:

- Perform a comprehensive analysis of the report with focus on conclusions and recommendations.
- Comment on the completeness of the terms of reference (TOR) addressed in each section of the report.
- Prepare professional opinions regarding the conclusions and recommendations contained in the report.
- Offer additional conclusions and recommendations with supporting rationale, analysis, and/or industry comparisons as appropriate.

## 1.2 Overview of the Company's Report

The Company formed a well-conceived organization structure to investigate the many areas of inquiry addressed in the report. The organization structure provided for three distinct functions: a) executive management, b) overall project management, and c) issue leadership and teams. These teams consisted of subject matter experts for each major topic of the report. In general, we found that the Company invested significant time and effort in producing a report of professional quality. However, the report could have been enhanced by the inclusion of additional industry benchmarks and comparative performance data. This is particularly needed in the areas of staffing levels, reliability performance metrics, and unit maintenance expenditures. WCI has provided such comparative data for the electric utility industry and considered same in formulating our independent judgments.

## 1.3 Conformance with the TOR

In general, but with some exceptions, the report chapters were thorough in terms of conformance with the agreed-upon TOR for all major topics and underlying issues. Each section of our assessment begins with an analysis of compliance with the applicable TOR, and indicates our opinion as to what, if any, deficiencies exist. Additionally, we offer a judgment as to whether the deficiency is minor or significant in terms of its impact on the quality and completeness of the report.

## 1.4 Comments on the Company's Conclusions and Recommendations

WCI agrees with many of PacifiCorp's conclusions and supports the implementation of all of their recommendations. In addition, as shown below, we have formulated independent conclusions and additional recommendations in key areas of concern. Although the PacifiCorp's recommendations are generally supported by an explanatory comment and time frame for decisive action, the recommendations must be converted to an implementation plan including:

- A statement of the recommendation with appropriate explanatory comment(s).
- A concise statement of the implementation objectives, i.e., what the Company wants to accomplish by implementing the recommendation.

- A summary of what will be done to implement the recommendation, i.e., the action steps required.
- An estimate of the benefits and costs of implementing the recommendation.
- A detailed listing of milestones, completion dates, and performance measurements for implementing the recommendation.
- The name and position of the Company official responsible for implementing the recommendation.

In our opinion, the implementation plan should be monitored quarterly by a task force consisting of appropriate representatives from stakeholders to this inquiry process. Absent this level of detail, it will be difficult to monitor and manage implementation of the recommendations in an effective and efficient manner.

### **1.5 Additional Recommendations**

Based on our review of the report, our independent analysis of the findings and conclusions contained in the report, our industry comparisons with Company performance data, and our professional judgment, we offer the following recommendations in addition to those contained in the PacifiCorp report:

#### **1. The Storm**

No additional recommendations

#### **2. Utah Power's Response**

- a. Conduct periodic "table-top" exercises for emergency response evaluation and include City and State emergency organizations in the simulation.
- b. Consider participating in EEI's "Restore Power" service, which provides real-time ability to request assistance. This service includes both utilities and contractors.

#### **3. Technology Issues**

While the following items are discussed in PacifiCorp's report, they were not identified as specific recommendations and therefore have been included here.

- a. Review telephone system bottlenecks that may exist in either outgoing or incoming trunk capacity.
- b. Consider enhancing the IVR system to better facilitate the ability to modify messaging on the fly in order to provide current outage and restoration status information to the callers.

#### **4. Vegetation Management**

- a. Accelerate the vegetation management program to reach compliance with a 3-year tree trimming cycle as soon as possible.
- b. As an initial step, PacifiCorp should be required to provide periodic status reports to the DPU as to its progress in meeting the 3-year tree trimming cycle goal. If the regulatory agency is not satisfied with the progress or results, mandated vegetation management standards should be imposed by the regulator.

#### **5. Investment Standards**

No additional recommendations

## 6. Reliability and Maintenance

- a. Conduct a maintenance plan audit to determine whether the Company is performing all inspections, testing, preventive and corrective maintenance in conformance with its maintenance plan requirements.
- b. Modify and expand the maintenance priority codes and schedules to specify the types of conditions requiring immediate corrective action, within one month, six months, and one year.
- c. Institute a rigorous program to prioritize, schedule and track corrective maintenance for both "A" and "B" (and expanded codes as above) maintenance items.
- d. Perform a physical inspection of a sample of the distribution system including conductors and ancillary equipment, poles and all attachments, cross-arms, protective devices, lightening protection, transformers, switches, regulators, substations, and right-of-way conditions.
- e. Review and update the Distribution Business Resource Plan last prepared in 2002.
- f. Provide suitable increases in baseline maintenance budgets and resources in order to keep up with corrective maintenance work orders such that system reliability improves. This item would involve two distinct and significant activities:
  - i. Evaluate baseline maintenance budgets to properly support corrective maintenance and system reliability targets
  - ii. Assess resource requirements based on the work plan to provide adequate resources (contracted and internal) to support the plan
- g. Mount a "catch-up" maintenance program in order to substantially reduce the outstanding corrective maintenance items within a short time period and with a view to improving system reliability, particularly SAIFI. Further, the Company should jointly with the DPU, determine a reasonable and measurable target for SAIFI performance improvement and/or reduction of equipment failure outage frequency as an expected outcome of increased maintenance spending
- h. Perform an annual review and comparison of PacifiCorp's Utah reliability metrics against itself, PacifiCorp other than Utah, and an industry benchmark panel

## 7. Organization and Resourcing

- a. Perform an activity analysis of the Company's comprehensive maintenance plan to determine the number of annual man-hours by job classification required to execute all plan requirements. Convert man-hour requirements to full-time employee equivalents considering factors such as vacations and holidays, sick time, and labor productivity rates. This analysis will suggest a minimum staffing level (including an appropriate level of contract resources) required to fully implement annual inspection, testing, preventive and corrective maintenance activities included in the maintenance plan.
- b. Consider engaging an outside company to perform an independent assessment of staffing needs in Utah in order to assure objectivity and minimize the potential impact of PacifiCorp budgetary constraints.

## 8. Comparative Performance and Benchmarking

- a. Given the physical, geographical, staffing, budgeting and performance differences among the Company's various state operations, PacifiCorp should expand its recently initiated participation in the PA utility T&D benchmarking

program to include separate reports for each of PacifiCorp's state operations, at least for Utah.

- b. Participate in both I.E.E.E. and EEI reliability surveys to provide additional insight as to relative performance.

#### **9. Major Event Definition and Compensation**

No additional recommendations

## **2 Background**

On December 26, 2003, Salt Lake City and surrounding areas were hit by a major snowstorm causing widespread power outages. Approximately 190,000 customers were affected. Although 85% of the affected customers were restored within 36 hours, many lost power for up to 5 days. The Utah Department of Public Utilities and Public Service Commission are conducting an investigation into this event.

PacifiCorp is cooperating with the Commission and has prepared and issued its own reports covering nine major areas of inquiry:

1. The storm,
2. Utah Power's response,
3. Technology issues,
4. Vegetation management,
5. Investment standards,
6. Reliability and maintenance,
7. Organization and resources,
8. Comparative performance and benchmarking, and
9. Major event definition and compensation.

## **3 Approach and Methodology**

### **3.1 Work plan**

The context of this report is a comprehensive review of PacifiCorp's "Utah Holiday Storm Inquiry – 2003" report. Our approach to this assignment was to review all available written materials, both provided by PacifiCorp and developed through our research, and to conduct interviews with relevant PacifiCorp team leads for each Chapter. The result of this work effort is contained in this report and provides comments and recommendations relative to:

1. PacifiCorp's conformance and adequacy of addressing the specific items contained in the Terms of Reference (TOR) as agreed to between the DPU and PacifiCorp.
2. Evaluation of PacifiCorp's overall response and comparisons with industry practices
3. Comparison of PacifiCorp's performance and comparisons with industry averages
4. Review of PacifiCorp's conclusions and findings and comments as to adequacy
5. Review of PacifiCorp's recommendations and provision of additional recommendations where appropriate

The original scope of work as proposed included an individual and sequential review of six chapters in PacifiCorp's report, namely:

1. Reliability and Maintenance
2. Investment Standards
3. Reliability and Service Quality Standards
4. Technology Issues
5. Organization and Resourcing, and
6. Storm Response

This scope was modified at the time of contracting to include a review of PacifiCorp's entire report, including nine chapters (noted above) dealing with the subjects contained in the Terms of Reference.

### 3.2 Interviews

WCI conducted a total of 11 interviews with PacifiCorp project staff as summarized in the following table:

**Table 3.2-1 Interviews Conducted**

Name	Date	Topic(s)
Managing Director, Transmission Systems (Inquiry Chair)	4/6/04	General overview
Power Delivery Audit Manager (Lead -Major Event Definition)	4/6/04	Major Event Definition
Distribution (Vegetation) Manager (Lead -Vegetation Management)	4/6/04	Vegetation
Managing Director, Employee Relations and Development (Lead - Organization and Resourcing)	4/6/04	Organization & Resourcing
Vice President, T&D Operations (Lead - Technology Issues)	4/6/04	Technology
Director, Metering Assets and Technology (Lead - Investment Standards)	4/6/04	Investment Standards
Managing Director, Organizational Change (Lead – Comparative Performance and Benchmarking) Also participating - Managing Director, Risk and Compliance and Director, Distribution Dispatch	4/8/04	Benchmarking
Manager Engineering (Lead – Reliability and Maintenance)	4/8/04	Reliability and Maintenance
Manager EAC (Lead – Utah Power's Response)	4/8/04	Storm Response
Vice President, T&D Engineering and Asset Management Also participating - Director, Network Performance Asset Management	5/3/04	Maintenance
Director, Customer Service - Performance Reporting	5/6/04	Call Center



### 3.3 Meetings and Teleconferences

Throughout the conduct of this assignment, a number of meetings/teleconferences were held to review completed sections and overall revisions of PacifiCorp's report, and a review of WCI's draft report, as summarized in the following table:

Table 3.2-2 Meetings and Teleconferences

Date	Topics
3/1/04	Project kick-off (teleconference)
3/16/04	PacifiCorp progress update (teleconference)
4/7/04	Delivery of partial report by PacifiCorp meeting at PSC/DPU
4/12/04	PSC/DPU/WCI initial review of PacifiCorp report (teleconference)
4/13/04	Reviewed Storm, Technology and Vegetation Chapters of PacifiCorp's report (teleconference)
4/15/04	Review updated PacifiCorp report sections (teleconference)
4/20/04	Review updated version of PacifiCorp report and recommendations (teleconference)
5/3/04	Reviewed changes/additions to PacifiCorp report, including Background and Executive Summary. (teleconference)
5/11/04	Final draft report review, both PacifiCorp and WCI (teleconference)
5/18/04	Technical Conference at PSC/DPU

### 3.4 Research and other document reviews

1. News articles from the Deseret Morning News, covering the public perception of the outage and PacifiCorp's response.
2. Information from PacifiCorp's web site covering: Description of PacifiCorp/Utah Power, Outage Goodwill Article, Power Restoration Sequence and Priority, Customer Service Commitments and Guarantees, Past Year Performance.
3. Articles from the Salt Lake Tribune
4. Utah Power Holiday Storm 2003 report
5. Inquiry Organization
6. Storm Photos and Information from PacifiCorp
7. PacifiCorp VM Program Review Ryan Brockbank November 25, 2003
8. PacifiCorp UTILITY VEGETATION MANAGEMENT, Stephen Cieslewicz, Robert Novembri, CN Utility Consulting, LLC, 11/23/03
9. Report to DPU on Planning and Engineering of Electric Distribution Facilities on PacifiCorp, Mar 30, 2002.
10. Utah Holiday Storm 2003 Status Report February 5, 2004
11. Calls to other regulators regarding status on standards or regulations governing vegetation management
12. Review of EEI 2002 Reliability Report, November 2003
13. Review EEI Utility Storm Restoration Response report
14. Web research on National Weather Service relative to the December 26 storm and other major storms.
15. Public utilities Fortnightly SPARK article on paying for reliability
16. KEMA Reliability Standards and Customer Satisfaction presentation to I.E.E.E September 2003
17. Reliability Regulation and its Implications, Cheryl Warren, presented to I.E.E.E. September 2003
18. Managing Change in Reliability Indices after OMS Implementation, Cheryl Warren, presented to I.E.E.E., September, 2003
19. Documents and presentations from C. Williams (FPL) and D. Schepers (AMEREN) on the I.E.E.E 1366-2003 Beta 2.5 Method for Major Event Definition
20. Research on the FERC website for electric utility maintenance expenditures and customer data
21. Review of the November 2002 PacifiCorp Distribution Business Resource Review
22. Other documents

## 4 Detailed Review of PacifiCorp's "UTAH HOLIDAY STORM INQUIRY – 2003" Report

In each chapter we address the following elements:

- Terms of Reference (TOR) - We review and comment on PacifiCorp's completeness and extent of compliance with the agreed upon TOR items for each chapter of the report.
- Conclusions and Related Findings – We assess and comment on PacifiCorp's conclusions and their related findings and analysis presented in the report. As part of our independent analysis, we provide additional industry comparisons and benchmarks.
- Recommendations - We review and comment on PacifiCorp's recommendations and suggest additional recommendations as we deem necessary.

### 4.1 The Storm

This chapter of the PacifiCorp report is intended to address two major issues:

1. Was the storm, in fact, unusual?
2. Did it cause more damage/customer interruptions than other storms?

#### 4.1.1 Terms of Reference Compliance

The following table illustrates our opinion of PacifiCorp's compliance with the agreed Terms of Reference.

Terms of Reference - Chapter	Addressed?			Reference
	Yes	No	Adequacy	
<b>I. The Storm</b>				
<i>Was the storm, in fact, unusual?</i>				
• Describe, in detail, the characteristics of the storm:	X		Y	Section 5.2
duration (hours, days)	X		Y	
coverage (square miles)	X		Y	
intensity (temperatures, snow depths, moisture content of the snow, etc.)	X		Y	
• Compare, using third-party meteorological data where possible, this storm with others				Section 5.2.1
<i>Did it cause more damage/customer interruptions than other storms?</i>	X		Y	
• Describe the nature and extent of the damage	X		Y	Section 5.3
• Quantify where possible:	X		Y	Section 5.3
number of customers impacted (total interruptions, peak interruptions, etc)	X		Y	Section 5.3
number of tree-related incidents	X		Y	Section 5.3
number of poles/wire down, etc	X		Y	Section 5.3
number of circuit lockouts	X		Y	Section 5.3
• Compare, using actual records where possible, with other storms (number of customers interrupted, extent of damage, etc.)	X		Y	Section 5.3.1

In our opinion, the Company has adequately addressed these issues and their underlying sub-issues contained in the Terms of Reference

#### 4.1.2 Conclusions and Related Findings

The storm chapter ends with the following Company conclusions and related findings.

1. The mega snowstorm that began December 26, 2003, resulted in widespread power system damage affecting thousands of customers.
2. The damage was the result of an unusually strong winter snowstorm with unprecedented moisture content.
3. The length and breadth of the storm significantly contributed to the type of damage the system experienced, from failed distribution lines to failed service lines in thousands of locations.

4. Compared to other storms, this storm required substantially more conductor, fuses, splices, and insulators than any in recent PacifiCorp history.
5. This mega-snowstorm ranks first in severity for moisture content or precipitation per inch of snow during the last 75 years as noted from weather records.

WCI concurs that this was a very significant storm. Based on our conversations with the National Weather Service (NWS) in Salt Lake City and data obtained from NOAA/NCDC, we offer the following additional findings and conclusions:

1. The storm was one of the five worst storms since 1928. A ranking follows (largest storms listed first in terms of snowfall):
  - i. December 12, 1993, Heavy snow, high water content
  - ii. March 22, 1944, Heavy snow and high winds
  - iii. Nov 5, 1998, Winter Storm, heavy, wet snow
  - iv. 1996 (data not available)
  - v. December 26, 2003, as reported by PacifiCorp.
2. The NWS representative we spoke to classified this as a one-in-ten year storm, based on snowfall accumulation.
3. There was a fair amount of rain on December 25<sup>th</sup> prior to the snowfall. There were several inches of snow on the ground and another 8-10 inches accumulated by 5:00AM 12/26/2003. The Salt Lake City temperatures did not drop below freezing until well after midnight, so there was probably little ice buildup prior to the snow accumulation.

While the December 26, 2003 storm was not the largest in recent history, it contained a confluence of factors, including drought-weakened trees coupled with the high water content in the snowfall, as explained by PacifiCorp, causing many trees and tree limbs to break and affect power lines that, in turn, caused widespread power outages.

### **4.1.3 Recommendations**

#### ***PacifiCorp Recommendation:***

1. Review requirements to collect outage data during major events (REAC activated) at facility points.

WCI concurs with this recommendation. We note that the Company recorded 7,907 outage incidents of which 1,641 (21%) were classified as tree related (i.e., requiring a tree trimming crew before power could be restored). However, the Company concludes that about 90% of the outage incidents were caused by tree contacts with power lines. This estimate is primarily based on the fact that about 34 miles of wire were pulled down while only 33 poles and 257 crossarms were replaced. While we cannot verify the Company's outage incident conclusion, it appears to be reasonable.

## 4.2 Utah Power's Response

This chapter of the PacifiCorp report is intended to address four major issues:

1. Describe the company's response to the storm.
2. Why did it take up to five days to restore some customers?
3. How did the company deal with emergency/dangerous situations, customers with special needs, etc.?
4. What planning/contingencies does the company undertake for situations like this?

### 4.2.1 Terms of Reference Compliance

The following table illustrates our opinion of PacifiCorp's compliance with the agreed Terms of Reference.

Terms of Reference - Chapter	Addressed?			Reference
	Yes	No	Adequacy	
<b>2. PacifiCorp's Response</b>				
<i>Describe the company's response to the storm</i>				
Document the company's actions at each stage of the event (including preparedness in advance of the storm, timing of resource availability) (including out-of-area and third-party resources), decision to switch off CADOPS/IVR, implementation of back-up systems, materials, vehicles, etc.)	X		Y	Section 6.7 Section 6.8 Section 6.4 Section 6.5.1 Section 6.5.2
<i>Why did it take up to five days to restore some customers?</i>				
• Provide a chronology of the restoration effort (as far as is possible given data problems)	X		Y	Section 6.3
• Describe, again, the nature and extent of the damage	X		Y	Section 5.3
• Describe the way in which the restoration effort was organized/prioritized (including why some customers were restored before others)	X		Y	Section 6.10
• Estimate, to the fullest extent possible, the impact of the technology failure on restoration efficiency and duration (including communication systems used by line crews and dispatchers, etc.)	X		Y	Section 6.5
<i>How did the company deal with emergency/dangerous situations, customers with special needs, etc.?</i>				
• Describe the procedure for dealing with high priority cases (example includes comment on live line on ground for seven days in Ogden)	X		Y	Section 6.10, and Section 6.11
• Share the output of a separate but related exercise with Salt Lake City and County to review communications protocols and procedures during extended outages	X		N	Section 6.10, Section 6.5, and Section 6.6
<i>What planning/contingencies does the company undertake for situations like this?</i>				
• Provide details of emergency response/business continuity plans (i.e. PDEAC, EAC, CSEAC activation, etc.)	X		N	Section 6.9
• Describe changes to emergency response plans as a result of experiences learned from this event	X		Y	Section 6.7, and Section 6.12
• Provide details of mutual assistance agreements and consider other sources of help	X		N	Section 6.9.4

In our opinion, the Company has adequately addressed these issues and their underlying sub-issues contained in the Terms of Reference with the following exceptions (WCI's comments, *in Italics*, follow each):

1. Share the output of a separate but related exercise with Salt Lake City and County to review communications protocols and procedures during extended outages.

*We did not find reference to any "separate but related exercise" mentioned in the report, but the report covered restoration, prioritization and Salt Lake city/County emergency organizations. It is common practice to hold periodic "event" simulations or "table top exercises" in which city and state emergency organizations are included to assure that adequate communications are established and maintained.*

2. Provide details of emergency response business continuity plans (i.e. PDEAC, EAC, CSEAC activation, etc.)

*The report contains a description of these emergency centers, but does not address continuity plans or activation escalation triggers.*

3. Provide details of mutual assistance agreements and consider other sources of help.

*The report provides a recommendation to enhance mutual aid arrangements, but provides no specifics.*

## 4.2.2 Conclusions and Related Findings

The report offers the following major conclusions related to the storm response:

1. The processes and procedures were followed and provided a good framework for managing the overall response effort. The weather forecast did not suggest a major weather event was approaching.
2. Problems with the CADOPS system did limit the information available to those coordinating the restoration effort.

The failure of the CADOPS system and the resulting limitation of information available to those coordinating the restoration effort certainly affected the ability of PacifiCorp to optimize the restoration process. In addition, nearly 48 hours elapsed from the time that CADOPS failed to the implementation of a grid restoration process. This leads us to conclude that the Company was “flying blind” in the overall restoration process during that time period. We do understand, however, that the SCADA system provided indication of major equipment operation and therefore could identify major feeder outages. This permitted the Company to respond to those situations and therefore effect restoration of potentially large numbers of customers. Nonetheless, without the ability to infer outages using CADOPS, we conclude that the overall duration of the outage may have been shorter had CADOPS been in operation, and we concur with the Company’s statement that some customers may have been out of power for a longer period than otherwise.

## 4.2.3 Recommendations

### *PacifiCorp Recommendations*

The storm response chapter concludes with the following Company recommendations.

1. Develop an Outage Management System business continuity plan in the event of the loss of a primary IT system.
2. Assure that lessons learned from this storm are communicated broadly and openly to the company’s stakeholders.
3. Update external communication plans to include regular updates on restoration activities, priorities, areas impacted, and tips for customers during a large-scale outage of this nature when traditional media is not sufficient.
4. Establish a training program covering expected customer interface behavior for borrowed employees and contractors (non-typical job role) who have been called to temporarily assist with restoration efforts.
5. Add appropriate IT staff and labor representatives into the organization structure when major events require REAC to be activated.
6. Update the Emergency Management Plan to include criteria outlining when to implement a “grid” or management by “feeder” restoration process.

7. Review staffing assumptions and availability when a major storm or event is anticipated.
8. Coordinate with state and local officials to develop emergency response plans to clear roads of snow and debris to allow access to areas with fallen wires.
9. Develop and implement a major event governance policy specifying authorization levels and procurement policies.
10. Enhance mutual aid agreements with neighboring utilities.
11. Review storm tracking and monitoring capabilities to anticipate mega-events.

***WCI Recommendations***

We concur with the Company's recommendations, and offer the following additional recommendations:

1. Conduct periodic "table-top" exercises for emergency response evaluation and include City and State emergency organizations in the simulations.
2. Consider participating in EEI's "Restore Power" service, which provides real-time ability to request assistance. This service includes both utilities and contractors.

### 4.3 Technology Issues

This chapter of the PacifiCorp report is intended to address four major issues:

1. Why exactly did the outage management system (CADOPS) fail?
2. How did the failure impact restoration and call center performance?
3. What are you doing to prevent similar failures in the future?
4. What are you doing to improve back-up systems?

#### 4.3.1 Terms of Reference Compliance

The following table illustrates our opinion of PacifiCorp's compliance with the agreed Terms of Reference.

Terms of Reference - Chapter	Addressed?			Reference
	Yes	No	Adequacy	
<b>3. Technology Issues</b>				
<i>Why exactly did the outage management system (CADOPS) fail?</i>				
• Describe the sequence of events leading up to the failure of CADOPS	X		Y	Section 7.2 (really 7.4)
• Establish the root cause of the technology failure	X		Y	Section 7.6
<i>How did the failure impact restoration and call center performance?</i>				
• Describe the normal operating function of the CADOPS system in managing outages (including fault location identification, the rolling up of outages, dispatching of troublemen/crews, etc.)	X		Y	Section 7.3 (in 7.2)
• Describe how this was impacted by the technology failure	X		Y	
• Describe the linkage between the CADOPS and IVR systems	X		Y	Section 7.4 (in 7.3)
• Describe normal call center operation (including the role of messaging, IVR, automated trouble orders, call center agents, etc.)	X		Y	Section 7.3, and Section 7.5 Section 7.7
• Describe how this was impacted by the technology failure	X		Y	Section 7.8
• Describe what improvement can be made to improve feed back to customers during outages	X		Y	Section 7.9
• Describe the impact of other technology problems (including 21st Century outboard calling)	X		Y	Section 7.4, Section 7.7 Section 7.8, and Section 7.9
<i>What are you doing to prevent similar failures in the future?</i>				
• Evaluate what actions may have been taken to prevent or mitigate the impact of the failure	X		Y	Section 7.10
• Describe technology improvements already in the pipeline (e.g., CADOPS infrastructure Upgrade)	X		Y	Section 7.11
• Evaluate the potential to avoid "collateral damage" to the IVR system as a result of CADOPS failure	X		Y	Section 7.12
• Describe stress tests that have been used and will be used to assure CADOPS will withstand future demands during major events	X		Y	Section 7.13
• What is our reliance on telecoms systems for system monitoring	X		Y	Section 7.14
• Examine best practice use of the CADOPS system and benchmark performance	X		N	Section 7.15
U.K. outage management				
<i>What are you doing to improve back-up systems?</i>				
• Review and evaluate the business continuity plan for the loss of the outage management system	X		Y	Section 7.16
• Review and evaluate the disaster recovery plan for failures of the CADOPS and IVR systems	X		Y	Section 7.17
• What warranties are included with the outage management system	X		Y	Section 7.18

In our opinion, the Company has adequately addressed the issues and their underlying sub-issues contained in the Terms of Reference with the following exception:

1. Examine best practice use of the CADOPS system and benchmark performance U.K. outage management.

*Although the report makes references to adopting best practices identified in Scottish Power's UK operation, we found no benchmarking information relative to UK outage management. However, we do not believe that the omission of UK benchmarking information significantly detracts from the report or its findings and recommendations.*

### 4.3.2 Conclusions and Related Findings

The report offers the following major conclusions related to technology issues:

1. The root cause of the technology failure and breakdown in the overall information management processes centers around four main factors: OMS ownership, back-up contingency plans, technical environment, and data quality and archiving.
2. System-wide breakdown grew over time as individual projects and functional enhancements were made to OMS without a holistic review of their interdependencies, relationships and impacts on the core CADOPS application.
3. They had no clear executive ownership for the entire integrated portfolio of information technologies associated with OMS.
4. The subsequent addition of IVRs, additional functionality for Dispatch, and the implementation of netCADOPS , while valuable projects in their own right, contributed to making the overall system more susceptible to failures.
5. Failure in one system had negative impacts on other systems that delayed employees in recognizing and acting on multiple process failures. The absence of a comprehensive back-up plan to deal with multiple and cascading technology failures resulted in several unproductive steps while looking for alternatives to manage the outage.
6. A detailed, thorough OMS review, however, should be undertaken even with these projects to assess the potential points of failure, determine appropriate redundancy and back-up systems, address data quality and archiving, and provide an overarching strategy and framework for current and future information technologies associated with OMS utilization and operation.

We concur with the preceding conclusions and related findings, but we believe that the Company may have spent too much time trying to “fix” CADOPS during the height of the storm.

### 4.3.3 Recommendations

#### *PacifiCorp's Recommendations*

The report offers the following recommendations related to technology issues:

1. Assign responsibility of the Outage Management System to a single individual, along with oversight of technologies that support the process.
2. Complete the augmentation of the Outage Management System that was at the center of the technology failure (CADOPS Infrastructure Update and Incremental Update projects).
3. Launch a data quality initiative, for customer connectivity, that combines process, data improvement, and quality control measurement. Customer-to-transformer and network accuracy must be satisfied in order to support Interactive Voice Response, outage inferencing and outage reporting.
4. Initiate a comprehensive analysis of the Outage Management System to identify hardware/software risks, optimum redundancy, back-up strategies, and future utilization.
5. Develop a blueprint that incorporates all business outage management processes and interdependencies so that impacts of various components are known and understood by everyone.
6. Assure that information technology systems and customer service resources are adequate to handle events of this magnitude in the future.



7. Review and update the internal outage IVR messages so customers can generate a trouble ticket when the IVR is unable to communicate with CADOPS.
8. Initiate a project to archive stale customer call data off the production of CADOPS.

***WCI Recommendations***

We concur with the Company's recommendations. While the following items are discussed in PacifiCorp's report, they were not identified as specific recommendations and therefore have been included here.

1. Review telephone system bottlenecks that may exist in either outgoing or incoming trunk capacity.
2. Consider enhancing the IVR system to better facilitate the ability to modify messaging on the fly in order to provide current outage and restoration status information to the callers.

## 4.4 Vegetation Management

This chapter of the PacifiCorp report is intended to address five major issues:

1. Is the Company's tree trimming program adequate for Utah?
2. Is the work completed efficiently and effectively?
3. Are current clearances an issue?
4. Is enforcement of clearances/rights-of-way/easements an issue?
5. Respond to allegations that the Company has failed to take action on requests to trim trees.

### 4.4.1 Terms of Reference Compliance

The following table illustrates our opinion of PacifiCorp's compliance with the agreed Terms of Reference.

Terms of Reference - Chapter	Addressed?			Reference
	Yes	No	Adequacy	
<b>4. Vegetation Management</b>				
<i>Is the company's tree trimming program adequate for Utah?</i>				
• Provide at least 10 years of budget history plus current 10-year plan numbers (total company with state specific, compare UPL, PacifiCorp, post SP funding levels if possible)	X		Y	Section 8.9 and Section 8.10
• Describe what we believe to be the optimal tree trimming program/cycle and where we are relative to it	X		Y	Section 8.15.1
<i>Is the work completed efficiently and effectively?</i>				
• Provide details and trends of Trees Inc 's performance (cost per tree, customer satisfaction, etc ) and benchmarking data if available	X		Y	Section 8.11
• Provide details of customer communications material	X		Y	Section 8.3
• Describe who is responsible for trimming trees near service drops	X		Y	Section 8.5.3
• Review October 2000 presentation made to commission on tree trimming program, are we there yet	X		Y	Section 8.12
<i>Are current clearances an issue?</i>				
• Describe current clearance policy (Transmission, Distribution, and Services)	X		Y	Section 8.5
• Discuss pros and cons of increasing clearances	X		Y	Section 8.15.2
• Describe if storm levels are considered with clearance policy	X		Y	Section 8.5
<i>Is enforcement of clearances/rights of way/easements an issue?</i>				
• Describe our rights with respect to rights of way/easements	X		Y	Section 8.13
• Describe legal and other impediments to enforcing rights (including details of access denials, were any outages related at sites where customers previously denied access)	X		Y	Section 8.7, Section 8.7.1 and Section 8.7.2
• Describe rights/obligations of the customer	X		Y	Section 8.12
• Describe our inspection policy (how often is necessary)	X		Y	Section 8.15.1
• Describe Oregon tree trimming program (include all states)	X		Y	Section 8.6
<i>Respond to allegations that you have failed to act on requests to trim trees</i>				
• Describe the process for dealing with customer requests	X		Y	Section 8.4.2
• Quantify, if possible, the number of requests received and the response made, if any	X		Y	Section 8.4.2

In our opinion, the Company has adequately addressed these issues and their underlying sub-issues contained in the Terms of Reference.

### 4.4.2 Conclusions and Related Findings

The report offers the following major conclusions related to vegetation:

1. According to ECI's storm-related tree damage assessment, 80% of the vegetation-related outages were non-preventable, while 80% of the vegetation-related preventable outages were on primary lines.
2. The ECI study further concluded that the most important contributing factor to the preventable outages was PacifiCorp's inability to be at its three-year tree trimming cycle.
3. The historically low vegetation management expenditures were primarily due to a misunderstanding of the magnitude of the work effort. The Company has encountered twice as many trees as were reported in a tree density study conducted by a consultant in 1998.

4. PacifiCorp's 10-year plan includes additional funding in the first four years to accommodate the higher than expected tree density to meet the recommended three-year cycle.
5. ECI's study indicated a need for increased diligence on vegetation management on back-lot lines, and also recommended increased clearances on three-phase and secondary lines.
6. Although PacifiCorp believes the extent of tree-caused damage was due more to the magnitude of the storm than inadequacies in the vegetation management program, the Company believes it can improve in terms of protecting the system by obtaining and maintaining a three-year cycle, modifying specifications, and focusing on back-lot lines.

It is not entirely clear to WCI whether the Company's conclusion that "the extent of tree-caused damage was due more to the magnitude of the storm than inadequacies in the vegetation management program" is fully supportable. First, as noted above, the Company admits to historically low vegetation management expenditures during the recent past. Second, in the four-year period between January 1, 2000, and December 31, 2003, PacifiCorp Vegetation Management completed on cycle roughly 7,100 of 11,100 Utah overhead distribution line miles. This accounts for 64% of the overhead distribution line miles in the state, or a 6.4-year cycle rate compared with the recommended 3-year tree trimming cycle. And finally, the Utah Power annual survey of tree conditions, last conducted by its utility arborists in November and December 2003, found between 22% and 39% of Utah trees that could potentially affect PacifiCorp facilities were currently in contact with the conductors. We conclude that three factors contributed to the numerous tree-related outages during the storm: (1) the vegetation management program was significantly below its target of a three-year tree trimming cycle, (2) many trees were most likely in a weakened and brittle condition due to persistent drought conditions, and (3) the accumulation of wet, heavy snow.

#### **4.4.3 Recommendations**

##### *PacifiCorp Recommendations*

The vegetation management chapter concludes with the following eight Company recommendations:

1. Develop an education plan to inform customers about the need for utility line clearance, healthy tree trimming practices, and planting the right tree in the right place.
2. Develop a preferred "tree pruning" contractor list for use by customers when trimming is the responsibility of the customer.
3. Determine whether vegetation management clearance zone specifications for insulated and non-insulated secondary and service wires should be modified.
4. Increase overhang clearances on primary three-phase lines, completely removing overhang up to the first protective device, and increasing clearance to 15 feet on three-phase lines thereafter.
5. Investigate the costs and benefits on increasing tree trimming on the Wasatch Front to a two-year cycle with additional attention to back-lot lines.
6. Acquire appropriate funding to obtain and maintain a three-year vegetation management cycle in Utah.
7. Modify the Company's transmission and distribution vegetation management specifications to focus on tree species in the cycle recommendation. The independent consultant is recommending a change to our current policy involving fast-growing trees (e.g., Siberian elm) that caused the most damage.

8. To ensure better reliability, work with local and state representatives to maintain distribution line rights-of-way, including safe clearances of energized lines from vegetation, under-builds, and other obstructions.

### ***WCI Recommendations***

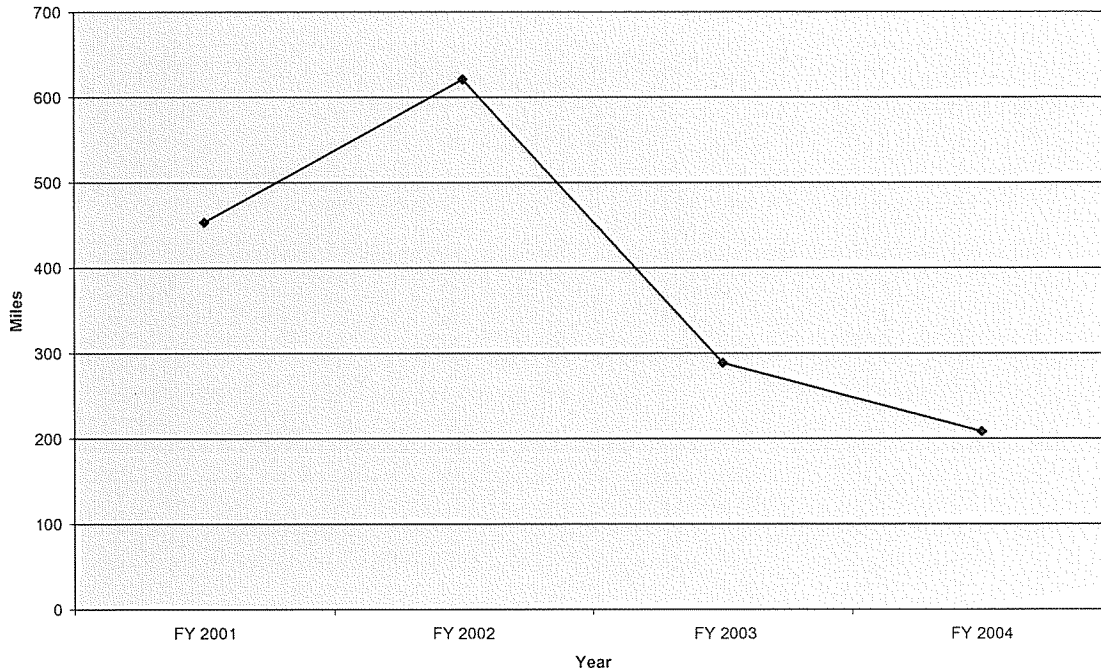
WCI supports and concurs with these recommendations. As part of our investigation, the Company's System Forester took us on a field inspection of various neighborhoods and back-lots. During this trip, we gained an understanding of the types of fast-growing, brittle species of vegetation as well as the back-lot challenges found in parts of the Company's service territory. Additionally, we are familiar with ECI's reputation and are inclined to accept their professional recommendations. However, we are unable to reconcile ECI's conclusion that 80% of the vegetation related outages were non-preventable with PacifiCorp's arborists' conclusion that between 22% and 39% of Utah trees that could potentially affect PacifiCorp's facilities were in contact with the conductors as of November/December 2003. However, ECI's report further indicates that 70% of the vegetation related outages on primary facilities were not preventable. This ties more closely with PacifiCorp's arborists' conclusion.

With regard to the costs of improving reliability, whether through an improved vegetation management program or other targeted maintenance activities, we note the findings of Accenture's February 2004 survey of residential customers who experienced the blackout of August 2003. Two findings from that survey may be of value to consider. First, 55% of respondents indicated a willingness to pay more for improvements that would maximize electric system reliability. And second, consumers want more information from their utility companies during emergencies. While they understand that emergencies may occur, and storm response workers are at times heroic in their round-the-clock efforts, customers want to know what's going on and when their service will be restored.

Based on ECI's report entitled "PacifiCorp VM Program Review Final 11-25-03", PacifiCorp's miles of primary scheduled for trimming declined significantly from FY 2001 through FY 2004.

Figure 4.4-1

Primary Trimming Scheduled (per ECI)



ECI in their report entitled “Assessment of Tree Damage Affecting the PacifiCorp Salt Lake City Distribution System Following the December 26, 2003 Storm”, dated March 15, 2004, shows the following table:

Table 4.4-1 Incidents

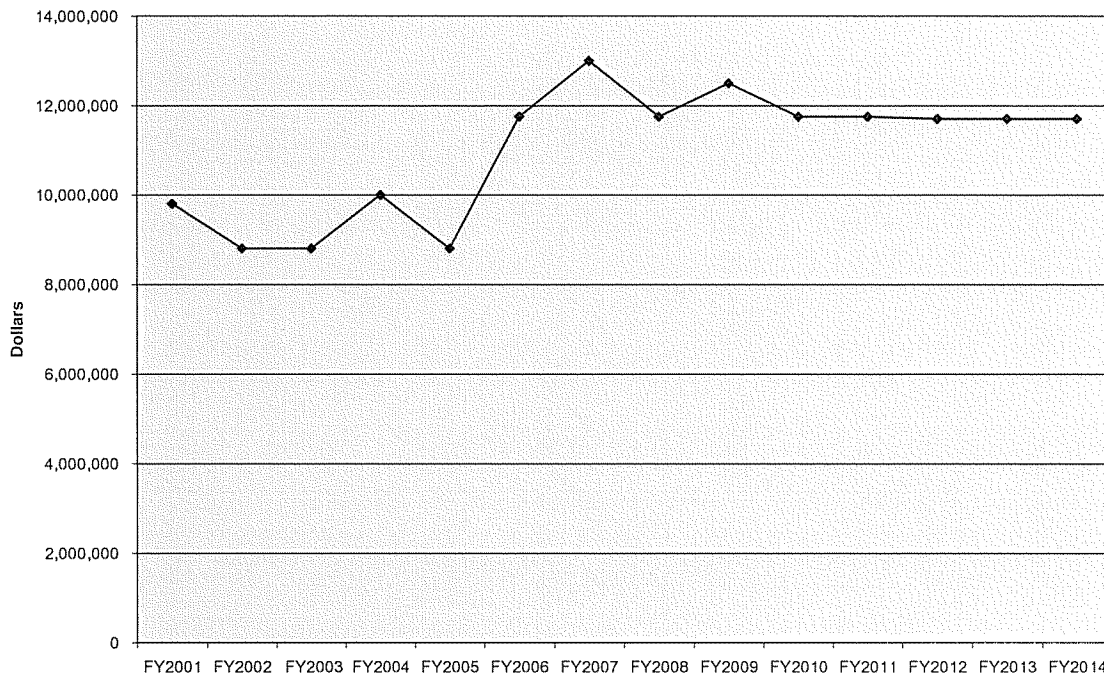
	All Incidents	Percent on Incidents Evaluated as Non-Preventable
<b>Primary</b>	747	70%
<b>Secondary</b>	141	88%
<b>Service</b>	520	92%
<b>Total</b>	1408	80%

We find that while 80% of the total incidents are classified as non-preventable, we notice that of the 747 incidents on primary, 30% were classified as preventable. In our opinion, primary outages are likely to have produced the rapid and large counts of customers out during the initial 12 hours of the storm. This further stresses the need for PacifiCorp to enhance its vegetation management program and reach a 3-year cycle as soon as possible with special focus on maintaining clearances on primaries.

As shown in the following chart, it appears that PacifiCorp is committed to an enhanced vegetation management program, as budgeted expenditures climb rapidly over the next two years and remain at an elevated level. We understand that these figures are based on the current budget and may change (presumably upward) in the new budget that is currently under internal review and approval.

Figure 4.4-2

Utah Vegetation Management Spending Levels



Some states have enacted vegetation management standards as reported by PacifiCorp. We conducted an informal survey of other states surrounding Utah as well as several others to gain a better understanding of existing or planned regulation of vegetation management programs.

Table 4.4-2 Vegetation Management Standards

State	Comments
California	Standards in place
Colorado	No Standards
Montana	No standards
Ohio	Mandates utilities to "...do whatever is necessary to establish and maintain safe and reliable service..."
Oregon	Standards in place
Virginia	Recommendations only that VA Power intensify its tree trimming activities
Utah	No standards in place, but the tariff requires actions similar to that of Ohio described above.
Wyoming	No standards

Based on the information described earlier, WCI has the following specific recommendations:

1. Accelerate the Vegetation Management program to reach compliance with a 3-year tree trimming cycle as soon as possible.
2. As an initial step, PacifiCorp should be required to provide periodic status reports to the DPU as to its progress in meeting the 3-year tree trimming cycle goal. If the regulatory agency is not satisfied with the progress or results, mandated vegetation management standards should be imposed by the regulator.

### 4.5 Investment Standards

This chapter of the PacifiCorp report is intended to address three major issues:

1. Is the company investing adequately in the electricity infrastructure in Utah?
2. Why aren't the assets better able to withstand storms?
3. Why doesn't the company underground all its electricity lines?

#### 4.5.1 Terms of Reference Compliance

The following table illustrates our opinion of PacifiCorp's compliance with the agreed Terms of Reference.

Terms of Reference - Chapter	Addressed?			Reference
	Yes	No	Adequacy	
<b>5. Investment and Standards</b>				
<i>Is the company investing adequately in the electricity infrastructure in Utah?</i>				
• Provide at least 10 years of budget history plus current 10-year plan numbers (total company and Utah specific)	X		Y	Section 9.2
• Describe current investment initiatives (including Quantum Leap, Utah generation, DSM, etc )	X		Y	Section 9.2
• Describe future investment strategy (capacity, automation, redundancy, etc )	X		Y	Section 9.2
• Describe the tools we use to plan investment levels (e.g., land use planning, growth rates, etc )	X		Y	Section 9.2
<i>Why aren't the assets better able to withstand storms?</i>				
• Describe how equipment and construction standards are arrived at – use examples (e.g., underground cable)	X		Y	Section 9.3
• Respond to the allegation that the company is using inferior underground cable	X		Y	Section 9.3
• Describe how standards differ across various parts of our service territory (e.g., based on climatic factors), describe contributions of ice and snow for line failures if trees are not involved	X		Y	Section 9.3
• Describe key determinants of asset condition/life (e.g., outage history, loading, number of operations, etc )	X		Y	Section 9.3
<i>Why doesn't the company underground all its electricity lines?</i>				
• Provide detailed cost estimates of underground versus overhead for various categories/voltages of assets	X		Y	Section 9.4
• Describe current underground policy (e.g., when and why do we underground assets)	X		Y	Section 9.4

In our opinion, the Company has adequately addressed these issues and their underlying sub-issues contained in the Terms of Reference.

#### 4.5.2 Conclusions and Related Findings

The report offers the following major conclusions related to investment and standards:

1. PacifiCorp's budgets demonstrate the commitment to maintain and operate an efficient and reliable distribution system within the state of Utah.
2. Facilities are maintained and reinvestment in replacing deteriorating equipment is an ongoing effort combined with reinforcing the system as growth requires it.
3. Material purchase specifications and the standards used to construct the overhead and underground systems meet or exceed NESC requirements without over-building the power system.
4. The company's current policy for constructing new underground systems or converting overhead systems to underground is consistent and fair and protects existing rate payers from inordinate expenses incurred at the request of others.

We agree with the company's findings and conclusions relative to capital budgets and programs, but would like to point out that we believe that budgets for maintenance can be improved as discussed in Section 4.6, Reliability and Maintenance. In our review of investment standards, we found that the Company provided estimates of some of the costs to place facilities underground,

but did not provide total costs. We believe that this could potentially confuse the casual reader. Therefore, we offer the following additional conclusions based on industry research

1. EEI in its "Utility Undergrounding Programs" report by Sciencetech, May 2001 provided the following information:

Utility	Average Cost per Mile
Mid-Atlantic Utility 1	\$ 764,655
Mid-Atlantic Utility 2	\$ 952,000
Mid-Atlantic Utility 3	\$ 1,826,415
Mid-Atlantic Utility 4	\$ 728,190
Mid-Atlantic Utility 5	\$ 950,000
Western State Utility Average	\$ 500,000
South East Utility 1	\$ 840,000
South East Utility 2	\$ 950,400
Western utility 1	\$ 1,100,000
Average	\$ 956,851
Average OH Line Cost	\$ 120,000
Minimum Multiple	4.2
Maximum Multiple	15.2

2. In an article in the FL Times Union dated April 21, 2004, JEA stated that it costs almost five times as much to put transmission lines underground than it would to keep them overhead. They also cited a specific set of projects intended to build or replace 65 miles of transmission lines over the next 5 years. The project cost for overhead is estimated at \$44 million, while the estimate to place all of these underground is \$215 million, about 5 times more. Furthermore, JEA indicated that placing these facilities underground would require a 5% rate increase.

### 4.5.3 Recommendations

#### *PacifiCorp's Recommendations*

The investments and standards chapter concludes with two Company recommendations.

1. Develop an education plan to inform customers of their responsibility to maintain and repair overhead service entrances and meter base equipment.
2. Develop a preferred electrician list for use by customers when customer-owned equipment is damaged and needs repair prior to service being restored.

We concur with PacifiCorp's recommendations.

### 4.5.4 Analysis and Industry Comparisons

The following data, charts, and graphs provide benchmark and comparative analytical support for our conclusions and recommendations.

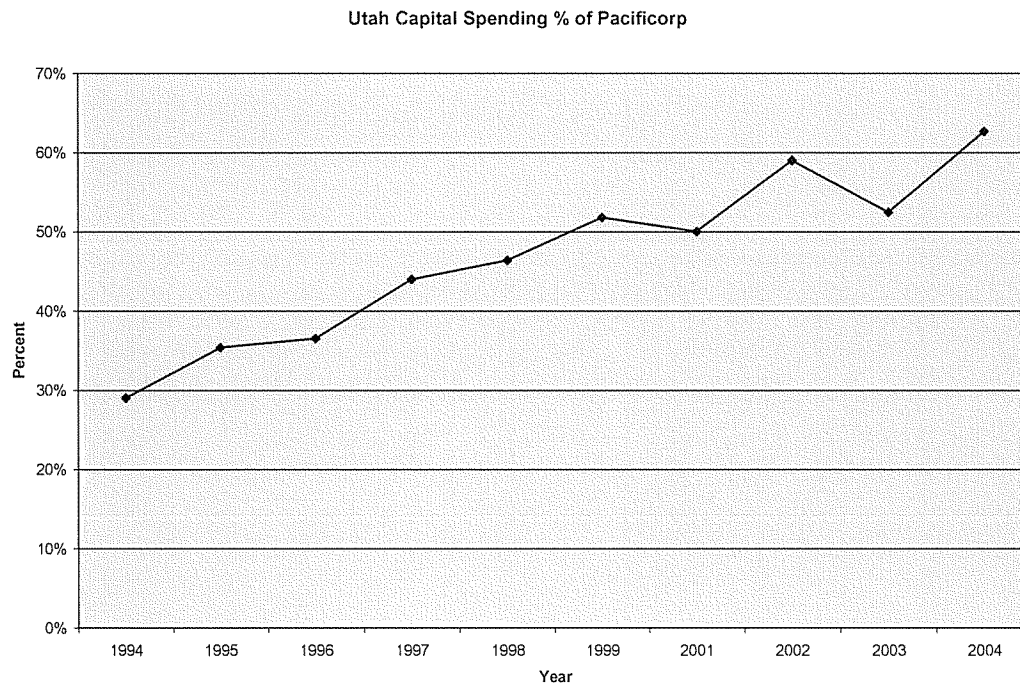


Figure 4.5-1



As shown on the preceding chart, Utah Power's capital spending pattern generally tracks that of PacifiCorp as a whole. However, the percentage allocated to Utah has increased.

Figure 4.5-2



As stated by PacifiCorp in the report, the commitment to Utah is demonstrated in the preceding chart. WCI's opinion is Utah is receiving its fair share of available capital funds to carry out approved programs.

Figure 4.5-3

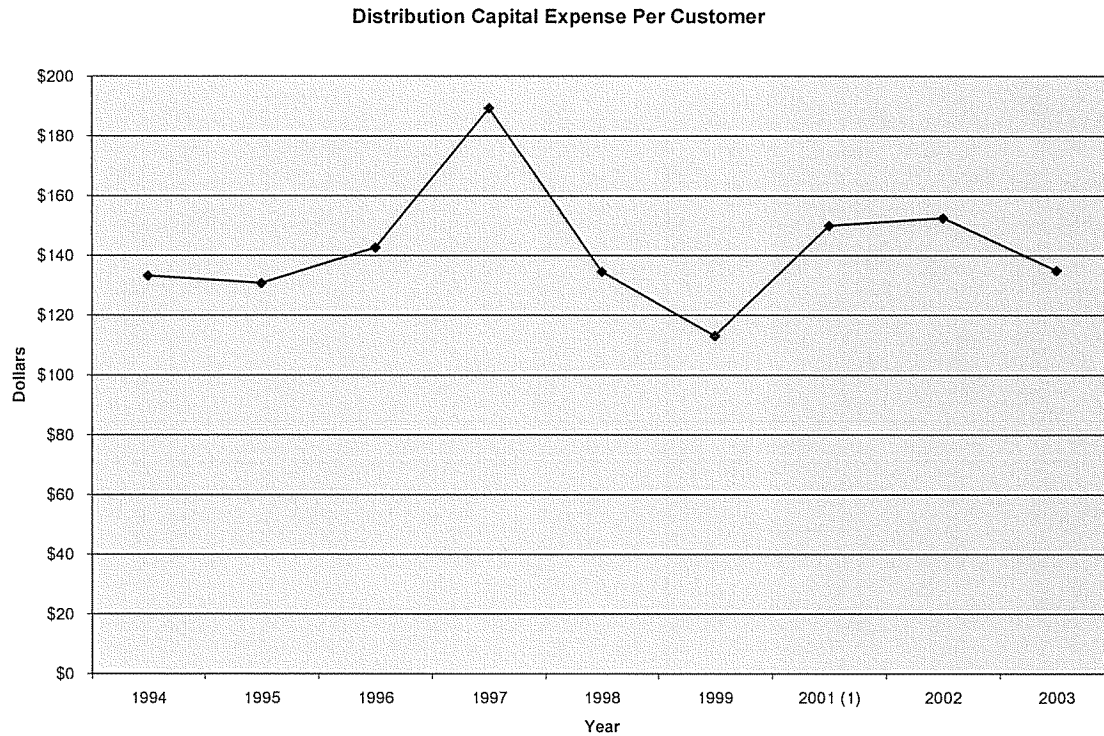
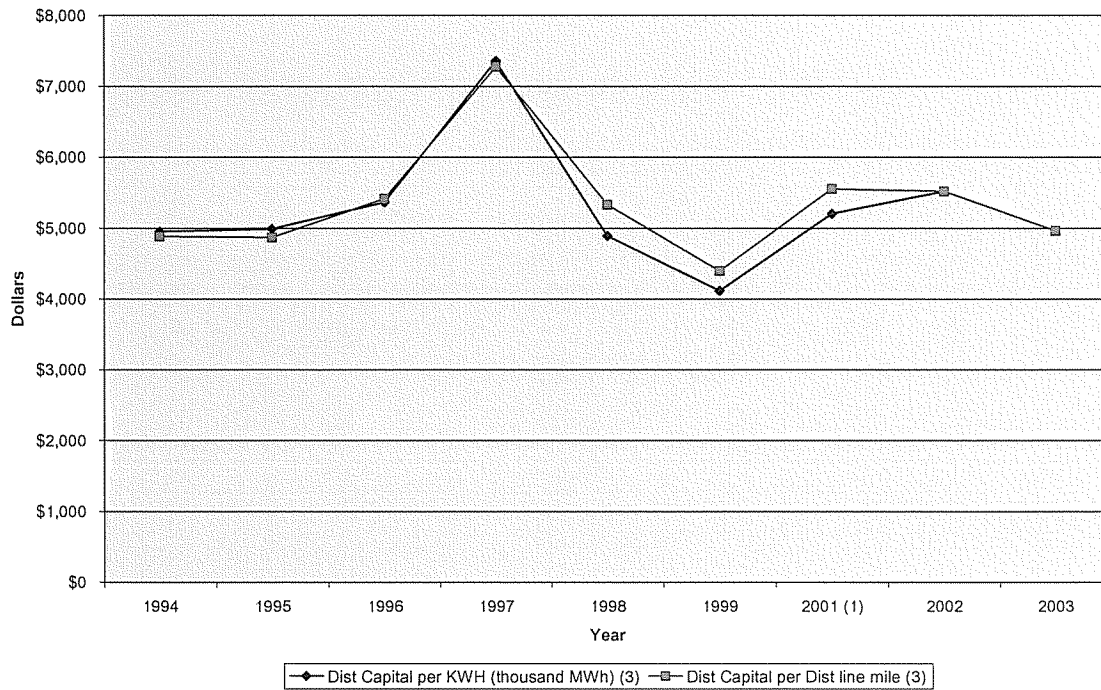


Figure 4.5-4

Distribution Capital Expenditures



The preceding two charts indicate that Utah Power's capital expenditure pattern is fairly flat if 1997 and 1999 are disregarded.

Based on year 2001 FERC Form 1 data, Utah Power's capital expenditures per customer are in the fourth (highest spending level) quartile and capital expenditures per kWh sold fall in the third highest quartile as depicted in the following two charts. This supports PacifiCorp's characterization of its capital program that includes initiatives such as Quantum Leap to satisfy system reinforcement and customer growth requirements.

Figure 4.5-5

Distribution Capital Spending per Customer  
 Source FERC 2001

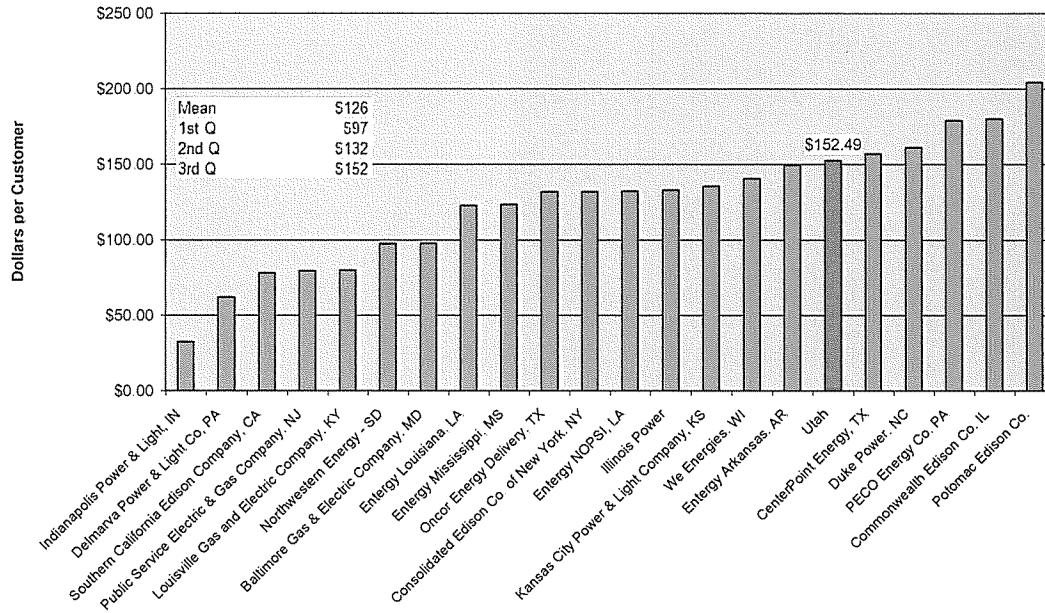
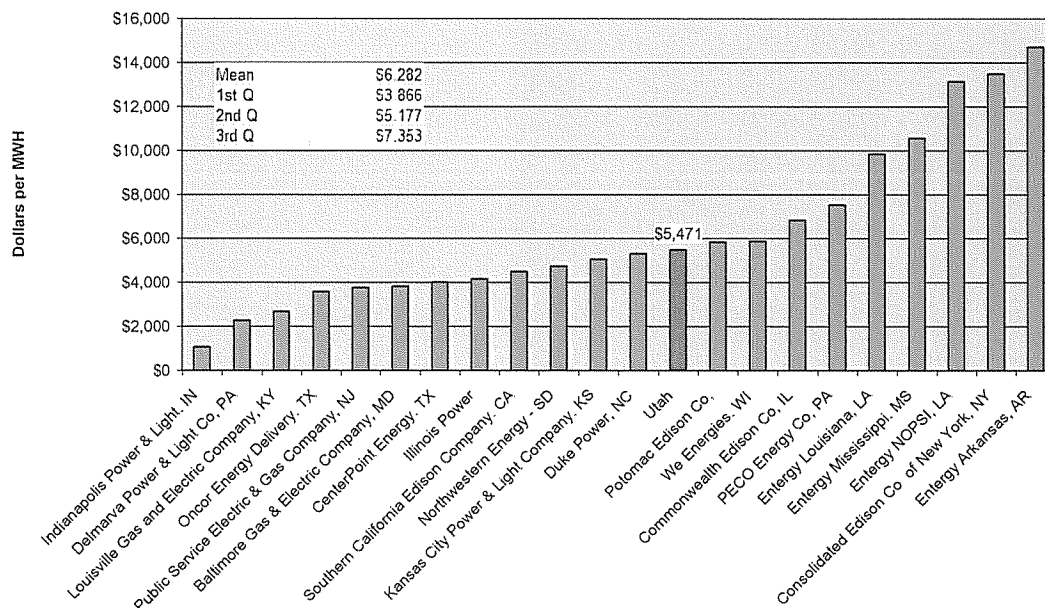


Figure 4.5-6

Distribution Capital Spending per MWH  
 Source FERC 2001



## 4.6 Reliability and Maintenance

This chapter of the PacifiCorp report is intended to address three major issues:

1. Is the reliability of the electric system deteriorating?
2. What is the Company doing to improve reliability?
3. Is the Company spending enough money on maintaining its assets?

### 4.6.1 Terms of Reference Compliance

The following table illustrates our opinion of PacifiCorp's compliance with the agreed Terms of Reference.

Terms of Reference - Chapter	Addressed?			Reference
	Yes	No	Adequacy	
<b>6. Reliability and Maintenance</b>				
Is it true that reliability is, in fact, deteriorating?				
- Describe reliability metrics (SAIDI, SAIFI, etc.) and measurement techniques	X		Y	Section 10.2
- Provide several years history (adjusted for reporting accuracy) of key metrics broken down by: month, year, etc. location (total company, state, Wasatch Front, etc) with and without "Major Events"	X		Y	Section 10.2
- Update reliability analysis from May 30, 2002, report to DPU	X		Y	
- Explain why some customers' reliability is better/worse than others (can a single residence's downed service line cause interruption to other customers)	X		Y	Section 10.3
- Describe program for inspecting distribution lines and equipment (what are your current plans for future, role of current maintenance level associated with storm damage, etc.)	X		Y	Section 10.5, Section 10.6 Section 10.7 and Section 10.8
<i>What are you doing to improve reliability?</i>				
- Describe impact of recent reliability initiatives (e.g., Quantum Leap)	X		Y	Section 10.4
- Explain how reliability dollars are targeted (e.g., worst-performing feeders)	X		Y	Section 10.4
- Explain how patterns of reliability are used to inform investment and maintenance plans	X		Y	Section 10.5
- Explain what specifically is done to improve reliability (e.g., rebuild/reconductor, autoreclosers, tree-trimming, etc.)	X		Y	Section 10.5
<i>Is the company spending enough money on maintaining its assets?</i>				
- Provide at least 10 years of budget history plus current 10-year plan numbers (total company and Utah specific)	X		Y	Section 10.7
- Describe maintenance plan and philosophy (e.g., maintenance intervals, which assets are maintained and which are not, etc.)	X		Y	Section 10.6
- Describe current initiatives to refine maintenance plan (prioritization based on "asset criticality," separation of operations budgets from maintenance budgets, etc.)	X		Y	Section 10.8

In our opinion, the Company has adequately addressed these issues and their underlying sub-issues contained in the Terms of Reference with the following exceptions:

1. Describe reliability metrics (SAIDI, SAIFI, etc.) and measurement techniques
2. Update reliability analysis from May 30, 2002 report to DPU

Although the Company addressed most of the issues, additional industry comparative data on maintenance expenditures and reliability performance is needed, along with additional historical Company data on reliability performance metrics (e.g., SAIFI, SAIDI, and CAIDI), and evidence that the Company is meeting the requirements of its comprehensive maintenance plan in order to be more fully responsive to the TOR.

### 4.6.2 Conclusions and Related Findings

The report offers the following major conclusions related to reliability and maintenance:

1. The Company has focused on improved reliability as evidenced by programs such as Network Initiative (and Worst Performing Feeder Program) Operation Summer 2001, Quantum Leap, Every Minute Counts, and improved outage reporting.

2. The Company has established reliability targets and has committed to meeting a SAIDI of 217 and a SAIFI of 2.23 by fiscal year 2005 in Utah.
3. The Company has adopted a comprehensive maintenance plan that is focused on inspection of distribution and transmission lines, as well as substations. In addition to inspections, preventive maintenance is performed on major substation equipment, and wood poles have a defined plan for testing and treatment.

WCI agrees with these conclusions and applaud the Company's recent initiatives intended to improve system reliability and maintenance. We note however that some of the programs listed above are capital rather than maintenance programs. We also find and conclude the following:

1. PacifiCorp (Utah) is close to achieving its cycle targets on inspections and preventative maintenance, as described later in this section, but corrective maintenance lags and the backlog of maintenance work orders is growing.
2. Maintenance expenditures for fiscal years 2002 and 2003 are lower than industry averages (e.g., \$27/customer and \$996/kWH sold in Utah versus \$45/customer and \$2,395/kWH sold in the industry). Further, the previous seven years of historical maintenance expenditures were much lower. As a result, there is need for aggressive "catch up" spending, and it is not clear whether the Company's future maintenance budgets go far enough.
3. The significant staffing reductions, implemented over the past 10 to 12 years, of customer-facing employees (discussed in Section 4.7 of this report), even with the addition of contractor staff (only some of which are assigned to maintenance) raises the issue of the adequacy of staffing levels as related to reliability and maintenance.
4. Based on an analysis of outage data provided by PacifiCorp to the DPU, we found that equipment-related outages over the 2001 to 2003 period amounted to an average of 45% of all outages (excluding filed major events). This is substantially higher than industry experience. EEI, in its 2002 Reliability Report, shows a figure of 25% for all equipment related outages (excluding major events) on overhead and underground equipment. This further raises questions relative to the adequacy of maintenance programs.
5. During a field inspection tour of the Kempner Road area of the distribution system, we noticed one or two leaning poles, several split cross-arms on poles, a number of insulators sitting directly on cross-arms, several slack spans of overhead wire, and a guy wire anchored in the sidewalk. While these situations may be isolated and not endemic to the system, they do raise questions as to whether the comprehensive maintenance plan is being executed as intended.

### 4.6.3 Recommendations

#### *PacifiCorp's Recommendations*

The reliability and maintenance chapter concludes with the following Company recommendation:

1. Adhere to the Company-published preventive and corrective maintenance plans.

#### *WCI Recommendations*

While WCI fully concurs with PacifiCorp's recommendation, we do not think it goes far enough in light of our findings and conclusions. According to the company's "Resource Review: Distribution Business" dated November 2002, prior to the recent formation of an asset

management department there was no defined maintenance plan or maintenance budget. It is further noted that the condition of the network in Utah is generally in worse condition than Oregon due to a historical lack of maintenance in Utah compared to a State mandated maintenance program in Oregon. Moreover, the maintenance strategy proposed in the Resource Review (the "\$51M" Plan on page 9) will not improve the average condition of the network and is unlikely to do better than sustain present outage performance.

The intent of our recommendations is to determine whether the Company needs to provide additional financial and human resources, beyond its maintenance budget forecast, in order to improve the condition of the distribution system and its reliability performance. Therefore, we recommend the following:

1. Conduct a maintenance plan audit to determine whether the Company is performing all inspections, testing, preventive and corrective maintenance in conformance with its maintenance plan requirements.
2. Modify and expand the maintenance priority codes and schedules to specify the types of conditions requiring immediate corrective action, within one month, six months, and one year.
3. Institute a rigorous program to prioritize, schedule and track corrective maintenance for both "A" and "B" (and expanded codes as above) maintenance items.
4. Perform a physical inspection of a sample of the distribution system including conductors and ancillary equipment, poles and all attachments, cross-arms, protective devices, lightning protection, transformers, switches, regulators, substations, and right-of-way conditions.
5. Review and update the Distribution Business Resource Plan last prepared in 2002.
6. Provide suitable increases in baseline maintenance budgets and resources in order to keep up with corrective maintenance work orders such that system reliability improves. This item would involve two distinct and significant activities:
  - a. Evaluate baseline maintenance budgets to properly support corrective maintenance and system reliability targets
  - b. Assess resource requirements based on the work plan to provide adequate resources (contracted and internal) to support the plan
7. Mount a "catch-up" maintenance program in order to significantly reduce the outstanding corrective maintenance items within a short time period and with a view to improving system reliability, particularly SAIFI. Further, the Company should jointly with the DPU, determine a reasonable and measurable target for SAIFI performance improvements and/or reduction of equipment failure outage frequency as an expected result of increased maintenance spending.
8. Perform an annual review and comparison of PacifiCorp's Utah reliability metrics against itself, PacifiCorp other than Utah, and an industry benchmark panel.

#### **4.6.4 Analysis and Industry Comparisons**

The following data, charts, and graphs provide benchmark and comparative analytical support for our conclusions and recommendations.

##### **4.6.4.1 Reliability Comparisons:**

We understand that implementation of the OMS has contributed to reliability indices that are more than likely not equivalent across the panel. However, the relative position of Utah Power's reliability performance indicates that PacifiCorp's emphasis on increasing both capital and maintenance programs, including vegetation management, is necessary.

As depicted in the following three charts, Utah Power's SAIFI and SAIDI fall well into the fourth (worst) quartile of EEI respondents. It should be recognized, however, that benchmarks such as these are not absolute measures. They are intended to be indicators of relative performance that suggest areas for examination and focus to determine opportunities for improvement and the application of best practices.

Figure 4.6-1

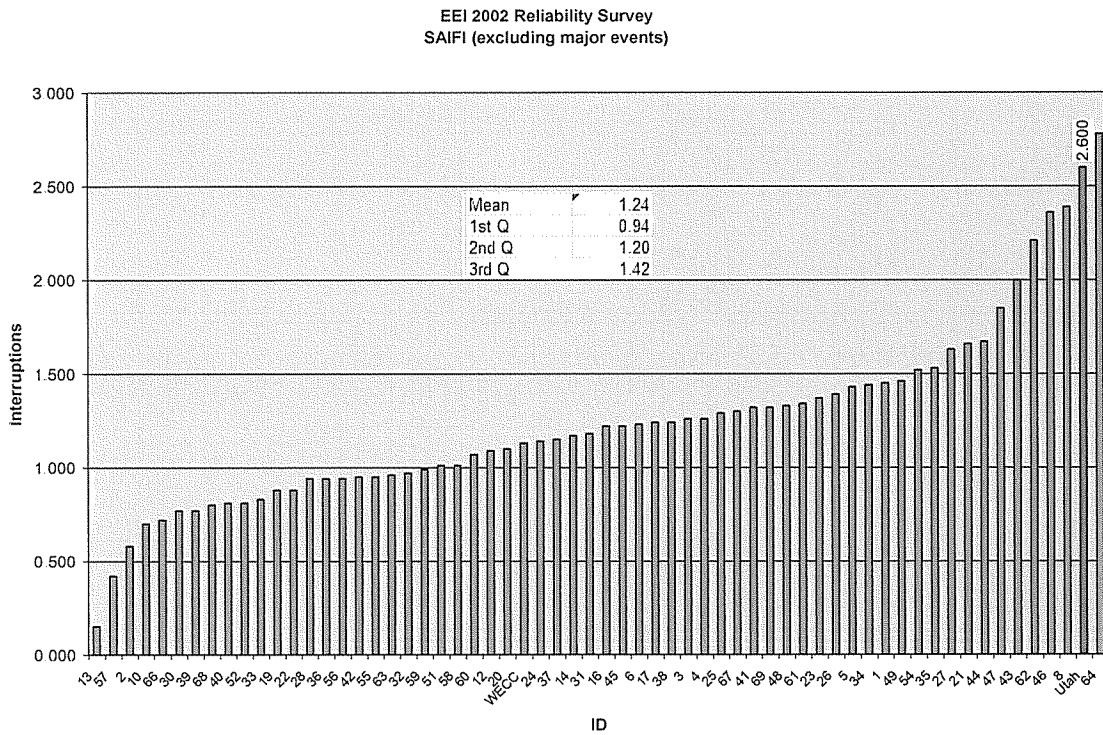
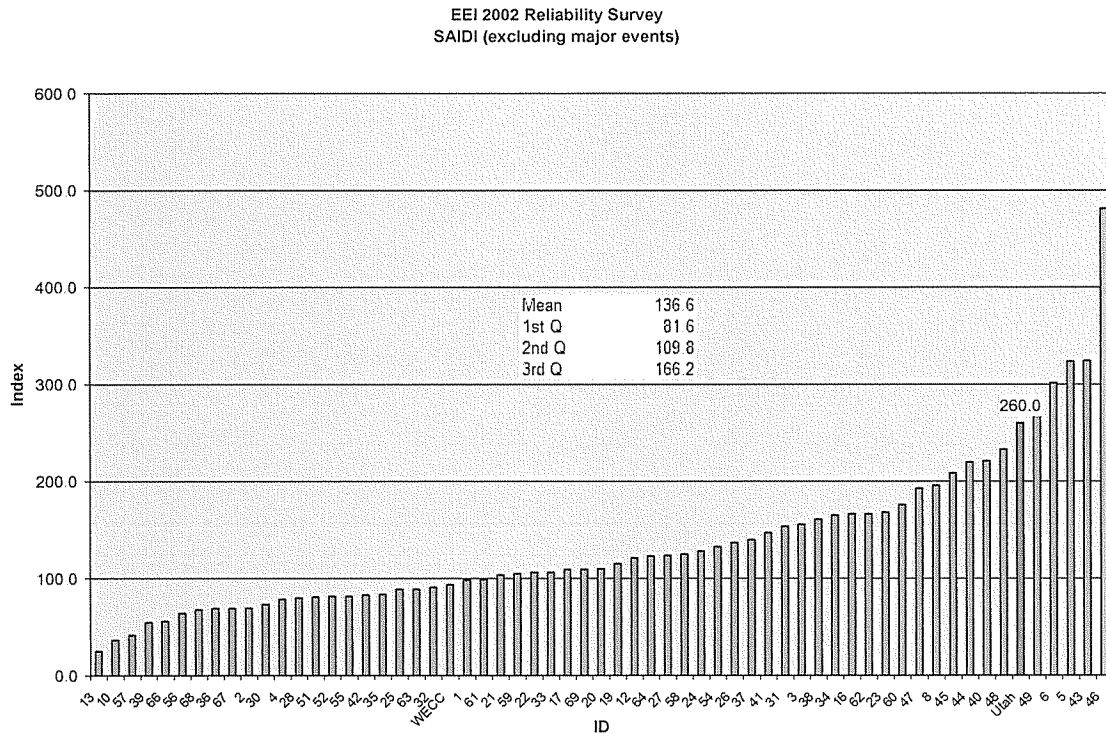


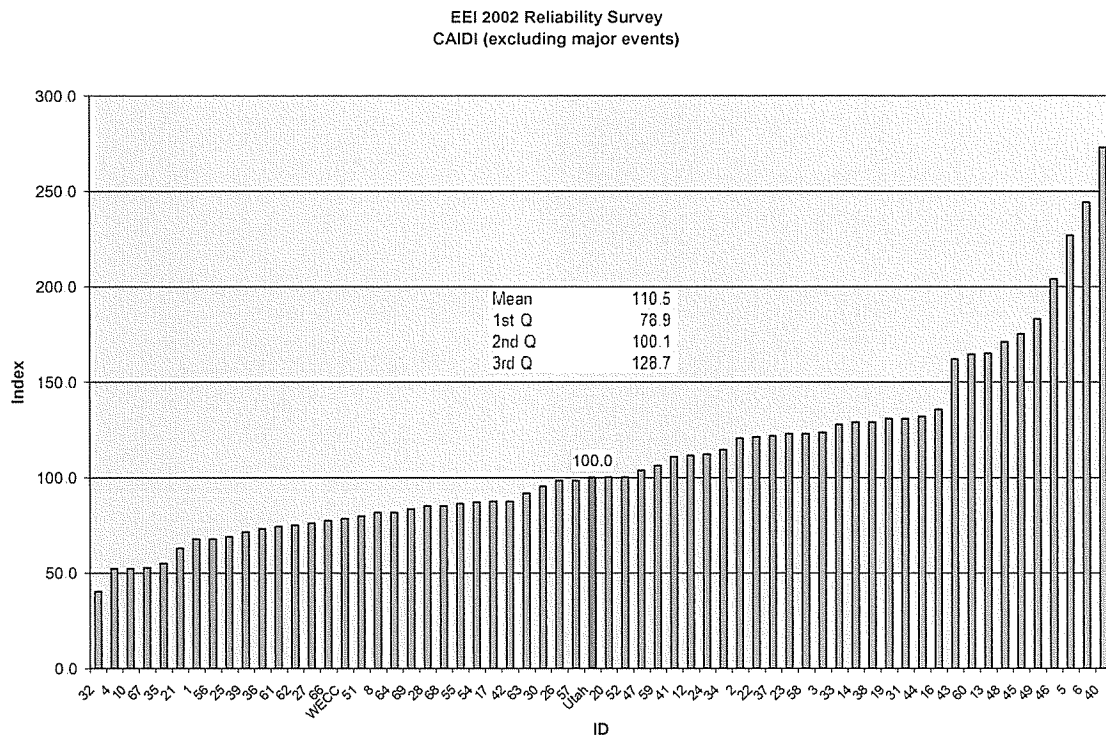


Figure 4.6-2



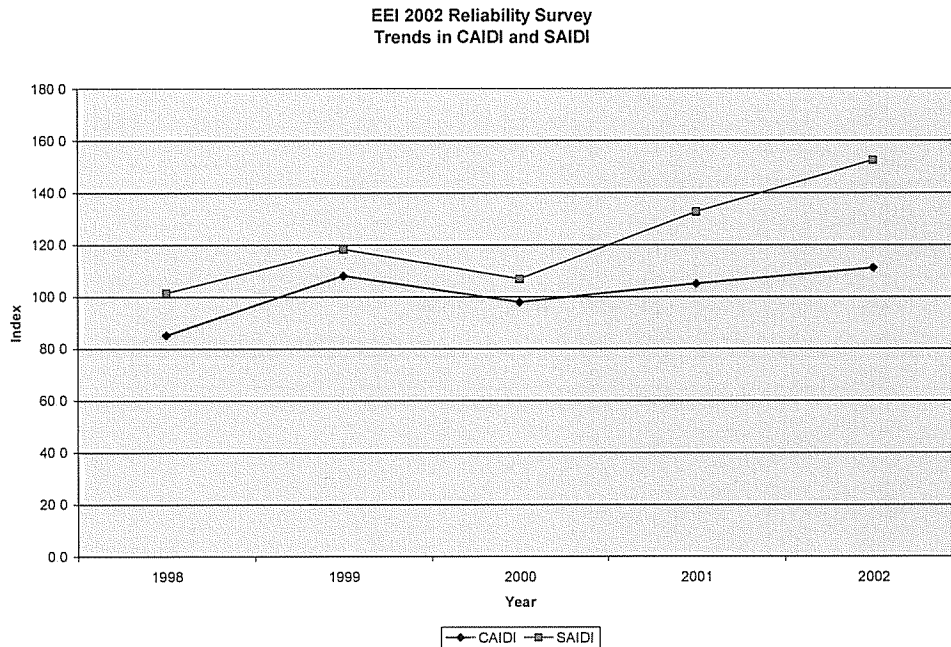
Utah Power's CAIDI performance falls into the middle of the pack and is in fact just inside the high end of the second quartile. While this metric may infer reasonable outage duration experiences from the customer perspective, SAIDI metrics indicate poor performance in overall system interruption duration and SAIFI metrics indicate poor performance in terms of interruption frequency. During our visit to the Sugarhouse area, one of the residents noted that he and neighbors experience 4-5 outages per year.

Figure 4.6-3



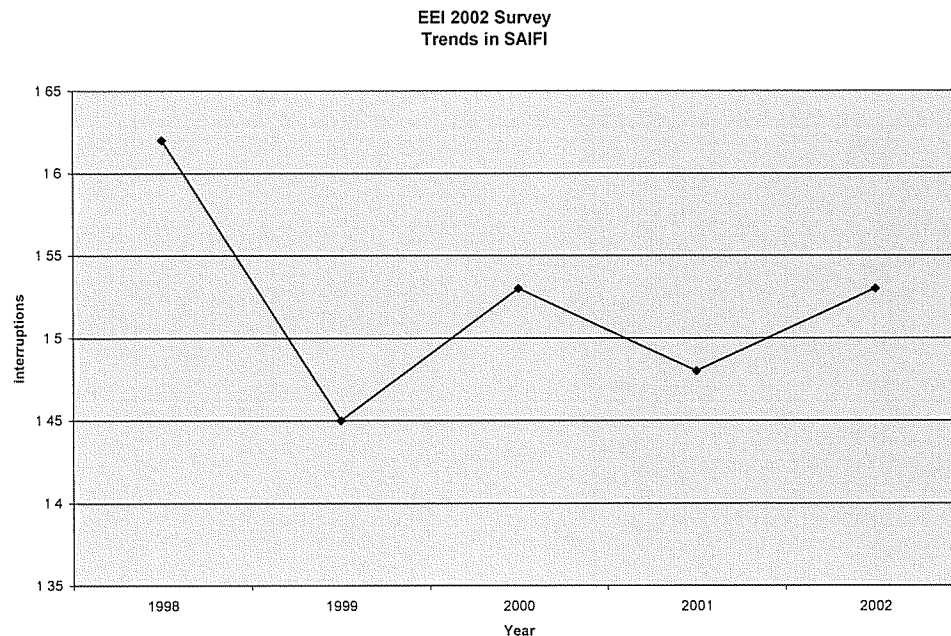
As depicted in the following EEI chart, industry trends in both SAIDI and CAIDI are slightly increasing, indicating that outage durations are longer. However, it should be noted that over the 1998 to 2002 period, a number of utilities have implemented OMS. Some or all of this increase may be attributable to the improved data resulting from the OMS, while actual durations may be declining.

Figure 4.6-4



Conversely, EEI data shows that SAIFI, or interruption frequency has declined and is staying fairly level.

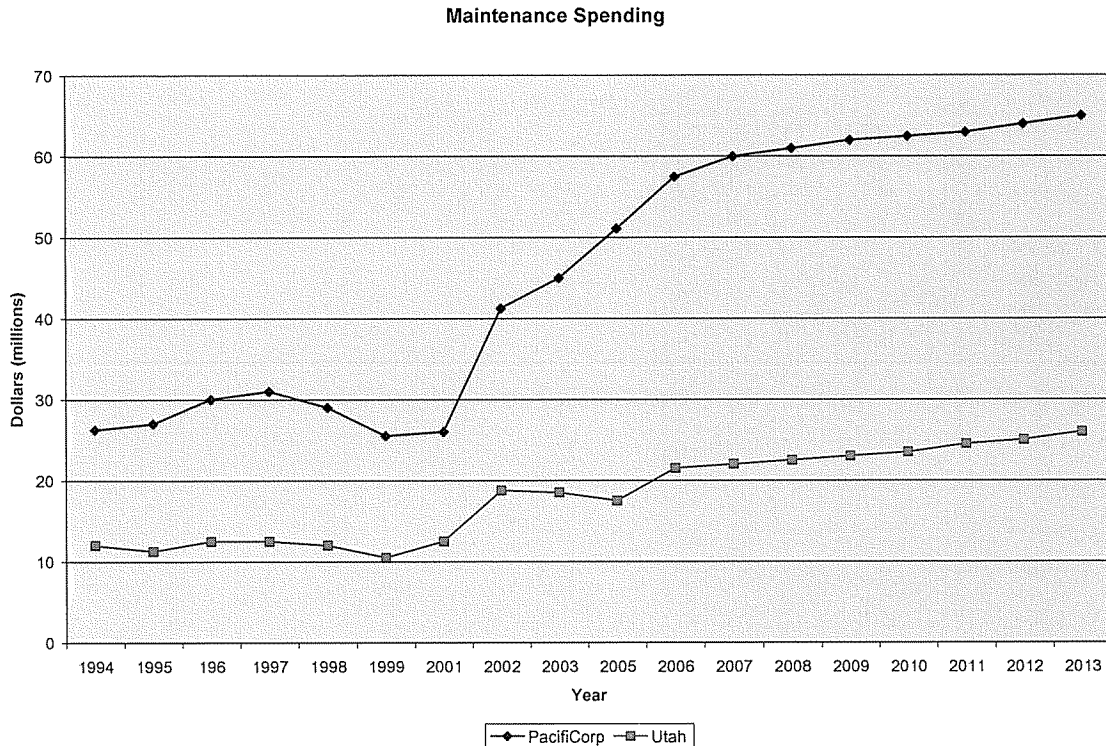
Figure 4.6-5



### 4.6.4.2 Maintenance Spending

We have examined the data provided in the PacifiCorp report to determine the relative level of spending in the distribution maintenance area. The following charts illustrate that the company has earmarked resources to significantly increase spending from its historically low levels:

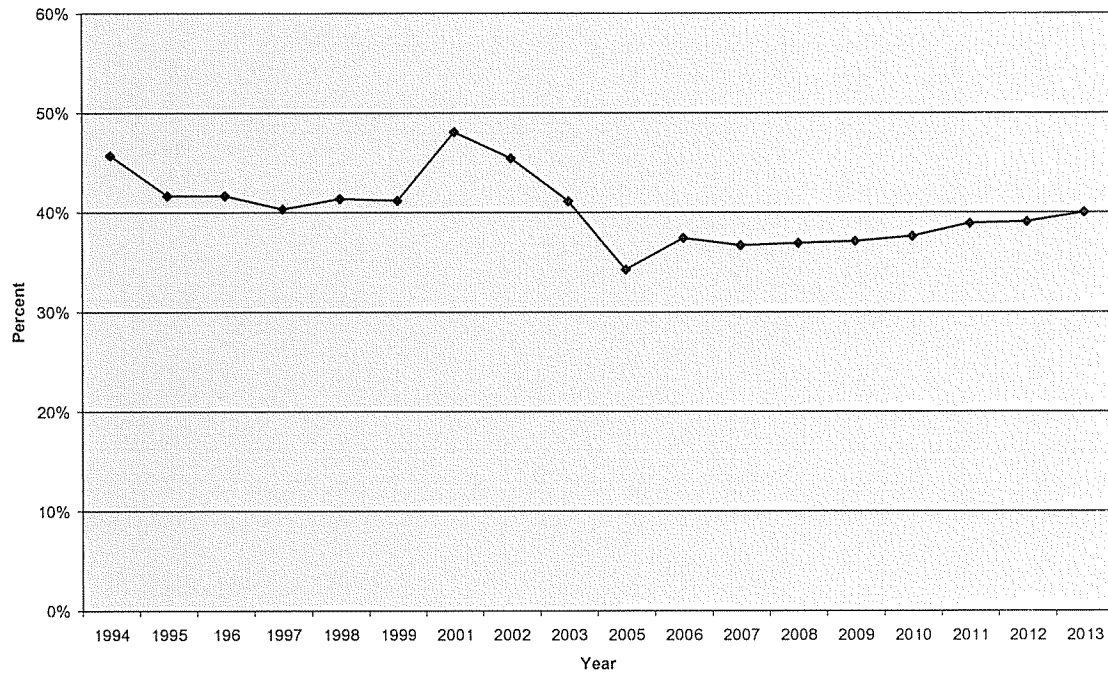
Figure 4.6-6



Utah's allocation of the PacifiCorp maintenance budget has remained fairly constant at around 40%. We notice, however, that aside from increased levels in the 2001-2003 period, forecast levels are slightly below historical percentages.

Figure 4.6-7

Utah Maintenance Spend as % of PacifiCorp



It appears that maintenance spending on a per customer basis has increased in recent years by 20% to 30%, and maintenance expenditures have increased in a similar fashion on a per line mile and per unit of energy sold basis.

Figure 4.6-8

Distribution Maintenance Expense per Customer

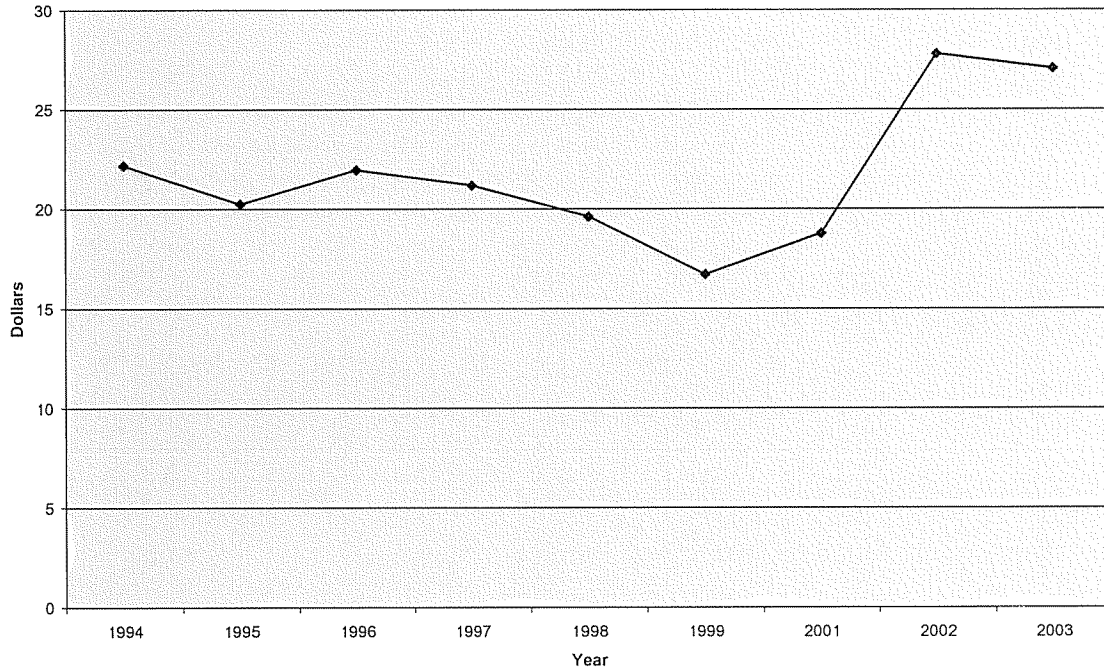


Figure 4.6-9

Maintenance Expenses



As depicted in the following charts derived from year 2001 FERC Form 1 data, Utah Power's maintenance spending levels (FY 2002) are within the first quartile (lowest spending quartile) and indicates that historical maintenance spending levels were lower than the industry average. Again we note that benchmarks such as these suggest areas for further examination and focus. They do not, in themselves, identify best practices, nor do they reflect rate impacts, if any, of higher levels of spending.

Figure 4.6-10

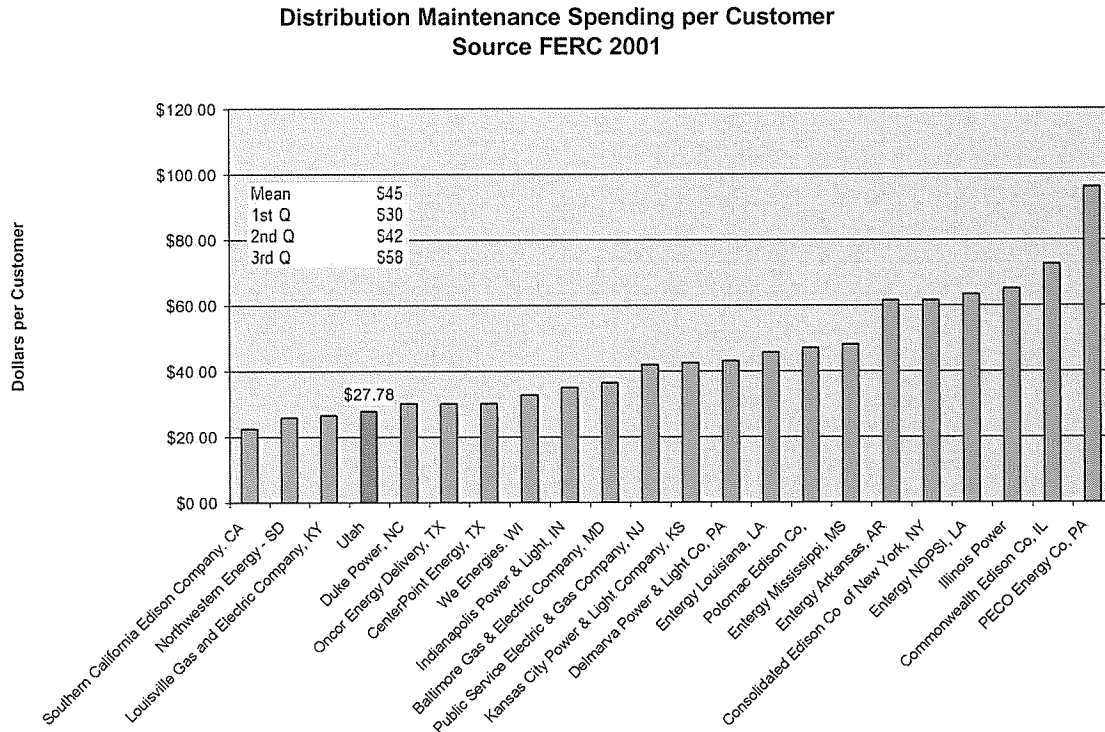
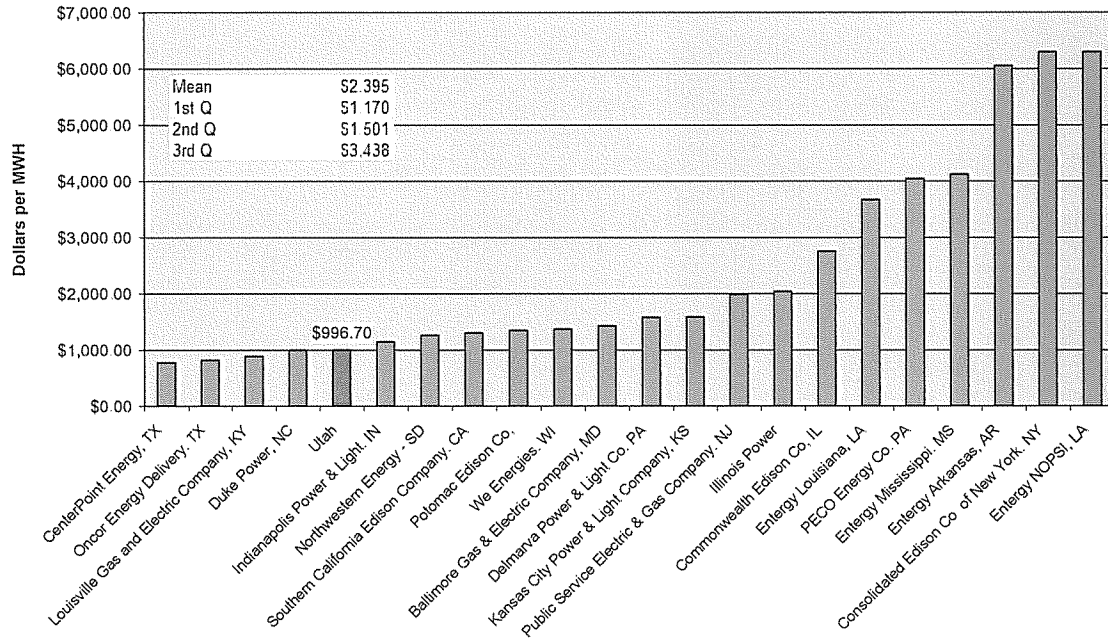


Figure 4.6-11

Distribution Maintenance Spending per MWH  
 Source FERC 2001





### 4.6.4.3 Maintenance Plan Cycles

During FY2002, PacifiCorp developed and implemented a Preventative Maintenance Plan as illustrated in their report in Table 10.6-1. We have examined this plan and cycle targets and compared it to a sampling of industry practices. We find that PacifiCorp's preventative maintenance plan conforms with industry practices as summarized in the following:

**Table 4.6-1 Maintenance Plan Cycles**

	Activity	Cycle	CA	PSEG	Rockland	JCP&L	Conectiv	US Navy
<b>Substations</b>	All - infrared inspections, I/R testing of substation bus, switches & major equipment	2 years	3-5 years					
Mobiles	Inspection	Monthly			Monthly			
Fill	Inspection	Monthly						
T&D (and Pole Mt)	Inspection	Monthly	1 year		Monthly			
<b>Circuit Breakers</b>	Inspect & Operate	Annual						
Distribution	Overhaul - varies by type	4-8 years	1-5 years		4-8 years			
Local Transmission	Minor Mice (Time/Ductor, inspect mechansm)	2 or 4 years						
<b>Transformers</b>	All LTC: DGA	3 month		1 year		4 years	1 year	
	DGA & oil quality for trf tank	1-3 years	1-5 years	4 years	1 year	2 year	1 year	2 year
	Overhaul LTC	3-8 years		8 years		8 years		
<b>Regulators (3 Phs)</b>	Overhaul - inspect contacts & filter oil	3 years	1-5 years		1 year			
<b>Relay Packages</b>	Test & Calibrate	1-8 years			2-4 years			
<b>Other Equipment</b>	All - part of monthly substation inspection plus:							
Batteries	Maintenance & load test	Annual			6 months			6 months
Circuit Switchers	Inspect, Test & Lubricate	5 years		3 year	1 year			4 years
Generators	Inspection	6-12 months						
<b>Distribution Poles</b>	Safety Inspections	2 year	1-2 years	1 year				
	Detail Inspections	8 year	-	3-4 years	periodic			
	Detail Test & Treat	16 year	10 year					
<b>UG Facility Points</b>	Detail inspections	4-8 years						4 year
<b>Local Transmisison Pole</b>	Safety Inspections	2 year		1 year	6 months			
	Detail Inspections	8 year		5 years	as required			
	Detail Test & Treat	16 year						

During a teleconference on May 3, 2004, PacifiCorp explained their maintenance plan and cycles and provided us with the following information on plan compliance for the FY2003 and FY2004 periods:

**Table 4.6-2 Maintenance Plan Compliance**

Equipment	Count	Cycle	% Accomplished in FY03/04
Substations	432	2 year	95.6%
Circuit Breakers	1,614	1, 4-8 years	80% (mixed 1 and 4-8 year)
Transformers	590	1-3 years	119%
		3-8 years	70%
Relays	2,253	1-8 years	95%
Poles	343,478	2 years	All (100%) done as part of Joint Use Inventory
		8 years	35% (target 25%)
		16 years	13.7% target 12.5%)
UG Facility Points	174,596	4-8 years	24% (target 25% to 50%) currently trying to reach a 4 year cycle
Local Transmission Poles	28,428	2 years	100%
		8 years	12% (target 25%)
		16 years	12% (target 12.5%)

As shown above, PacifiCorp has made significant progress in meeting its maintenance plan cycle targets relative to inspections and preventative maintenance. However, during the referenced teleconference, PacifiCorp indicated that during FY2003, they recorded 8,800 NESC code violations and corrected 6,500 (73.9%) of these. During FY2004, they identified 13,000 violations and corrected 10,000 (76.9%) of these. While there are still about 25% of corrections outstanding, PacifiCorp states that its target is to achieve a 100% correction rate within 10 years. We applaud PacifiCorp on its commitment, but urge the company to accelerate its maintenance programs to reach conformance in a significantly shorter time period.

**Table 4.6-3 PacifiCorp Corrective Maintenance Priorities**

Priority	As of		
	4/1/2002	4/1/2003	4/1/2004
"A" Recorded	2114	2303	3512
"B" Recorded	10984	6529	9781
Total Recorded	13098	8832	13293
"A" Accomplished		2110	3001
"B" Accomplished		4390	6943
Total Accomplished		6500	9944
"A" Outstanding	2114	2307	2818
"B" Outstanding	10984	13123	15961
Total Outstanding	13098	15430	18779

PacifiCorp indicated priorities for NESC condition violations found during inspections and preventative maintenance as follow:

**Priority A:** Conditions found that pose an imminent hazard to the public or employees, or risk of loss of supply or damage to the electrical system. Based on information from PacifiCorp, Priority A items are targeted for correction before the next FY reporting period.

**Priority B:** Conditions found that while they are signs of defect or damage, in the opinion of the inspector do not pose an imminent hazard. Based on information from PacifiCorp, Priority B items are targeted for correction during grid maintenance, system reinforcement, or new facility work.

In our opinion, these priority codes and time frames for correction are too broad and vague to provide meaningful guidance to corrective maintenance practices. For example, a leading East-coast utility uses the following prioritization classifications and lists specific examples of the types of conditions included in each priority code

- Priority 0 (Urgent) – Corrective action required immediately or within 5 days
- Priority 1 - Corrective action required within 6 months of inspection
- Priority 2 - Corrective action required within 12 months of inspection
- Priority 3 - Corrective action required within 18 months of inspection

In addition to these priorities, a fifth category is provided to record non-reportable conditions that are not scheduled for correction, but are handled during major maintenance or capital work. As a result, we have recommended a modified and expanded prioritization scheme as included in the recommendation section of this chapter.

## 4.7 Organization and Resourcing

This chapter of the PacifiCorp report is intended to address three major issues:

1. Does the Company employ enough people in the state of Utah to operate the business effectively?
2. Why aren't more Company activities/functions based in Utah?
3. Why has the Company let so many experienced people leave the organization?

### 4.7.1 Terms of Reference Compliance

The following table illustrates our opinion of PacifiCorp's compliance with the agreed Terms of Reference.

Terms of Reference - Chapter	Addressed?			Reference
	Yes	No	Adequacy	
<b>7. Organization and Resourcing</b>				
<i>Do you employ enough people in the state of Utah to operate the business effectively?</i>				
· Describe the recent "Resource Review" and its findings	X		Y	Section 11.4
· Describe recent initiatives to increase the number of employees, control costs and improve response time (e.g., second shift, contractor exchange, etc.)	X		Y	Section 11.4 and Section 11.5
· Explain why some activities are outsourced (e.g., tree-trimming, large construction projects, etc.)	X		Y	Section 11.3
· Describe how equipment standards/technology have impacted the requirement for field-based employees	X		Y	Section 11.3
<i>Explain why more activities/functions aren't based in Utah</i>				
· Describe the prevailing organizational design/model (and, in particular, where and why a functional or a geographic approach is employed)	X		Y	Section 11.4
· Clarify what functions are based in Utah (including Operations, Dispatch, Wasatch Customer Service Center, Field Engineering, etc.)	X		Y	Section 11.4
· Share plans to increase senior-level representation in the state	X		Y	
· Decisions — who makes them: Portland or Salt Lake	X		Y	
<i>Why have you let so many experienced people leave the organization?</i>				
· Give detail (timing, rationale, etc.) of voluntary work force reduction initiatives (focus on line personnel and responders)	X		Y	Section 11.2 and Section 11.3
· Provide details of current age profile		X	N	
· Provide details of apprentice program revitalization (in both Power Delivery and Generation)	X		Y	Section 11.4

In our opinion, the Company has adequately addressed these issues and their underlying sub-issues contained in the Terms of Reference with the following exception:

1. Provide details of current age profile

*We did not find references or data to fulfill this item within the report. However, it appears that PacifiCorp is aware of manpower needs in its customer-facing staff, in particular journeymen, and has taken action to bolster the apprentice program. Therefore, while we encourage the company to consider this information when formulating manpower plans, it is not necessary to provide details of age demographics for the purpose of this report.*

Although the Company addressed most of the issues, additional industry comparative data on staffing ratios is needed (e.g., employees per line-mile, customers per employee, etc.), as well as a rigorous analytical basis for determining appropriate staffing levels in light of workload requirements and customer growth projections in order to be more fully responsive to the TOR.

## 4.7.2 Conclusions and Related Findings

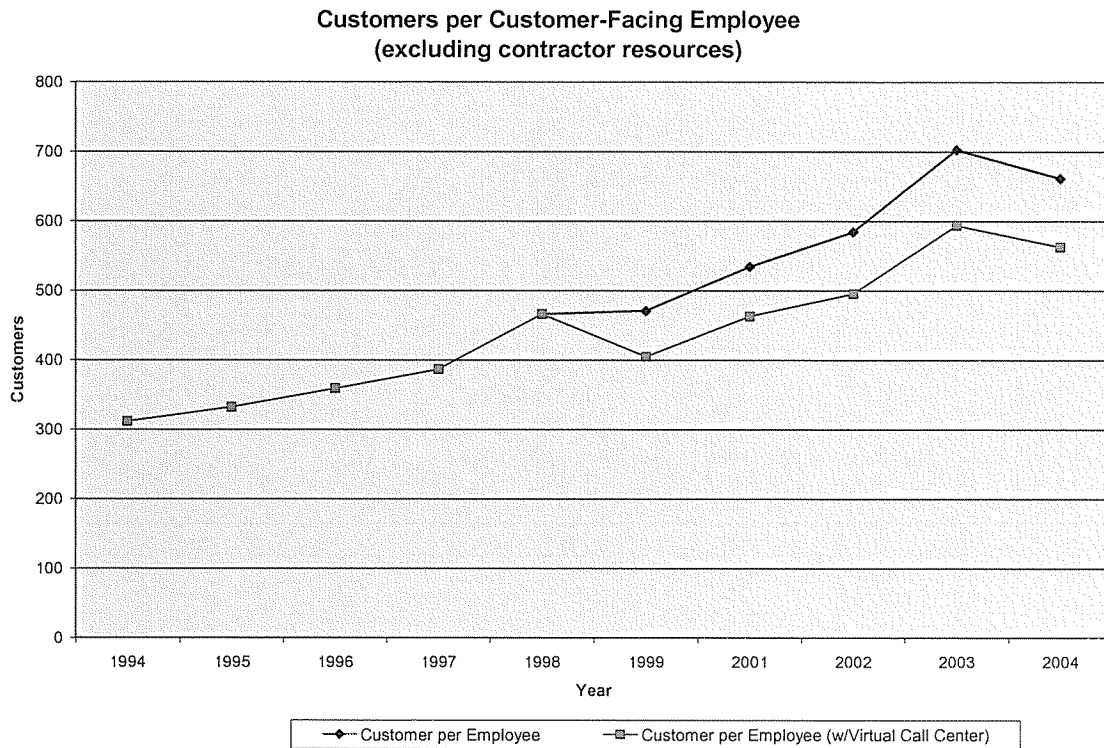
The report offers the following major conclusions related to organization and resourcing:

1. The Company performed a resource review during year 2002 which resulted in a re-organization of the Distribution department and added 79 customer-facing jobs in Utah as of December 2003
2. PacifiCorp has further demonstrated its commitment to Utah-based employees through the Power Delivery Apprenticeship Program and increased technical training.
3. Employee surveys conducted in years 2001 and 2003 relayed the sentiment that the business is resource constrained. However, they also demonstrated improved employee motivation, confidence about PacifiCorp's future success, and pride in the Company.
4. In order to mitigate future risks regarding available resources for major storms, PacifiCorp is entering into a Western Region Mutual Assistance Agreement that will provide additional sources of skilled manpower from neighboring utilities during emergencies.
5. Based on its maintenance plans, customer and system growth, technology improvements, and efficiency gains, PacifiCorp believes that the current staffing plan is appropriate. Utah Power will continue to add apprentices and staff, and implement technology and work process improvements to address the load growth in Utah and maximize value for customers.

While WCI is in agreement with the Company's recent initiatives intended to increase access to skilled personnel during storms and to increase the ongoing staffing levels of customer-facing employees in Utah, we are unable to comment on the quality of analysis used by the Company to determine its staffing needs. The Distribution Business Resource Review of November 2002 recognizes the need to increase staffing levels but does not explain the analytical methodologies employed. We also note that the employee surveys conducted in years 2001 and 2003 found that 59% and 61% of the respondents, respectively, believe there are resource constraints in the power delivery organization. Therefore, we find and conclude the following:

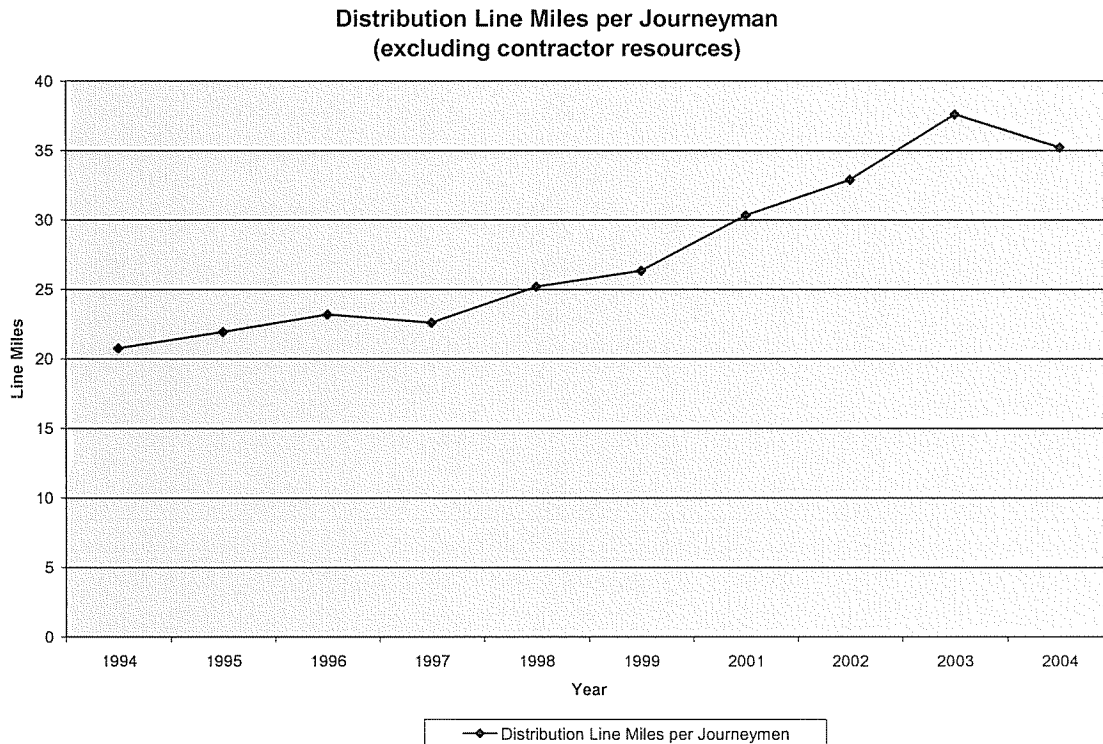
1. The Company has not provided any comparative industry staffing benchmarks to provide support for the reasonableness of its staffing levels.
2. During the period of 1990 through 2002, the Company reduced its customer facing work force in Utah from 1831 employees to 895 employees, a decrease of 51%. The Company did, however add contractor resources to supplement its internal workforce. The Company has not been able to provide specific breakdowns of the contractor resources between capital and maintenance activities, although the Company indicated that the majority of contractor work is in the area of service connections. This leads us to conclude that the effective decrease in customer facing work force may be somewhat less than 51%. During the 1994 to 2004 period, the Company experienced customer growth of 31%. This implies a significant increase in labor productivity and raises questions regarding the amount of operation and maintenance work able to be accomplished at such reduced staffing levels. This is further illustrated in the following two charts:

Figure 4.7-1



As shown in the preceding chart, there has been a substantial increase in the number of customers per customer-facing employee (these include customer service, field support, journeymen, and meter readers). The lower curve reflects the operation of the “virtual call center” with staff at both Wasatch and Portland. Given that there will be Oregon calls taken as well, the effective ratio for Utah’s customers will lie somewhere between the two curves. While productivity, information systems enhancements, and call center consolidation may account for a portion of this increase in customers per customer-facing employee, the magnitude of the increase drives our concern that insufficient staff have been retained or replaced to handle all workload requirements in light of the maintenance policy, reliability performance goals, and customer growth..

Figure 4.7-2



As shown in the preceding chart, there has been a substantial increase in the miles of distribution lines per journeyman. While productivity and information systems enhancements may account for a portion of this, we have concerns. The downturn from 2003 to 2004 may reflect the addition of new apprentices.

3. During year 2003, the Company increased its customer facing work force from 895 to 972, an increase of 77. However, we are not able to comment on sufficiency of this action.
4. While the Company's comprehensive maintenance plan is appropriate, and their performance in achieving most of their inspection and preventative maintenance targets appears to be generally on schedule, corrective maintenance appears to be persistently falling behind and the backlog of maintenance work growing.

### 4.7.3 Recommendations

#### *PacifiCorp Recommendations*

The organization and resourcing chapter concludes with no Company recommendations.

#### *WCI Recommendations*

The company's Distribution Business Resource Review of November 2002 cites risks resulting from the low level of resources to meet current workloads. The risks include excessive amounts of overtime, working in violation of the hours of service requirements of the Department of Transportation, and potential violation of regulatory obligations. Regarding overtime, the

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resource review found internal crews working up to 94% overtime in some areas, and 38% on average in Field Operations. Moreover, the limited number of skilled Plant employees resulted in the diverting of resources from maintenance work to capital projects. These conditions coupled with findings included in the previous section of our report raise serious concerns regarding staffing levels. As a result, we recommend the following:

1. Perform an activity analysis of the Company's comprehensive maintenance plan to determine the number of annual man-hours by job classification required to execute all plan requirements. Convert man-hour requirements to full-time employee equivalents considering factors such as vacations and holidays, sick time, and labor productivity rates. This analysis will suggest a minimum staffing level (including an appropriate level of contract resources) required to fully implement annual inspection, testing, preventive and corrective maintenance activities included in the maintenance plan.
2. Consider engaging an outside company to perform an independent assessment of staffing needs in Utah in order to assure objectivity and minimize the potential impact of PacifiCorp budgetary constraints.

The intent of our recommendations is to satisfy the question of whether the Company needs to hire additional human resources, beyond its current and planned employee additions, in order to strike an acceptable balance between cost optimization versus maintenance and reliability performance of the electric transmission and distribution system.

## 4.8 Comparative Performance and Benchmarking

This chapter of the PacifiCorp report is intended to address two major issues:

1. How does PacifiCorp/Utah Power's performance compare with other utilities?
2. Respond to the allegation that the quality of service has declined with each merger

### 4.8.1 Terms of Reference Compliance

The following table illustrates our opinion of PacifiCorp's compliance with the agreed Terms of Reference.

Terms of Reference - Chapter	Addressed?			Reference
	Yes	No	Adequacy	
<b>8. Comparative Performance and Benchmarking</b>				
<i>How does PacifiCorp/Utah Power's performance compare with other utilities?</i>				
• Assemble available benchmarking information (Note: it is notoriously difficult to compare utilities on a like-for-like basis due to the lack of published, normalized performance data)	X		Y	Section 12.2
• Provide details of outage duration for other storms and for other utilities (PGE, PSE, etc ), and include information for Utah municipals (Murray, Bountiful, Kaysville)	X		Y	Section 12.2
<i>Respond to the allegation that the quality of service has declined with each merger</i>				
• Provide key performance indicators for each of the following periods (to the extent records exist):	X		Y	Section 12.3
Pre-PacifiCorp merger				
Post-PacifiCorp merger				
Post-ScottishPower merger				
• Metrics to include:	X		Y	Section 12.3
Customer service indicators				
Investment levels				
Reliability measures				
Safety statistics				
etc.				

In our opinion, the Company has adequately addressed these issues and their underlying sub-issues contained in the Terms of Reference. However, we believe that had the Company provided industry comparisons, these may have been instructive in defining areas of focus for improvement.

### 4.8.2 Conclusions and Related Findings

The report offers the following major conclusions related to comparative performance and benchmarking:

1. Despite difficulties in developing meaningful comparisons with other utilities, PacifiCorp has and will continue to refine its metrics and track its performance utilizing best practices and industry standards drivers, such as EEI and IEEE.
2. PacifiCorp agrees with the approach of IEEE P1366-2003 and it supports this methodology being utilized more broadly.
3. PacifiCorp has experienced zero or fewer than normal lost-time or recordable incidents.
4. While there is room for improvement, PacifiCorp employs a number of best practice approaches to efficient and effective outage management in terms of technology, planning, internal communications and metrics.
5. Based on the comparative performance and benchmarking review, it is clear that Utah Power customers have benefited from the successive mergers from a price and service perspective. Service has improved as PacifiCorp has implemented a number of best practice technologies and metrics to improve customer service and outage call handling.
6. PacifiCorp material specifications for poles and wires meet or exceed industry standards and the design parameters are appropriate for the Utah geography.



7. PacifiCorp has made significant investments in capital and maintenance in the Utah service territory, with maintenance and capital investments trending up over the past three to four years. However customer perception of reliability continues to decline in the face of rising customer expectations.
8. PacifiCorp recognizes it must continue to assess and invest in system improvements to further improve reliability. Reliability of supply, however, was not the fundamental failure in the events of December 26, 2003 to January 2, 2004. The fundamental failure was the inability to provide adequate information to customers that was timely and accurate.

While PacifiCorp offers reasoning as to why they have not included industry benchmarks, we find that such benchmarks provide value in identifying areas on which the Company should focus to better understand their performance relative to others and to use this information to seek out other panel members whose performance appears to be best-in-class. This can lead to identification of best practices that are applicable in Utah Power and/or all of PacifiCorp.

### **4.8.3 Recommendations**

#### ***PacifiCorp Recommendations***

The comparative performance and benchmarking chapter concludes with three Company recommendations.

1. Work with commission to adopt IEEE P1366-2003 as the methodology to utilize for evaluating system reliability.
2. Develop and standardize post-event data collection for major events including personnel response numbers, damage type and customer data for future industry comparison use.
3. Continue to evaluate reliability improvements without compromising PacifiCorp's price position.

#### ***WCI Recommendations***

WCI supports and agrees with the foregoing recommendations. We believe, however, that PacifiCorp should expand its benchmarking efforts to provide comparisons to industry. In this context, we understand that PacifiCorp has signed up for and is participating in PA Consulting Group's current T&D Benchmarking program and we applaud the Company's decision to do so. We offer the following additional recommendations:

1. Given the physical, geographical, staffing, budgeting and performance differences among the Company's various state operations, PacifiCorp should expand its recently initiated participation in the PA utility T&D benchmarking program to include separate reports for each of PacifiCorp's state operations, at least for Utah.
2. Participate in both I.E.E.E. and EEI reliability surveys to provide additional insight as to relative performance.

### **4.8.4 Analysis and Industry Comparisons**

Relevant industry comparison data and analyses have been provided in the respective Chapters.

## 4.9 Major Event Definition and Compensation

### 4.9.1 Terms of Reference Compliance

The following table illustrates our opinion of PacifiCorp's compliance with the agreed Terms of Reference.

Terms of Reference - Chapter	Addressed?			Reference
	Yes	No	Adequacy	
<b>9. Major Event Definition and Compensation</b>				
<i>Is the number and frequency of "major events" increasing?</i>				
• Document all major events since inception and comment on any observed pattern	X		Y	Section 13.4
<i>Should the major event definition be revisited?</i>				
• Review history of the Customer Guarantee and Performance Standards programs	X		Y	Section 13.6
• Describe purpose of the "major event" exclusion (e.g., to track "underlying" performance)	X		Y	Section 13.2.1
• Describe linkage between the definition/targets/payments/etc.	X		Y	Section 13.2
• Work with regulators to review major event definition (describe major event definition in other states served by company)	X		Y	Section 13.2.1
• Include consideration of technology failures/performance issues in determining major event criteria	X		Y	Section 13.1
<i>Should customers receive compensation/guarantee payments given the extent of the inconvenience during long outages?</i>				
• Examine the costs and benefits of a "backstop" compensation plan (regardless of major event declaration)	X		Y	Section 13.6
• Describe UK customer service guarantee programs (what is major event, are payments made, etc.)	X		Y	Section 13.6
• Boxing Day Storm in UK (describe what ScottishPower did for customers)	X		Y	Section 13.6

In our opinion, the Company has adequately addressed these issues and their underlying sub-issues contained in the Terms of Reference.

### 4.9.2 Conclusions and Related Findings

The report offers the following major conclusions related to major event definition and compensation:

1. PacifiCorp is confident that its performance consistently meets the reasonableness tests applicable to day-to-day performance and major events. The company also understands that "reasonableness" may from time to time require independent evaluation by regulators.
2. Evaluations should be conducted by qualified personnel who have engineering and industry expertise. In the case of this inquiry, a third-party consultant is conducting such an evaluation.
3. The company recognizes that, if ever its design and operating decisions in relation to a declared major event are determined to be unreasonable, corrective action may be necessary.
4. Utah Power does not currently see the benefits to the general public nor the wisdom in offering an ongoing, standard compensation plan related to extended outages. If such a program were to be offered, it would need to be funded through rates.

WCI concurs with these conclusions and adds that adoption of a consistent method of determining major events will bring benefit to PacifiCorp and the industry in general as it will allow more meaningful comparisons of performance metrics, particularly reliability measures. However, the proposed method may result in a higher count of excludable events thus improving the reliability metrics excluding storms. We believe this trade-off is justified.

### **4.9.3 Recommendations**

#### *PacifiCorp Recommendations*

1. Design a process that is agreeable with the Utah PSC, to determine a major event definition, and any associated compensation plans.
2. Work with the Utah Public Service Commission to adopt the IEEE-P1366 (Guide for Electric Power Distribution Reliability Indices) reliability measurement standards.
3. The company proposes that the Utah Public Service Commission adopt the IEEE-P1366 Standard as the major event definition for the Customer Guarantee Program, to be filed as an updated version of Rule 25, including Performance Standards 1-5. The company believes that the new standard should also be used for customer guarantee performance. However, since there is still much to be discussed in terms of public policy and the company's future plans for its customer guarantee program, the company proposes that the existing discussions be continued pending a joint agreement on future directions. Meetings already have been scheduled to continue this dialog.

WCI concurs with these recommendations.