

# Oregon Investor-owned Utilities Seven-Year Electric Service Reliability Statistics Summary 2002-2008

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Report available at <http://www.puc@state.or.us> (Click on "Safety")



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## Introduction

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Safe and reliable electric power at a reasonable cost is the goal of our industry. How this goal is measured and evaluated for individual customers at the distribution level has changed and improved over the years. The overall robustness and integrity of the distribution systems today are far superior to the systems serving Oregonians 15 or 20 years ago. And yet, the expectations and needs of the average electric customer, whether urban or rural, continue to be higher and higher. Today's wide variety of home and business electronics makes our lives better, but also makes us increasingly dependant on high quality, reliable electric service. The challenge is to find the right balance between low cost and high service quality.

Utility operators need to know how their systems are performing with accurate and up-to-date information. Regular system inspections are important for knowing the general condition of the system. For more immediate information, Oregon's three Investor-Owned Utilities (IOUs) have monitoring and control systems, and each one has chosen a different type of system. PacifiCorp initiated its Computer Aided Distribution Operations System (CADOPS) in Oregon in 2002. Portland General Electric continues to expand Supervisory Control and Data Acquisition (SCADA) systems to additional substations and Idaho Power has added Sentry units downstream of operating devices on their system. Also, some of the new customer meters with real time communication capabilities, promise better system performance analysis tools and prompt utility notification in case of outages. Of course, all of this comes with a price tag.

The Oregon Public Utility Commission has been working with these utilities to bring greater uniformity and accuracy to the data being reported annually. This data is required by OAR 860-023-0080 through 0160. Accurate data allows meaningful comparisons year-to-year and utility-to-utility, even though the systems and the areas served are very different. Accurate data also allows the utility to direct operations and maintenance funds in a more efficient manner, based on solid facts related to what customers on a given circuit are experiencing.

Some of the changes in data collection result in more accurate but higher numbers, which seems to indicate poorer service (even when it has not changed). In general, the multi-year graphs give a good idea of what customers are experiencing in Oregon. The comparisons in performance in this report give a variety of ways of looking at the same general subject. The report does focus on the system failures (outages), but it is important to know that most Oregon customers of these three utilities are receiving safe and reliable service.

Note: IOU means Investor-Owned Utility, which are fully regulated by the Oregon Public Utility Commission. These utilities, Portland General Electric, Pacific Power and Light (PacifiCorp), and Idaho Power, serve almost 74 percent of Oregon's electric customers.

## General Information

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### This report:

#### A. Compares three utilities whose customer base and service territories are very different in nature:

**Portland General Electric** (PGE) - has a compact service territory with a fairly urban and suburban character in N.W. Oregon. Average customer per line/trench mile is about 45.4\*.

**PacifiCorp** (PAC) - includes some larger Oregon cities but serves several separate areas and is mostly rural. Average customer per line/trench mile in Oregon is about 26.5\*.

**Idaho Power** (IPC) - covers a very rural part of Eastern Oregon, including some very remote areas. Average customer per line/trench mile in Oregon is about 6.8\*.

#### B. Uses standard industry formulas to calculate data points:

##### **SAIFI** - System Average Interruption Frequency Index

The average number of times that an average customer experiences a service interruption during a year. SAIFI is an indicator of utility network performance. (Note: This does not include automatic operations or “blinks.” See MAIFle, below.)

##### **SAIDI** - System Average Interruption Duration Index

The average total amount of time that an average customer does not have power during a year. SAIDI generally measures the operating performance of the utility in restoring customer interruptions.

##### **MAIFle** – Momentary Average Interruption Event Frequency Index

The average number of times that an average customer experiences momentary interruption events during a year. This does not include events immediately preceding a sustained interruption.

For further information, see OAR 860-023-0080.

#### C. Other

In this report, statistics for SAIDI and SAIFI are shown excluding and including major events.

Per OAR 860-023-0080, “Major event” means a catastrophic event that:

- a. Exceeds the design limits of the electric power system;
- b. Causes extensive damage to the electric power system; and
- c. Results in a simultaneous sustained interruption to more than ten percent of the metering points in an operating area.

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\*These are approximate customer/high voltage line miles and include transmission and distribution, both overhead and underground.

Note: Staff’s emphasis on the safety and reliability of electrical utility systems can also be found in the Service Quality Measures for PGE and PacifiCorp, the annual Incident Report, Safety Staff Policies, and National Electrical Safety Code enforcement and administration for Oregon.

## **Data Collection Methodologies**

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Each of the three electric utility companies use somewhat different data collection methods for reliability reporting:

### **Idaho Power Company**

Idaho Power Company (IPC) gathers data for the Oregon Annual Electric Service Reliability Report (AESRR) through an Outage Management System (OMS) and dispatch entry process. The OMS receives trouble orders in real time from the Customer Information System (CIS) as they are entered by call center staff. The OMS analyzes the call pattern and predicts the potential extent of each outage. The OMS operators (located in the dispatch center) perform switching real-time on an electronic map in the OMS to reflect all distribution switching performed in the field and any SCADA operations. OMS records are transferred nightly into a permanent historical datamart (PDM). PDM is an Oracle database with a combined Crystal Reports and Excel/Visual Basic reporting system. Transmission events are still entered in the Dispatch Outage Reporting System (DORS). DORS is a SQL (Structured Query Language) database with a Visual Basic/Access reporting system.

Dispatchers also enter any interruption or switching on a Switching Log. OMS records and switching logs are compared and reconciled each evening by dispatch center personnel, to ensure accuracy and consistency. Momentaries are gathered from the Sentry monitoring system and entered manually into the OMS. The use of the OMS and PDM, to report outages, means that single transformer and even single service outages are captured and reported. This level of detail was not available before the implementation of the OMS.

The information from several events, performance data, outage causes, and equipment and statistical reports from PDM are run on IPC's Oregon operating area and each Oregon circuit. The reports are used to create Excel tables and charts and geographic information system (GIS) maps for the AESRR.

Idaho Power's service territory includes one operating area in Eastern Oregon.

### **PacifiCorp**

PacifiCorp operates automated outage management and reporting systems. Customer trouble calls and SCADA events are interfaced with the Company's real-time network connectivity model, its CADOPS system. By overlaying these events onto the network model, the program infers outages at the appropriate devices (such as a transformer, fuse, or other interrupting device) for all customers down line of the interrupting device. The outage is then routed to appropriate field operations' staff for restoration, and the outage event is recorded in the Company's Prosper/US outage repository. In addition to this real-time model of the system's electrical flow, the Company relies heavily upon the SCADA

System that it has in place. This includes the Dispatch Log System (an Access database application) which serves to collect all events on SCADA-operable circuits. All data is then analyzed for momentary interruptions to establish state-level momentary interruption indices.

PacifiCorp service territory in Oregon includes 23 operating areas. The operating areas include: Albany, Bend/Redmond, Clatsop (Astoria), Coos Bay/Coquille, Corvallis, Cottage Grove/Junction City, Dallas/Independence, Enterprise, Grants Pass, Hermiston, Hood River, Klamath Falls, Lakeview, Lebanon, Lincoln City, Madras, Medford, Milton-Freewater, Pendleton, Portland, Prineville, Roseburg/Myrtle Creek, and Stayton.

## **Portland General Electric**

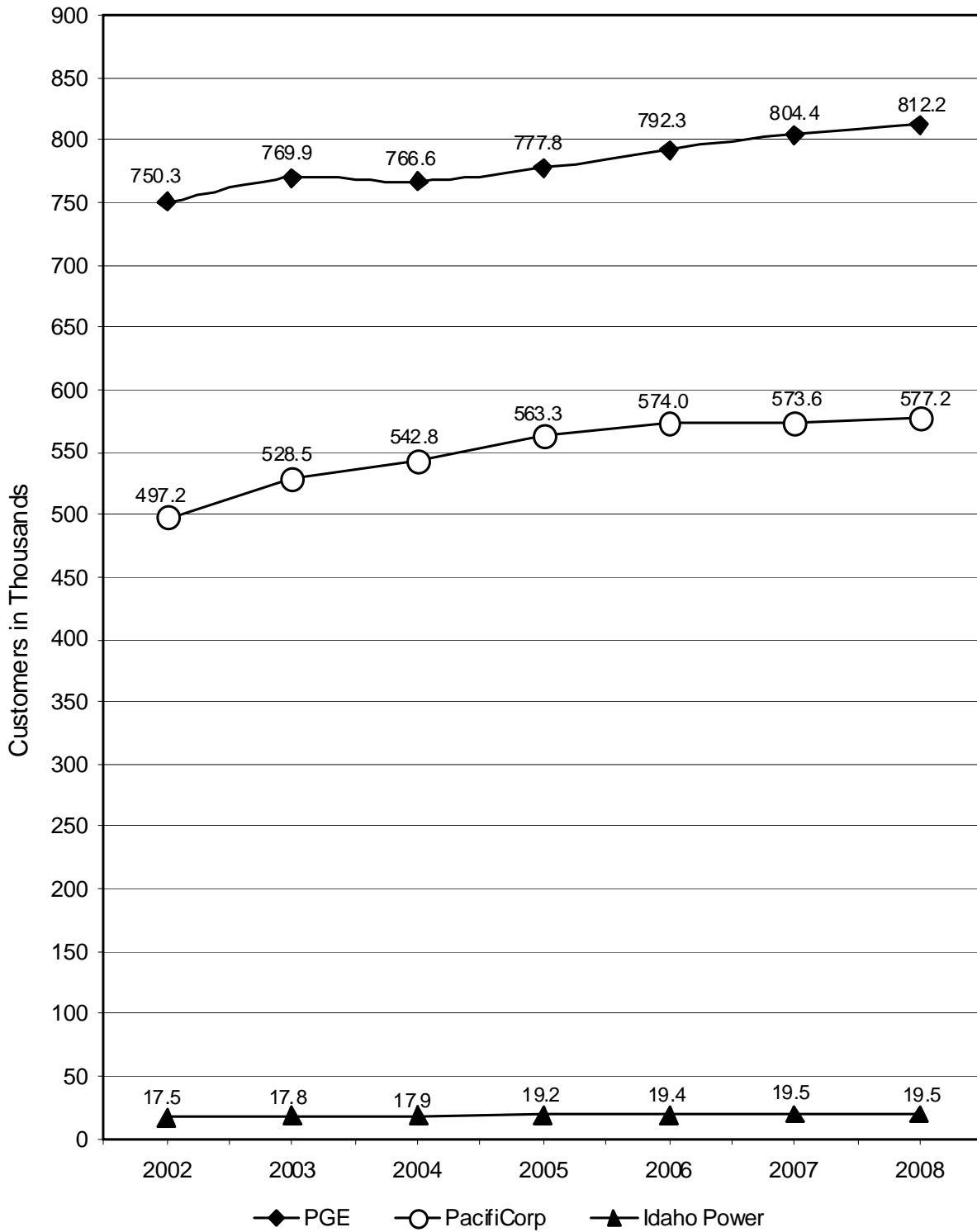
PGE uses a computerized OMS to log and track outages that occur on the system. It interfaces to CIS, GRID (an electronic map-based connectivity system), outage history and IVR (Interactive Voice Response) to generate an outage record once a trouble call comes in. This information is transferred into a new reliability program every month where outages are reviewed and evaluated to ensure that the data is as accurate as possible. The reviewed outages are then used to calculate SAIDI, SAIFI, and data presented in PGE's Annual Reliability Report.

Momentary outages (MAIFle) are logged and reported for the stations equipped with SCADA and MV90 (a meter-based data collection system). Out of PGE's 146 distribution substations, 87 are equipped with SCADA and 52 are equipped with MV90. The 7 remaining distribution substations, with neither SCADA nor MV90, have recorded reading collected on a monthly basis.

PGE's service territory includes four operating areas in Northwest Oregon. They are the Central Region, Eastern Region, Southern Region, and Western Region.

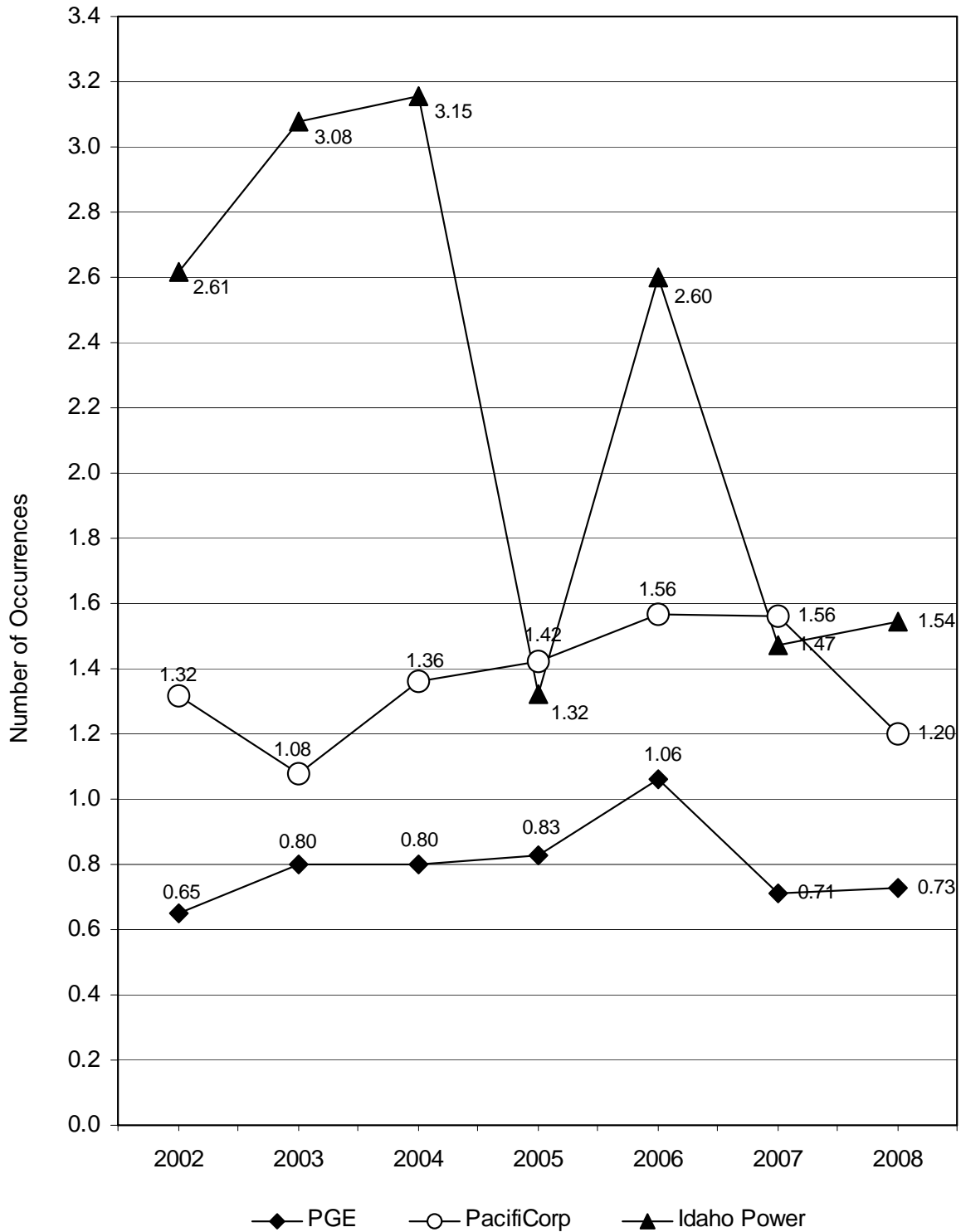
# Number of Customers (Oregon\*)

2002-2008

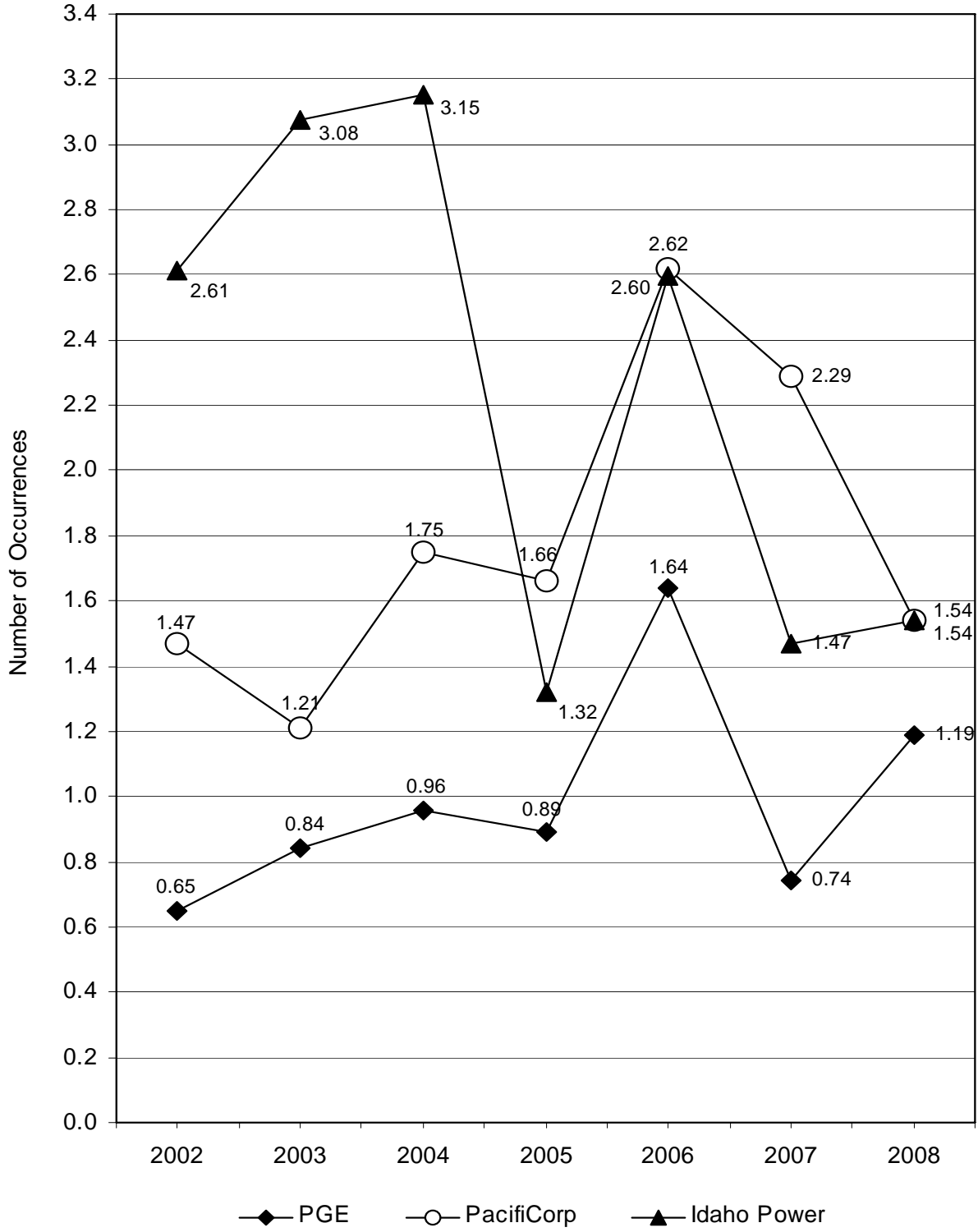


\* From number of metering points as defined in OAR 860-023-0080 and as reported in each company's annual reliability report required by OAR 860-023-0150.

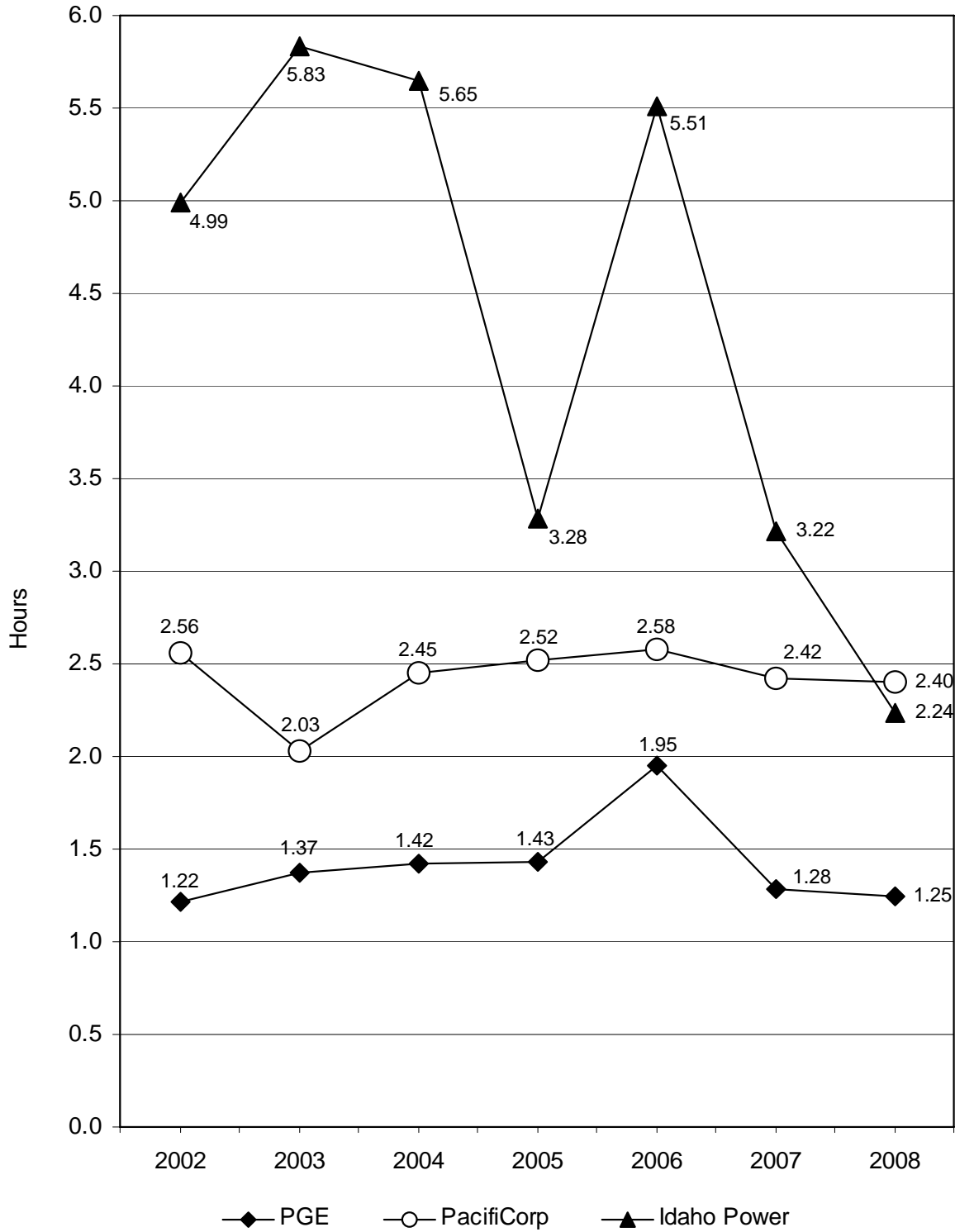
# SAIFI (with Major Events excluded) Average Number of Outages Per Customer



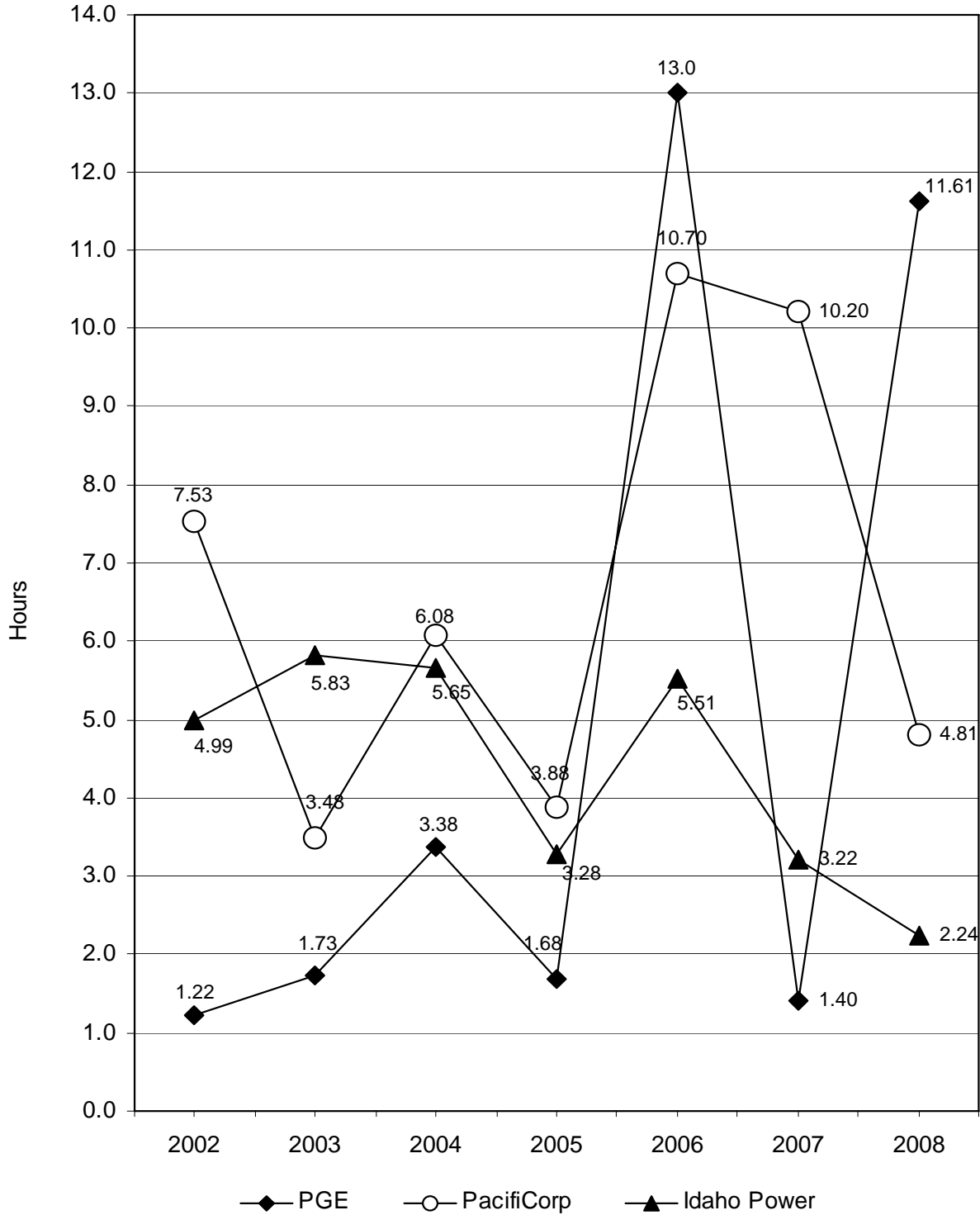
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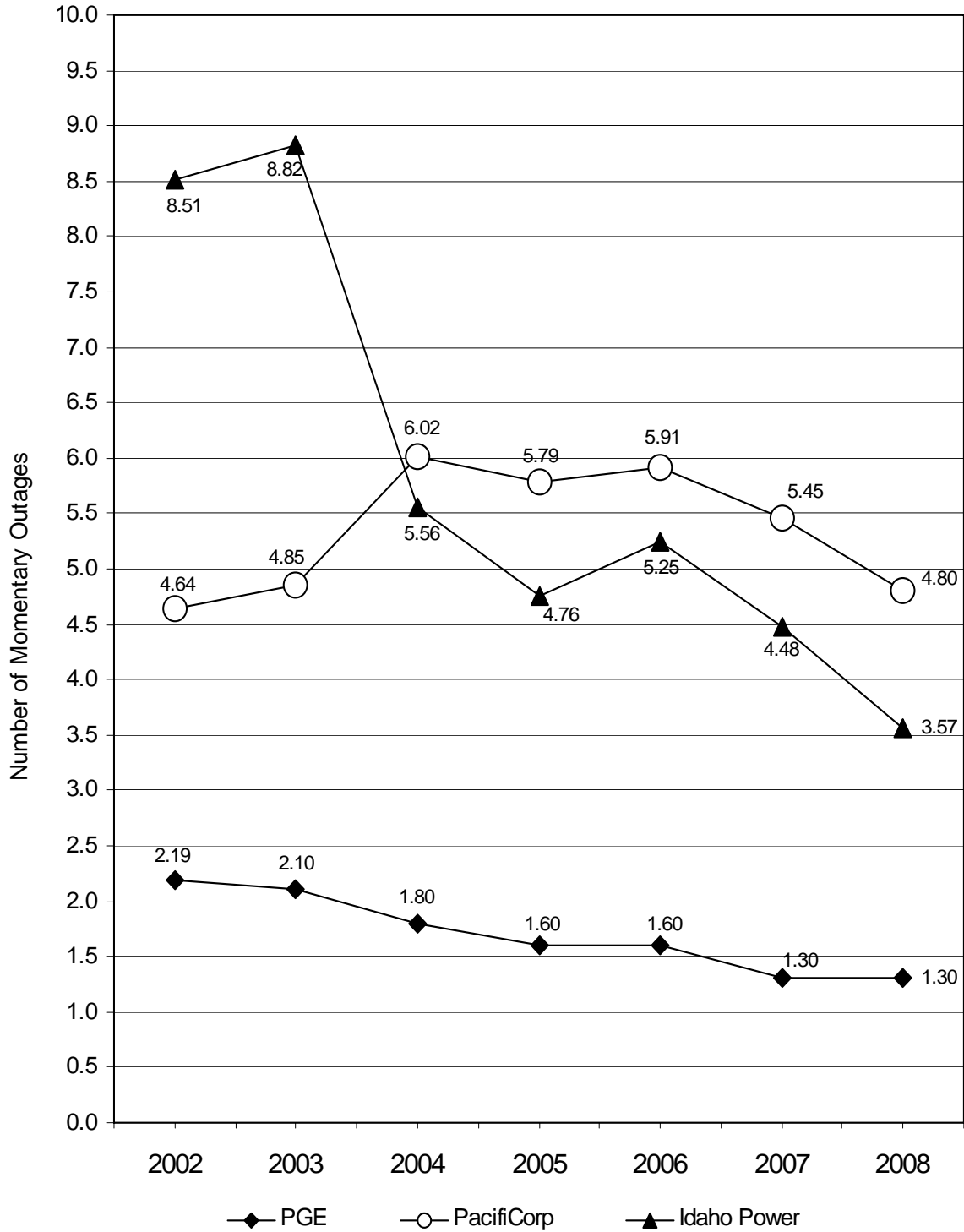
# SAIDI (with Major Events excluded) Average Hours of Outages Per Customer



# SAIDI (with Major Events included) Average Hours of Outages Per Customer



# MAIFie (with Major Events excluded) Average Number of Momentary\* Outages Per Customer



\*Interruptions under five minutes