

## Methodology/Disclaimer

### Use of This Data – Disclaimer

This data is provided “as-is” and ERI Economic Research Institute, Inc. (“ERI”) acting under the DBA of SalaryExpert, and SalaryExpert.com make no warranty, either expressed or implied, including but not limited to, warranties of correctness and fitness for a particular purpose. In no event will ERI be liable for any indirect, special, consequential, or other damages however caused. Data has been modeled from a foundation of datasets provided by ERI's historic study of U.S. DOL/ETA/BLS OES collections. International data is created from online international remuneration, cost of living, and college entry offer surveys as found in SalariesReview databases that are used to create similar OES geographic area job family norms.

### Data Sources and Calculations – An Overview

This program solves the need to refresh screens that handicaps any quick calculating retrieval program provided on the Internet. **SalaryExpert** contains a complex program that, if downloaded, provides numerous graphs and presentations. The approach is to utilize actual survey data and report the percentages used to reform the foundation numbers (beginning with U.S. OES salary survey data for the 1999 - 2007 years and showing the 2007 rates utilized for H1-B purposes) and SalariesReview.com data (for International analyses). Percentages used for ranges, cost of living, and benefit costs are provided by [www.salariesreview.com](http://www.salariesreview.com). Should maturity curves be displayed, mid-tenure years are taken from the OES – DOT crosswalk (using ERI's eDOT's SVP measures, which are now updated and found in ERI's enhanced Dictionary of Occupational Title™) with data points of 1 year, the eDOT year, and 2x the DOT year.

### Data Sources

ERI Economic Research Institute, [www.eri.co.uk](http://www.eri.co.uk), Ltd., and SalariesReview provide the data underlying these analyses. The U.S. survey sources are non-copyrighted data collections. The BLS provides further information on international statistical agencies: [www.bls.gov/bls/other.htm](http://www.bls.gov/bls/other.htm).

### Cost of Living

The **Salary Expert** Cost of Living calculation incorporates housing and apartment rental data from sources such as: the National Association of Realtors Median Sales Price of Existing Single-Family Homes for Metropolitan Areas, the S&P/Case-Shiller Home Price Indices for 20 Metropolitan areas and three aggregated composites, the Bureau of Labor Statistics Home Price Index and the Federal Housing Finance Agency House Price Index. These are all considered broad measures in the movement of single family home prices and are usually MSA or city wide figures. **Salary Expert** assumes the same expenditure pattern for all salary levels and uses a generalized price level index to calculate differences in expenditure components. **Salary Expert** assumes no taxes.

### Differences between SalaryExpert's site and other Competing Free Data sites

#### SalaryExpert.com

#### Free Sites (providing Questionable Data)

Provides a reliability standard error	Reliability statistics are not provided
Shows sources and source data	Do not disclose all sources; show no source data
Provides a population “n” estimate, illustrates if jobs exist in an area	Provide no population “n” (show nuclear engineers in Juneau, Alaska when none exist)
Provides buying power comparisons	No comparison cost-of-living data is provided
Shows total compensation with benefits	Show employee benefit data and gives advice
Displays a full statistical methodology	Limit explanations of “methodology”
Source data defensible in court	Uncertain admissibility per Court challenges
All data compared to National Norms	No cost-of-living, benefit or combined comparisons
Conservative values assist management	High values create inflated employee expectations

## Parallel, Adopted Methodology

Except as shown on the graphs and reports (presentations of modification percentages), **SalaryExpert's** methodology borrows from and parallels that found at <http://stats.bls.gov/oes> as described on the following pages.

## Skill-Based Pay Estimates

All data estimates are derived from the weighted averages of real salary surveys' means, with some of these surveys grouping a large number of jobs into job families. When job grouping occurs, the reported results are distributed among the specific jobs within a job family using (with permission from ERI Services, Inc) the eDOT's™ worker characteristics. Adjusted by these measures, this effectively creates a "skill-based" pay average. (There is no skill-based adjustment when job grouping does not occur.)

## Methodology/Disclaimer

### Immigration Wage/Salary Trends ERI's Time Series of the Data Reported in the Occupational Employment Statistics Salary Surveys

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This data is provided "as-is" and ERI makes no warranty, either expressed or implied, including but not limited to, warranties of correctness and fitness for a particular purpose. In no event will ERI be liable for any indirect, special, consequential, or other damages however caused. In some cases, no published assignments of geographic areas exist (see Requested OES Area below); in other cases, ERI has found data that appears incorrectly keyed. ERI presents a crosswalk among eDOT, SOC, OES, and NOC code that is created from its best effort analyses of reported data. ERI has no way to audit this data; it is republished as collected. U.S. raw data shown is non-copyrighted (as is all U.S. Government data). For international data, ERI relies upon data contributed from various ERI licensed surveys and from Internet visitors' input. The latter data is only accepted and accommodated within SalariesReview.com analyses if it meets certain Standard Error tests (generally, data input should be within plus/minus 2 standard errors of the calculated mean).

#### OES Survey Job Class Description

Job Class, as used by ERI, denotes the fact that the Occupational Employment Statistics (OES) Salary Survey begins with the premise that it will include all workers in America and reflect all jobs and positions. ERI's definition of a *position* is that it is a specific job held by an individual with specific duties, objectives, and responsibilities. A *job* is a grouping of similar positions, and a *job family* is a collection of jobs. The OES survey is best described as a collection of job families for higher levels, technical, and professional positions, although it may actually represent a "position" with lower level responsibilities (such as a word processor). The *Job Class* term is used to denote that the OES job definition will include many different types of positions and job titles, including in some cases, that job's first-line supervisory counterpart and paraprofessional peers. It will often represent a collection of job families (some 820 in all). Likewise, each of [SalariesReview.com's](http://SalariesReview.com) approximately 5,700 positions have been condensed into 820 job families so that International, Canadian, and U.S. positions are measured in the same manner.

#### Requested OES Area and Defined Areas

Any one of 633 different OES areas covering all of the U.S. and its territories can be selected (areas have been updated to reflect the 2000 Census with all states, except Delaware, being altered effective July 2006). OES Area names are those defined and used by the U.S. Government. In addition, ERI provides data on a state, territory, and province summation basis with those areas' codes ending

with four zero digits. Likewise, ERI has created similar "OES Areas" for some 1,400 international locations. There is no common rule used, such as the 2-hour commuting definition for the U.S., because of transportation differences among countries. Work locations are typically defined as within 100 kilometers.

### **Time Series Projection**

ERI calculates a linear regression line based upon up to three data points published by the Occupational Employment Statistics Salary Survey. The Institute uses July median collection dates for each of the 959 job classes and 820 job groups found in 633 geographic areas. OES collects data throughout the year and BLS adjusts it to a central date. ERI assumes that the last day of each month is used and projects data to one day short of the first of the next month for any inquiry, using an equation in the form of:  $Y = a + b * X$ . This equation is established from the reported weighted average of each year. The use of the equation is to project means for any month (defined as the same month as the inquiry with 2008 data being defined as  $2008 \times 12 + 6 = 24102$  for the "x-axis" coordinate). Similarly, the 2009 data (collected in 2007) was regressed against a 241014 value, and Year 2007 data (reflecting 2005 data) was regressed against 24090. The resulting equation is then applied. For example, a May 2008 date is defined as  $2008 \times 12 + 5$  or 24101. If data is present for one year and not for another or is of a different "type," then ERI assumes the projected rate will not be less than the most recent value gathered for that job.

### **Survey/Source Name**

**SalaryExpert.com.** ERI research data provide answers to all manner of questions on market pricing, industry benchmark listings, employee transfers, salary planning, and branch pay administration. These analyses are founded on either U.S. OES surveys or ERI's own SalariesReview.com interactive survey sites.

### **Survey Data Publishers**

The publisher and collectors of this data are the U.S. Department of Labor's Employment and Training Administration (ETA), the Bureau of Labor Statistics (BLS), and 54 State Employment Agencies (SESAs), all acting together to create consistent prevailing wage rates to be used as the wage component of the Bureau of Labor Statistics' expanded Occupational Employment Statistics (OES) program. SalariesReview is the publisher and collector of international data.

### **OES/SOC Job Reference Number**

This is a 6-digit number assigned by the SOC to define the positions surveyed. For surveys conducted in the Year 2000 and thereafter (reported in the Year 2001), this number was changed to comply with the North American Free Trade Act (NAFTA), and the Standard Occupational Code (SOC) was adopted as a 6 digit code as contrasted to early years use of a 5 digit OES code. At that time, the US Government began to speak of job families as "occupations," a term that previously (for Centuries) had meant "jobs."

### **OES Area Reference Number**

This is a six-digit number. The first two digits represent the state (or territory) and the latter two represent one of the 631 geographic areas that cover and include all areas within the United States and the 46 assigned Canadian areas. Metropolitan Statistical Areas are used, as are OES self-described areas such as "Northwest Washington," which includes all counties not already included in PMSAs and/or MSAs. Except for Massachusetts, Connecticut, and Rhode Island (which divide counties), OES areas can all be defined as a collection of counties and/or Canadian Census subdivisions. SalaryExpert international OES areas (like those in Canada) have been developed by ERI and ERI and are defined by either the census organization employed by the respective country or areas defined by the primary city. These areas are defined by a 12-digit code that embeds a country identification along with two possible sub regions.

### **Salary Survey Area**

The collections of counties and/or subdivisions are those found within a specified OES area either government supplied or created by ERI and/or ERI for this application.

### **Job Titles Included**

The titles shown are those understood by ERI to be found within the Job Class Description. Selecting any one of the underlined (blue) titles below takes one to [www.SalariesReview.com](http://www.SalariesReview.com), a fee-based report for the specified position. Double clicking on the active link/titles will take users to this separate survey (not the OES) where base salary, incentive, total compensation, and survey participant estimates may be found. If a position title is in [blue](#) and underlined, sufficient sample sizes exist to report wage/salary data. If black and not linked/underlined, sufficient sample sizes do not exist at this time in [SalariesReview.com's](http://SalariesReview.com) "U.S. and Canada Wage and Salary Survey."

### **OES Survey Job Description**

Survey Descriptions are those of the OES with additional inputting of qualifiers to illustrate when jobs include first-line supervision, paraprofessionals, etc.

### **Methodology/Description**

As found in this prose.

### **Report Date**

Report Date is the date on which the Search Report is generated on the Internet.

### **Data as Reported**

Each year ERI accesses the data files of the OES survey and extracts the reported means, Level I, II, III and Level IV data for 633 geographic areas. ERI has titled the "Year 2007" data as "Data to be Used in 2007," even though the information was collected in 2004-2005 and labeled as "2005" data by other entities. 1998 represents the first year of data reporting and many areas were reported as a "contiguous area" that may or may not be within the same state. These "contiguous areas" may change from year to year. To establish meaningful trend lines, ERI has selected to focus on the "1," "3," and "4" Types that are described below.

The definitions below are taken directly from General Administrative Letter No. 2-98, the Labor Department's Guidance on New Prevailing Wage Policies for immigration programs of October 31, 1997 as enhanced by GA Letter No. 1-00 of May 16, 2000 (and are no longer found on any US Government Web site).

### **Type**

OES reports positions within an area as either "1" (local area in which individuals may commute); "2" (contiguous/adjacent area); "3" (state-wide), or "4" (national). ERI does not necessarily show all these values and in all cases converts data to annual compensation (by multiplying hourly rates x 2080 hours). Should an area show a "4" for data in 2005, a "2" for data in 2004, and a "1" for data in the Year 2007, only the latter would be used (and the equation would be a horizontal straight line). Overall Mean is not usable for certification purposes per GA Letter 2-98; Level I Mean is the weighted average of the first one-third of a survey sample; and Level II Mean is the weighted average of the remaining two-thirds (including all those positions that "work with indirect supervision"). OES has historically provided a separate database for Researchers Employed by Colleges and Universities, College and University Operated Federally Funded Research and Development Centers, and Certain Research Agencies. (The data in this report are from the general OES database and not for Researchers.)

1 = MSA, PMSA, or Balance of State Area  
(local area in which an individual may commute);

- 2 = Contiguous/Adjacent Areas;
- 3 = Statewide;
- 4 = U.S. Nationwide.

A horizontal equation is utilized if no local area data existed before the most recent year. For example, the 2006 data is projected as unchanged in the Year 2007. Only "like areas" are trended (2 vs. 2, 3 vs. 3, 1 vs. 1, or 4 vs. 4). If the Government does not report local area data (a "1" in the most recent year), a trend line and its projection may not be reported.

### **Annual Mean**

The OES definition of "mean" is well defined for our purposes:

*Methodology in any type of survey must reflect the average (arithmetic mean) rate of wages, that is, the rate of wages to be determined, to the extent feasible, by adding the wages paid to workers similarly employed in the area of intended employment and dividing the total by the number of such workers. This will, by definition of the term arithmetic mean, usually require computing a weighted average.*

That said, we refer the interested reader to the concepts of winzorized means and hot decking as described in the Government's technical site: <http://stats.bls.gov/oes> as used in the OES survey. Canadian annual means are the earnings reported for those fully employed in that occupation.

### **Level I**

These are beginning level employees who have a basic understanding of the occupation through education or experience. They perform routine or moderately complex tasks that require limited exercise of judgment and provide experience and familiarization with the employer's methods, practices, and programs. They may assist staff performing tasks requiring skills equivalent to a Level II and may perform high-level work for training and developmental purposes. These employees work under close supervision and receive specific instructions on required tasks and expected results. Work is closely monitored and previewed for accuracy. (Canadian Level I represents the average for the lowest earning census division reported from among those fully employed within this occupation. Should there be only one census division in an assigned area, then Level I, Level II, and Annual Mean Earnings will be the same for this Canadian area.)

### **Level IV**

These are fully competent employees who have sufficient experience in the occupation to plan and conduct work requiring judgment and the independent evaluation, selection, modification and application of standard procedures and techniques. Such an employee uses advanced skills and diversified knowledge to solve unusual and complex problems. They may supervise or provide direction to staff performing tasks requiring skills equivalent to a Level I. These employees receive only technical guidance, and their work is reviewed for application of sound judgment and effectiveness in meeting the establishment's procedures and expectations.

If a baccalaureate degree is normally required for entry into the occupation, the wage rate for a job offer in that occupation requires a further advanced degree (Master's or PhD) for workers performing tasks requiring skills at a Level II. In this case, the requirement for advanced education substitutes for the skills required at a Level II. Where an advanced job degree is normally required for entry in the occupation, the wage rate for a job offer in that occupation shall be the rate for workers performing tasks requiring skills at a Level I, unless there are other requirements contained in the job offer or components thereof which require skills that are at a Level II. For example, a job opportunity for a librarian, an occupation for which a Master's degree is normally required for entry into the occupation, would generally be considered to require skills at a Level I, unless other requirements in the job offer or components thereof require skills at a Level II.

Where States licensure is required for an individual to independently perform all of the duties encompassed by the occupation, such workers shall be considered to be performing work requiring skills at a Level II, unless the employer can present sufficient evidence that the individual does not, in fact, independently perform all of the duties encompassed by the occupation.

In practical terms, if an employee utilizes any discretion, or works with any freedom of action, it is most likely a Level IV position. The overall Mean is not usable for certification purposes per GA Letter 2-98; Level I Mean is the weighted average of the first one-third of a survey sample. Level II Mean is the weighted average of the remaining two-thirds, including all those positions that "work with indirect supervision." Canadian Level II earnings are the highest reported average for any one-census subdivision within the assigned OES area. In 2005, the OES added two additional levels for a sequence of **Levels I, II, III, and IV**.

**Data reported by U.S. Dept. of Labor - Occupational Employment Statistics Prevailing Wage Rates** for 07/01/06-06/30/07 H-1B Estimates have been enhanced with two calculated columns: Level 2 and Level 3 because as of March 28, 2005, ETA 9089 rules requiring at least 4 levels of wages. The Consolidated Appropriations Act, 2005 amended Section 212(p) of the INA, 8 U.S.C. 1182(p) now provides that: (3) The wage required to be paid pursuant shall be 100 percent of the prevailing rates and:

4) Where the Secretary of Labor uses, or makes available to employers, a governmental survey to determine prevailing wage, such survey shall provide at least 4 levels of wages commensurate with experience, education, and the level of supervision. Where an existing government survey has only 2 levels, 2 intermediate levels may be created by dividing by 3 the difference between the two levels offered, adding the quotient thus obtained to the first level, and subtracting that quotient from the second level.

### **Sample Size**

At this time, the OES does not "directly" publish the sample size of its survey, neither incumbents represented nor firms surveyed. To complete this analysis, ERI has had to estimate the number of incumbents from reported "all-over" state accumulations. In ERI's opinion, one of the reasons for not reporting the number of incumbents measured is that the State Labor Departments (which have a funding related, OMB- BLS goal of an 80% response rate from all mailed OES survey questionnaires) have been given guidance on *mean imputation* and *nearest neighbor hot decking*.

To explain, the OES survey consists of both head count and salary data collection. When wage data is missing and head counts exist, missing data is "imputed" from national distributions. When head counts are not reported, but wage data exists, "hot decking" is used. Selected is the closest comparable company "donor," and that donor's wage data is used. When both total employment and wage-employment data are missing, both hot decking and imputation are used.

### **Reliability Statistics - A Note for Expert Witnesses**

In 1975, the U.S. Congress passed Federal Rule of Evidence 702 so that a threshold standard for the admission of expert witness testimony might exist in Federal Courts. The basis of the concept is that experts should use methodologies that are "generally accepted" by a discipline's practitioners. The rule states: "If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise." Following this, the Supreme Court issued an opinion in *Daubert v. Merrill-Dow Pharmaceuticals*, 509 U.S. 579, 113 S. Ct. 2786, 125 L.Ed.2d 469 (1993), that has become the standard for the admission of "general acceptance." In this case (a standard adopted by most Federal and State Courts), the admittance of expert witness testimony and evidence required a two-step analysis: a) evidence must be relevant, and b) evidence must be reliable. The *relevance* is a subjective judgment, but simple logic may be applied (salary survey data for use in lost wage analyses, proxy compensation data for use in maximum reasonable compensation cases, etc.) For the latter, *reliability*, the Supreme Court established four separate, non-exclusive tests: 1) it can be illustrated that the theory or technique can be tested, 2) the data has been subjected to peer review

and publication, 3) there is a known or potential rate of error, and (4) there is a level of general acceptance in that particular discipline's community.

In March of 1999, the United States Supreme Court issued a ruling in the *Carmichael* case that further defined when a Daubert reliability challenge applies. In *Carmichael*, the Supreme Court ruled that reliability must be established in all types of expert testimony, whether scientific, non-scientific, or technical. The Court held that the role of a trial judge was that of "gatekeeper" regarding both the relevance and reliability of all expert testimony. The Court stated that the *Daubert* case was not intended to be limited to scientific cases only. Instead, it would/should apply to all fields of expert testimony. Providers of expert witness testimony must be prepared to describe why they utilized an analysis and why the analysis and data can be considered reliably sufficient.

SalaryExpert can show a rate of error. The OES survey representing all jobs and areas in the U.S. and the official *head count* of those working in America includes a published standard error. The standard errors shown for this Internet site's presentation are those taken directly from OES published data. Data for international comparisons (where Daubert is not a concern) are calculated from data entered by Internet data providers.

### Calculation of Populations and Standard Errors

The OES survey reports three data points for each of the 820 jobs in 633 geographic areas. Level I, II, III, and Level IV, and Average earnings can be used to create a fourth point. (One knows that Level I represents the 16.5<sup>th</sup> percentile. Level II represents the 66.5<sup>th</sup> percentile. Their sum, plus a 4<sup>th</sup> point, should average to that reported for the job class.)

State populations are reported for all classes and divided among the various counties for each of the OES geographic areas. A population for each area (assuming an equal distribution within a state) may be assumed. Thus, data points for a known number of incumbents may be constructed for the calculation of both correlation and standard error. Level I and Level II data points were defined as the high and low averages found within census subdivisions for the "full time employed."

ERI's SalaryExpert provides a Standard Error from the report page for each data presentation:

SYZ Position	
Reliability Statistics	
Data:	Total Compensation (Base Salary plus Bonus)
City:	<b>Costa Mesa</b>
Area:	<b>Orange County</b>
Survey:	OES Data Years 2003, 2004, and 2005 SalariesReview.com
Observations	<b>1,200</b>
Standard Error	<b>2.3%</b> (As reported)
Sources:	OES - ETA - BLS and State Agencies SalariesReview.com
See Methodology	

### Reliability Statistics Definitions

#### Data

Values include incentives (see full definition above and below).

#### City

Populations of employees in a job group are defined across a wide geographic area. OES reported populations are for areas from which workers may commute and typically represent

much larger areas than a city metropolitan area. Canadian estimates reflect a minimum of at least one census subdivision (which are, on average, much larger than any single U.S. county).

### **Area**

These are as defined by OES; ERI divides Canada geographically using the same methodology by which BLS/ETA defines U.S. areas.

### **Survey**

At the time of writing this Methodology, 10 complete years of OES datasets and 78 SalariesReview.com survey sources exist as foundation data.

### **Observations**

OES reported job survey populations are for areas from which workers may commute and typically represent much larger areas than a city metropolitan area. As mentioned, Canadian observations reflect a minimum of at least one census subdivision. The OES is the prorated percentage applied to the populations from government data.

### **Standard Error**

Early in the Year 2000, the OES began to report "Relative Standard Error" (RSE). To explain, the particular sample used in the OES survey is one of a large number of all possible samples of the same size that could have been selected using the same sample design. To quote the OES Technical Notes:

Estimates derived from different samples would differ from each other. The variance of a survey estimate is a measure of the variation among the estimates from all possible samples. The standard error of a survey estimate is the square root of its variance; the relative standard error is the ratio of the standard error to the estimate itself. The sample estimate and its standard error allowed OES to construct an interval estimate with a prescribed level of confidence that the interval will include the mean value of the estimates from all possible samples.

To illustrate, if all possible samples were selected, and if each of these were surveyed under essentially the same conditions, and an estimate and its estimated sampling error were calculated from each sample, then approximately 90 percent of the intervals from 1.6 standard errors below to 1.6 standard errors above the derived estimate would include the average value of the estimates from all possible samples. This interval is called a 90 percent confidence interval.

Approximately 95 percent of the intervals from two standard errors below to two standard errors above the derived estimate would include the average value of the estimates from all possible samples. This interval is called a 95 percent confidence interval. For example, suppose that an estimated occupational employment total is 5,000 with an associated relative standard error of two percent. Based on this data, the standard error of the estimate is 100 ( $= 5,000 \times 0.02$ ) and the 95 percent confidence interval for the estimate is (5,000 +/- 200) or (4,800 to 5,200). This confidence interval is one of many that could be constructed based on the same sample design. Approximately 95 percent of these confidence intervals would encompass the average value of the estimates from all possible samples.

The Relative Standard Errors shown are those reported by the OES for the job groups in each state or territory. While ERI distributes populations so that one might review the probable populations within an OES area for a particular job group, it illustrates the same standard error for the same job group in all OES areas within a state. One should be able to sum all of the populations within a state and see a number equal to the state population reported. The standard error reported would be the same for all the subgroup OES areas within that state. For international data, standard errors shown are ERI estimates as taken from *SalariesReview.com*. (Default fields illustrating that these calculations have not yet been finalized are indicated as 00.00, 15.00, and/or 22.00. Users should disregard these preliminary numbers.)

### **Sources**

Only the before mentioned OES and SalariesReview sites have been used to create the values shown. Should Reliability Statistics be illustrated for areas in which there exists no predicted population, it will be because that value applies to the state/territory totals.

## **ERI Statement as to the Relevance and Reliability of Data**

Relevance is determined by the circumstances and situation presented. ERI provides outsourced analyses and presentations of salary, executive compensation, benefit, and cost of living survey data. (See this Methodology's Disclaimer.)

Reliability is described in a four-part, non-exclusive summary to match the *Daubert* challenge:

### **Theory/Technique Demonstrations**

Methodologies accompany each SalaryExpert survey and ERI's Internet presentation of OES and SalariesReview.com salary data used for immigration purposes as found at [www.salaryexpert.com](http://www.salaryexpert.com). These methodologies include definitions of terms, examples of calculations, and identifications of sources and data updates.

### **Subject to Publication and Peer Review**

SalaryExpert surveys and ERI's Internet presentation of OES census salary data used for immigration purposes are constantly published and updated. The former is published on a quarterly basis, and the latter two daily. Internet visits now exceed 300,000 a month to all sites.

### **Known or Potential Rate of Error**

Each SalariesExpert survey report and ERI's Internet presentation of OES salary data used for immigration purposes illustrate, via a "Reliability Statistics" link, the beginning of a statistical overview of ERI data.

### **General Level of Acceptance within the Discipline's Community**

Clearly, free salary data is not accepted within the professional community of analysts and compensation benefit managers. ERI would expect that this would change over time. For U.S. analyses (to which Daubert challenges pertain), which in SalaryExpert's case are totally sourced and founded, should pass most Daubert challenges as OES data is the default required source for prevailing wages in lieu of alternative private survey sources. (Technical notes are included for further review.)

## **ERI Counts of Hits to the Internet Fileservers**

ERI Economic Research Institute, Inc. are testing the tracing of queries (job name and area only) by users of the SalaryExpert Global Salary Calculator product to ascertain whether the interest in specific jobs can be used to estimate the "job availability" for specific positions. (SalaryExpert collects no other data during a query; this tracing will be of the *number of hits* to specific *spots* in SalaryExpertPro's Internet fileservers databases.) For example, we know that 10,000 computer programmers exist in a geographic area, but no one knows how many programmers in Java, COBOL C++, FORTRAN, ColdFusion, etc. exist within this 10,000 "count." (U.S., Canadian, U.K., and other countries utilize a SOC/O\*NET type job family approach in compiling employment and wage data; job family numbers are known.) The research test is to see whether the "interest" in salary levels matches specific job distributions in areas where these specific job count numbers are known. Results can be found at the ERI website: [www.erieri.com](http://www.erieri.com).

## **Technical Notes - Occupational Employment Statistics**

### **Employment Estimates**

Employment estimates represent the estimate of total wage and salary employment in an occupation across the reporting industries. An OES survey form sent to an establishment contains between 50 and 225 OES occupations. The number of occupations listed on a form depends on the industry classification and size class of the sampled establishments. To reduce paperwork and respondent burden, no survey form contains every OES occupation.

## **Wage Estimates**

Wages for the OES survey are straight-time, gross pay and are exclusive of premium pay. Included are base rate, cost-of-living allowances, guaranteed pay, hazardous-duty pay, incentive pay, including commissions and production bonuses, and on-call pay. Excluded are back pay, jury duty pay, overtime pay, severance pay, shift differentials, non-production bonuses, and tuition reimbursements.

## **Mean Annual Wage**

Most employees are paid at an hourly rate by their employers and may work less than or more than 40 hours per week. The annual wage estimates in this release are calculated by multiplying the mean wage by a "year-round, full-time" hours figure of 2,080 hours per year (52 weeks by 40 hours). Thus, the annual wage estimates may not represent the actual annual pay received by the employee. There are a small number of occupations where only an annual wage figure is provided. The workers in these occupations are paid based on an annual amount, but generally work less than the usual 2,080 hours per year. Since the survey does not collect the actual hours worked, the hourly rate cannot be calculated with a reasonable degree of confidence from the annual wages. For this reason, only the annual salary is reported for these occupations. Occupations that typically have a work-year of less than 2,080 hours include musical and entertainment occupations, flight attendants, pilots, and teachers.

## **Mean Hourly Wage**

The mean hourly wage is the estimated total wages for an occupation divided by its weighted survey employment.

## **Median Hourly Wage**

Median hourly wage is the estimated 50th percentile of the distribution of wages; 50 percent of workers in an occupation earn wages below, and 50 percent earn wages above the median wage.

## **Survey Method and Reliability Statement OES Survey All-Industry Wage Rate Estimates**

The following prose sections have been taken directly from past U.S. Government's non-copyrighted sites describing this survey, some of which is no longer found on any other web site.

### **General**

The Occupational Employment Statistics (OES) survey is an annual mail survey measuring occupational employment and wage rates by industry for wage and salary workers in nonfarm establishments. The survey samples approximately 400,000 establishments per year, taking 3 years to fully collect the sample of 1.2 million establishments. BLS and the Employment and Training Administration (ETA) provide the funding for the survey. BLS provides the procedures and technical support, while the State Employment Security Agencies (SESAs) collect the data. The SESAs produce occupational estimates by detailed industries for local areas and the states. BLS produces similar industry-specific estimates for the nation as well as employment and wage estimates for 750 occupations (although ERI counts 959 job class definitions within the OES description file) across all industries for the nation, each of the 50 states plus the District of Columbia, and Metropolitan Statistical Areas (MSAs).

### **Survey Definitions and Concepts**

Many of the concepts and definitions used in the OES Survey are comparable to those in the *Current Employment Statistics* survey, a monthly BLS payroll survey of nonagricultural establishments. Many others, however, are unique to this survey. Key definitions are as follows:

An *establishment* is an economic unit, such as a factory, mine, or store, which produces goods or services. It is generally at a single location and engaged predominantly in one economic activity.

The OES survey defines *employment* as the number of workers who can be classified as full-time or

part-time employees including: workers on paid vacations or other types of leave; workers on unpaid short-term absences; salaried officers, executives, and staff members of incorporated firms; employees temporarily assigned to other units; and employees for whom the reporting unit is their permanent duty station regardless of whether that unit prepares their paycheck. The survey excludes the self-employed, owners/partners of unincorporated firms, and unpaid family workers. Employees are reported in the occupation in which they are working, not necessarily for which they were trained.

The OES classification system uses seven *occupational divisions* to categorize workers in one of 750 (or 959 according to ERI's count) detailed occupations. The seven divisions are as follows:

- Managerial and Administrative
- Professional, Paraprofessional, and Technical
- Sales and Related
- Clerical and Administrative Support
- Service
- Agricultural, Forestry, and Fishing
- Production, Construction, Operating, Maintenance, and Material Handling

*Annual wage:* Most employees are paid at an hourly rate by their employers and may work less than or more than 40 hours per week. The annual wage estimates in this release are calculated by multiplying the mean wage by a "year-round, full-time" hours figure of 2,080 hours per year (52 weeks by 40 hours). Thus, the annual wage estimates may not represent the actual annual pay received by the employee. There are a small number of occupations only provide an annual wage figure. The workers in these occupations are paid based on an annual amount, but generally work less than the usual 2,080 hours per year. Since the survey does not collect the actual hours worked, the hourly rate cannot be calculated with a reasonable degree of confidence from the annual wages. For this reason, only the annual salary is reported for these occupations. Occupations that typically have a work-year of less than 2,080 hours include musical and entertainment occupations, flight attendants and pilots, and teachers.

*Hourly versus annual wage reporting:* For each occupation, respondents are asked to report the number of employees paid within specific wage intervals. The intervals are defined both as hourly rates and the corresponding annual rates, where the annual rates are constructed by multiplying the hourly wage rate for the interval by the typical work year of 2,080 hours. In reporting, the respondent can reference either the hourly or the annual rate, but is instructed to report the hourly rate for part-time workers.

The *Unemployment Insurance (UI) Address File* is a micro-level employer file prepared quarterly by each State's Employment Security Agency and submitted to the Bureau of Labor Statistics.

*Industry classifications* are based on the Standard Industrial Classification Manual: Office of Management and Budget, 1987. Industry classification is on the basis of the major product or activity of the establishment, as determined by total sales or receipts of the calendar year prior to classification.

### **Scope of Survey**

The survey included private establishments in SIC codes 07, 10, 12-17, 20-42, 44-65, 67, 70, 72, 73, 75, 76, 78-84, 86, 87, and 89 covering agricultural services; mining; construction; manufacturing; transportation and public utilities; wholesale and retail trade; finance, insurance, real estate, and services. The survey also covered private and government establishments in SIC codes 806, 821, 822, 824, and 829, the Postal Service (SIC 43), as well as all remaining state and local government establishments.

The reference date of the 1997 survey was the week that included October 12, November 12, or December 12 of 1997. The reference date for a particular establishment in this survey is dependent on its two-digit SIC code. See the table below.

### **Reference Date Industries Surveyed**

October 12	07, 15-17, 41, 46, 50-62, 67, 70, 73, 79, 84
November 12	26-28, 30, 35, 36, 40, 42, 45, 47, 48, 63-65, 75, 76, 78, 80, 81, 83, 86, 87, 89

December 12 10, 12-14, 20-25, 29, 31-34, 37-39, 44, 49, 72, 82, state and local governments

## Sampling Procedures

The sampling frame for this survey was the list of establishments that reported to the state Unemployment Insurance (UI) files for the two-digit SICs listed above.

Establishments in the United States were stratified by Metropolitan Statistical Area (MSA), three-digit SIC, and size of firm (i.e., size class). Size classes were defined as follows:

Size class	Number of Employees
1	1 to 4
2	5 to 9
3	10 to 19
4	20 to 49
5	50 to 99
6	100 to 249
7	250 to 499
8	500 to 999
9	1,000 or more

Establishments in size classes 2 to 6 were selected based on a probability sample. The sampling weights in size class 2 were adjusted to account for the employment in size class 1. In 1998, the OES Survey began sampling establishments in size class 1; thus, establishments in all size classes are now represented in the probability sample. UI reporting units with 250 or more employees are sampled with certainty across the three-year cycle of the survey. Approximately one-third of these units are selected within each MSA/SIC/Size class each year. The above allocation resulted in a total initial sample size of 409,347. (Note that the combined sample size is not a simple sum of the two-years samples. Some state government establishments are included in the survey each year. In the tabulations for the combined survey these establishments are only included once, from the most recent year. Federal government units are also included in the combined tabulation.)

### Method of Collection

Survey schedules were initially mailed to virtually all sampled establishments. Larger establishments, however, had personal visits.

Two additional mailings went out to non-responding establishments at approximately three-week intervals. Telephone follow-ups and, in some cases, non-respondents considered critical to the survey because of their size received personal visits.

### Response

Subsequent to the close out date for National estimates, states collected additional data and used to prepare their own estimates. Consequently, the response rates in most states are higher than the response rate used to develop estimates of all-industry wage rates for each MSA.

### Estimation Methodology

The OES survey samples approximately 400,000 establishments each year and, over a 3-year period, contacts approximately 1.2 million establishments. Each single-year sample represents one-third of both the certainty and non-certainty strata for the full 3-year sample plan. While estimates can be made from a single year of data, the OES survey has been designed to produce estimates using the full 3 years of data. The full 3-year sample allows the production of estimates at fine levels of geography, industry, and occupational detail; while estimates using any one year of data would be subject to a higher sampling error due to the smaller sample size and the limitations associated with having only one-third of the certainty units. Producing estimates using 3 years of sample data provides significant sampling error reductions (particularly for small geographic areas and occupations); however, it also has some quality limitations in that it requires the adjustment of earlier years' data to the current reference period. This is a procedure referred to as "wage updating".

The *wage updating procedure* adjusts prior year wages to reflect increases between the previous data

and current year data. This aging of wage data is accomplished through a multiplicative factor (1.000 + *rate of change*) applied to prior year wages during the estimation process. For the 2005 estimates, the OES program has used the over-the-year fourth quarter wage changes from the Bureau's Employment Cost Index to adjust the 2004 survey data before combining it with this year's fourth quarter 2005 data. The ECI over-the-year wage changes provide the rate of change from the fourth quarter of 2004 to the fourth quarter of 2005 for the nine occupational divisions for which ECI estimates are available. Such a procedure assumes that each occupation's wage moves according to the average movement of its occupational division and that there are no significant geographic differences. Since this may not be the case, the wage updating procedure has some quality limitations.

The *hot deck (nearest neighbor) imputation procedure* imputes for unit non-response. This type of non-response occurs when a unit reports no employment data. In hot decking, units in the sample are stratified into "year/State/4-digit industry/size class" cells. Within each cell, a donor (i.e., responding unit) is selected to represent each non-respondent under the proviso that a donor cannot be selected twice. The sampling frame employment matches donors with non-respondents. Once a donor and non-respondent are matched, the occupational employment totals from the donor are copied over to the non-respondent. In the event that a donor is not available at the "year/State/4-digit industry/size class" cell level, the procedure advances to succeeding higher-level cells until it finds a donor.

Occasionally a responding establishment may provide employment information, but omit wage distribution information for selected occupations. The OES survey currently uses a variation of the mean imputation procedure to impute for item non-response. This type of non-response occurs when a unit reports the total-employment for its occupations but not the corresponding employment by wage intervals. In this procedure, units in the sample are stratified into "year/MSA/3-digit industry/size class" cells. A wage-employment distribution is then calculated for those occupations with missing wage-employment-based on the usable data in the cell. Missing wage-employment entries use the just calculated wage-employment distribution to prorate the total-employment of those occupations with the missing data.

A separate ratio estimator is used to develop estimates of occupational employment in each wage interval. The auxiliary variable is the population value of total employment obtained from the refined Unemployment Insurance files for the reference month. Within each MSA, the estimated employment for an occupation at the reported "three-digit SIC/wage interval" level was calculated by multiplying the weighted employment by its ratio factor. The estimated employment for an occupation at the all-industry level was obtained by summing the occupational interval employment estimate across all industries within an MSA reporting that occupation. A further adjustment to each occupational employment total was made as described in the Reliability of the Estimates section. This adjustment did not affect the mean or median wage rates. The employment and wage data for federal government workers in each occupation were added to the survey derived data.

A *mean wage* and a *median wage* are calculated using wage data from establishments in the industries that reported employment for an occupation.

*Mean wage* is the estimated total wages for an occupation divided by its weighted survey employment. For the upper open-ended wage interval, a Winsorized mean procedure is used to estimate the mean wage. That is, the mean wage value for the upper open-ended wage interval is set at its lower bound ("80.00 and over"). For the other intervals, the Office of Compensation and Working Conditions calculate a mean wage value based on occupational wage data collected. These interval mean wage values are then attributed to all workers reported in the interval. For each occupation, total weighted wages in each interval (i.e., mean wages multiplied by weighted employment) are then summed across all intervals and divided by the occupation's weighted survey employment to obtain a mean wage.

*Median wage* is the estimated 50th percentile of the distribution of wages; 50 percent of workers in an occupation earn wages below, and 50 percent earn wages above the median wage. The wage interval containing the median wage is located using a cumulative frequency count of employment across wage intervals. After the targeted wage interval is identified, the median wage rate is then estimated by a linear interpolation procedure

## **Reliability of the Estimates**

The occupational wage rates in this report are estimates derived from a sample survey. Two types of errors are possible in an estimate based on a sample survey - sampling error and non-sampling error. Sampling error occurs because the observations are based on a sample, not on the entire population. Non-sampling error is due to response, non-response, and operational errors.

*Non-sampling Errors* - Estimates are subject to various response, non-response, and operational errors during the survey process. Sources of possible errors are data collection, response, coding, transcription, data editing, non-response adjustment, and estimation. These errors would also occur during a complete census conducted under the same conditions as the sample survey. Explicit measures of their effects are not available. However, it is believed that the important response and operational errors were detected and corrected during the review and validation process.

The employment total and wage data for the occupation reflect only those industries that reported the occupation. This occurs primarily in those industries where the occupation appeared on the survey form. Since not every occupation appears on every industry-specific form, there may be a bias in the employment and wage data for some occupations. The extent of this bias is unknown.

Another source of potential bias is the limitations placed on the size of the benchmark factors. A benchmark factor is the ratio of a known employment value to a sample-derived employment estimate. This factor is used to make a post-stratification adjustment that makes the total weighted employment estimate at the state / three-digit SIC industry / Metropolitan Statistical Area (MSA) / employment size class level match the population employment at that level. The source of the population employment data is the states' Quarterly Unemployment Insurance files for the reference period of the survey. In cases where a small sample was taken, the ratio factor can become large or small. In order to prevent an establishment from contributing either too much or not enough to a MSA's wage rate estimates, the benchmark factor was not allowed to exceed a predetermined value. The total employment count for those MSAs with a benchmark factor limited by this ceiling will be biased to a small degree in those strata. The employment not assigned to those strata because of this ceiling was then distributed across the other MSAs in the state / three-digit industry, so that the estimated employment of the State / three-digit industry would match the known employment totals at that level.

*Sampling Errors* - The particular sample used in this survey is one of a large number of possible samples of the same size that could have been selected using the same sample design. For example, occupational wage rate estimates derived from the different samples will differ from one another. A sampling error is the deviation of a sample estimate from the average of all possible sample estimates. The standard error of an estimate, is a measure of the variation of estimates across all possible samples, and thus is a measure of the precision with which an estimate from a particular sample approximates the average result of all possible samples. Estimates of sampling errors for the occupational employment and mean wage rate estimates at the National level are available from BLS -Washington.

### **Quality Control Measures**

Quality control measures implemented in the OES survey include:

- Review of the specific occupations to be collected for each industry, and those to be collected in residual categories
- Creating and validating the sample frame for all states at BLS - Washington
- Allocating and selecting the sample for all states at BLS - Washington
- Follow up solicitations of non-respondents (especially critical non-respondents)
- Review of survey schedules to verify the accuracy and reasonableness of the reported data
- Adjustments of atypical reporting units on the data file
- Validation of the non-response adjustment factors
- Validation of the population employment and ratio factors

- Standardized data processing programs and activities.

## Frequently Asked Questions

The following prose sections have been taken directly from past U.S. Government's non-copyrighted sites describing this survey, some of which is no longer found on any other web site.

### What does the OES program produce?

The OES program produces employment and wage estimates for over 750 occupations. These are estimates of the number of people employed in certain occupations, and estimates of the wages paid to them. These estimates are available for the nation as a whole, for individual States, and for selected metropolitan areas; national occupational estimates for specific industries are also available.

### What basic concepts are essential to understanding the OES survey?

*Establishment, Industry, and Occupation* are three key concepts.

- An establishment is the physical location of a certain economic activity, for example, a factory, store, office, or mine. Generally, a single establishment produces a single good or provides a single service. An enterprise (a private firm, government, or nonprofit organization) could consist of a single establishment or multiple establishments. A multi-establishment enterprise could have all its establishments in one industry (i.e., a chain), or could have various establishments in different industries (i.e., a conglomerate).

- An industry is a group of establishments that produce similar products or provide similar services. For example, all establishments that manufacture automobiles are in the same industry. A given industry, or even a particular establishment in that industry, might have employees in dozens of occupations. The Standard Industrial Classification (SIC) system groups similar establishments into industries.

- An occupation is a set of activities or tasks that employees are paid to perform. Employees that perform essentially the same tasks are in the same occupation, whether or not they are in the same industry. Some occupations are concentrated in a few particular industries, other occupations are found in the majority of industries.

### What are the differences between the Bureau's Occupational Employment Statistics (OES) wage estimates and National Compensation Survey (NCS) wage estimates?

Both the OES and the NCS programs provide information on wages and salaries by occupation, but they have different strengths.

- The OES survey provides earnings on an hourly and annual basis, including mean and median earnings for all areas national, state, and MSAs, as well as 10th, 25th, 75th, and 90th percentile wage rate estimates for the nation. The NCS survey also provides mean earnings on an hourly and annual basis for all surveys and earnings distributions by the 10th, 25th, 50th, 75th, and 90th percentiles for some surveys. The OES program is the larger survey and can provide a greater range of occupations and areas, while the NCS program conducts personal visits and can provide greater depth by obtaining occupational work level.

The NCS occupational work level is based on the duties and responsibilities of the job. An architect, for example, who directs a major project would typically be more highly compensated than an architect preparing a small part of a project under direct supervision.

- The OES program provides information for more occupations (about 700 occupational classifications compared with about 450 occupational classifications in the NCS). The NCS program, on the other hand, provides information on the wages for the occupations it covers at specific levels of work rather than just an average for all workers in the occupation.

- The OES program provides information for the nation, for states, and for 334 metropolitan areas, as well as for the District of Columbia, Puerto Rico, the Virgin Islands, and Guam. The NCS program provides information for the nation, for 81 metropolitan areas and 73 non-metropolitan counties representing the U.S. and for the nine Census divisions (although not all areas have information for all occupations).

The metropolitan definitions differ for the two programs: Where an area has both a primary metropolitan statistical area (PMSA) and a broader consolidated metropolitan statistical area (CMSA), the OES program uses the PMSA and the NCS program uses the CMSA.

- If you want wage estimates for pay-setting purposes and want to set pay according to the level of work that is being performed, the NCS estimates are the better choice. If you need to know the general wage profile for a large number of occupations in a large number of areas, the OES estimates are the better choice. If you need information by State, you will need to use OES estimates.

- Both surveys include full-time and part-time workers who are paid a wage or salary. The NCS program obtains actual work schedules from the establishment, while the OES program assumes standardized schedules. Thus, if you need information on occupations in which the work schedule is atypical, you need to exercise caution in using the OES estimates.

- Both surveys exclude agriculture, fishing and forestry industries, and private household workers; the OES program includes federal civilian employment, except for some national security agencies, while the NCS program excludes federal government employment.

- The OES program includes establishments with five or more workers, while the NCS program only includes establishments with at least 50 workers. Thus, if you want pay in a broader range of workplaces, use the OES estimates; if you want information about pay in larger establishments, use the NCS estimates.

### **Does the BLS have OES estimates for specific industries?**

Yes, it has OES estimates, including a sample of national industry-specific occupational employment and wage estimates. The BLS produces national occupational employment and wage estimates for most 2- and 3-digit SIC industries. These estimates are available by request; there may be a charge for these data.

Industry-specific OES estimates for individual states may be available from the states' Labor Market Information (LMI) or Research, Analysis, and Statistics offices which are part of their State Employment Security Agencies (SESAs). Availability, format, and medium of the data vary by state. To obtain OES data for a particular State, please contact the appropriate office.

### **Does the BLS have OES estimates for individual States?**

Yes, it has OES estimates, including statewide cross-industry occupational employment and wage estimates for individual states. Additional information may be available from the State Employment Security Agency (SESA) in each state. Format and medium of the data vary by State. To obtain additional estimates for a particular state, contact the appropriate office.

### **Does the BLS have OES estimates for metropolitan areas?**

Yes, it has OES estimates, including cross-industry occupational employment and wage estimates for metropolitan areas.

Metropolitan areas comprise one or more entire counties, except in New England, where cities and towns are the basic geographic units. Where metropolitan areas are combined to form consolidated metropolitan areas (CMSAs) the component metropolitan areas are designated primary metropolitan

statistical areas (PMSAs). Metropolitan areas that are not combined to form CMSAs are designated metropolitan statistical areas (MSAs). There is more information about metropolitan areas on the Census Bureau Web site.

The OES program produces cross-industry occupational employment and wage estimates for MSAs and PMSAs. The OES program does not produce estimates for CMSAs. The metropolitan area definitions used to produce OES estimates are those that were in effect during the year prior to the survey year. The definitions of some metropolitan areas or their components may have been changed since the current OES estimates became available.

### **What is the difference between *Occupational Employment and Wage Estimates* and *Industry Staffing Pattern Estimates*?**

The Occupational Employment Statistics program produces *Occupational Employment and Wage Estimates* and *Industry Staffing Pattern Estimates*, both of which consist of employment and wage estimates by occupation. The *Occupational Employment and Wage Estimates* consist of national, state, and metropolitan area estimates. The *Industry Staffing Pattern Estimates* contain only national estimates.

The main difference is that the *Occupational Employment and Wage Estimates* are cross-industry estimates, and the *Industry Staffing Pattern Estimates* are industry-specific estimates.

- Cross-industry estimates are calculated with data collected from establishments in all the industries in which a particular occupation is surveyed. (Not every occupation is surveyed in every industry.) For example, the cross-industry occupational employment estimate for mechanical engineers is the sum of all the industry-specific estimates for mechanical engineers. Likewise, cross-industry occupational wage estimates for mechanical engineers are calculated from data collected from establishments in all the industries where mechanical engineers are surveyed.
- Industry-specific estimates are calculated with data collected from establishments in a particular industry. Industry-specific occupational employment estimates are based on the number of people employed in that occupation in a particular industry. Similarly, the industry-specific occupational wage estimates are calculated with data from establishments in one particular industry. Since different industries employ people in different occupations, the occupations in the staffing pattern for one industry will not be the same as the occupations in the staffing pattern for another industry.

Prior to 1996, national industry-specific estimates of occupational employment were the only OES estimates produced by the BLS; wage estimates were not produced.

### **Why are an occupation's cross-industry employment and wage estimates calculated from industries in which it was surveyed?**

OES estimates are calculated from data that employers provide by filling out survey forms. There are different survey forms for different industries. The occupations listed on survey forms vary depending on the industry and size of establishment. No survey form contains all 750+ OES occupations, because no industry employs workers in every occupation. Survey forms contain between 50 and 225 occupations. Customizing the survey forms reduces paper work and respondent burden, making the survey form easier for employers to fill out. This increases the response rate and allows the OES program to produce better estimates.

When an occupation's industry-specific employment estimates are summed to produce its cross-industry employment estimates, only those industry-specific estimates from industries where the occupation appeared on the survey forms are included in the summation. Similarly, the calculation of an occupation's cross-industry wage estimates is made with data from industries where that occupation was surveyed. There exists the possibility that some employment in a particular occupation could exist in an industry where it was unexpected and therefore, not surveyed; in such cases it would be missed and not included in the calculation of that occupation's employment and

wage estimates.

### **Why are OES estimates from one year survey to another not comparable?**

The 1997 OES employment and wage estimates presented on this Web site are based on data from both the 1996 and 1997 OES surveys. The two years of sample responses for employment and wage data have been combined to produce the 1997 estimates. The 1996 wage data have been adjusted to the 1997 reference period by using the over-the-year wage change in the most applicable Employment Cost Index (ECI) series. The employment estimates from 1996 and 1997 have been adjusted to the full universe counts for the 1997 survey reference period based on the Covered Employment and Wages (ES-202) program. Furthermore, the estimation methodology has been improved since the 1996 estimates were prepared. Therefore, the 2005 estimates are not strictly comparable to the 1996 OES estimates, and the Year 2000 data (collected in 1998 and 1999) are not strictly comparable either. Likewise, 2005 data, collected in 2003 may not be comparable.

### **Why does the OES survey produce estimates from more than one year's data?**

Significant reductions in sampling error can be achieved by taking advantage of a full three years of data, covering 1.2 million establishments and over 70 percent of the employment in the United States. This feature is particularly important in improving the reliability of estimates for detailed occupations in small geographical areas. Combining multiple years of data is also necessary to obtain full coverage of establishments with 250 or more workers since, in order to reduce respondent burden, the OES survey samples them only once every three years.

While there are significant advantages, there are also limitations associated with this estimation procedure in that it requires "wage updating" for the earlier years of data. For wage-updating purposes, the Bureau has used the national over-the-year wage changes from the fourth quarter of 2003 to the fourth quarter of 2004 for the nine occupational divisions for which ECI estimates are available. Such a procedure assumes that each occupation's wage, as measured in the earlier years, moves according to the average movement of its occupational division and that there are no major geographic differences. BLS will conduct research to determine the accuracy of this approach and to investigate other approaches.

### **Does the OES survey produce estimates by age, race, sex, or educational attainment?**

No. The OES survey program does not gather demographic information. However, the BLS' Labor Force Statistics from the Current Population Survey program provides information on employment, unemployment, and weekly earnings, by a variety of demographic characteristics.

### **Does the OES survey produce estimates by size of establishment?**

No. The OES survey does not produce estimates based on total establishment employment. Information pertaining to the number of establishments in various employment size classes and their aggregate employment (economy wide and by industry) can be obtained by contacting the staff at the "ES-202" or Covered Employment & Wages program.

### **Does the OES program have any data on unemployment for specific occupations?**

No. The OES survey does not produce estimates on unemployment. However, there is some information on selected unemployment indicators (including broad occupational groups) in *The Employment Situation* news release, which is part of Labor Force Statistics from the Current Population Survey. The Labor Force Statistics staff has more detailed information on the characteristics of the unemployed.

### **Does the OES program have any information on job vacancies?**

No. The OES survey does not ask establishments for information about any vacancies they may have. The U.S. Department of Labor maintains a Web site where job seekers can search America's Job Bank for job vacancies.

### **Does the BLS have employment projections for specific occupations?**

For more than 50 years, the Bureau's [Occupational Outlook Handbook](#) has been a nationally recognized source of career information. It describes what workers do on the job, working conditions, the training and education needed, earnings, and expected job prospects for a variety of occupations.

### **How does the OES survey define “employees”?**

Employees are all part-time and full-time workers who are paid a wage or salary. The survey does not cover the self-employed, owners and partners in unincorporated firms, household workers, or unpaid family workers.

### **Does the BLS have occupational employment estimates that include the self-employed?**

The Bureau of Labor Statistics' Office of Employment Projections provides current and projected national economy-wide (across all industries, including the self-employed) occupational employment estimates for selected occupations.

### **How does the OES survey define “wages”?**

Wages for the OES survey are straight-time, gross pay, exclusive of premium pay.

**Included** in the collection of wage data are:

- Base rate
- Cost-of-living allowances
- Guaranteed pay
- Hazardous-duty pay, incentive pay including commissions and production bonuses
- On-call pay

**Excluded** from the wage data are:

- Back pay
- Jury duty pay
- Overtime pay
- Severance pay
- Shift differentials
- Non-production bonuses
- Tuition reimbursements

### **How long has the OES survey collected wage data?**

The OES survey collected both occupational employment and occupational wage data nationwide for the first time in 1996. Prior to 1996, occupational employment estimates by industry were the only

national OES estimates produced by the BLS.

### **What are mean wages? What are median wages?**

The OES program produces estimates of wages by occupation; i.e., the wages paid to wage or salaried employees in a given occupation in the U.S., in a particular state, or in a particular industry. These occupational wage estimates are either estimates of mean wages or median wages.

- A mean wage is an average wage. The calculation for an occupational mean wage estimate is the summing of wages for all employees in a given occupation (either in the U.S., a particular state, or a particular industry) and then dividing the total wages by the number of employees.

- A median wage is a boundary. An occupational median wage estimate is the boundary between the highest paid 50% and the lowest paid 50% of workers in that occupation (either in the U.S., a particular state, or a particular industry). Half of the workers in a given occupation earn more than the median wage, and half the workers earn less than the median wage.

### **How does the OES conduct the survey?**

The Occupational Employment Statistics (OES) survey is an annual mail survey measuring occupational employment and wage rates for wage and salaried workers in nonfarm establishments, by industry. The survey samples approximately 400,000 establishments per year, taking three years to fully collect the sample of 1.2 million establishments. BLS and the Employment and Training Administration (ETA) provide the funding for the survey. BLS provides the procedures and technical support, while the State Employment Security Agencies (SESAs) collect the data. The SESAs produce occupational estimates by detailed industries for local areas and the states. BLS produces similar industry-specific estimates for the nation as well as employment and wage estimates for 750 occupations across all industries for the nation, each of the 50 states plus the District of Columbia, and Metropolitan Statistical Areas (MSAs).

### **When will this year's OES estimates be available?**

The OES program produces estimates from data collected in an annual nationwide survey. The survey begins with the sending of survey materials to selected establishments during the last quarter (October, November, December) of the survey year. Data collection starts then and continues into the early months of the following year. As the data collection finishes, the data entry and estimate processing begins, followed by estimates production and validation. The OES releases estimates in the last quarter of the year following the survey.

### **What occupations are surveyed?**

An establishment responding to the OES survey should report all employment according to the OES classification system, which is an empirically based economy-wide occupational classification system. The OES occupational classification system identifies over 750 occupations. Each OES occupational classification comprises a title, a definition, and a five-digit OES code.

### **How does the OES program classify occupations?**

OES groups occupational classifications into seven divisions:

1. Managerial and Administrative
2. Professional, Paraprofessional, and Technical
3. Sales and Related
4. Clerical and Administrative Support

5. Service
6. Agricultural, Forestry, and Fishing
7. Production, Construction, Operating, Maintenance, and Material Handling

Each division is subdivided into major and minor occupational groups. A five-digit OES code is assigned to each OES occupation. The first digit represents the occupational division; the second, the major group; the third, the minor group; and, along with the first three digits, the last two digits identify the detailed occupation. When the OES occupational classifications are listed in OES code order, similar occupations are listed together.

### **Is the OES classification system compatible with other occupational classification systems?**

Yes. The OES classification system is compatible with the 1980 Standard Occupational Classification System (SOC) and the U.S. Bureau of the Census occupational classifications. By using a crosswalk to the SOC or Census system users can compare OES estimates with occupational data from other sources. The NOICC Crosswalk is the source of various "crosswalks" that are used to link the occupational classifications of one system to those of another.

### **How does the OES program define industry classifications? What is the SIC?**

The OES program uses definitions of industries found in the Standard Industrial Classification (SIC) system. The SIC system is used throughout the federal government to group establishments into industries. The SIC Division Structure makes it possible to collect and calculate establishment data by broad industrial divisions (labeled A through K), industrial groups (the 2-and 3-digit SIC levels), and specific industries (the 4-digit level). See the Standard Industrial Classification Manual: 1987 (Executive Office of the President, Office of Management and Budget), available in many libraries. The OES survey produces occupational employment and wage estimates for 2-and 3-digit SIC industrial groups. (Note: OES estimates of government employment and wages do not correspond to the SIC system. In the case of government, the OES survey produces occupational employment and wage estimates for local government, state government, and Federal Government.)

### **What industries are surveyed? What industries are not surveyed?**

The OES survey collects occupational employment and wage data from establishments in nonfarm industries. The OES survey produces estimates of occupational employment and wages for 2-and 3-digit industrial groups in these industrial divisions: Mining; Construction; Manufacturing; Transportation; Communication; Electric, Gas, and Sanitary Services; Wholesale Trade; Retail Trade; Finance, Insurance, and Real Estate; Services; and Government.

The OES program does not survey in SIC 01 (Agricultural production -- Crops); SIC 02 (Agricultural production -- livestock and animals specialties); SIC 08 (Forestry); SIC 09 (Fishing, hunting, and trapping); and SIC 88 (Private households).

### **Does the BLS make OES estimates available in print or electronic form?**

The BLS makes OES estimates available via this Internet site, in publication, and in electronic format.

- This Internet site contains cross-industry Occupational Employment and Wage estimates for the U.S., for individual states, and for metropolitan areas. It also has a sample of national (industry-specific) Industry Staffing Pattern estimates.
  
- The BLS produced annual OES publications containing occupational employment estimates by industry for 2-digit SIC industrial groups from 1988-1995. (These publications do not contain wage estimates.) The 1997 OES publication presents both selected occupational employment and wage estimates for 2-digit SIC industrial groups.

· OES estimates in electronic format are available by request. The BLS can provide 1997 occupational employment and wage estimates by industry (for 2-and 3-digit SIC industrial groups). There may be a charge for estimates in electronic format.

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