

# Evaluation of Data Submitted to American Public Power Association's 2017 Safety Awards of Excellence

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# Introduction

This report provides both tabular and graphical evaluations of the data submitted to the American Public Power Association's (The Association) annual Safety Awards of Excellence for 2017<sup>1</sup>. The purpose of compiling this data is to offer a benchmark for individual municipal utilities. The intent of this report is to help safety professionals analyze their utility's yearly performance in relation to others in the public power community. Through the data presented in this report, the Association aspires to help safety professionals create a context for review of safety program efficacy at their individual utilities.

Each year, the Safety Awards are open to any Association member utility, Joint Action Agency, Federal Agency, and State Association/Agency that wishes to participate.<sup>2</sup> Since participation is voluntary, the rules are set up to encourage consistent involvement. Thus, to be eligible to win an award, participants must submit data for three consecutive years; in the third year, the participant will be considered eligible for an award. Consistent submission helps to minimize selection bias and skewing of yearly data.

Entries are sorted into groups according to the total number of hours worked by all electric utility employees at that particular utility in the designated year. The group categories are the same from year to year; a group-specific analysis is presented in section II of this report.<sup>3</sup>

Awards are given out to the participating eligible utilities with the lowest incidence rate within each group. The incidence rate is calculated by using a standardized U.S. Occupational Safety and Health Administration (OSHA) formula. This formula was developed to give a relative number of accidents that an organization might expect if it had 100 employees. Since the incidence rate is based on a ratio, any utility that has fewer hours worked will experience a larger proportional impact of any incident (or "case") on the final incidence rate. Conversely, a utility with more hours worked will experience a smaller proportional impact of any incident on the final incidence rate.

The incidence rate calculation is demonstrated below (note the weighting factor of 200,000 worker hours representing 100 typical employees).

$$\text{Incidence Rate (TRIR)} = \frac{(\text{Total Reported Incidents} * 200,000 \text{ Work Hours})}{\text{Number of Work Hours}}$$

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<sup>1</sup> The American Public Power Association's Safety Awards of Excellence program was formerly referred to as the Association's Safety Contest.

<sup>2</sup> Starting in 2010, JAAs, Federal Agencies, and State Associations/Agencies were incorporated into a group based on their worker-hours. These organizations did not displace any utility winners in each group; rather, when applicable, they were recognized by lowest incidence rate within their worker-hour category group.

<sup>3</sup> Group categories were changed slightly by the Association's Safety Committee in 2003 to account for utility growth.

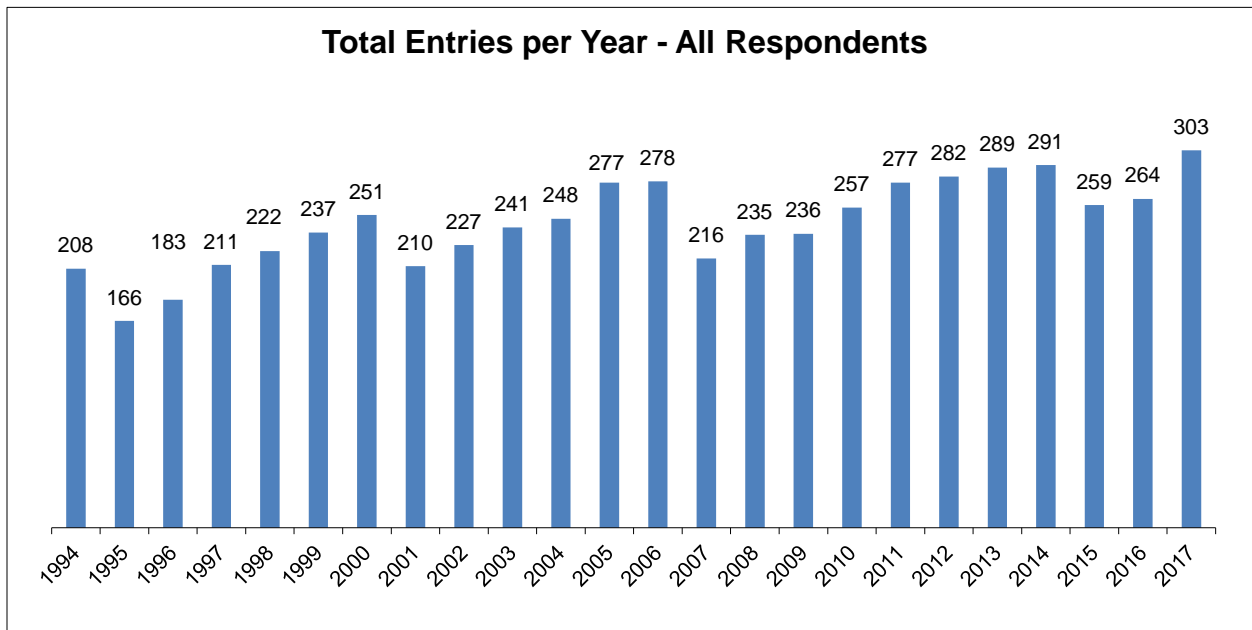
Along with the group-by-group and regional (according to the Association regions) analyses of the 2017 Awards data, this report shows data averaged for all groups combined over the history of the awards.<sup>4</sup>

## Section I – General Overview

This section provides a general overview of data submitted from 1994 through 2017 and provides the basis of benchmarking comparison for 2017 data. The data in this section of the report are taken from part B of the entry form, titled “Reportable Injuries and Illnesses.” All entries received are incorporated into the following graphs. For reference purposes, the Safety Awards entry form is included as Appendix A of this report.<sup>5</sup>

Overall participant data consisting of all worker-hour category groups combined across all years are shown below in bar graphs. The data submitted by participants covering 2017 is mostly in line with the historical data set. Figures 1, 2, and 3 show the number of entries, overall average incidence rate, and total number of fatalities by year. Entries are accepted for the prior complete year each January; e.g., 2017 data are collected in January 2018.

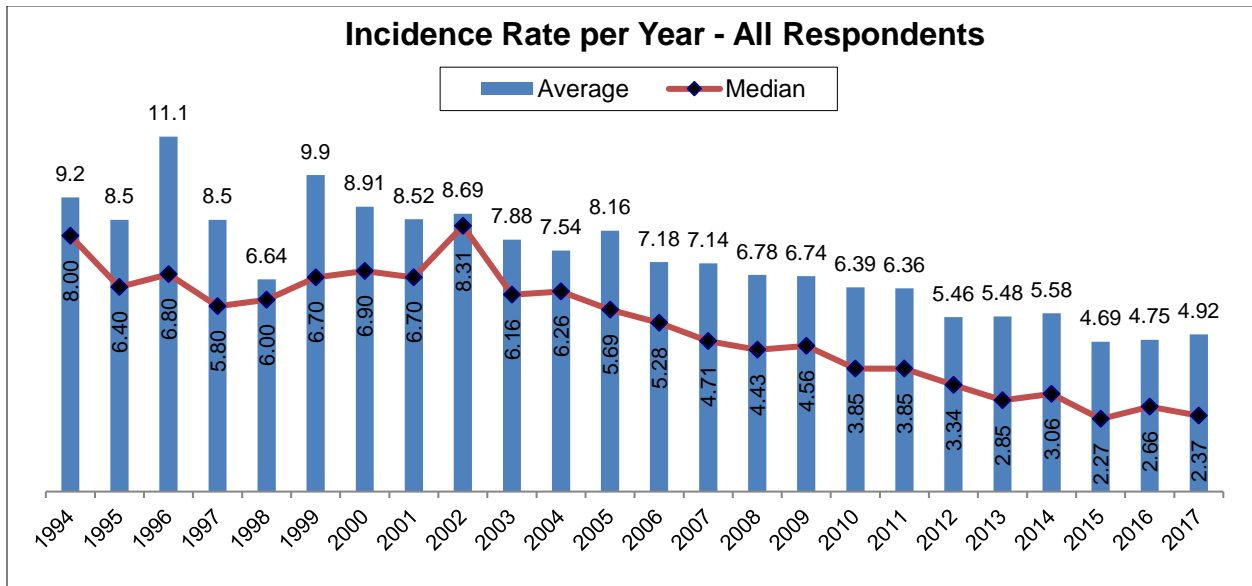
**Figure 1: Total Entries per Year**



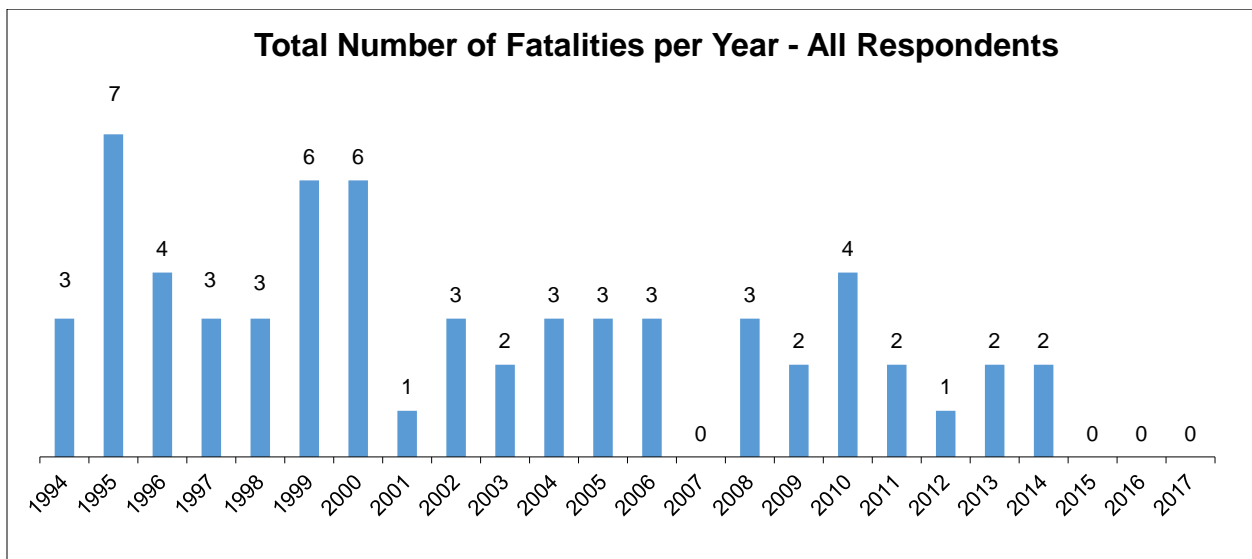
<sup>4</sup> Association regions are defined in Section III

<sup>5</sup> While the Safety Awards entry form has been updated slightly over the years, the essential information that has been gathered in each annual cycle has remained consistent.

**Figure 2: Incidence Rate**



**Figure 3: Total Number of Fatalities**

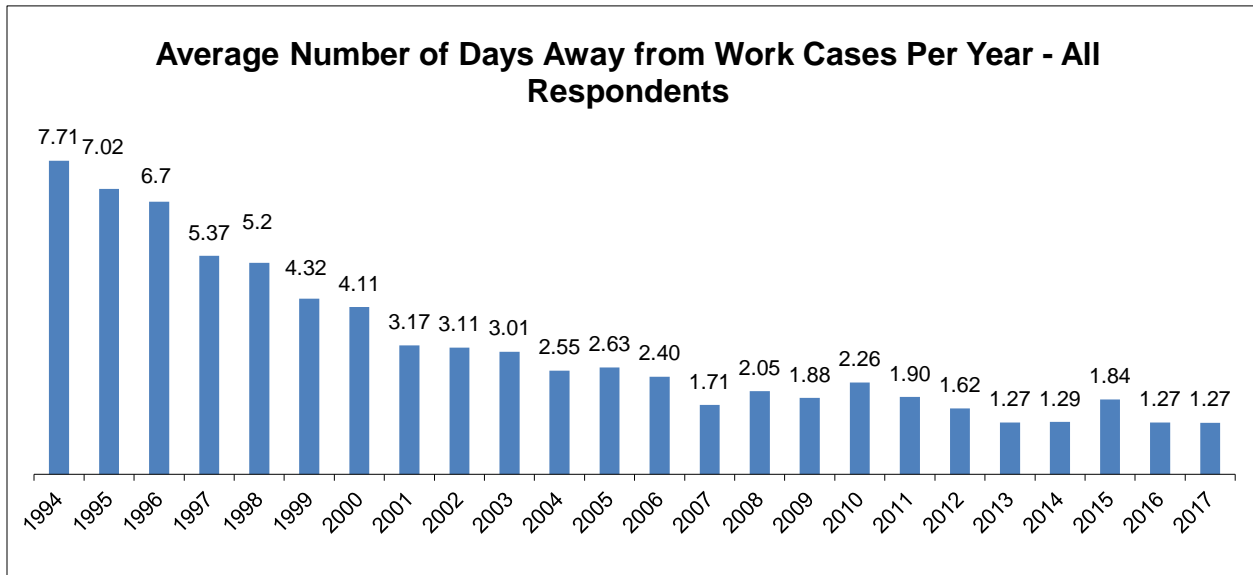


It is important to note that Figures 4, 5, and 6 are based on the number of **cases** reported in part B of the entry form, and not the actual number of **days** away from work or **days** of restricted or job transfer, as reported in part C. This information helps safety personnel to focus on the number of incidents that occurred.

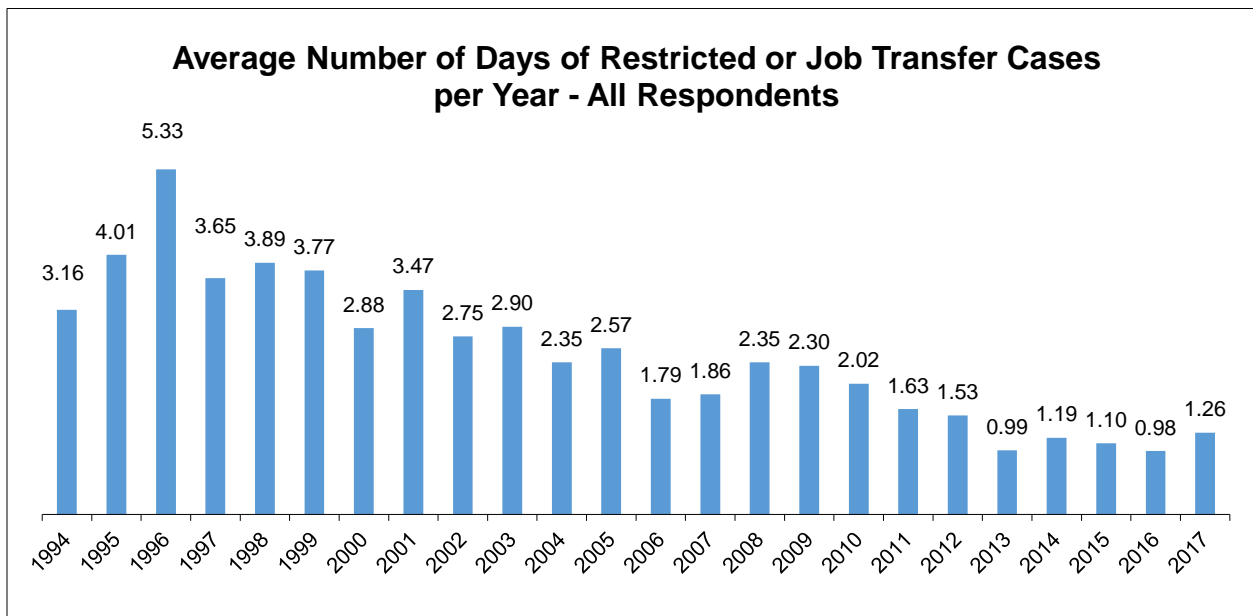
For example, an injury at one utility that required an employee to remain “Away from Work” for 45 days (due to one incident) is equivalent to an injury at another utility where the employee remained “Away from Work” for 2 days (also from one incident)—in each example, the **incident** would be considered as one **case**, regardless of the **number** of resulting **days** away from work. The type or duration of the injury is not considered, rather only that the incident resulted in

reportable injury. For further explanation of “cases” and case reporting, please see the Association’s Safety Awards of Excellence Rules and Regulations document in the Appendix of this report. Figures 4, 5, and 6 are presented with data from all respondents.

**Figure 4: Average Number of Days Away from Work Cases**



**Figure 5: Average Number of Restricted or Job Transfer Cases**



**Figure 6: Average Medical Treatment Cases**

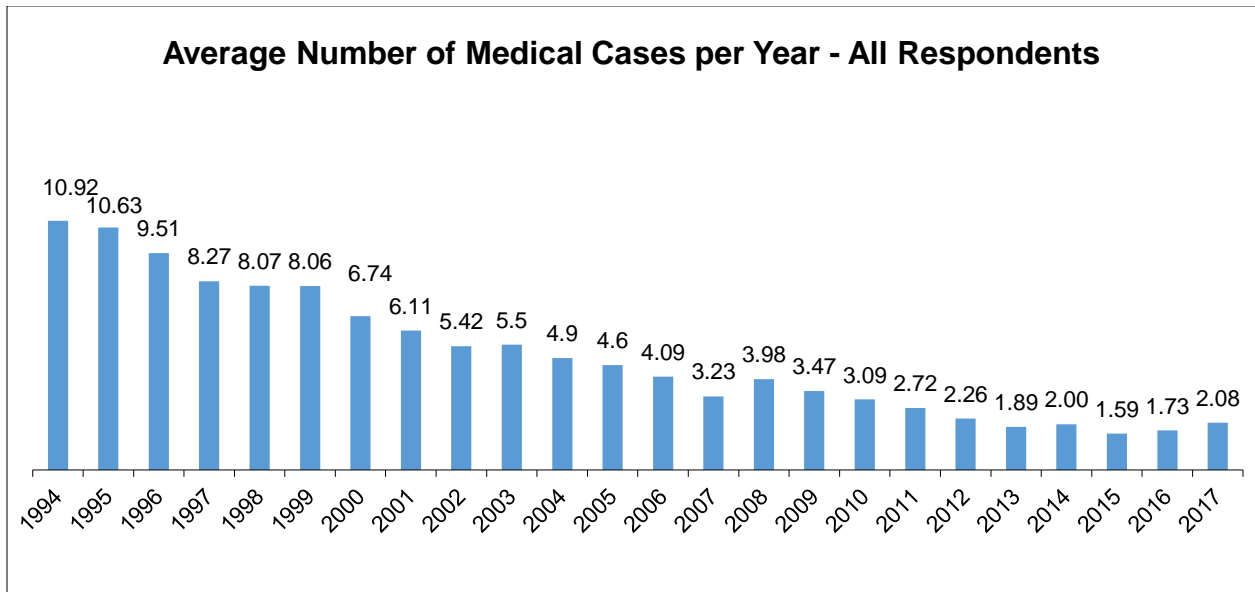
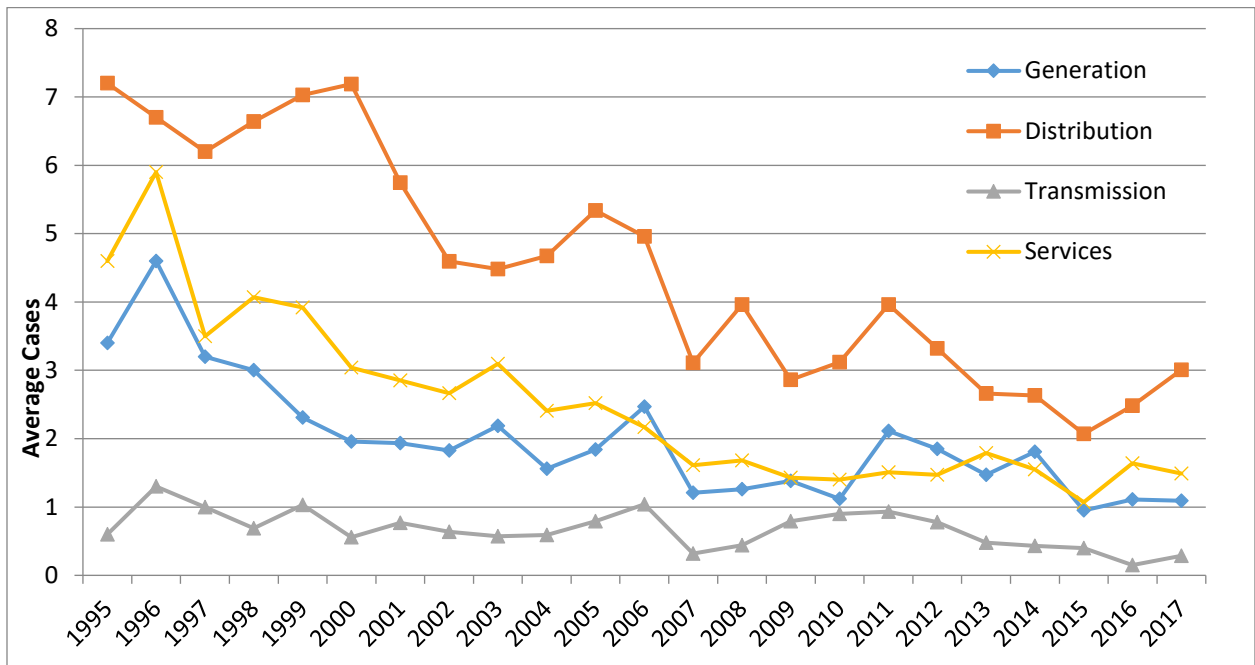


Figure 7 below presents the average attributable cases (from 1995-2017) for the generation, distribution, transmission, and services components of responding utilities.

**Figure 7: Average Attributable Cases Based on Utility Component per year (1995-2017)**



## Section II – Award Groups

Once data is submitted to the American Public Power Association, the entries are sorted into groups according to the total number of hours worked by all electric utility employees at that particular utility in the designated year. The group categories are the same from year to year; the table below shows the current groups used in the Awards.<sup>6</sup>

**Table 1: Award Groups by Number of Worker-Hours of Exposure in One Calendar Year**

<b>Groups</b>	<b>Worker-hour Categories</b>
Group A	Less than 15,000 worker-hours of exposure
Group B	15,000 to 29,999 worker-hours of exposure
Group C	30,000 to 59,999 worker-hours of exposure
Group D	60,000 to 109,999 worker-hours of exposure
Group E	110,000 to 249,999 worker-hours of exposure
Group F	250,000 to 999,999 worker-hours of exposure
Group G	1,000,000 to 3,999,999 worker-hours of exposure
Group H	More than 3,999,999 worker-hours of exposure

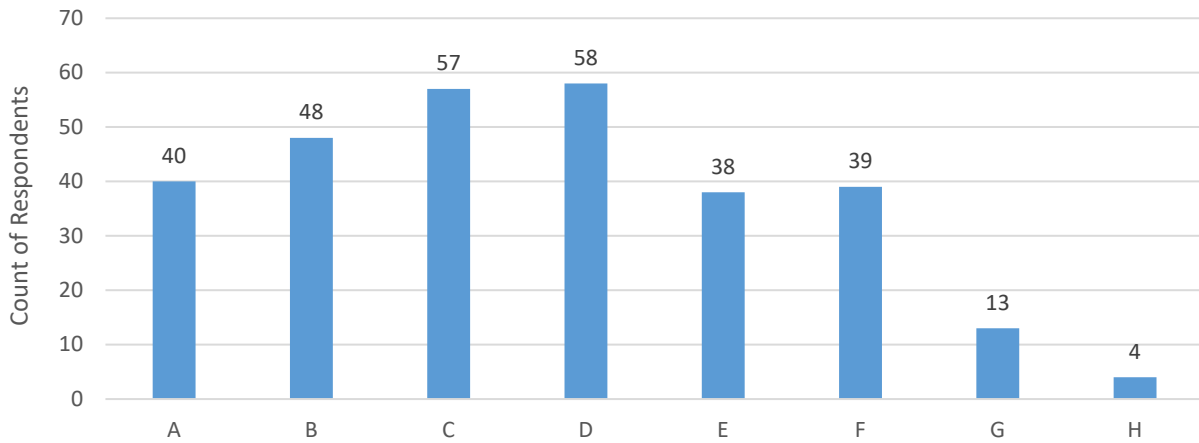
The information provided in this section is based on the data gathered for the year 2017 from parts B, C, and D of the entry form broken out by group. The incidence rates along with average number of cases from the case types recorded on the entry form are displayed by utility group.

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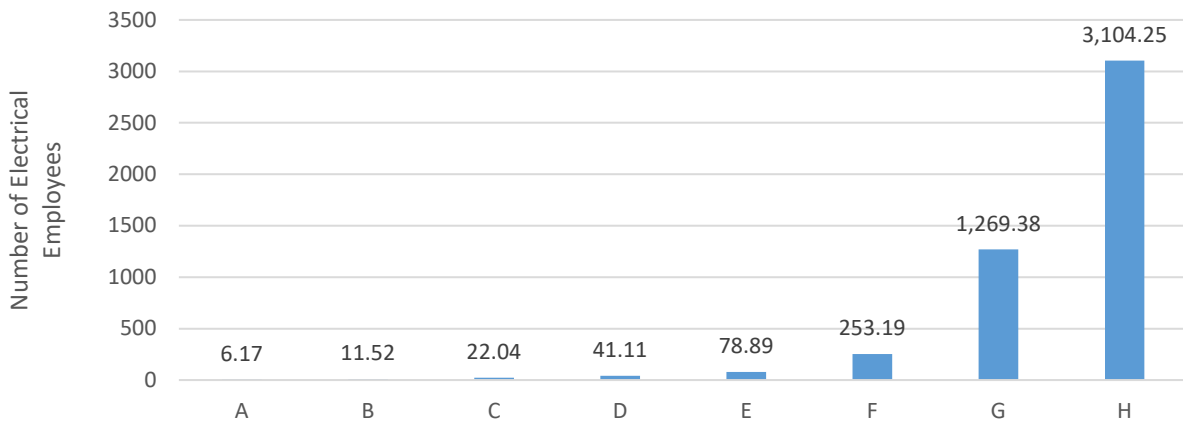
<sup>6</sup> Group categories were changed slightly by the Association's Safety Committee in 2003 to account for utility growth.



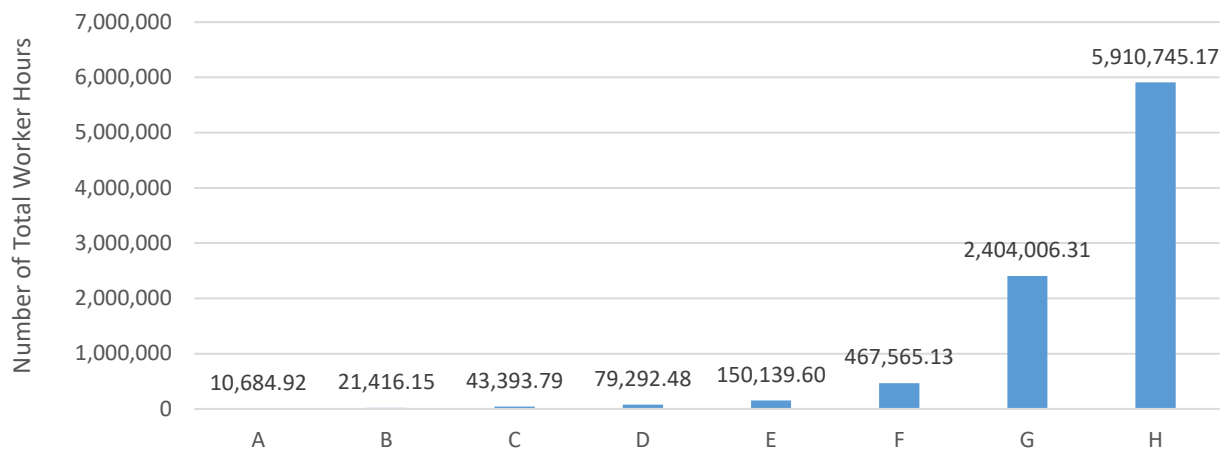
**Figure 8: Count of all Respondents in 2017 by Group**



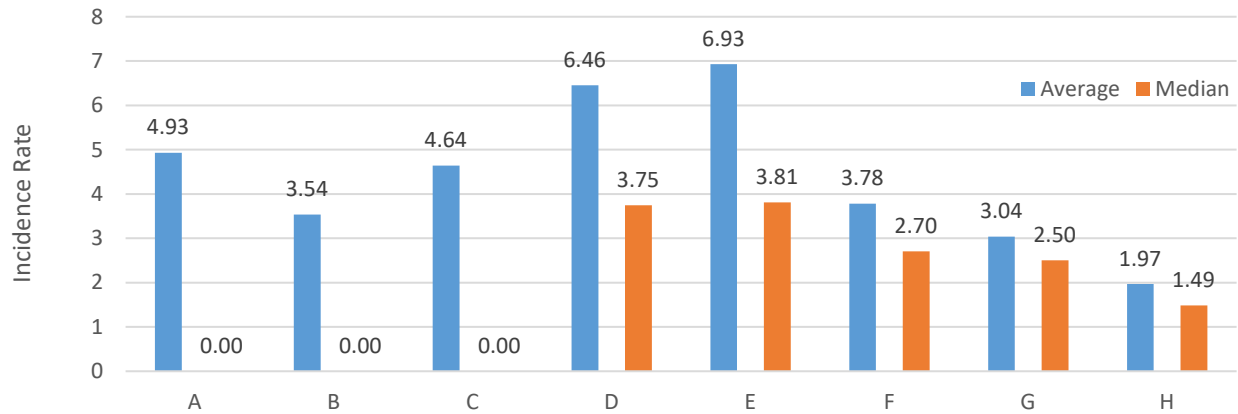
**Figure 9: Average Number of Electrical Employees in 2017 by Group**



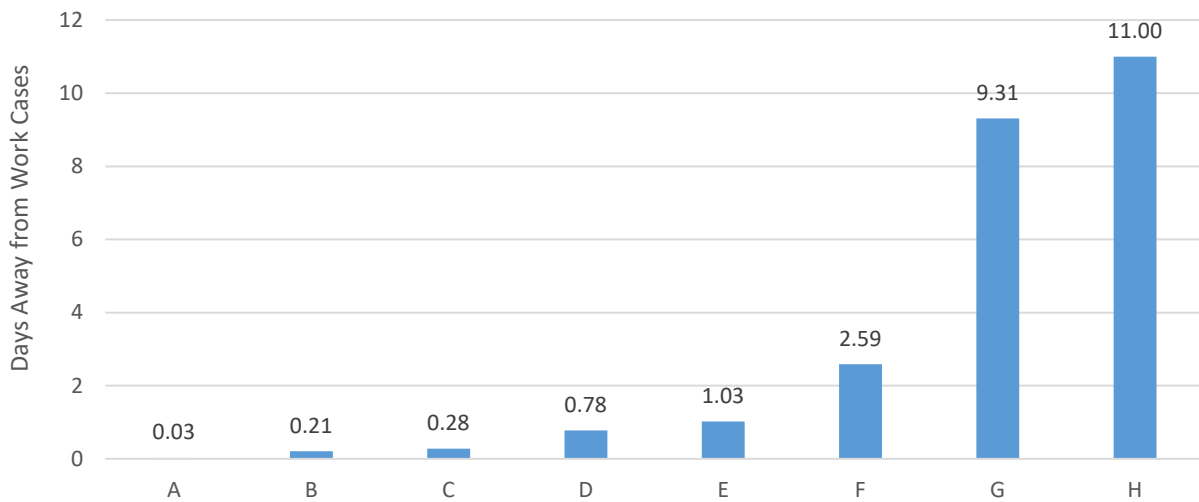
**Figure 10: Average Number of Total Worker Hours in 2017 by Group**



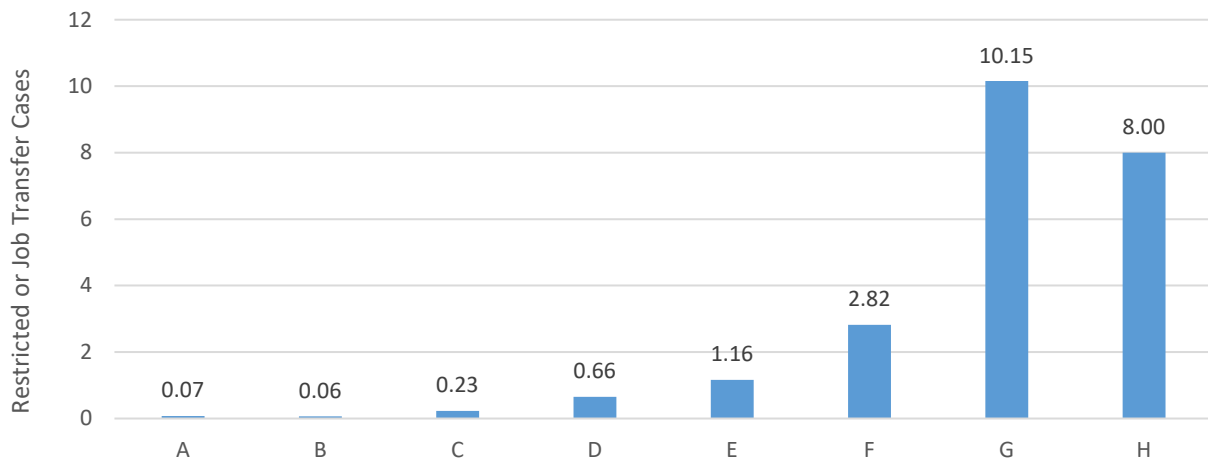
**Figure 11: Average and Median Incidence Rates by Groups**



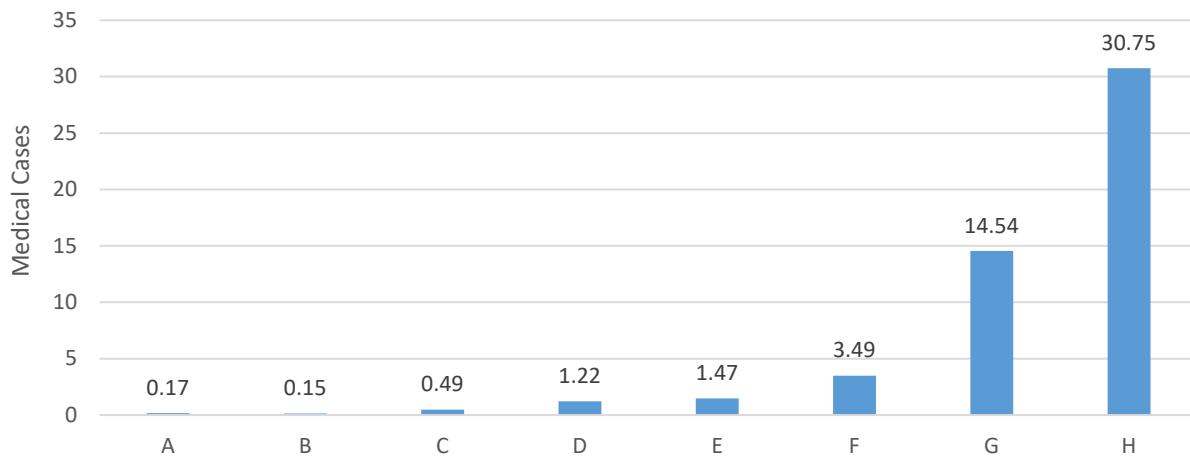
**Figure 12: Average Days Away from Work Cases for 2017 by Group**



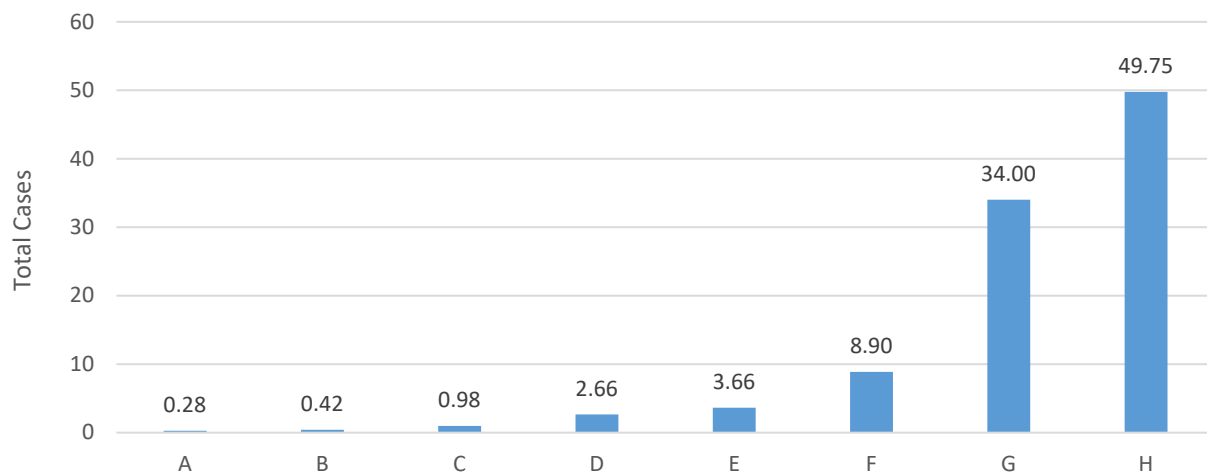
**Figure 13: Average Number of Restricted or Job Transfer Cases for 2017 by Group**



**Figure 14: Average Number of Medical Treatment Cases for 2017 by Group**



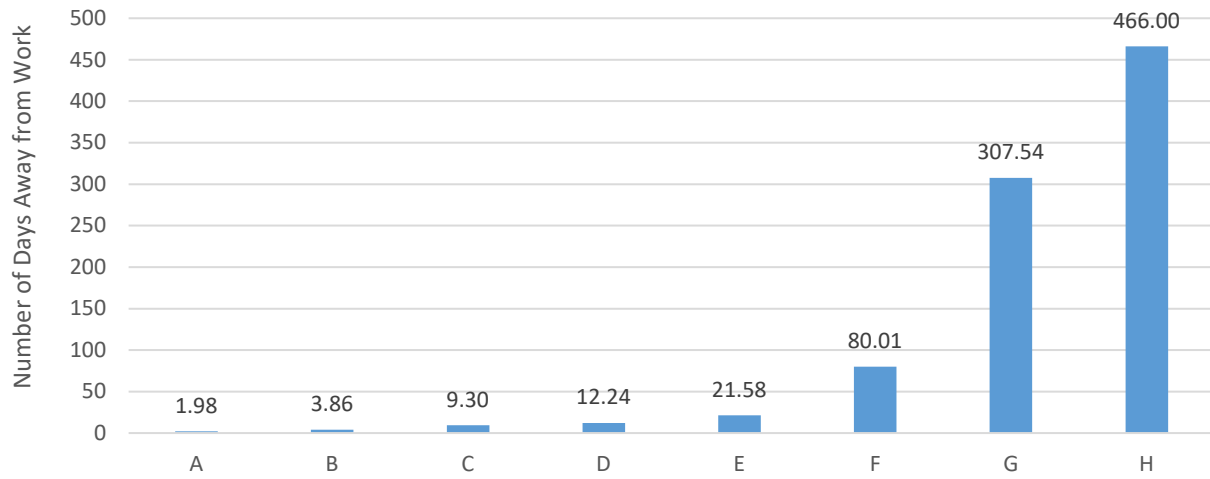
**Figure 15: Average Number of Total Cases for 2017 by Group**



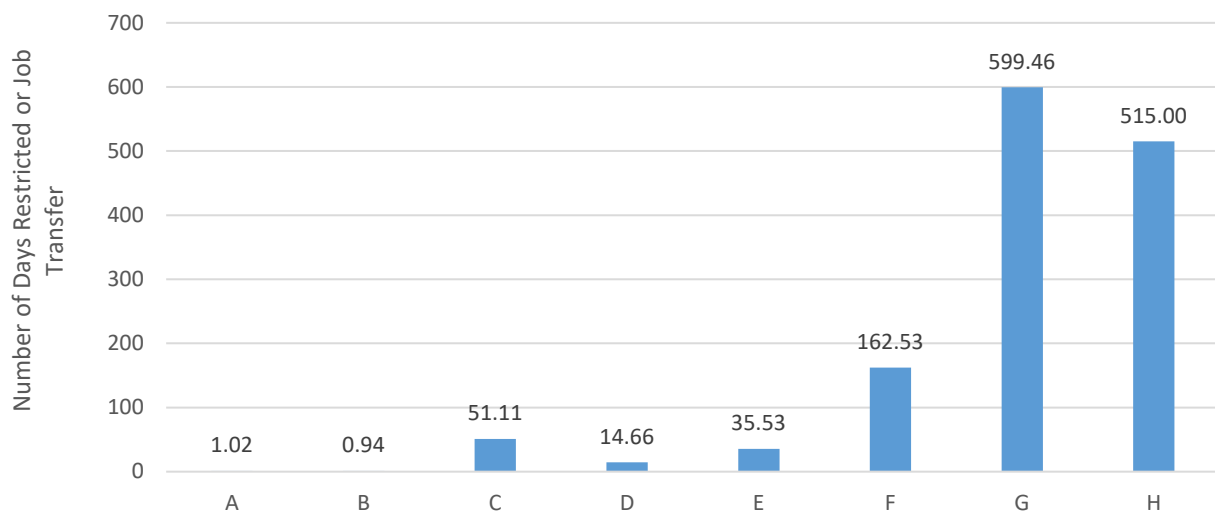
While systems with more worker-hours tend to have lower incidence rates (see Figure 11), they are also more likely to have higher average numbers of cases (days away from work, restricted or job transfer, and/or medical treatment). More worker-hours of exposure create more opportunities for incidents to occur; likewise, a utility with fewer worker-hours (employees) is likely to have fewer cases than one with more worker-hours (employees).

In part C of the entry form, utilities record the cumulative cases for days away from work or on restricted duty for all employees. When assigned, these days can be taken by employees or mandated by managers, and can be due to either injuries or illnesses. As expected, Figures 16 and 17 shows that the average number of cases increases as electrical worker-hours increase.

**Figure 16: Average Number of Days Away from Work by Group**



**Figure 17: Average Number of Days Restricted or Job Transfer by Group**



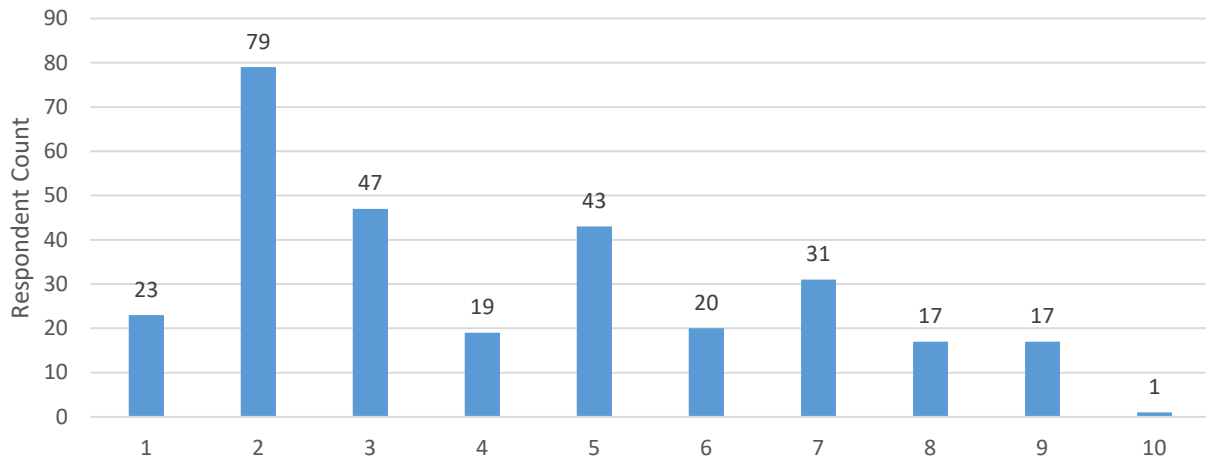
## Section III – Award Region

This section provides an additional analysis of the Section I data by regions. The regions were established by the American Public Power Association’s Board of Directors in the 1980s. A breakdown of the regions can be found below.

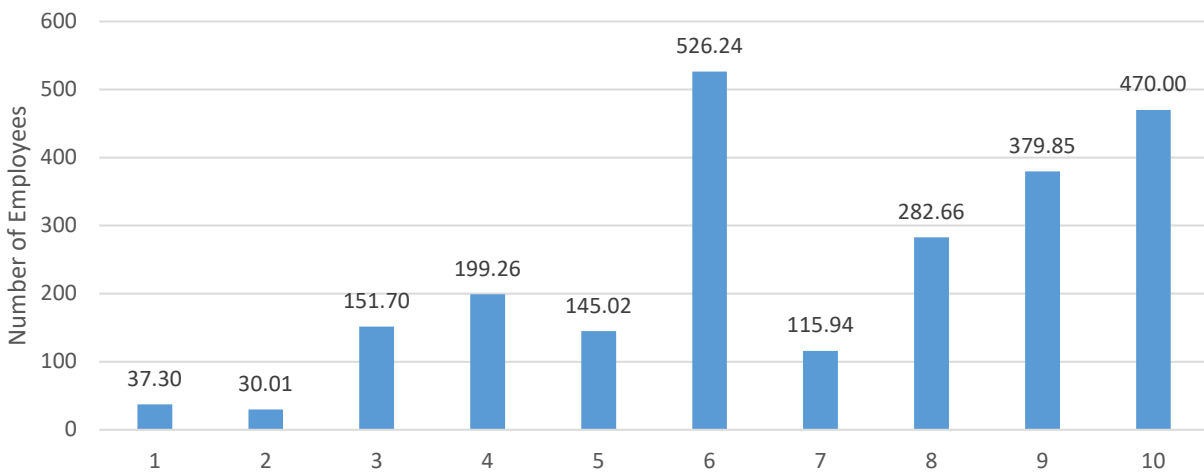
- Region 1:** Wyoming, Colorado, New Mexico, Utah
- Region 2:** Indiana, Illinois, Michigan, Ohio, Wisconsin
- Region 3:** Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota, South Dakota
- Region 4:** Oklahoma, Arkansas, Texas, Louisiana
- Region 5:** Maryland, Delaware, West Virginia, Virginia, North Carolina, South Carolina, Georgia, Florida
- Region 6:** Nevada, Arizona, California
- Region 7:** Kentucky, Tennessee, Mississippi, Alabama
- Region 8:** Maine, New Hampshire, Vermont, Connecticut, Rhode Island, Massachusetts, New Jersey, New York, Pennsylvania
- Region 9:** Montana, Idaho, Washington, Oregon, Alaska
- Region 10:** American Samoa, Federal States of Micronesia, Guam, Northern Mariana Islands, Palau, Puerto Rico, Virgin Islands

As shown in Section II, utility size, as grouped by worker-hours, may have an impact on average values in a given region. Thus, we have broken out the count of utility entrants with greater than 1 million worker-hours for reader consideration in Figure 21.

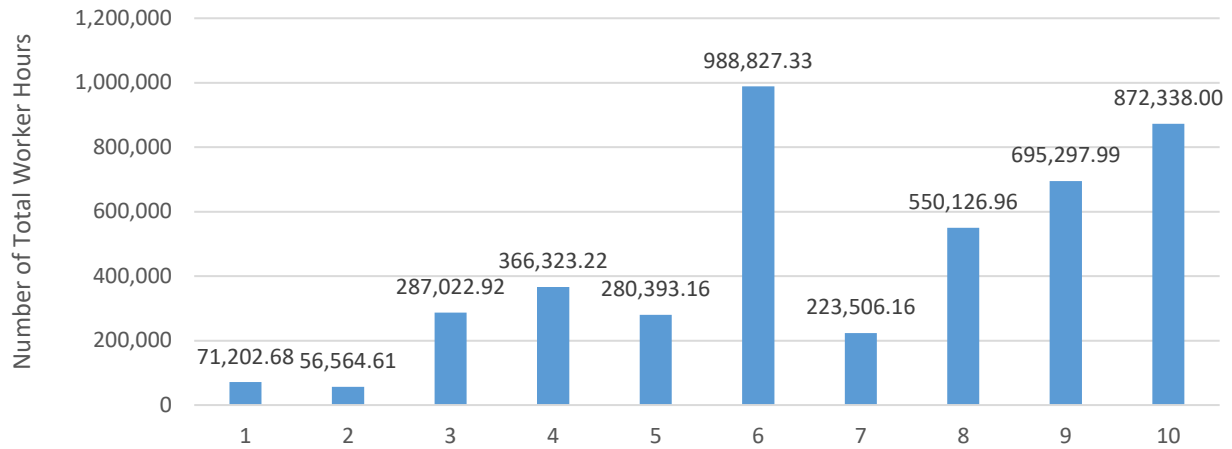
**Figure 18: Count of All Respondents by Association Region**



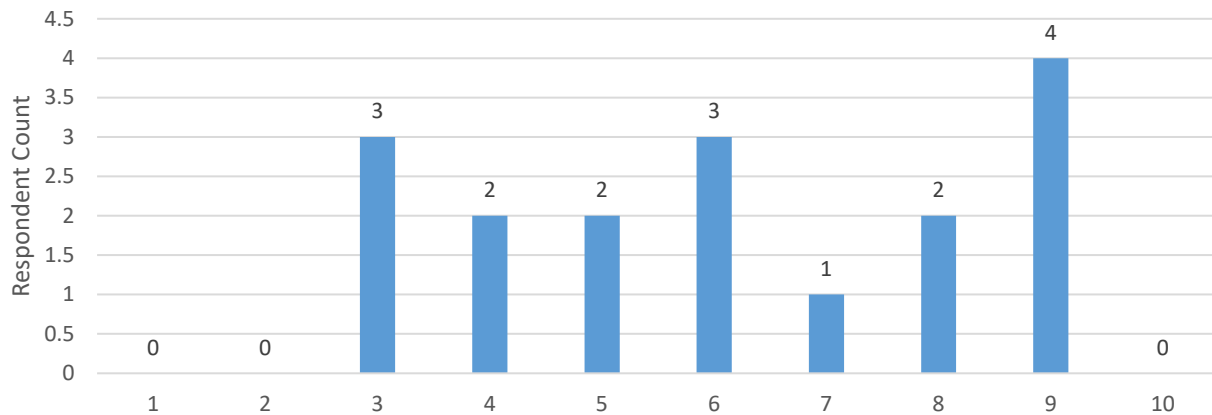
**Figure 19: Average Number of Electrical Employees in 2017 by Region**



**Figure 20: Average Number of Total Worker Hours in 2017 by Region**

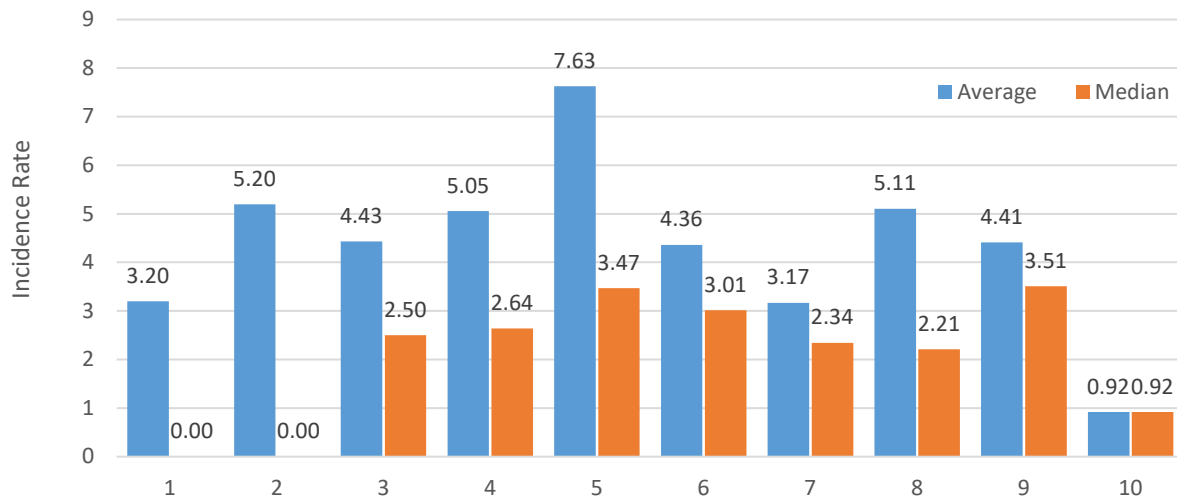


**Figure 21: Count of All Respondents with More Than 1 Million Worker-hours by Association Region**

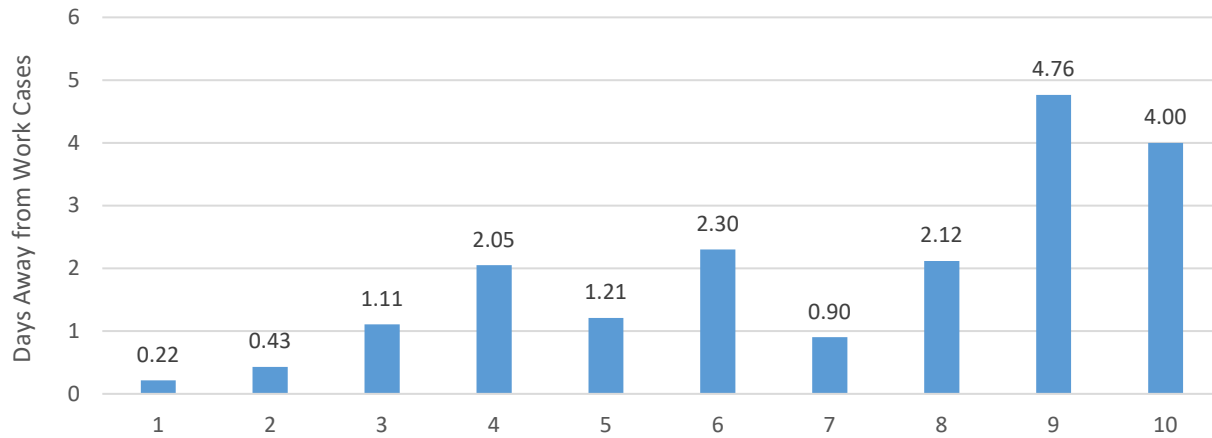


In the following graphs, it is important to keep this information in mind; while systems with more worker hours tend to have lower incidence rates, their average number of cases tend to be higher.

**Figure 22: Average and Median Incidence Rates by Association Region**

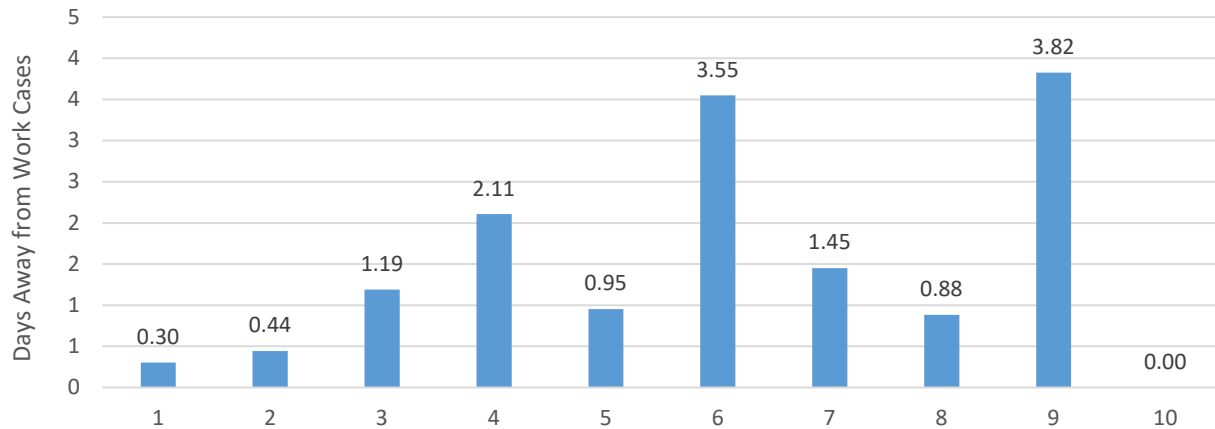


**Figure 23: Average Days Away from Work Cases by Association Region**

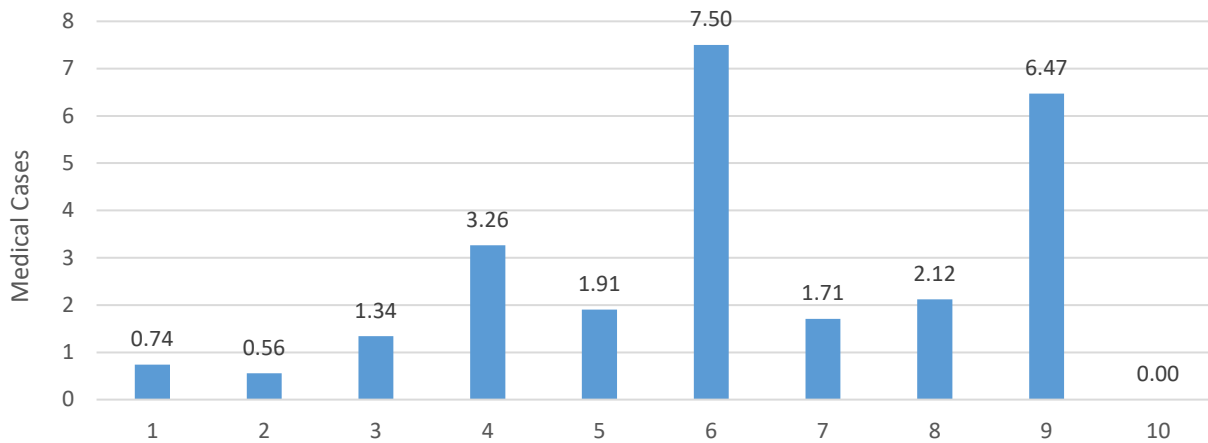




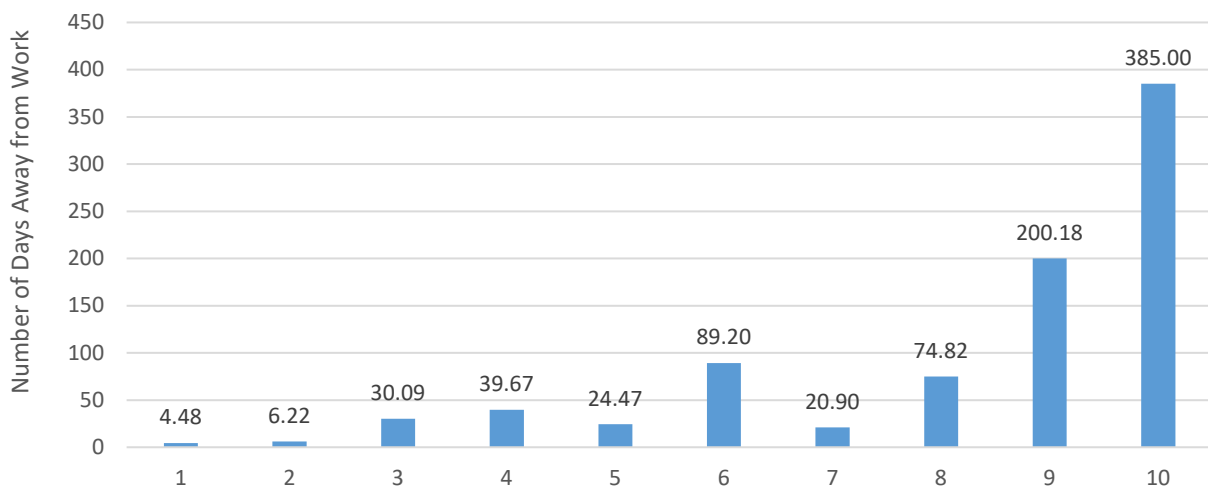
**Figure 24: Average Restricted or Job Transfer Cases by Association Region**



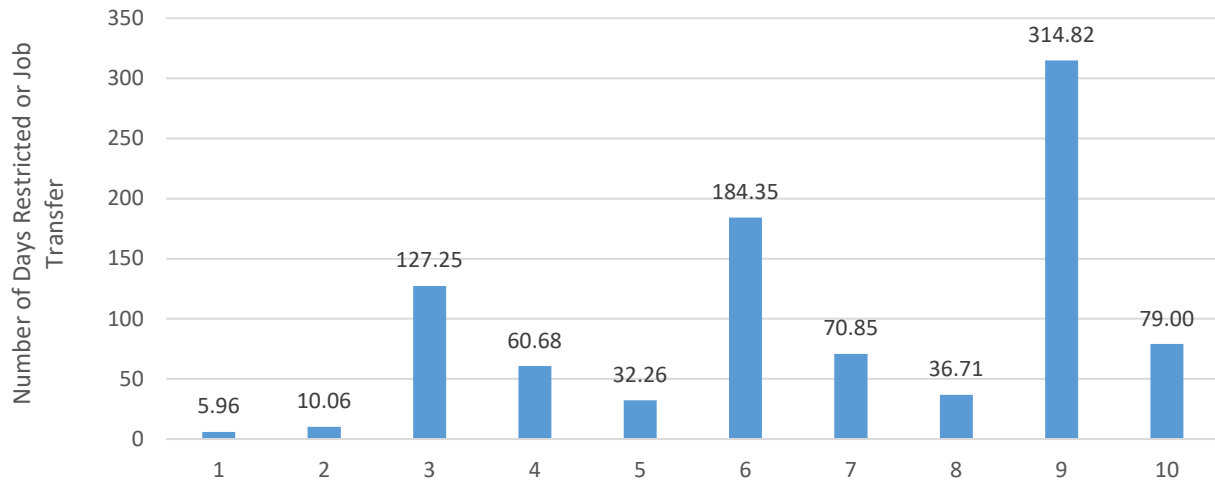
**Figure 25: Average Medical Cases by Association Region**



**Figure 26: Average Number of Medical Treatment Cases for 2017 by Region**



**Figure 27: Average Number of Days Restricted or Job Transfer by Region**



# Section IV – DART Rate

Every year, the safety team receives specific requests for subsets of information that would allow them to calculate their region or group’s DART rate. DART rate is short for Days Away from work, days of Restricted work activity, and/or days of jobs Transfer rate. This year in the Evaluation of Data Report for the Safety Awards we have decided to include a new section that focuses on the DART rate in addition to the Total Recordable Incident Rate (TRIR).

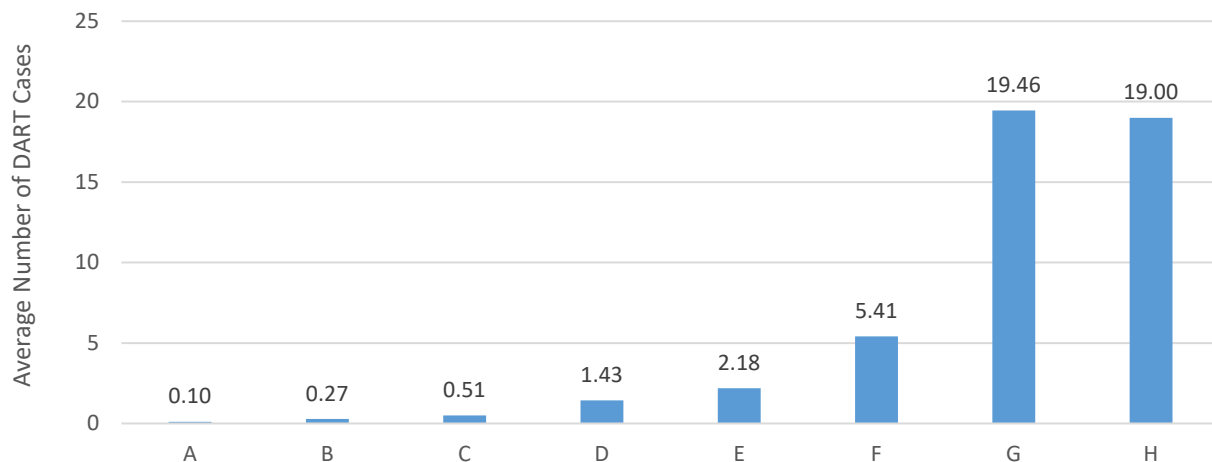
Determining how a utility prioritizes the safety of their workers using a statistic can be extremely difficult, especially when trying to comprehend a utilities safety culture. After doing some initial research and talking with members, we found that the TRIR encompasses more of the safety culture at a utility due to its inclusion of all injuries and illnesses regardless if those cases resulted in days away, restricted duty, and/or job transfer. However, we also found that other utilities preferred the DART rate because it only accounts for injuries or illnesses that result in a loss of productivity, meaning that the employee couldn’t do their job for a certain time, had to lighten their duties or performed a different job altogether.

It is important to note that all figures in Section IV only include cases that resulted in a fatality, days away from work, days of restricted work activity, and/or days of jobs transfer. All other recordable cases such as medical treatment and their corresponding graphs and figures can be found in Sections I, II, III, and V. Group and Region breakdown can be found in Sections II and III, respectively.

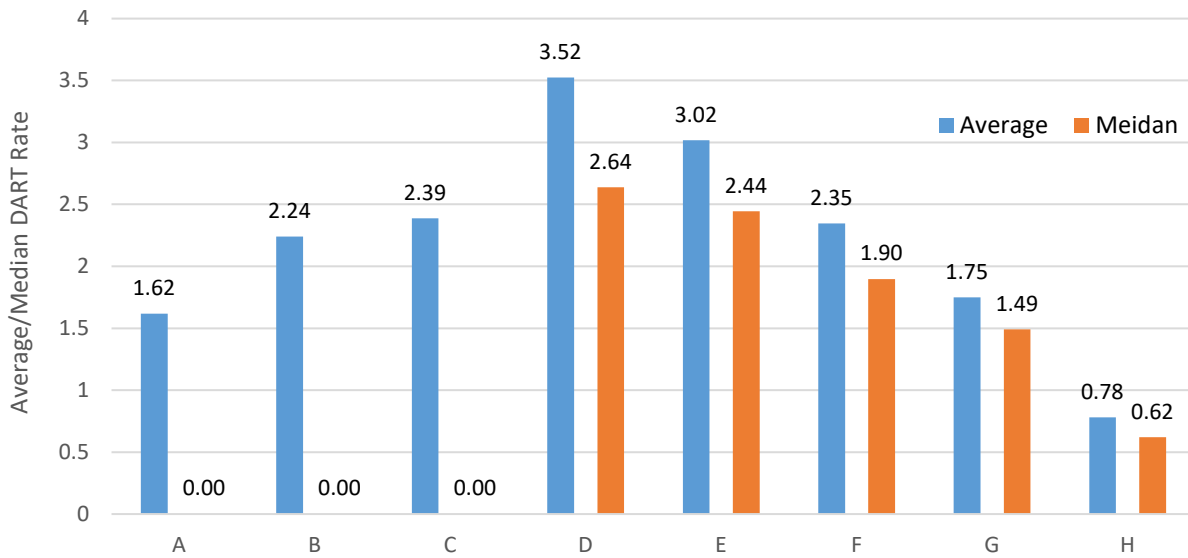
$$\text{DART Rate} = \frac{((\text{Days Away from work Cases} + \text{Job Transfer or Restricted Cases}) * 200,000 \text{ Work Hours})}{\text{Number of Work Hours}}$$

## DART - Group

**Figure 28: Average Number of DART Cases by Group**

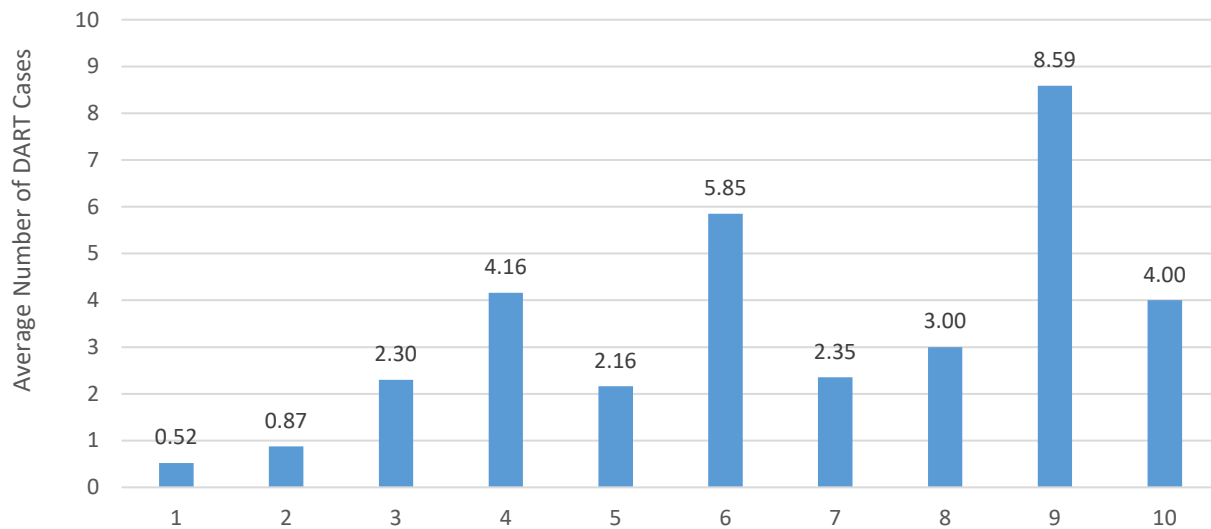


**Figure 29: Average/Median DART Rate by Group**

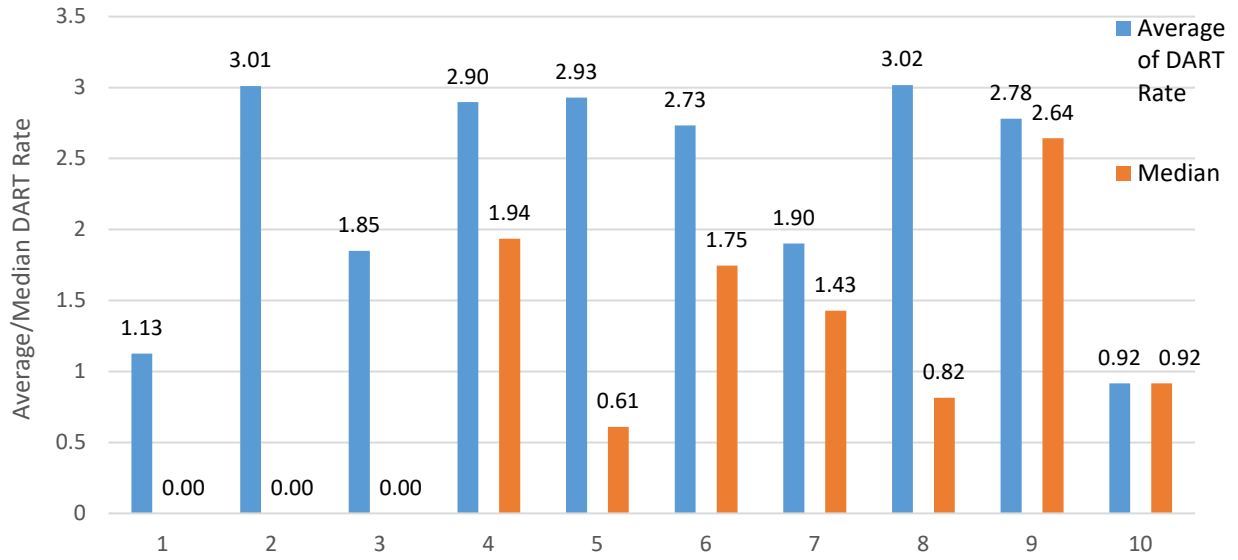


**DART - Regional**

**Figure 30: Average Number of DART Cases by Association Region**



**Figure 31: Average/Median DART Rate by Association Region**



## Section V – Cases per Exposure Year

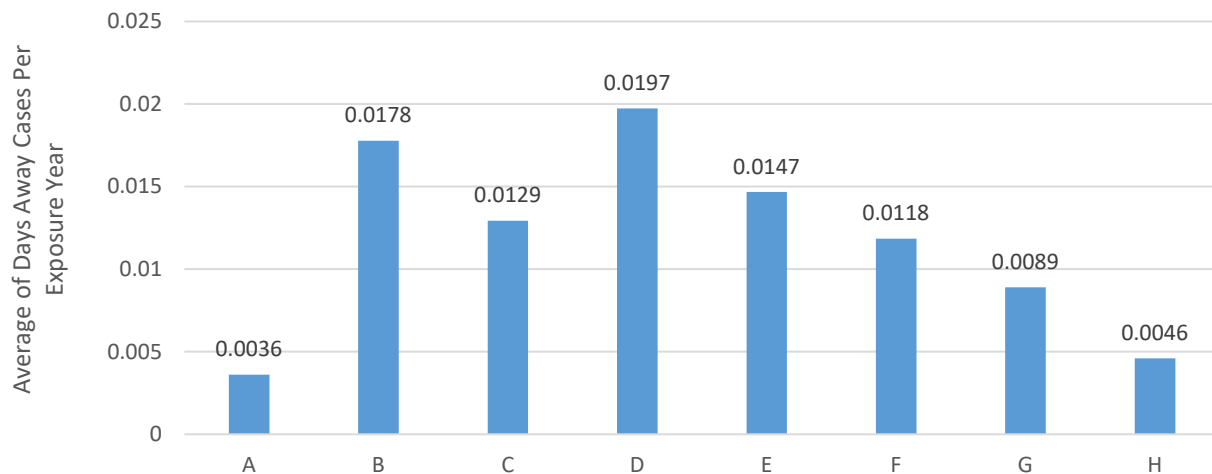
Public Power, as a subgroup of the electric industry, has difficulty finding a statistic that accurately depicts the safety culture. Although the Total Recordable Incidence Rate and DART Rates help benchmark across the entire industry, normalizing utilities worker hours to 100 employees skews smaller utilities data. Skewed data becomes all too common in a sector where 49.7% of the utilities serve less than 2,000 customer meters.

To represent a utilities safety culture without averaging, normalizing, or skewing data we decided to include a new section on Cases per Exposure Year. Cases per exposure year has three components: total number of cases, 2080 worker hours of exposure (number of worker hours in one year), and the number of exposure hours for electrical employees at your utility. These three input numbers are represented in the equation below.

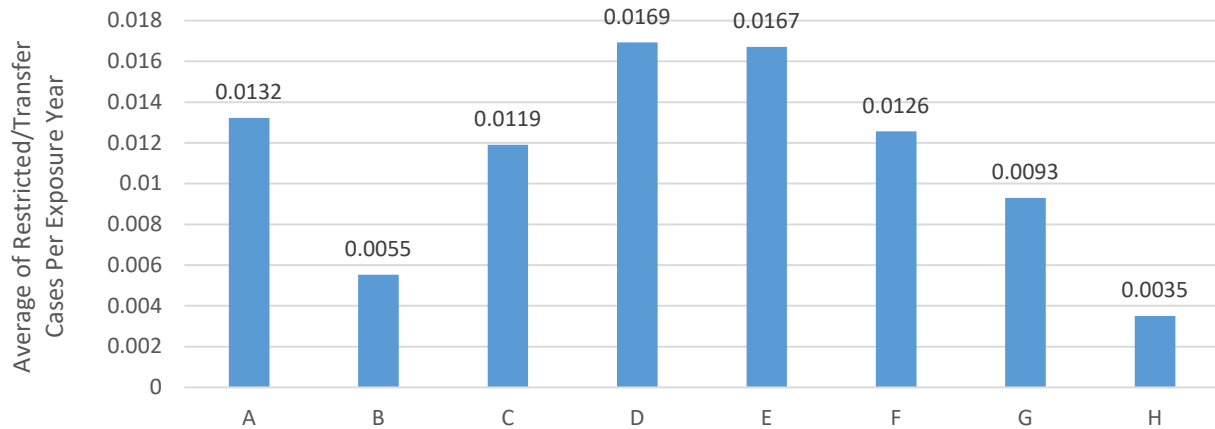
$$\text{Cases Per Exposure Year} = \frac{(\text{Cases} * 2080 \text{ Worker Hours})}{\text{Number of Work Hours}}$$

### Cases Per Exposure Year - Group

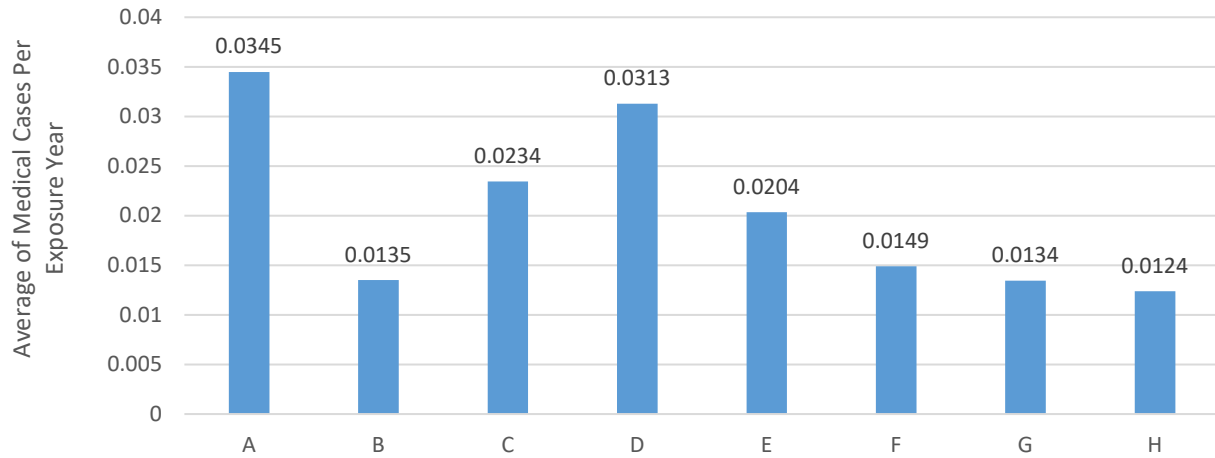
Figure 32 - Average of Days Away Cases Per Exposure Year by Group



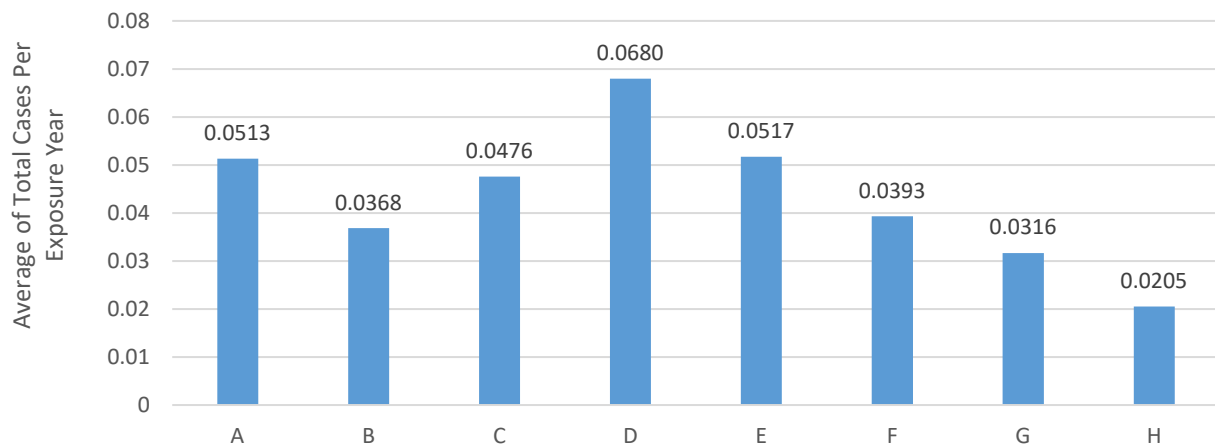
**Figure 33 - Average of Restricted/Transfer Cases Per Exposure Year by Group**



**Figure 34 - Average of Medical Cases Per Exposure Year by Group**

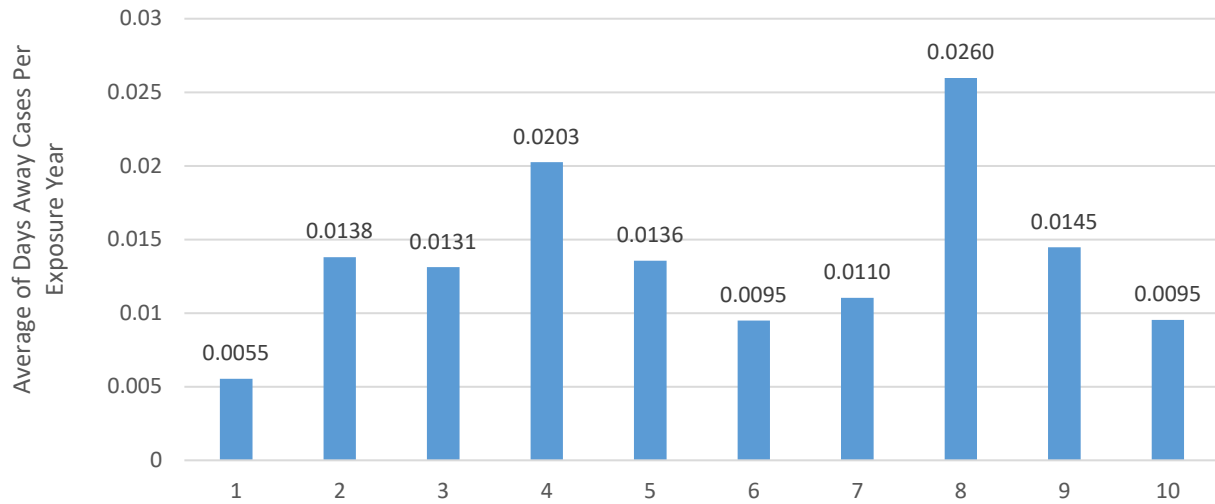


**Figure 35 - Average of Total Cases Per Exposure Year by Group**

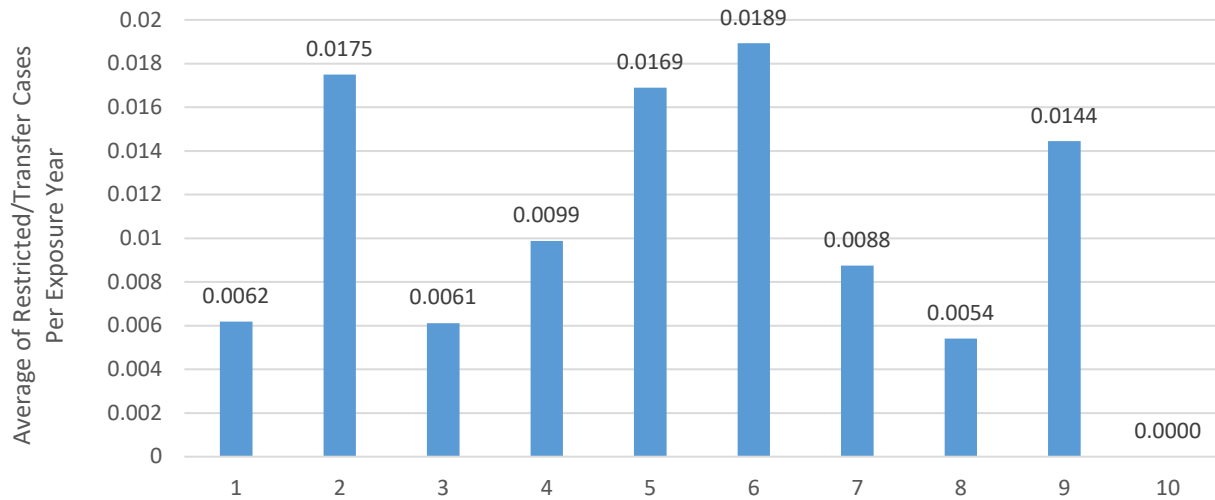


## Cases per Exposure Year - Region

**Figure 36 - Average of Days Away Cases Per Exposure Year by Association Region**

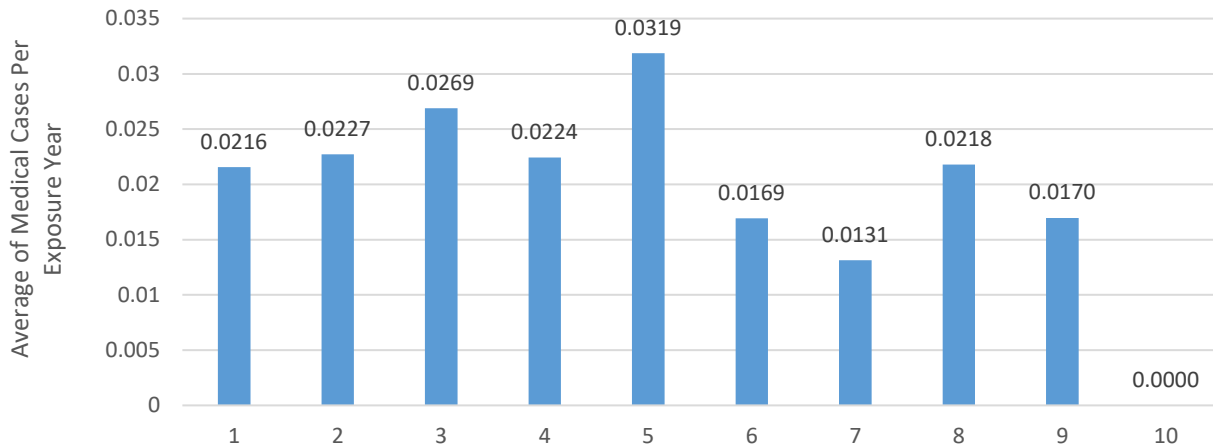


**Figure 37 - Average of Restricted/Transfer Cases Per Exposure Year by Association Region**

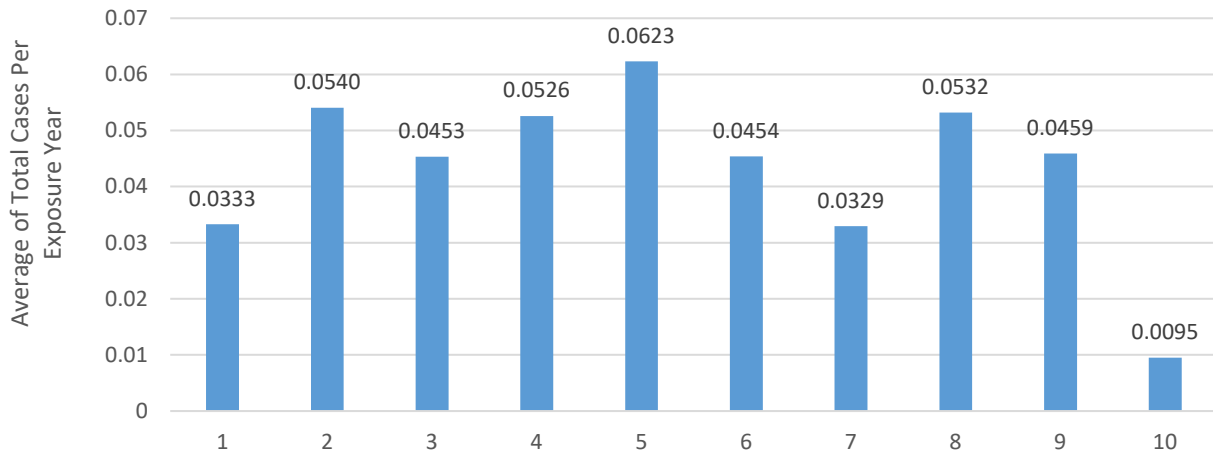




**Figure 38 - Average of Medical Cases Per Exposure Year by Association Region**



**Figure 39 - Average of Total Cases Per Exposure Year by Association Region**



## Section VI - Summary

The American Public Power Association encourages each utility to review the overall combined utility statistics along with the statistics for their utility grouping. For example, a small utility that falls into Group A may find it useful to compare itself to the overall combined data in order to track their safety performance against all public power utilities across the United States. Yet, this same utility may not find the actual breakdown of Group H data to be of interest. (A comparison of a 15,000 worker-hour utility to a 4,000,000 worker-hour utility may not provide any insightful information.) However, the 15,000 worker-hours of exposure per year utility should find value in comparing itself directly to any data provided for Group A.

The American Public Power Association provides the data presented in this report for use by its members in aggregate form only. The individual names of the utilities that have entered the Awards are confidential. Each year, The Association releases only the names of those utilities that have received Awards recognition, in addition to their calculated incidence rate and worker-hours for the given year.

Since greater numbers of entrants enhance the value of the Safety Awards for all utilities involved, The Association again encourages all members to continue submitting data on a yearly basis, regardless of the number of accidents/injuries that have occurred over the calendar year.

We welcome comments and suggestions on how to make this report better, as we strive to improve the accuracy and readability with each edition. You may reach Engineering Services staff directly via e-mail or phone:

Ethan Epstein, Energy and Environmental Services Assistant, 202-467-2924 or [EEpstein@publicpower.org](mailto:EEpstein@publicpower.org)

Michael Hyland, Senior Vice President, Engineering Services, 202-467-2986 or [MHyland@publicpower.org](mailto:MHyland@publicpower.org)

Alex Hofmann, Energy and Environmental Services Director, 202-467-2956 or [AHofman@publicpower.org](mailto:AHofman@publicpower.org)

# Appendix

- [2017 Safety Awards of Excellence Annual Report Form](#)
- [American Public Power Association Safety Awards of Excellence Rules and Regulations](#)
- [OSHA Forms for Recording Work-Related Injuries and Illnesses](#)