



# 2016 Electrical Safety Review

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NREL

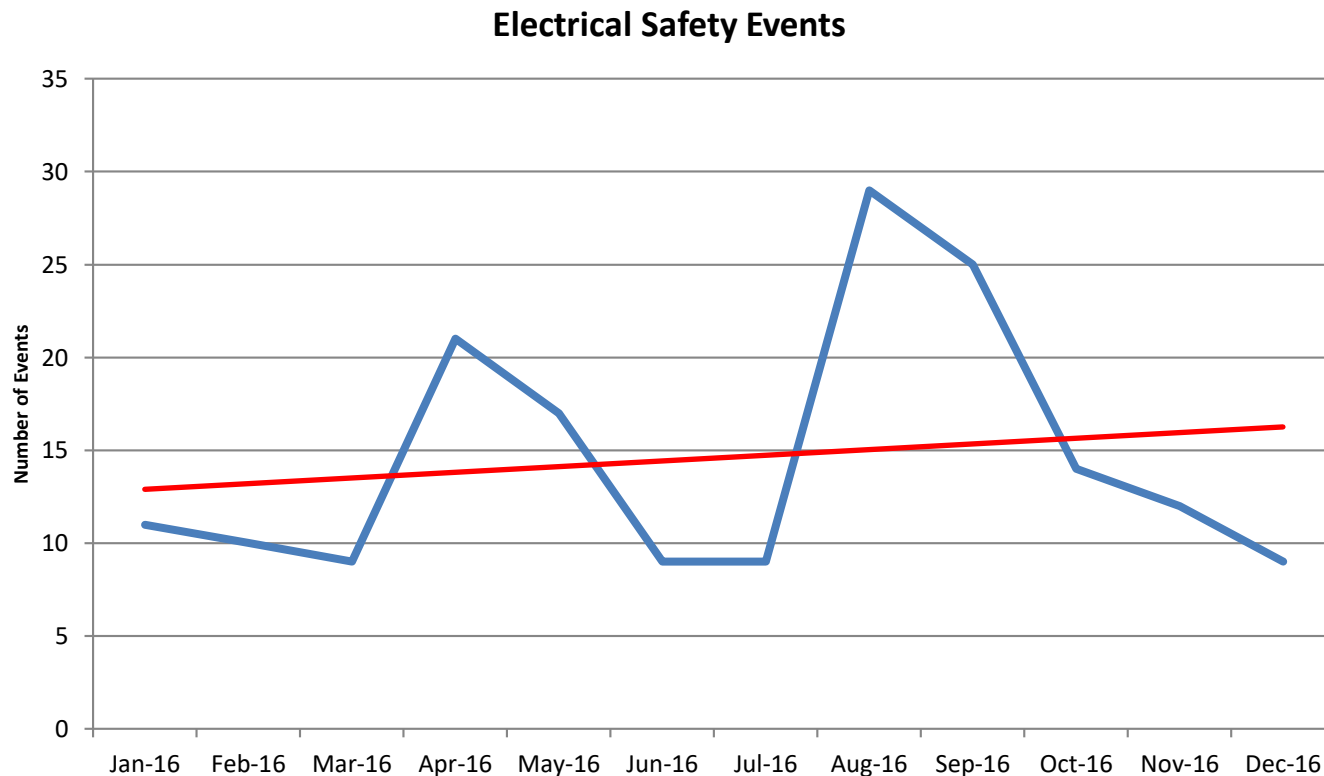
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# Introduction

- The number of reported electrical safety events has shown a slight increase over the year



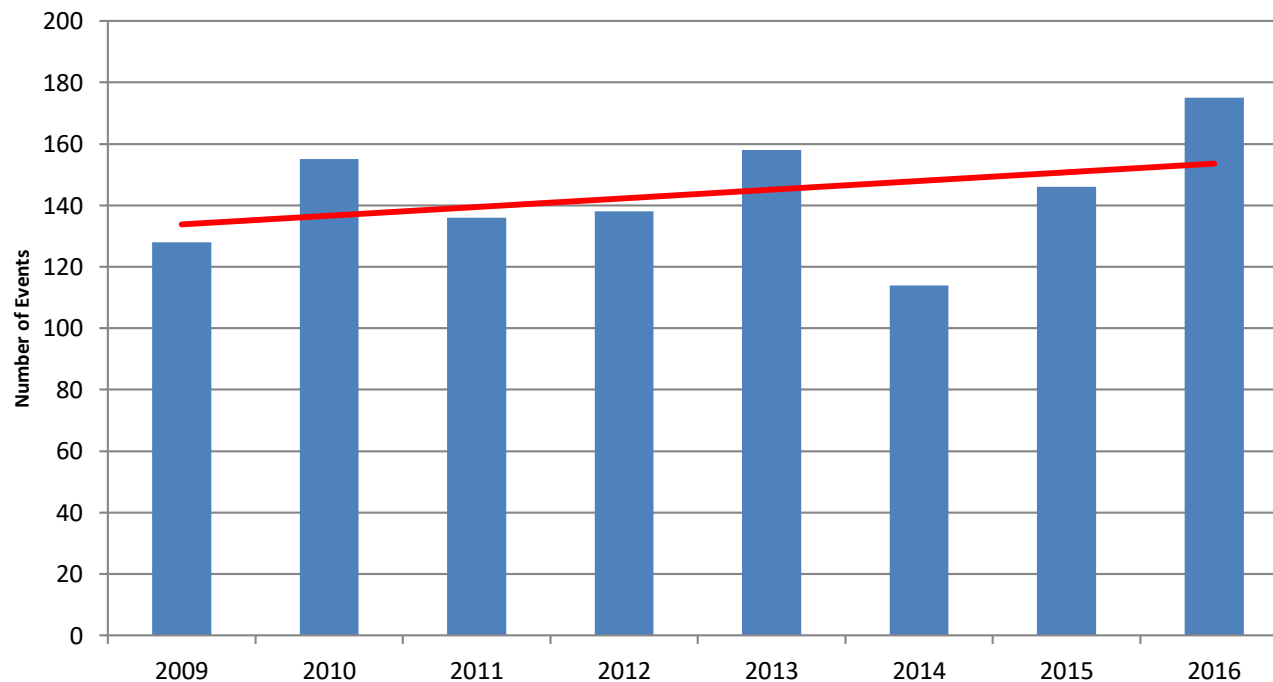
# Why should we be concerned?

- Electrical hazards caused around **134 deaths** and **4,480 injuries** in the workplace in 2015. Electrical accidents rank sixth among all causes of work-related deaths in the United States
- Workers in Private sector industries that produce goods (Natural Resources and Mining, Construction, and Manufacturing) sustained 75% of on-the-job electrical fatalities while workers in the Service providing industries sustained 25% for 2015 (BLS data)
- Although more electrical burn injuries than electric shock injuries occurred in the Construction industry between 2003 and 2015, that gap is beginning to narrow. The Construction industry saw more electric shock injuries than electrical burn injuries in 2010, 2013, and 2015. In fact, 3 times more electric shock injuries than electrical burn injuries occurred in 2015. The Utility industry continues to see more electrical burn injuries than electrical shock injuries each year except for 2015 when their numbers were approximately equal.
- DOE has had only one electrical fatality in the past eight years.

# The Data Set

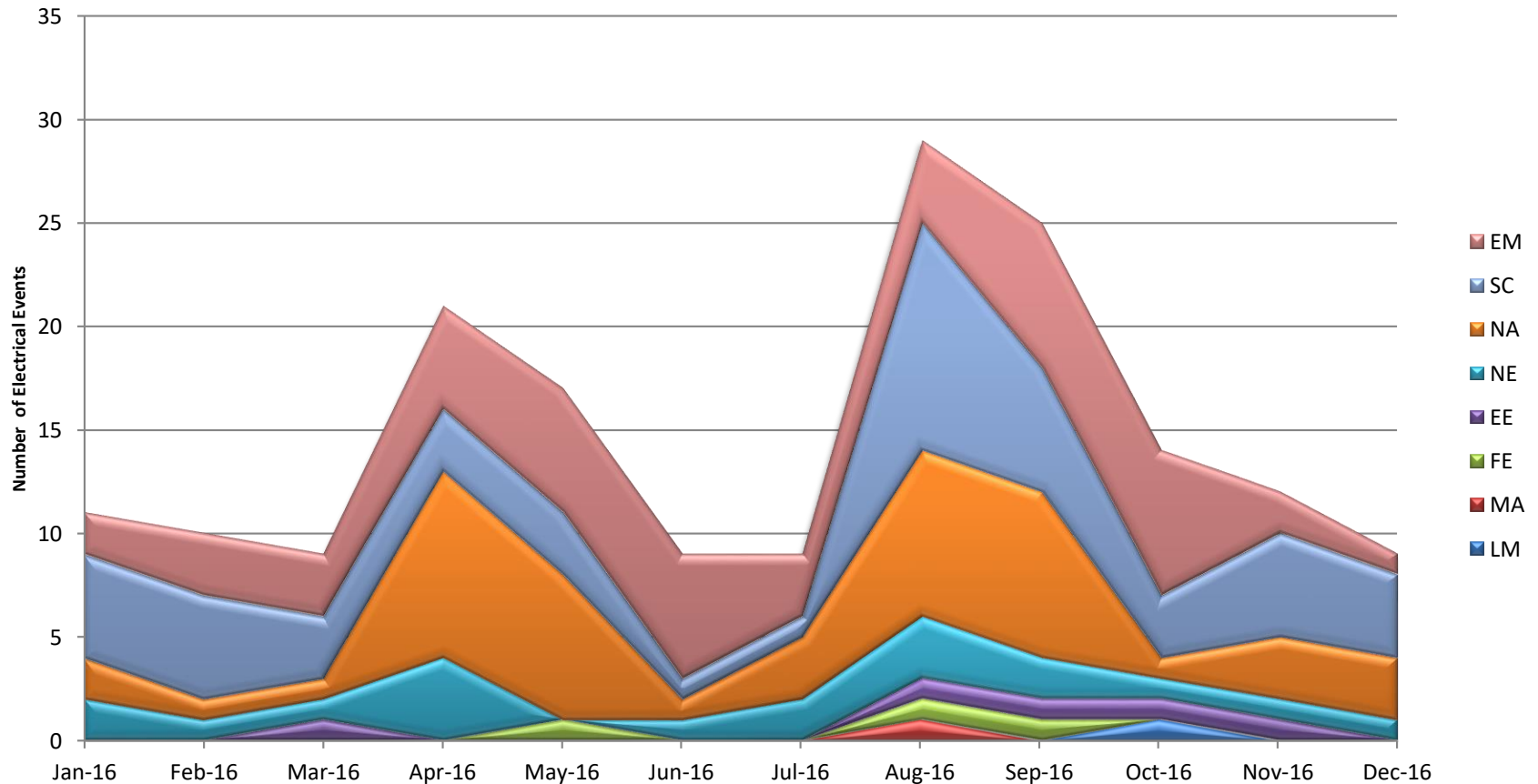
- The CY-2016 data set included **175 ORPS** reports that were coded for electrical safety issues
- Electrical safety events accounted for **17%** of all ORPS reports, which is a **2%** increase over CY-2015

Electrical Events - Past Eight Years



# What Secretarial Offices were involved?

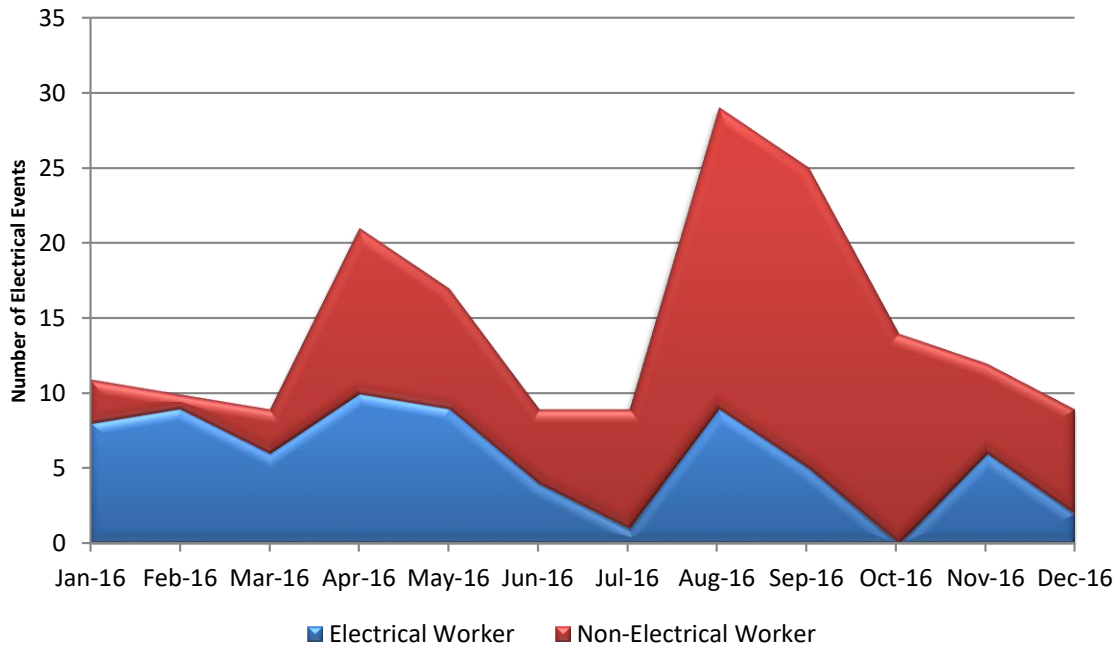
**Electrical Events by Month and Secretarial Office**  
(Offices with 1 or more events)



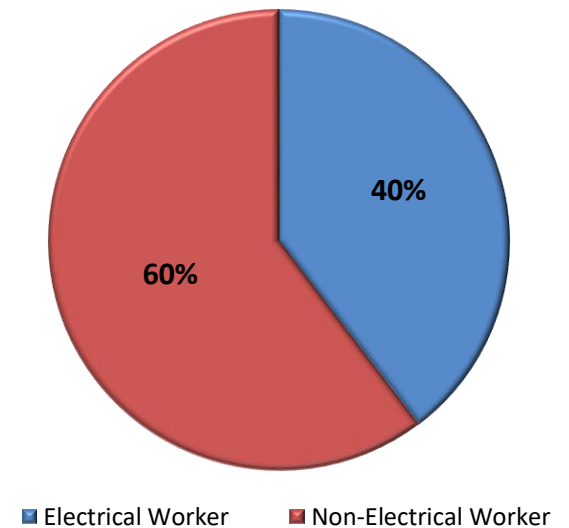
# How do worker types compare?

- These charts show a comparison of Electrical Workers versus Non-electrical Workers

Electrical Safety Events by Worker Type

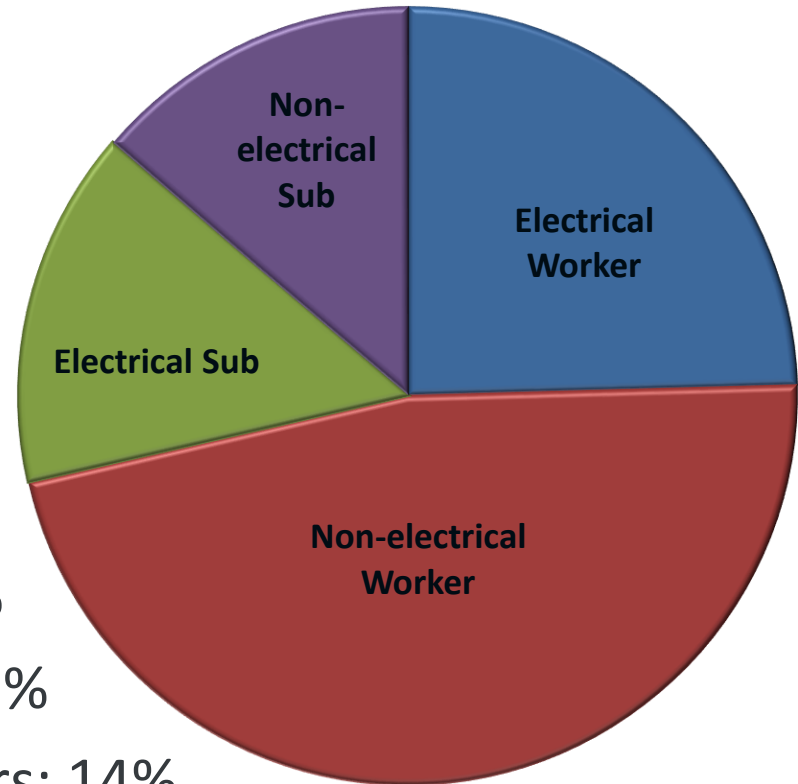


Distribution by Worker Type

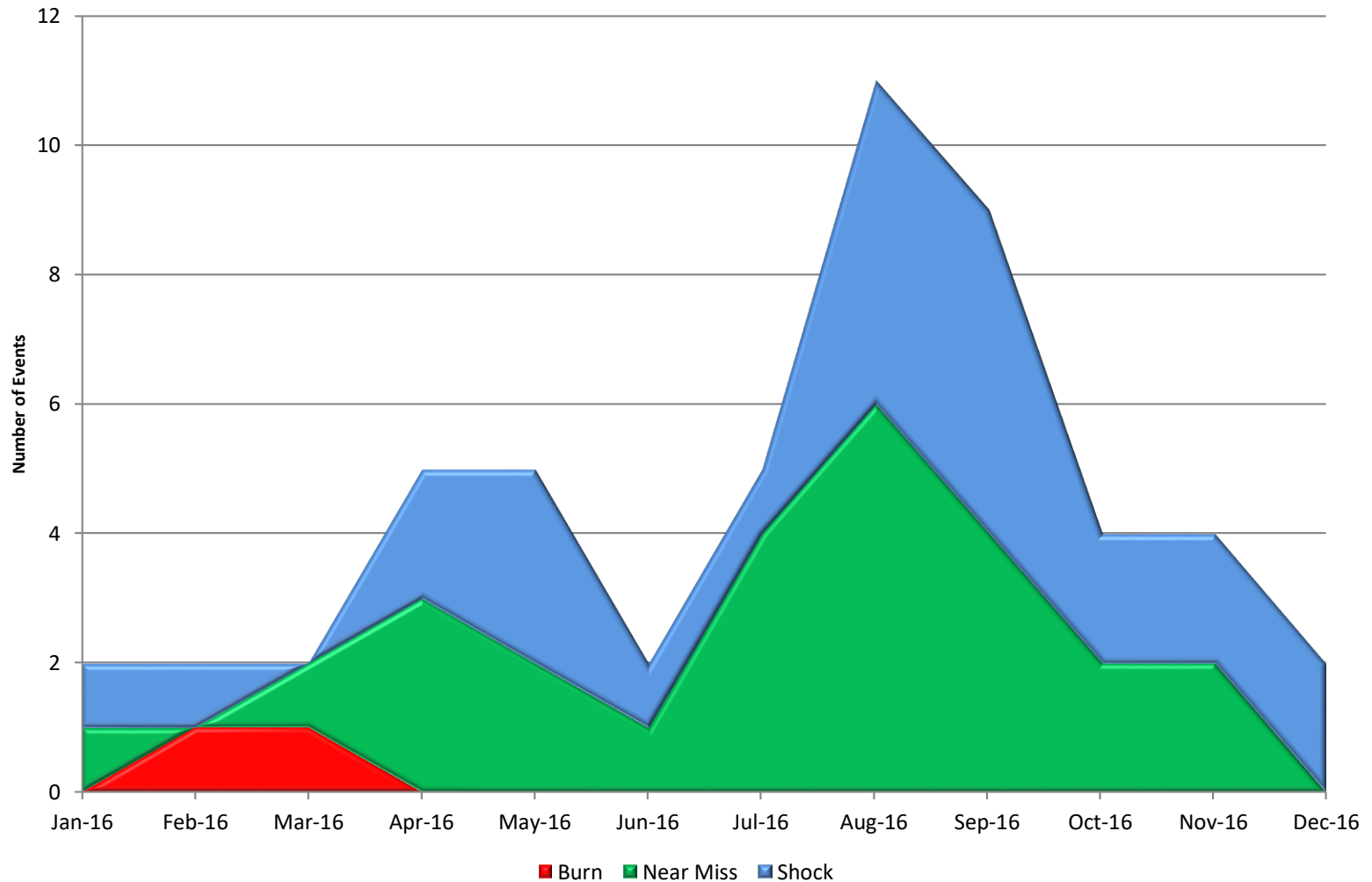


# Who were the workers?

- Electrical Workers: 25%
- Non-electrical Workers: 47%
- Electrical Subcontractors: 15%
- Non-electrical Subcontractors: 14%



## Near Miss, Burn, and Electrical Shock

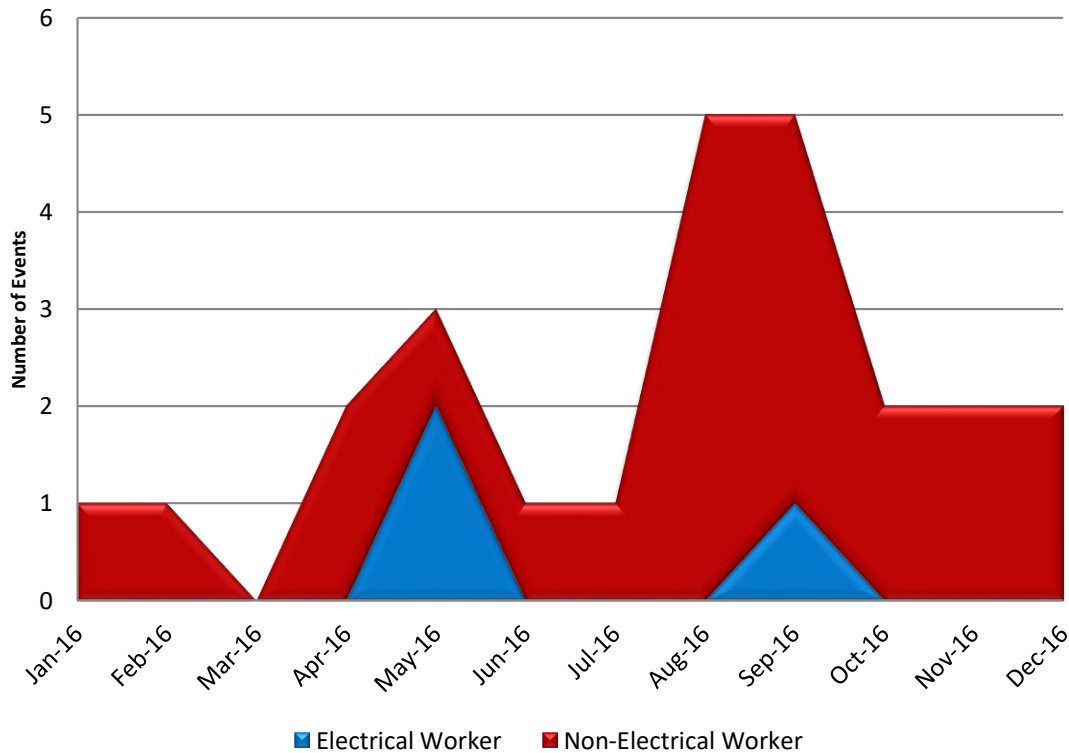




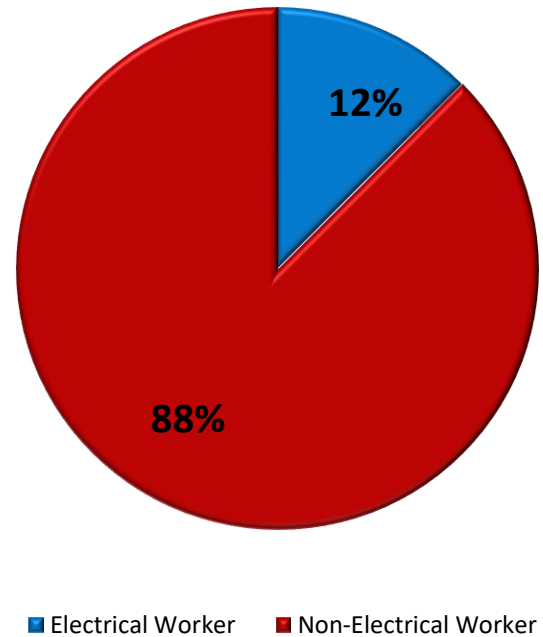
# Electrical Shock Events

- There were 25 shocks in CY-2016. The average over the past five years is 29 shocks per year

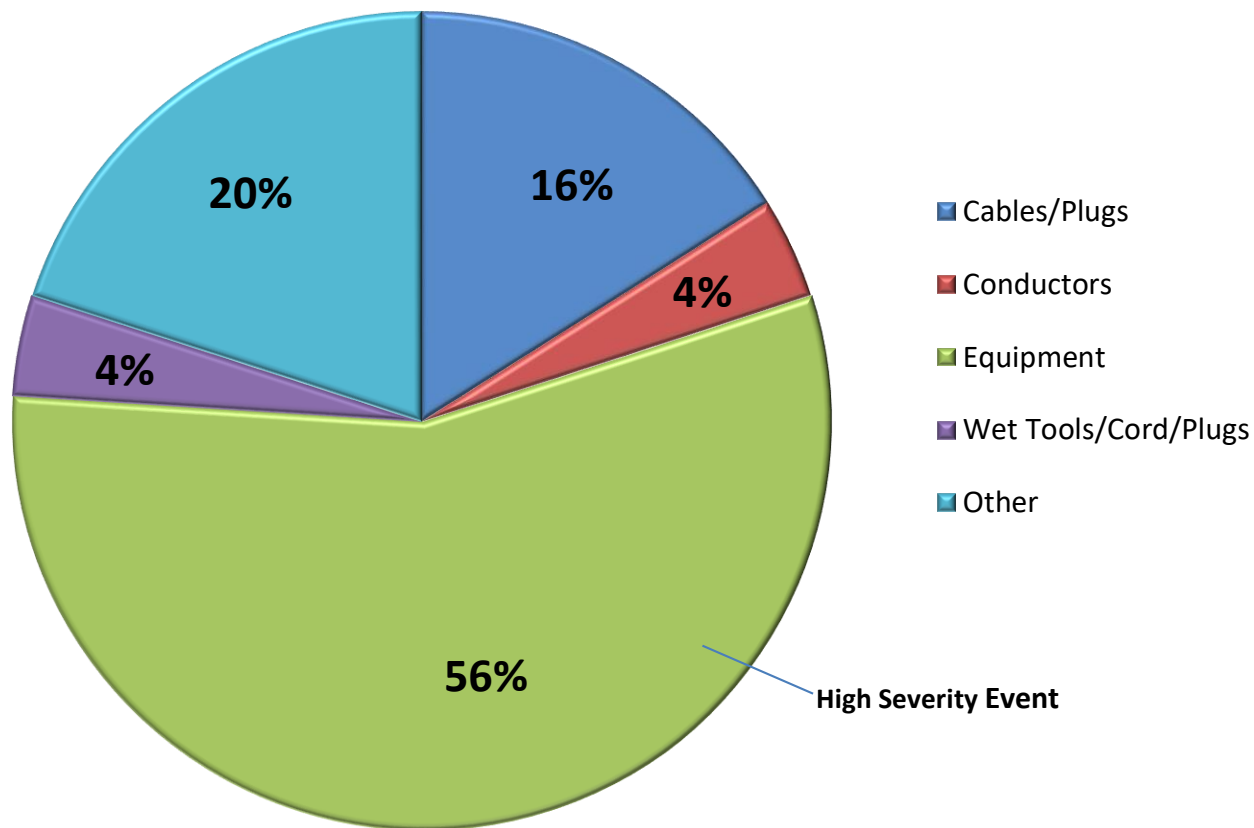
### Electrical Shocks by Worker Type



### Distribution by Worker Type



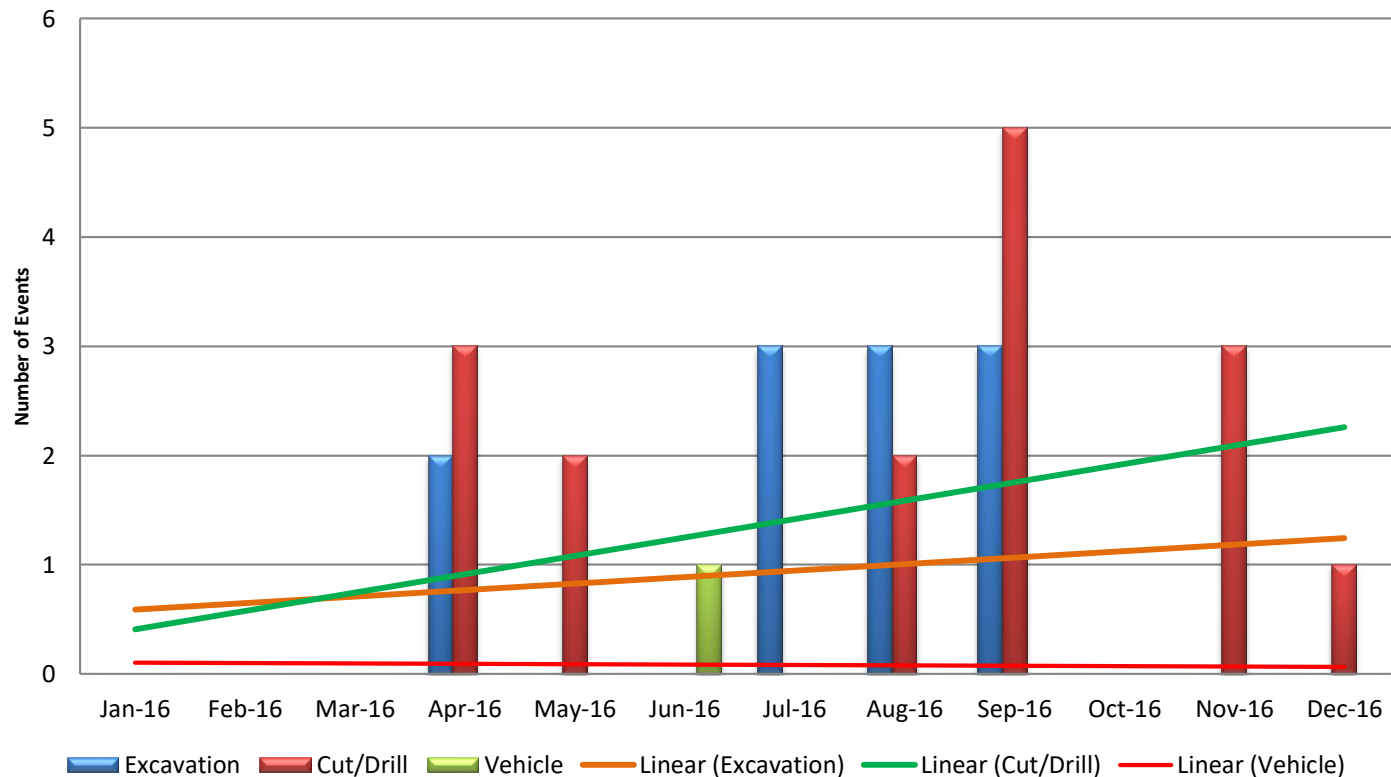
## Distribution of Electrical Shocks by Source



# Electrical Intrusion Events

- The overall trend of electrical intrusions for the year was unfavorable.
- All three categories show increases over last year.

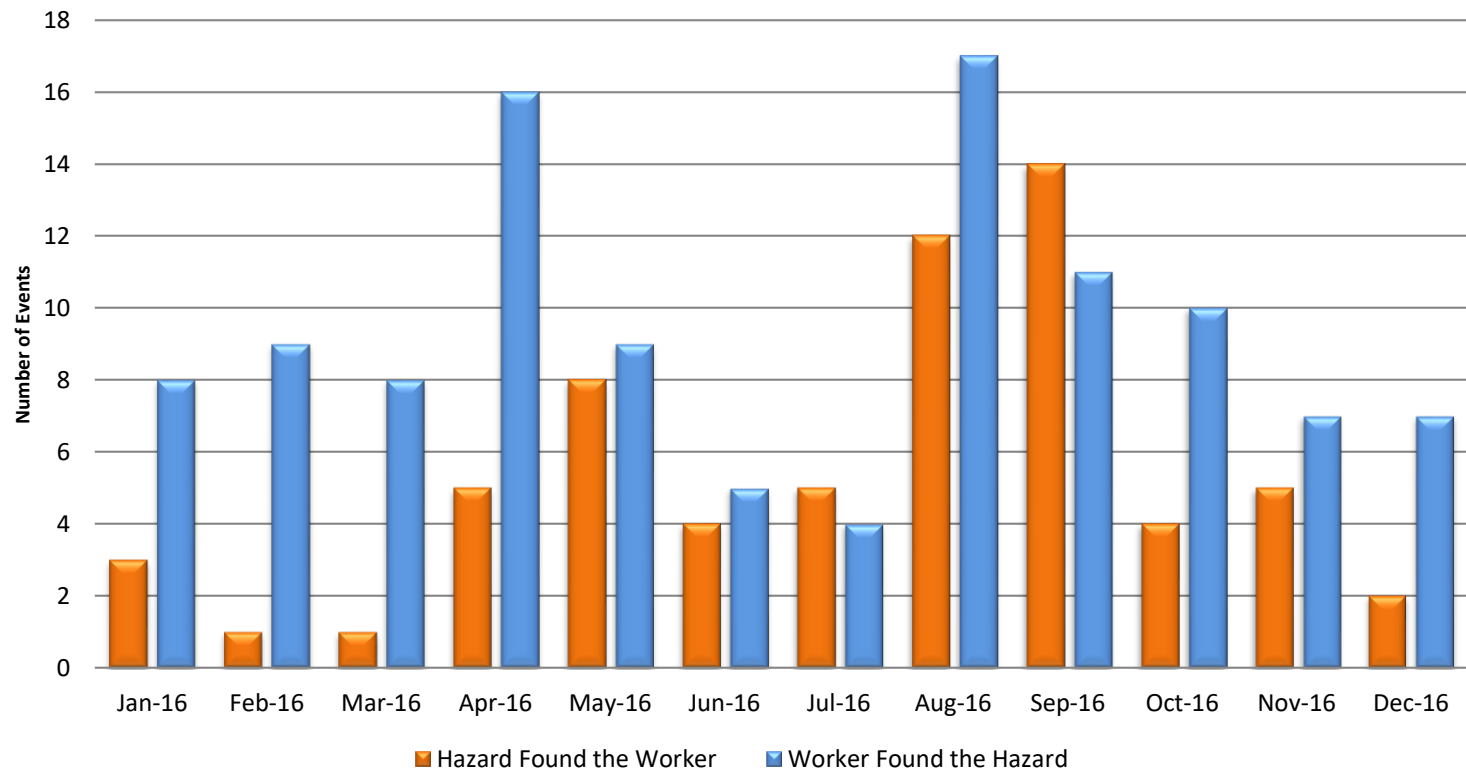
## Excavation, Cutting/Drilling, and Vehicle Intrusion



# Hazards Recognition

- During the year, workers recognized potential hazardous conditions 63 % of the time—11% less often than last year

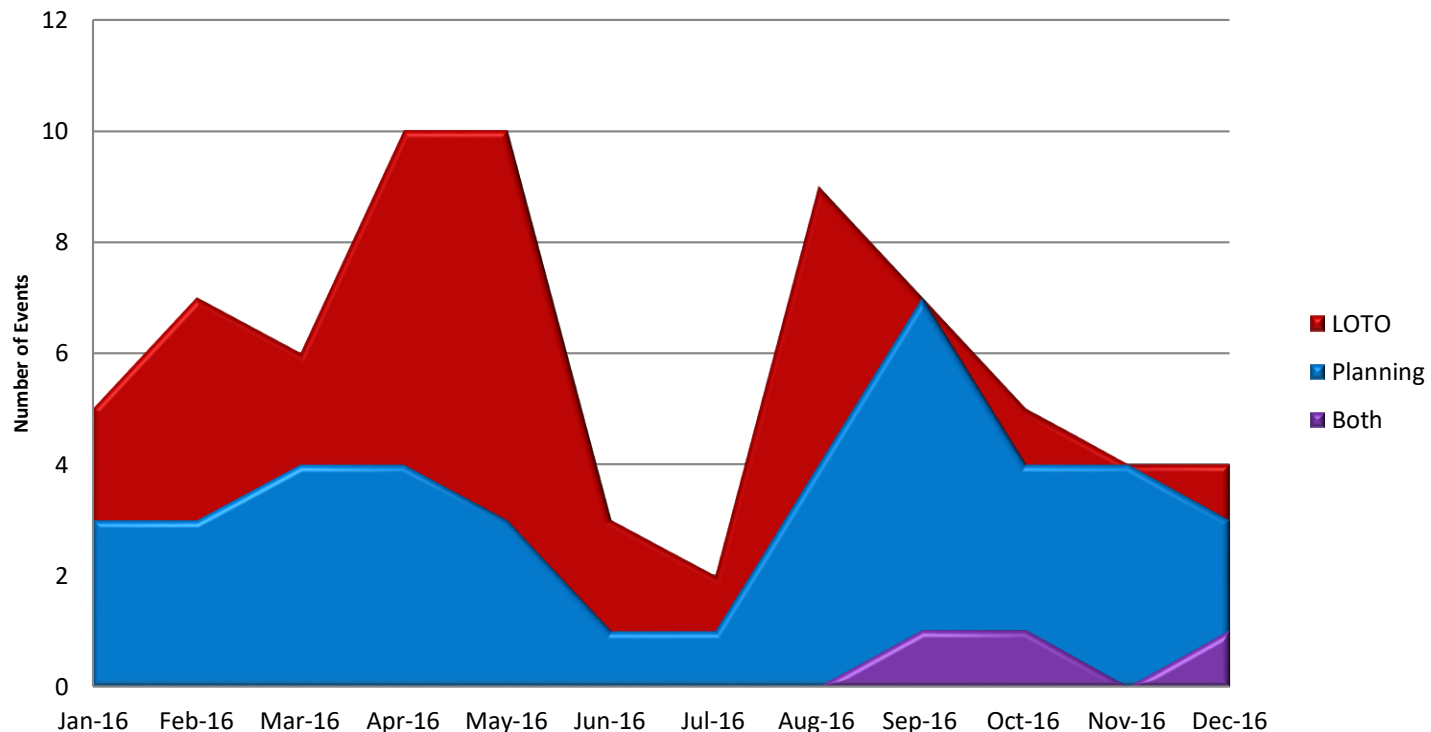
### Electrical Hazards Recognition



# Hazardous Energy Control and Job Planning

- The five-year average is 55 lockout/tagout events and 33 job planning events per year
- CY-2016 lockout/tagout and job planning events are above average totaling 72 and 41, respectively
- Three CY-2016 events involved both lockout/tagout and job planning

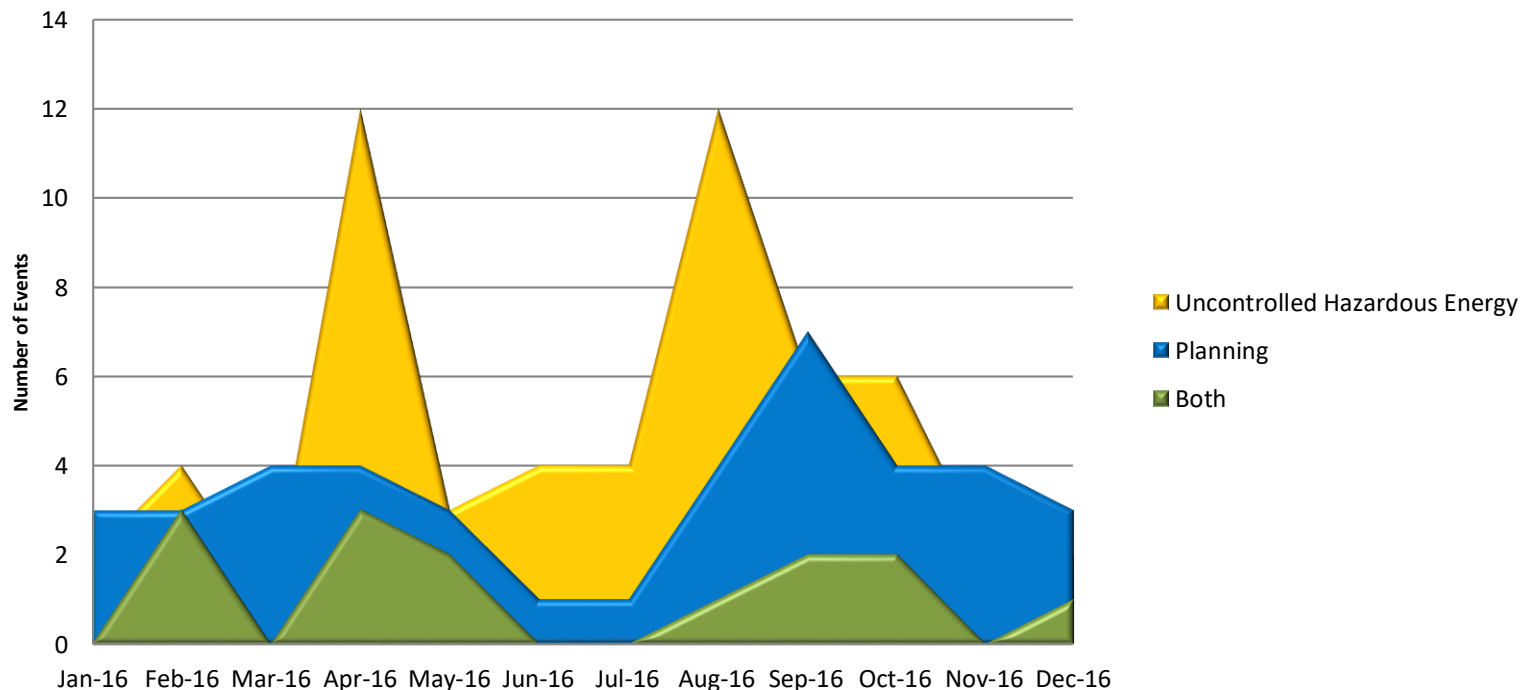
## Inadequate Job Planning and Lockout/Tagout



# Hazardous Energy Control and Job Planning (Continued)

- The five-year average is 44 uncontrolled hazardous energy events and 33 job planning events per year
- CY-2016 LO/TO and job planning events are above average totaling 58 and 41 events, respectively
- Fourteen CY-2016 events involved both uncontrolled hazardous energy and job planning

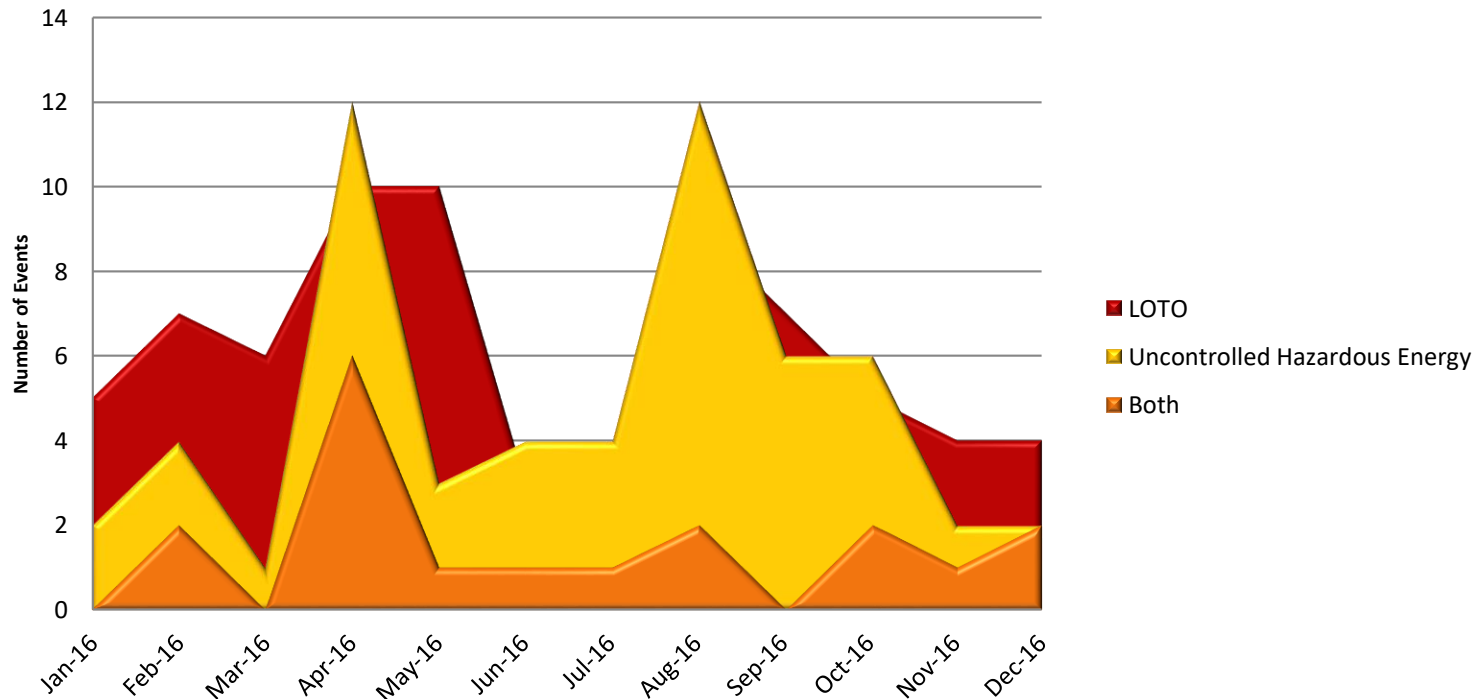
## Inadequate Job Planning and Uncontrolled Hazardous Energy



# Hazardous Energy Control and Lockout/Tagout

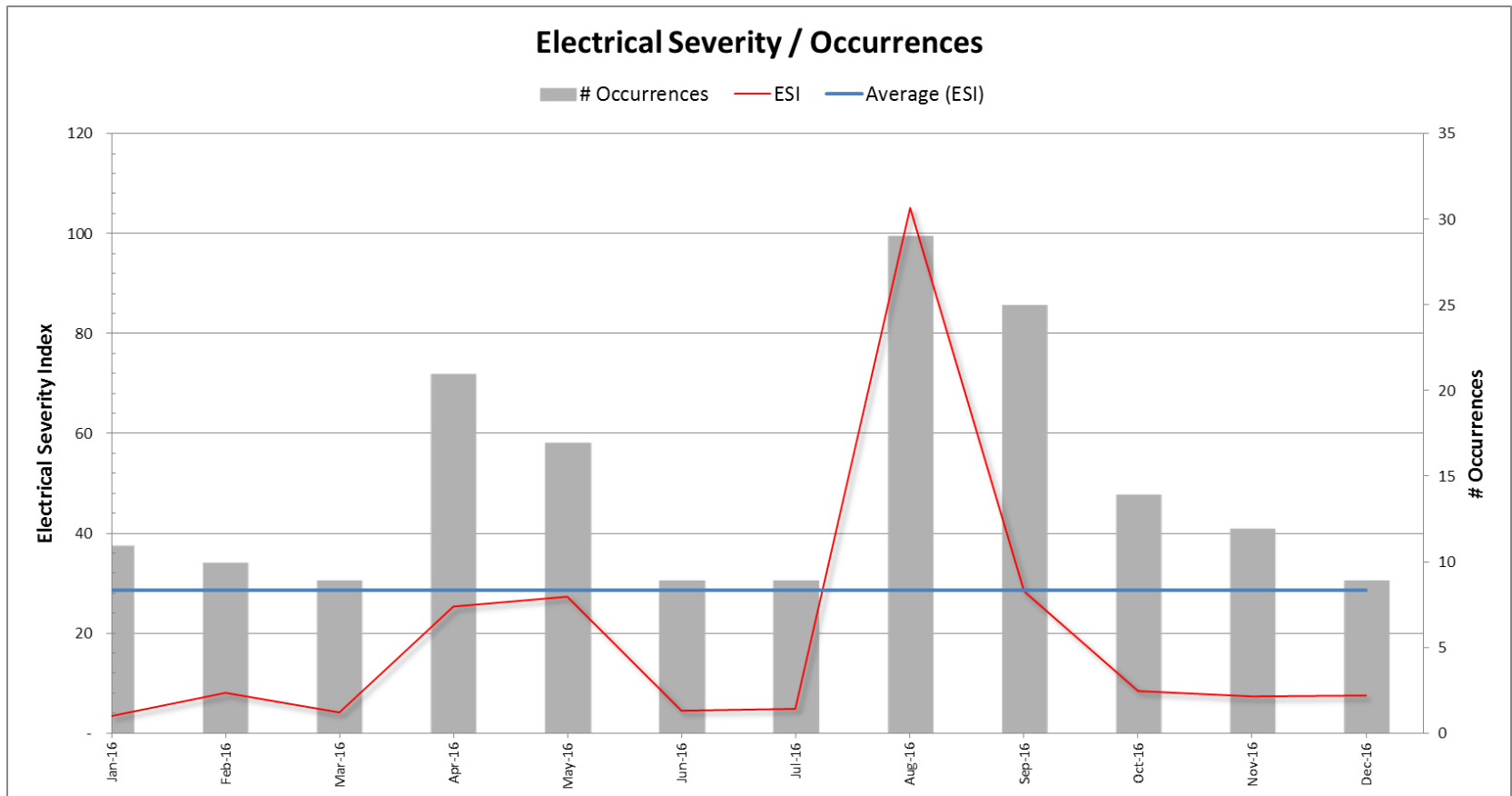
- The five-year average is 44 uncontrolled hazardous energy events and 55 lockout/tagout events per year
- CY-2016 uncontrolled hazardous energy and lockout/tagout events are above average totaling 58 and 72 events, respectively
- Eighteen CY-2016 events involved both uncontrolled hazardous energy and lockout/tagout

## Uncontrolled Hazardous Energy and Lockout/Tagout



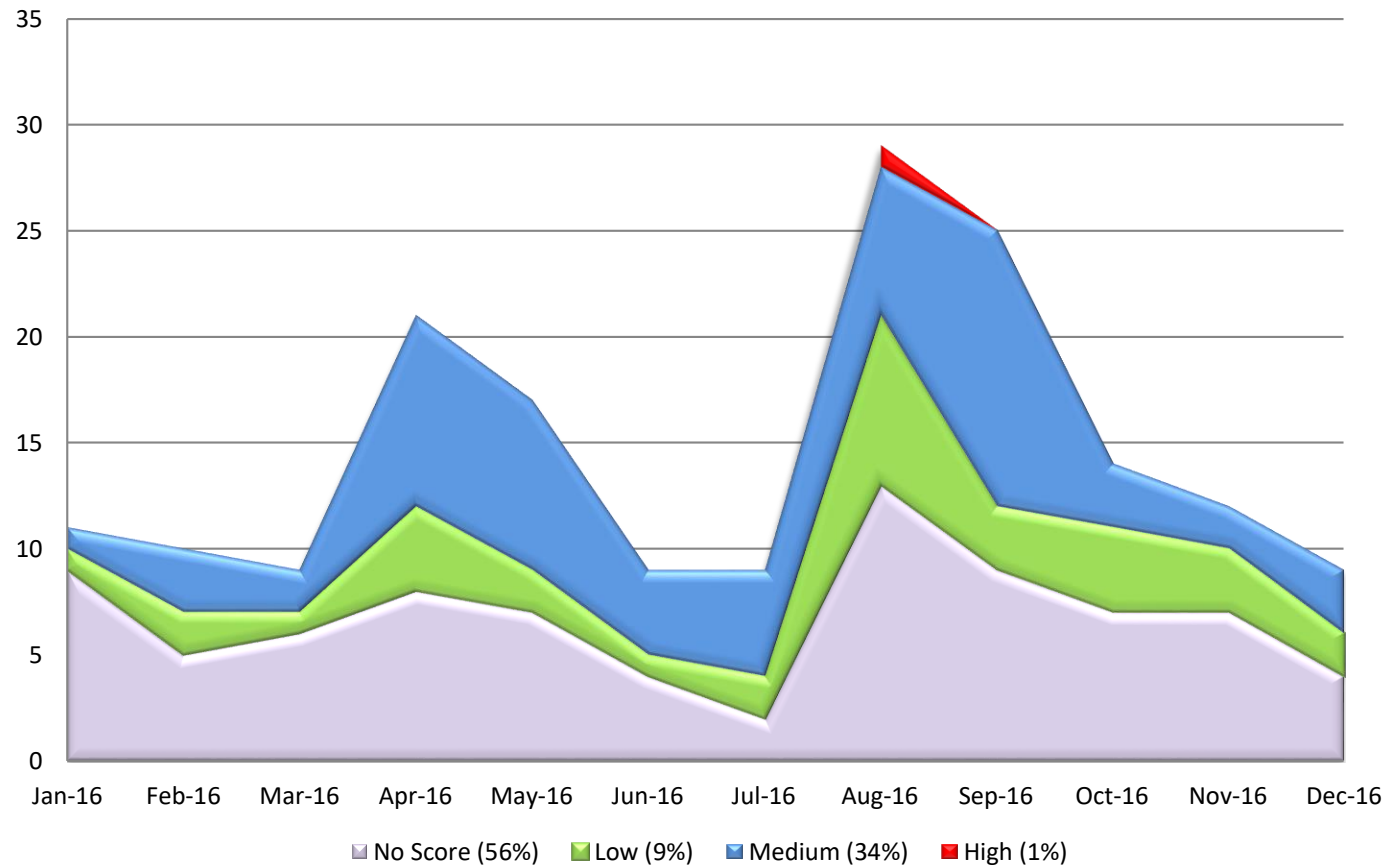
# Electrical Severity

- The CY-2016 Electrical Severity Index decreased and normalized in comparison to the dramatic increase in CY-2015 due to two high scoring events; one of which obtained one of the highest severity scores ever recorded throughout the DOE complex at 42,000





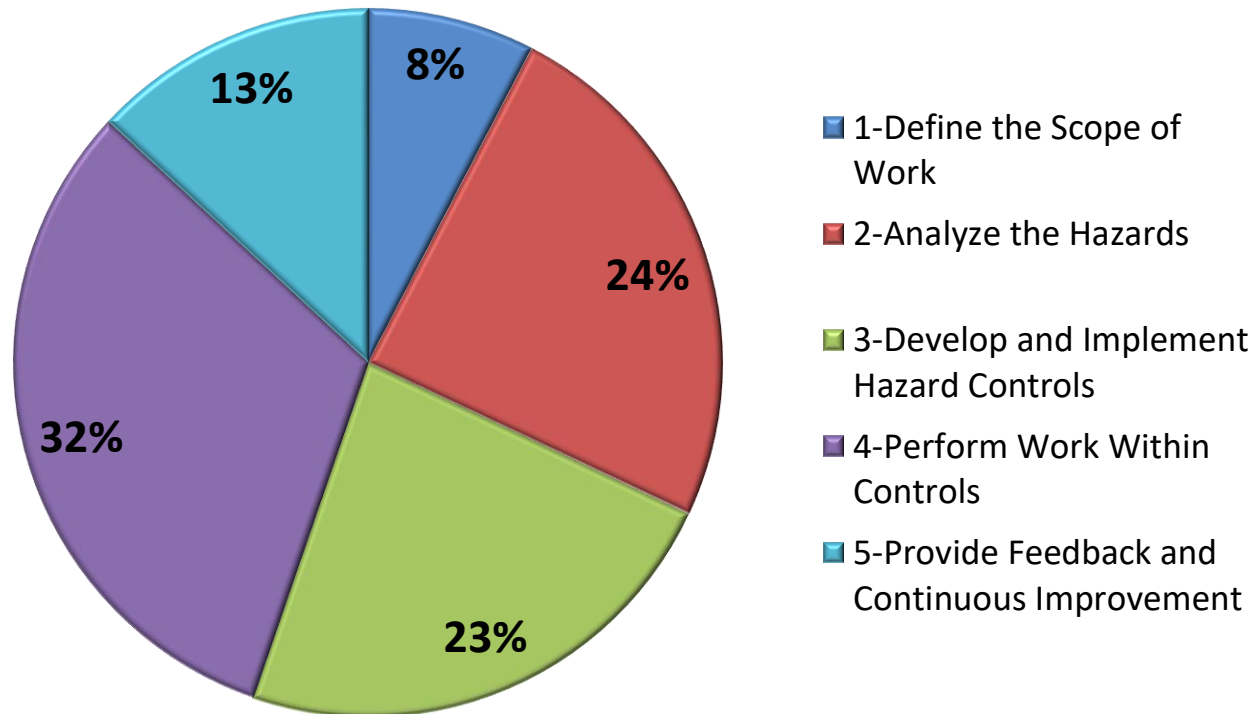
## Electrical Severity Categories



# Integrated Safety Management

- One or more ISM Core Function codes may be assigned to each electrical safety event

**CY-2016 ISM Core Functions**



# Areas of Improvement

- We have seen improvement in the following areas:
  - Based on the statistics, we have only seen improvement in the severity index. The severity of events for 2016 was lower than 2015
  - What next?
  - How do we improve?

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# Questions

Thank You!

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