

ANALYSIS OF PUBLIC SHOCK AND ELECTROCUTION CASES

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Abstract

Data regarding accidental public shock and electrocution incidents due to contact with energized surfaces in the public right of way is almost non-existent. This paper reports on a project to collect information on these cases and provides a basic analysis of the findings to date.

Data Collection Process

The initial search for public shock and electrocution cases started with general Internet queries. The results were less than satisfactory, returning just a handful of separate incidents. A more detailed search was then conducted using an electronic newspaper database. This morgue service compiles electronic clippings from over 1,000 papers across the United States and Canada. The archives start at various years for different publications. Results dropped off significantly before 1985, so the search was conducted from January 1980 until October 2006.

A case from 1978 is included in the data set, but it was gathered from a follow up story that fell within the search range.

Two separate searches were run- one using the term "electrocuted" and the other using the term "electrical shock". These terms returned in excess of 18,000 articles. The decision was made to screen each story rather than to narrow down the results by adding additional search term criteria because of writing styles of the authors. For example, a luminaire might also be called a street lamp, light pole, utility pole, or a light standard. A handhole enclosure also goes by the name j-box, junction box, utility box, pole box, pull box, or service box. Refining the search might allow certain cases to go unidentified if the reporter used different terminology. 33 cases were found that did not involve luminaries or handhole enclosures- incidents that would have been missed attempting to refine the search.

Cases that occurred in major cities were reported, and frequently repeated, in many different regional news publications and sometimes nationally. Shocks or deaths that happened in smaller towns often appeared only once in the local newspaper, usually with no follow up. This was another factor in deciding to evaluate each article individually.

Criteria for Inclusion in the Database

The intent of this project is to collect data on shock and electrocution cases that have occurred on public right of ways, to unsuspecting individuals in the course of their normal daily activities, who made contact with some energized surface that should not normally have any voltage potential on it.

It is just as important to understand what types of cases are not included in this database. Shocks or deaths to electricians or utility linemen were not included, nor were cases involving citizens making contact with power lines from climbing poles or illegally entering electrical compounds. Residential, utility theft, vandalism and “knock down” cases are not included. Downed power lines were not included, but two low hanging line cases were. In both instances, 7,200 volt conductors were within unaided touching distance of ground level. Cases of electrical injury or death from carnival rides were not included. Shocks or electrocutions due to faulty wiring in pools, spas and hot tubs were not included, however, a double fatality case involving a public fountain was.

All cases that met the criteria were included in the database regardless of the species of mammal that suffered the shock or electrocution. It is reasonable to assume that any voltage capable of shocking/killing a large dog (11 cases) or horse (5 cases) might also present a similar hazard to humans under the right circumstances.

Cases That Make Up the Database

72 cases make up the present database: 54 electrocutions and 18 shocks. In evaluating the newspaper articles, the phrases electrocution and shocked were sometimes used incorrectly by the writers. In some stories, a person or animal was “shocked to death” or “nearly electrocuted”, and in others the victim “survived an electrocution”. For the purpose of this paper, an electrocution means a fatality and shocked means the person or animal survived. The database corrects and standardizes the language of the writers.

Incidents by Year

As previously stated, the search range was from January 1980 until October 2006. A 1981 article referred to the legal settlement of a 1978 incident involving a 15 year-old boy who gained access to an unlocked electrical utility box. Searching the newspaper database specifically for the year 1978 did not yield any results, but enough details were provided in the 1981 story to warrant inclusion in the data set.

Year	Number of Events	Year	Number of Events	Year	Number of Events
1978	1	1988	2	1998	2
1979	0	1989	1	1999	3
1980	0	1990	6	2000	5
1981	1	1991	2	2001	1
1982	1	1992	1	2002	4
1983	1	1993	2	2003	4
1984	0	1994	0	2004	7
1985	1	1995	3	2005	2
1986	3	1996	0	2006	6
1987	6	1997	7	---	---

Table 1

Incidents by Season

Cases were distributed fairly evenly across spring, summer and autumn seasons, decreasing during the winter.

It had been speculated in some recent news articles that the use of electrically conductive substances such as anti-icing compounds, salts, or other chemicals might increase cases during the winter season. This chart, and the following “Incidents by Month” (Chart 2), suggests that this might not be the case.

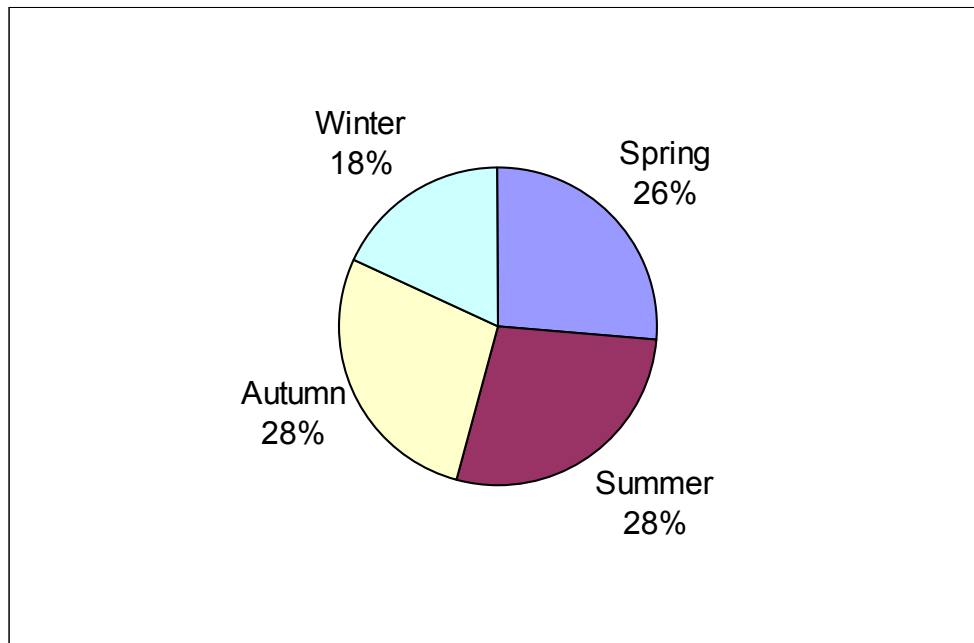


Chart 1

Actual numbers for Chart 1 are: Spring, 19; Summer, 20; Autumn, 20; Winter, 13.

Incidents by Month

When plotted, cases formed a classic bell curve peaking in June. This may be attributed to the fact that people spend more time outdoors during this time of year and have more opportunities to make contact with energized surfaces.

The two events that occurred in December were simultaneous human electrocutions taking place in Florida after a rainstorm. A standing puddle of water surrounding the base of a luminaire had become energized due to damaged insulation on phase conductors supplying the fixture. Two 15 year-old boys came in contact with that water and were killed instantly.

Of the 4 events that occurred in January, 1 was a human electrocution and 3 were animal electrocutions. Two cases took place in New York and two in Massachusetts.

Road salts and chemicals might have been a contributing factor in the Massachusetts and New York cases, but it is unlikely that they were present in Florida.

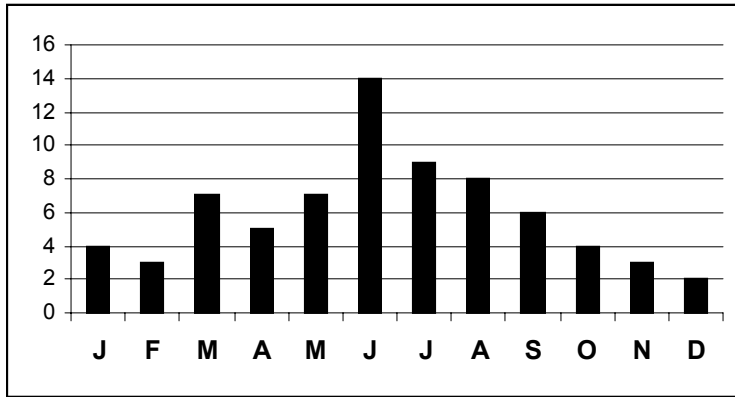


Chart 2

Incidents by Species

Humans were involved in 56 (78%) of the cases. Animals accounted for the remaining 16 (22%) events. Of the humans, 34 were male, 16 female. Gender could not be established for 6 humans and is represented as the 8% Unk in the chart

Dogs were involved in 11 cases and horses were involved in 5 cases. No other species of animals were reported as being involved in any of the cases.

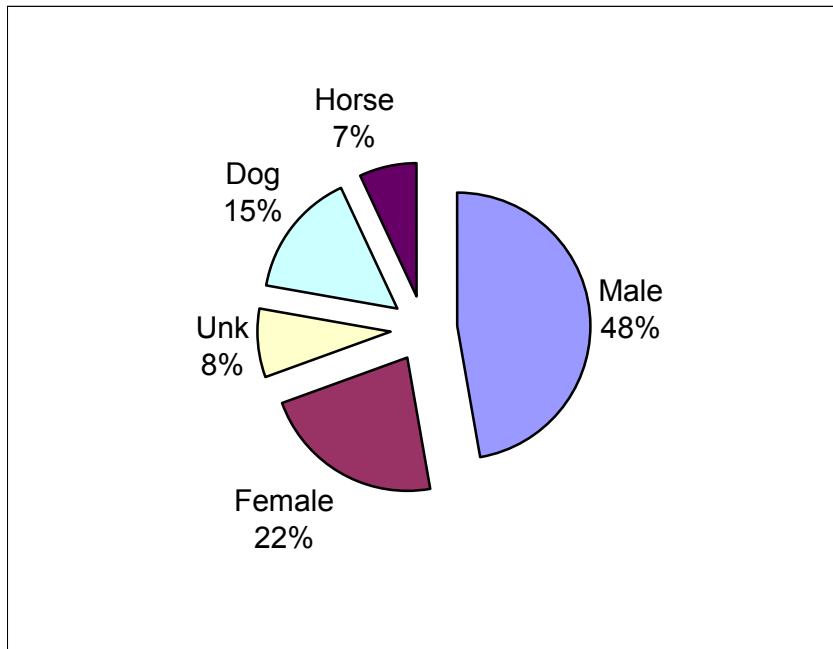


Chart 3

Incidents by State

23 States, and the District of Columbia, have reported in their media public shock and electrocution incidents:

State	Number of Cases	State	Number of Cases
FL	11	LA	2
NY	9	MO	2
DC	6	NC	2
IN	4	WA	2
MA	4	IL	1
OH	4	KY	1
PA	4	MN	1
CA	3	NJ	1
MD	3	OK	1
NV	3	TN	1
TX	3	VA	1
GA	2	WI	1

Table 2

Incidents by Type of Equipment

Luminaries, handhold enclosures and construction plates were identified as being the leading source of energy in 64% of all cases. The remaining 36% of cases are distributed among 18 different sources. It is interesting to note the diversity of surfaces that have been documented as being energized.

Equipment	Counts	Equipment	Counts
Luminaire	25	Fence	1
Handhole enclosure	14	Pole cover plate (missing)	1
Construction plate	7	Metal door frame in sidewalk (basement elevator)	1
Guy wire	3	Sidewalk (energized)	1
Bus stop	2	Temp electric service	1
Low hanging power line	2	Traffic signal	1
Manhole	2	Transformer (pad mounted)	1
Metal pipe	2	Tree stump	1
Public fountain	2	Utility switch (pole mounted)	1
Underground wiring	2	Unknown	1
Utility cabinet	1	---	---

Table 3

Conclusion

Approximately 20 additional incidents are under investigation for database inclusion at this time. It does not appear that any significant shift will occur in these preliminary findings by adding these cases. Data searches will continue by using additional newspaper and legal search engines as well as contributions by other interested parties.

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