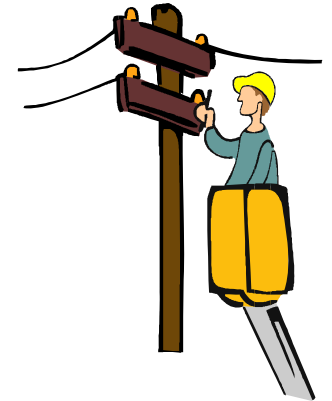




# 2008 *Utility Electric Contact Report*



(For injury incidents reported to the Oregon PUC through 2007)

Report compiled July 2008



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

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## Introduction

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Incident reporting to the PUC is required by **ORS 654.715** (IOU's), and **OAR 860-024-0050** (all "operators" - defined in OAR 860-024-0001). The PUC Utility Safety, Reliability, and Security Staff use this information to help with National Electrical Safety Code (NESC) administration and to promote accident prevention.

The safe transportation of electric energy includes: building and maintaining facilities to meet applicable safety codes; performing daily operations safely with trained, qualified, and supervised employees and contractors; and protecting the public. The root cause of many accidents is related to an unsafe act, not an unsafe condition. Also, there is often a lack of awareness of the degree of danger. The innocent looking wire that a bird can land on with impunity has the potential to end, or change forever, the life of a person who touches it. It is essential that all of us who live and work around power lines understand the danger, the possible consequences, and how to avoid it. The electric utilities have a responsibility to provide this education, to train and supervise employees, and to build and maintain their facilities to comply with the NESC, as required by the Commission's Safety Rules in OAR 860, Division 24.

This report contains a number of accompanying charts, along with a summary and recommendations. Electric operators can use this information to more accurately target their public information program and their worker safety training.

## Summary

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Seventeen people were injured as a result of power line contacts in 2007 in sixteen separate incidents in Oregon. One person was fatally injured. Thirteen other people were hospitalized, and four received minor treatment or no treatment as a result of electrical burns or shock. Pages four and five of this report show that the electrical accidents in 2007 are significantly higher than those of 2006. Trends indicate that the construction-related contact accidents are on the rise.

All the 2007 injuries<sup>[1]</sup> were the result of unsafe actions near high voltage power lines by workers and members of the public. Those people injured failed to take appropriate precautions while conducting activities in close proximity to high voltage lines. Fourteen of the people injured were involved in contacts with overhead high voltage lines. Three people were injured because of contacts to underground power lines.

As for injuries to members of the general public, three people were seriously injured. One involved a fatality in which a man climbed a tree with a metal pole trying to rescue a cat. Another male was seriously injured when his paraglider collided into an overhead voltage power line. In another incident, a young man was hospitalized after he climbed up a high voltage transformer platform and contacted an energized jumper while he was taking photographs.

Of serious concern is increased numbers of construction/maintenance workers who were injured in the operation of lift equipment near high voltage lines. The separate incidents reported to the PUC included:

- Two workers injured when their roofing material conveyor contacted energized overhead lines;
- A concrete pumper truck contacted a primary phase, resulting in the hose operator receiving a shock;
- A snorkel lift operator received electrical burns in attempting to install poles under overhead primary lines; and
- A boom contacted an overhead high voltage line causing the line to burn open. The energized line fell and contacted the boom operator on the left arm.
- A painter, who was on a lift power washing a government building, contacted an overhead power line.

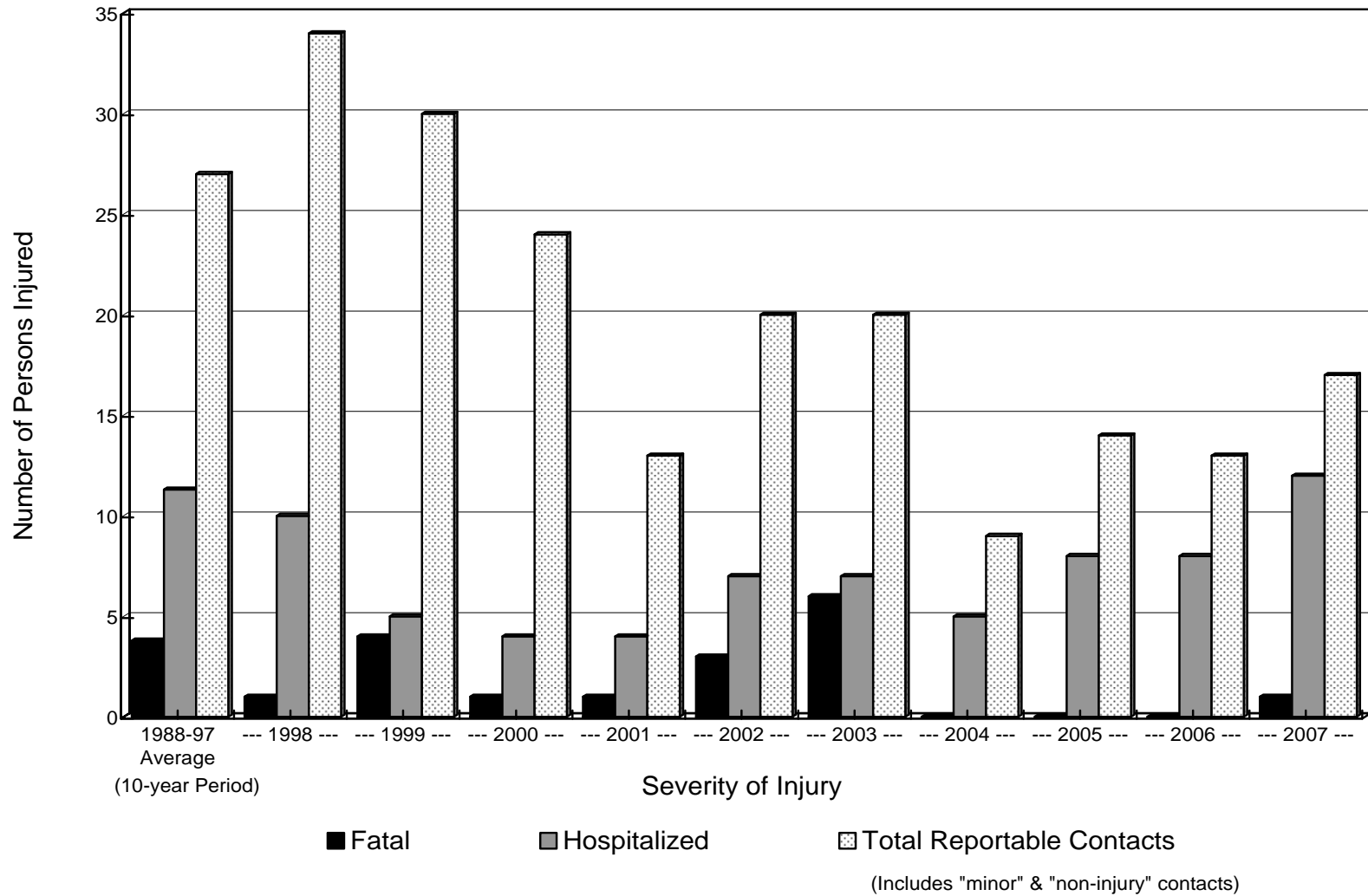
<sup>[1]</sup> Injury as defined in OAR 860-024-0050. There were additional “reportable injuries” to utility personnel that did not involve electrical contact. These are not included in this report.

## Summary (continued)

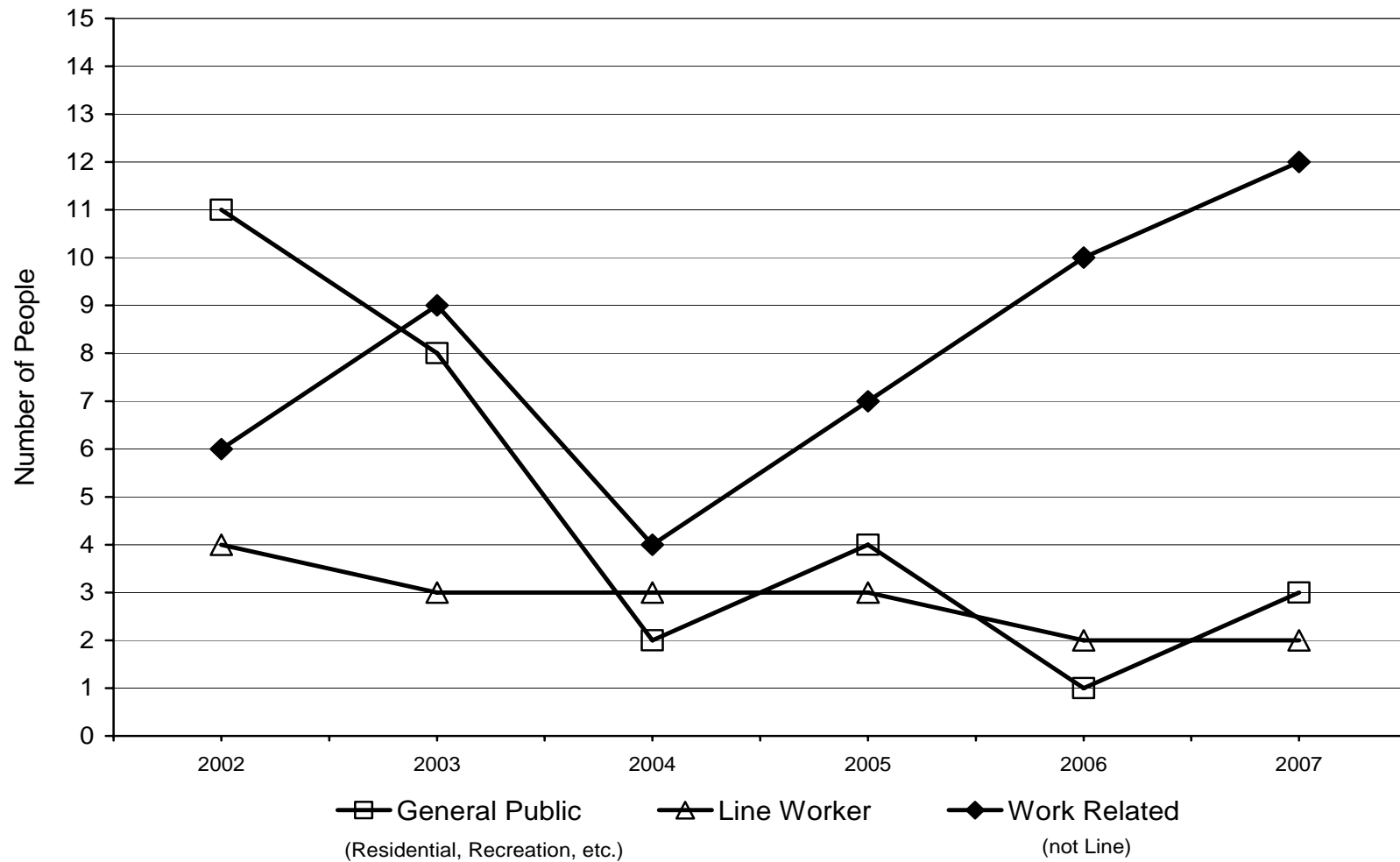
Three of the high voltage contact injuries involved construction workers excavating into underground lines. Two of the injuries were the result of workers sawing into conduits containing energized primary lines. No evidence was provided that indicated the workers notified the applicable utilities in advance of their underground work.

Two utility line workers were hospitalized because of contacts with energized lines in 2007 (the same number as in 2006). One incident involved an apprentice lineman who was changing out a cross arm and was setting up to transfer wire on a distribution pole. Another incident involved a line foreman who was installing a jumper in a substation with the jumper arcing over to a transmission switch.

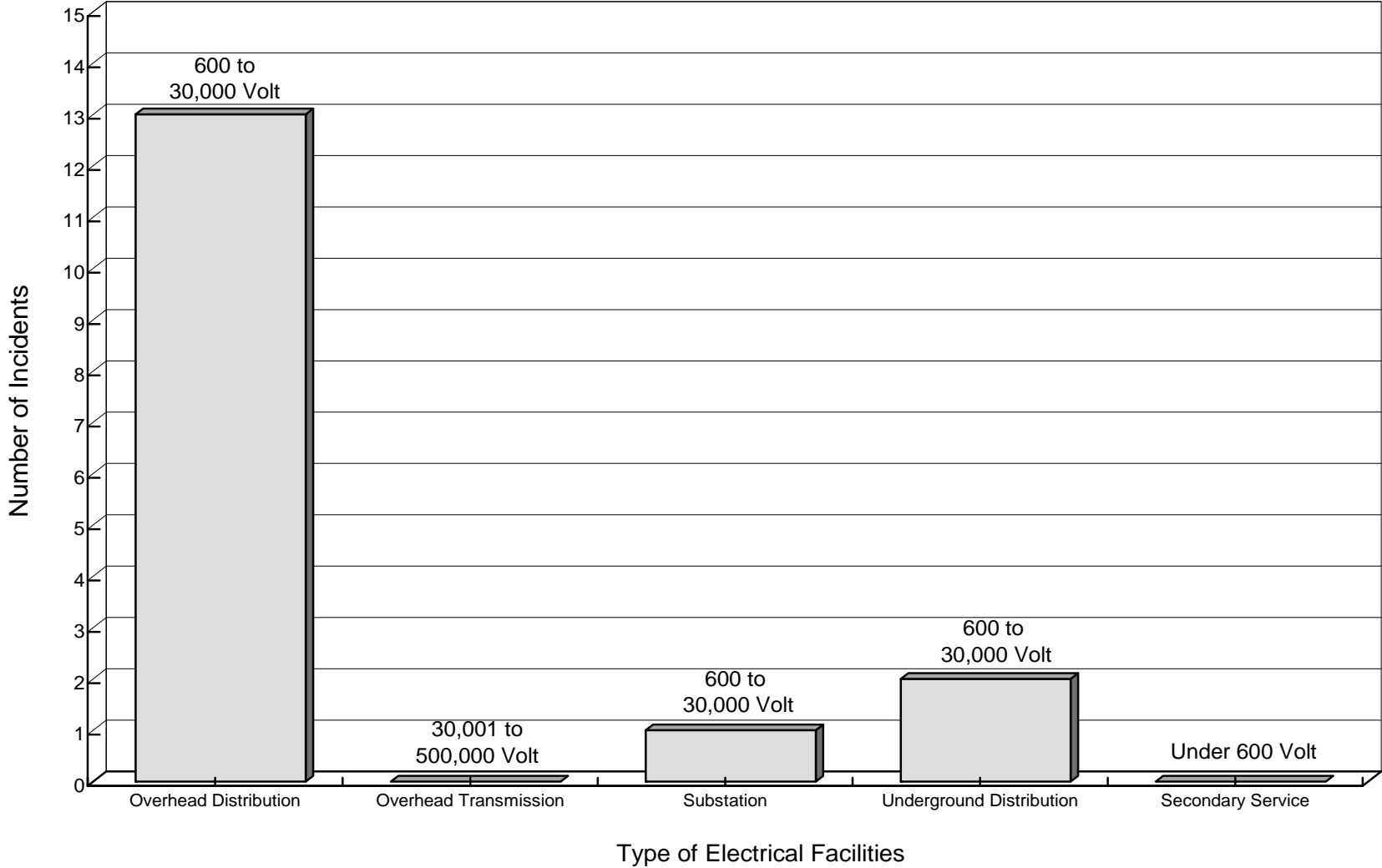
## Electrical Contact Injuries by Severity



## Electrical Contact Injuries by Activity Classification

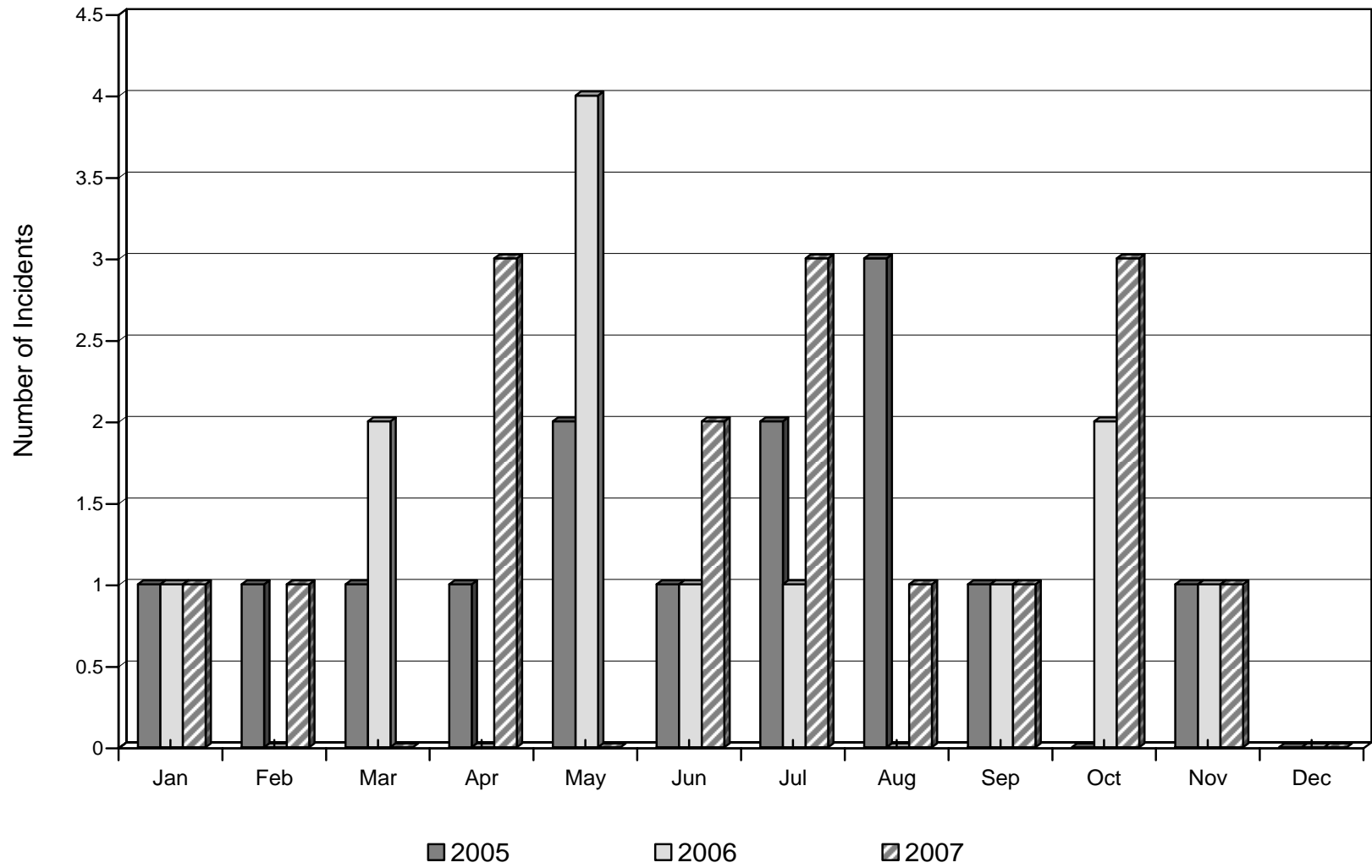


# Type of Electrical System Involved 2007 Incidents



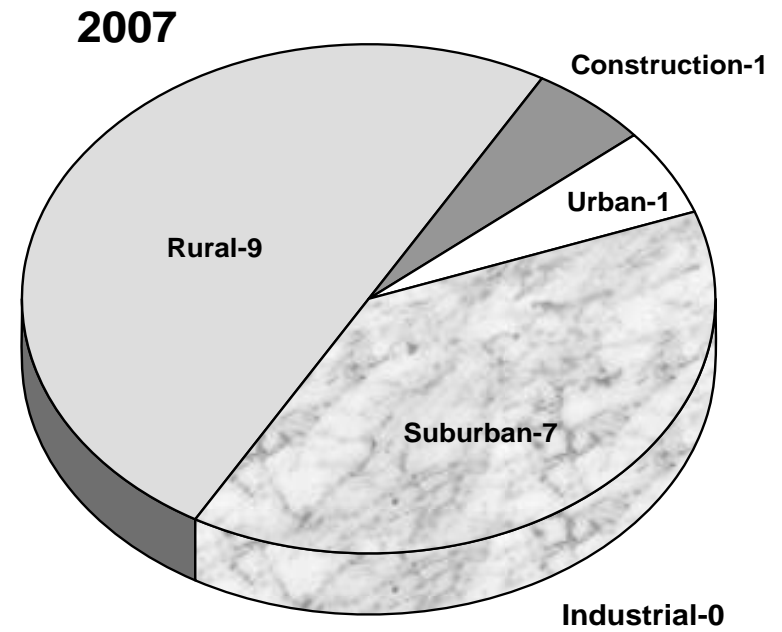
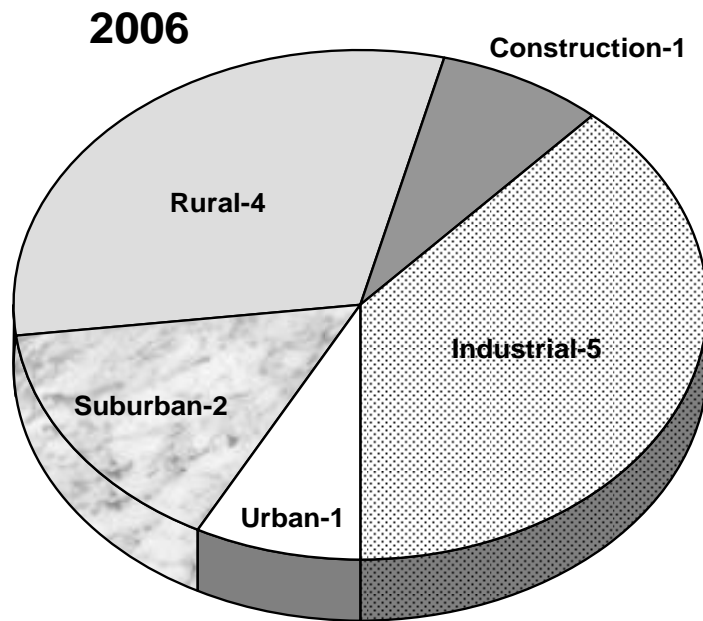


## When Incidents Occurred - By Month



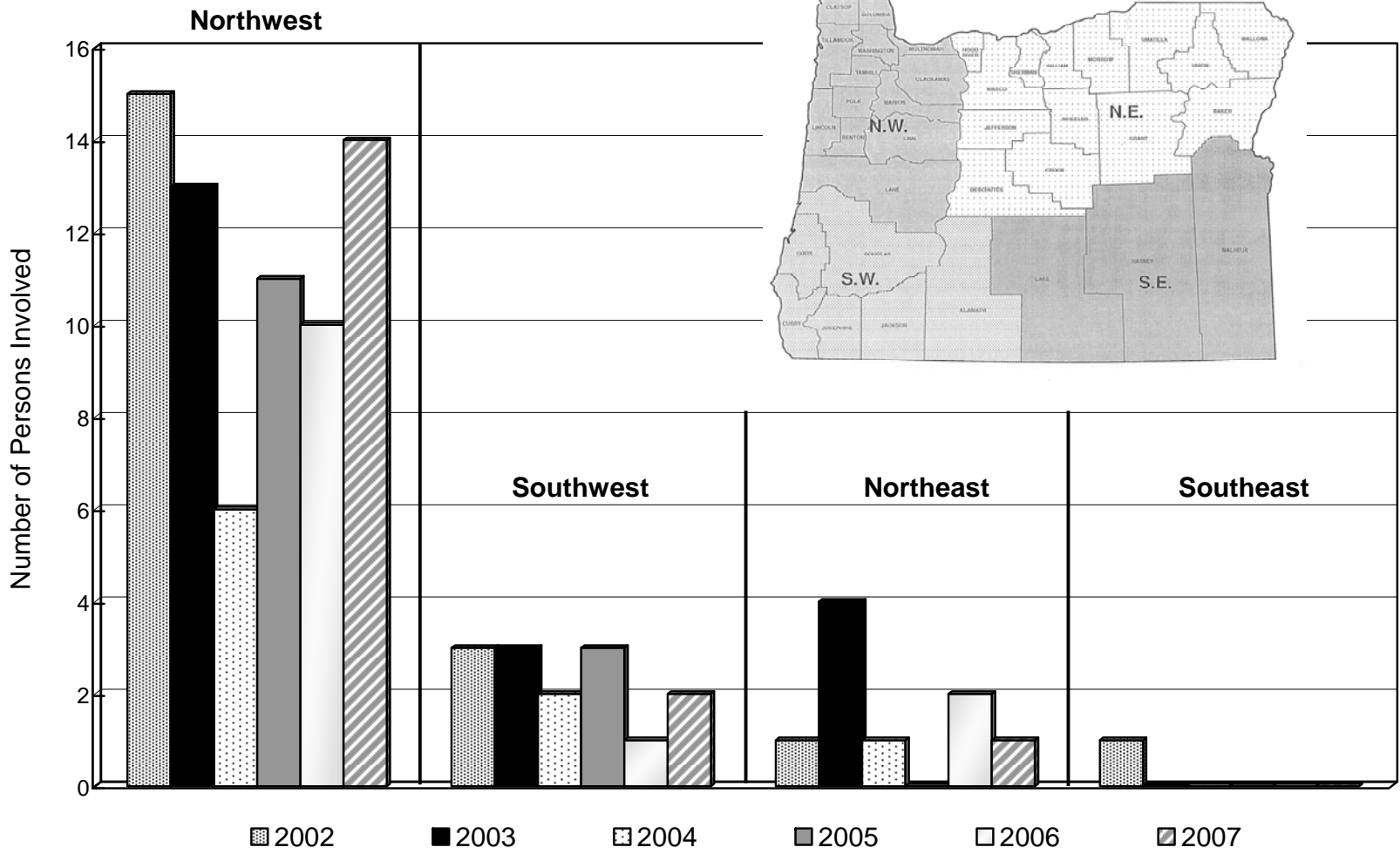
The pie chart below indicates where people are injured in regard to:  
**Demographic Areas or Sites: Rural, Suburban, Urban, Industrial, and Construction**

Our statistics show rural areas typically have a higher rate than other types of areas (although not in 2006).



**By Person Injured**

# Where Contact Injuries Occurred - By Area

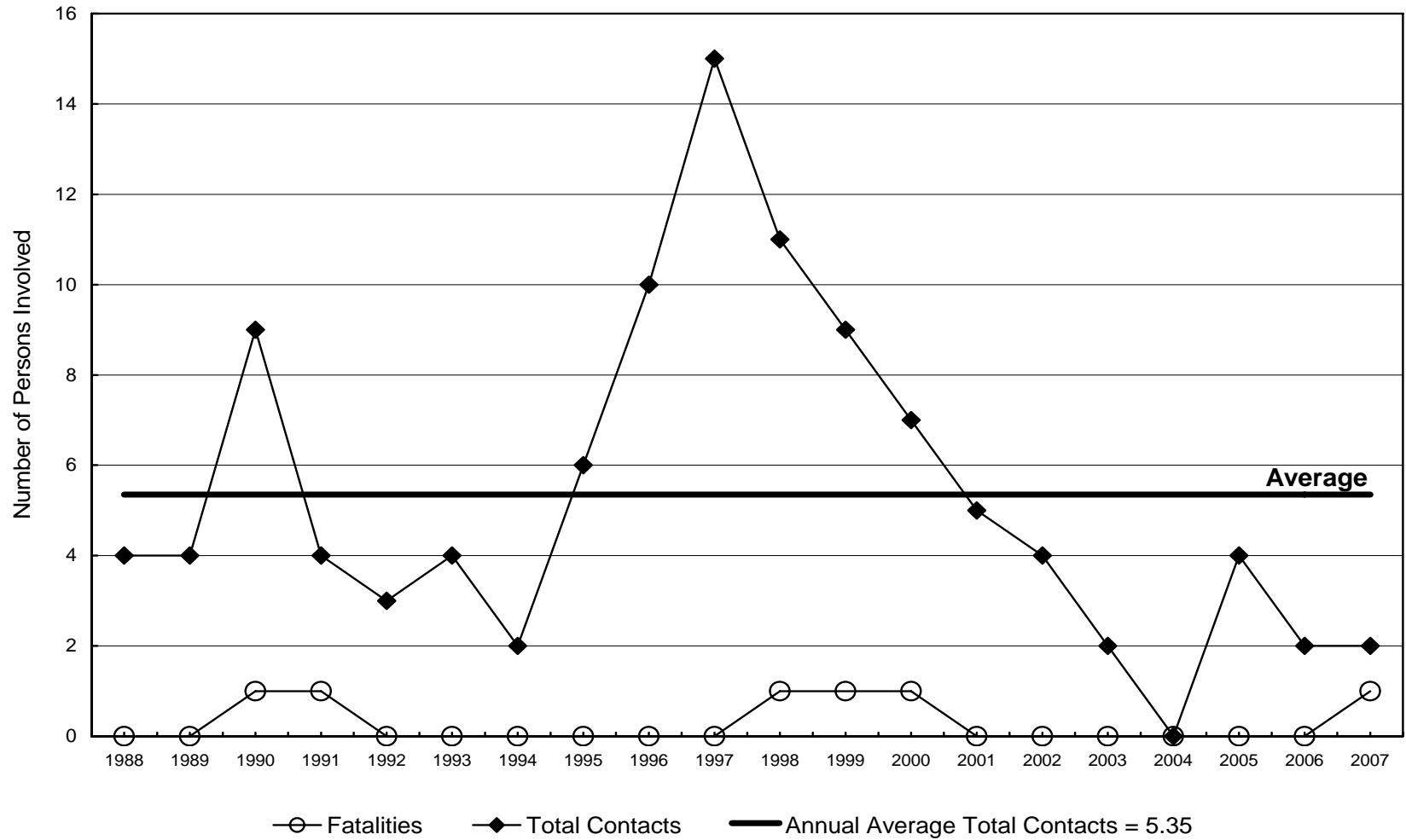


## Special Areas of Concern

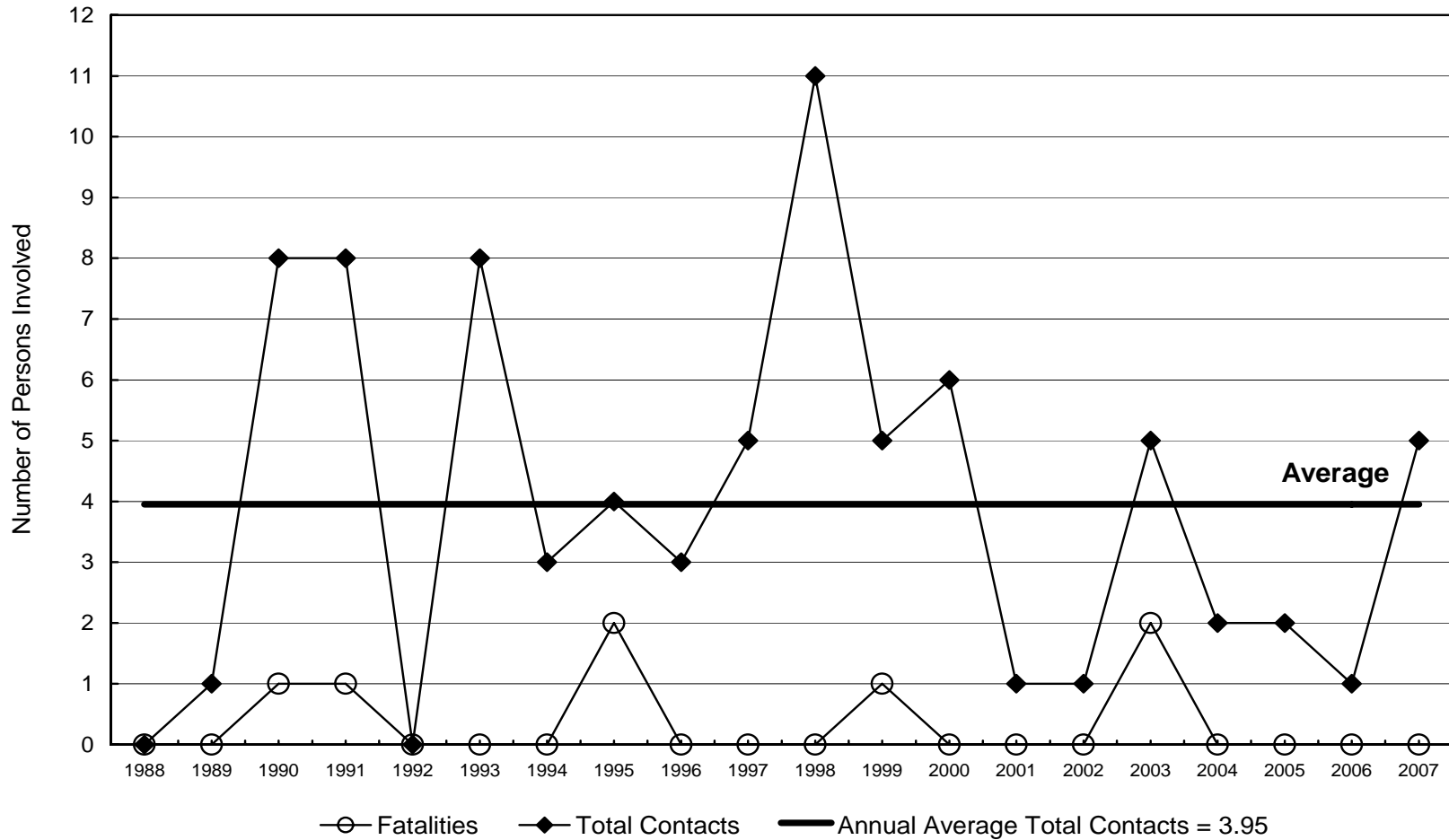
The next four charts track 20 years of incidents related to certain equipment or activities:

- ◆ **Tree Related** - This category is, on average, where most people are injured. There has been an average of 5.35 tree related contacts per year over the last twenty years. Many of these contacts involved homeowners trimming or falling trees in their yards. The majority of the remaining contacts were non-utility tree trimmers (landscapers) and loggers. If utility customers are going to get injured with high-voltage lines, the chances are high that it will be connected to a tree in their yard. The 2003 total of two injuries in this category is quite low. The number of incidents in 2004 matches the astounding 1986 total of zero accidents in this category. Unfortunately, two men were injured in tree-related incidents in each of the years 2006 and 2007.
- ◆ **Crane or Lift Equipment Related** - Crane or lift equipment related contacts have been a continuing source of concern needing special attention by the electric utilities and Oregon OSHA. Over this 20-year period, there has been an average of 3.95 people injured each year. Below are some conclusions taken from recent crane incidents.
  - Crane or Lift equipment contacts have been the most likely incident type to result in multiple victims.
  - Line visibility is not a problem in most cases.
  - Most operators know of the line's presence.
  - The types of "crane" or "lifts" involved in line contacts are highly varied.
  - Operator experience and training is highly varied.
  - Moving cranes or lifts in the "up" position is dangerous.
  - Cement pumper incidents are becoming more common.
- ◆ **Irrigation Pipe Related** - These incidents usually occur when farm workers raise pipes vertically to clear animals or debris. When a power line is above them, there are disastrous results. Utility education efforts, (e.g. Spanish-speaking radio stations) appear to be working. There have been no accidents of this type since 2003.
- ◆ **Antenna Related** - Antenna contact is another area that usually involves members of the public installing or maintaining equipment near homes. There have been no antenna related accidents reported since 2004.

## Tree Incidents Reported 20-Year History

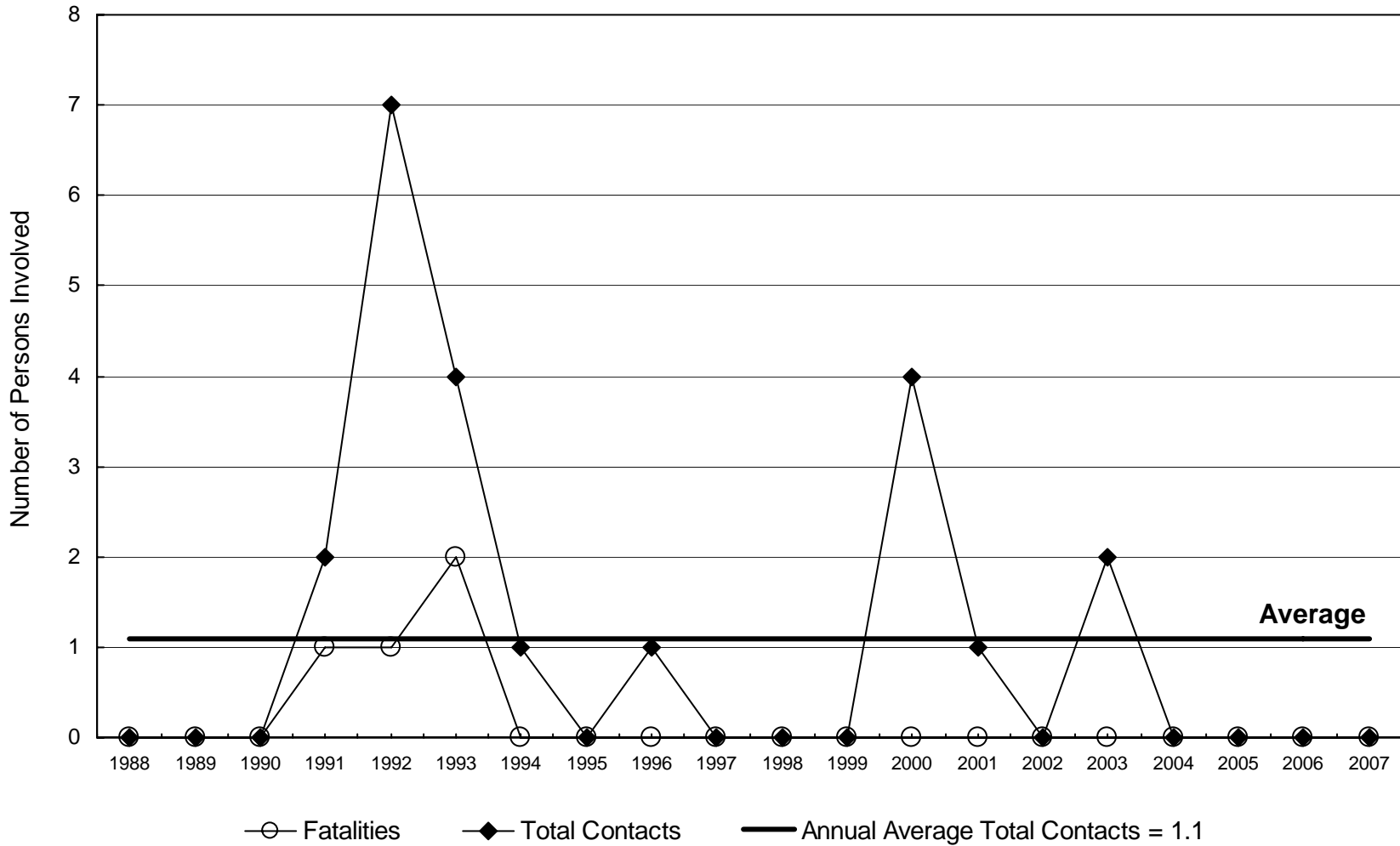


## Crane or Lift Equipment Incidents Reported 20-Year History

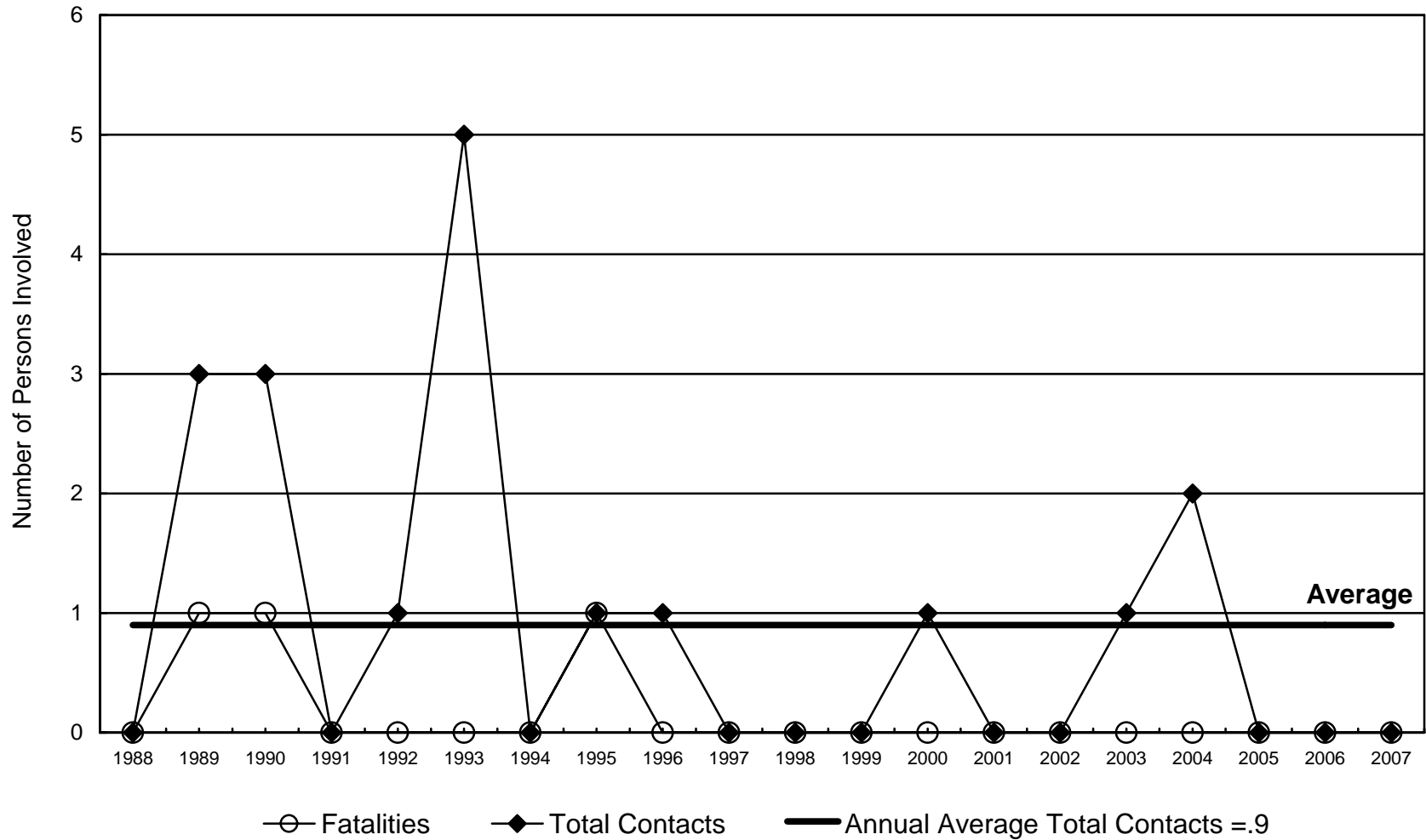


Note: 2006 statistics do not include four firemen who were injured when a fire truck ladder was raised into a high voltage line.

## Irrigation Pipe Incidents Reported 20-Year History



## Antenna Incidents Reported 20-Year History



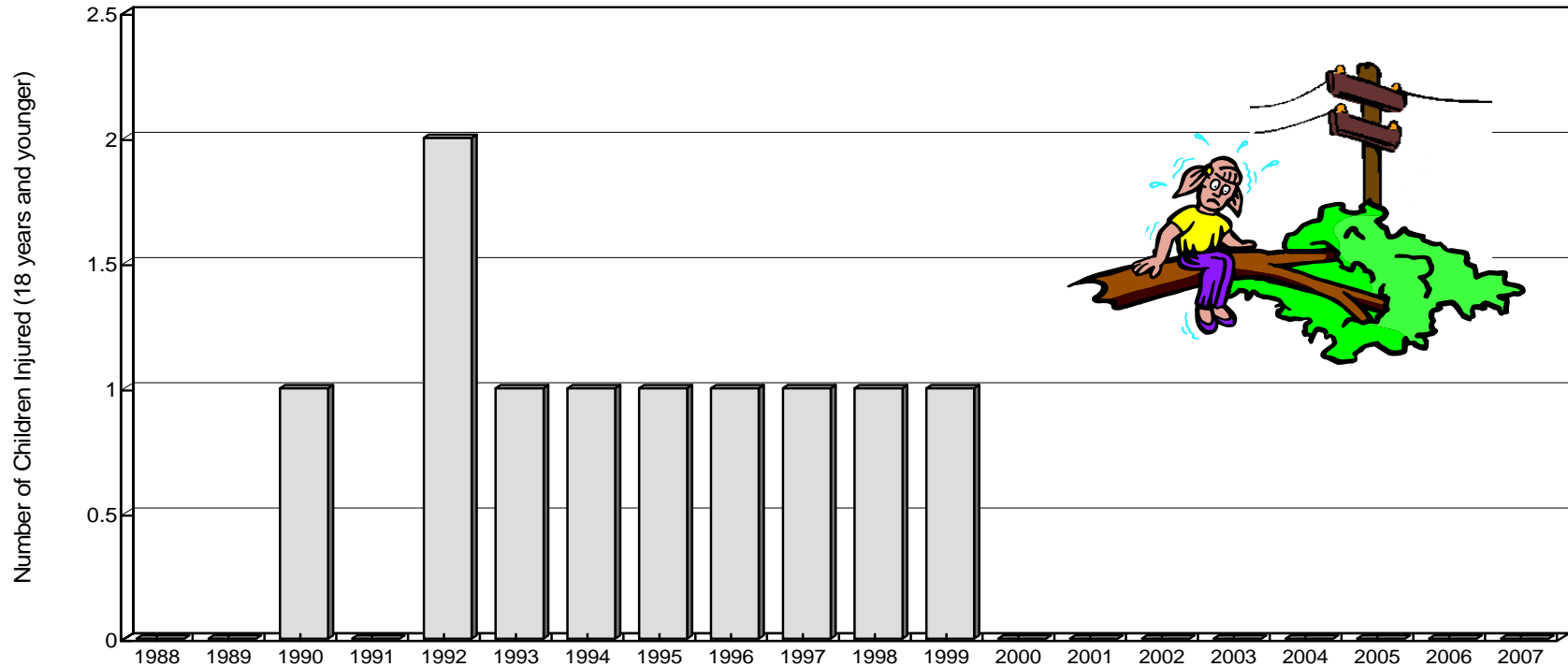


## 2007 – Breakdown of Injury Contacts by Activity Involved (By Person Injured)

Note: Some incidents fit into multiple categories.

➤ <b>Tree Trimming/Falling or Other Contact</b>	1
➤ <b>Excavation/Dig-ins</b>	3
➤ <b>Construction/Maintenance (all types)</b>	14
➤ <b>Irrigation Pipe</b>	0
➤ <b>Crane/Lift/Digger booms</b>	
• Lift Truck	5
• Concrete Booms	1
➤ <b>Ladder access</b>	0
➤ <b>Line/Utility-Related Work</b>	
• Overhead line work (electric)	1
• Underground work	0
• Electric Substation	1
➤ <b>Direct Contact</b>	
• Line worker (overhead system)	2
• Wire down (Boom Truck)	1
• Underground	0
• Climbed Utility Structure	1
➤ <b>Vehicle collision (car hit pole)</b>	0

## Children Incidents in Trees 20-Year History High-Voltage Line Contacts in Oregon



Average Injury over 20-year period is about one every other year or .5 per year.

**This last chart, Children Incidents in Trees, reflects some serious statistics for an activity that concerns us all.**

Although there were no injuries in this category in the last seven years, we cannot afford to become complacent.

This is an important safety issue. Staff believes that consistently better tree-to-line clearances being maintained across the state are directly contributing to these excellent results.

The worst years on record were 1980 through 1983 when there were 12 children injured in trees.

## Recommendations to Electric Utilities by the OPUC Safety Staff

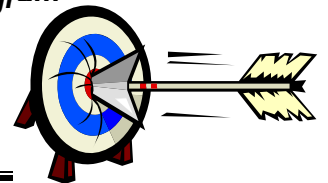
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1. Continue the effective general safety education programs now in place. These efforts are preventing accidents. Ongoing programs for schools are particularly encouraged. All grade school students in Oregon should receive power-line safety education at least twice during these years. Some excellent bill stuffers have been developed, and we recommend their use for educating customers about common hazards. Specifically timed safety messages on radio and television are valuable to warn the public about downed lines and other hazards.
2. Focus educational programs to:
  - a. Trends indicate that construction-related accidents are on the rise. Target construction workers where construction is anticipated. A special emphasis should be placed on work using crane or lift equipment. Crane and lift-related accidents have been very high when construction levels are up. Educate about dig-in hazards and one-call notification.
  - b. Warn homeowners and landscape tree trimmers about electrical hazards related to trees. This is a key area needing emphasis to every customer.
  - c. Continue education for agricultural workers. PUC staff specifically recommends broadcasting messages on Spanish language-speaking radio stations. Irrigation pipe accident prevention should be particularly emphasized. Stacking or laying out pipe under power lines should be discouraged (per OSHA rules). This has been a significant cause of serious injuries in years past.
3. Emphasize utility worker safety programs to reduce the number of contact incidents. Consider the expanded use of rubber gloves in any primary area, overhead and underground, energized or not.
4. Notification to utilities should be encouraged prior to all work or activities which will occur near both overhead and underground lines.
5. Maintain a National Electrical Safety Code compliant system to provide a consistently safe environment for electrical and communication workers.

***Each electrical utility should consider these recommendations with the perspective of knowing your local conditions and activities, priorities, and potential hazards. Our hope is that this information will help you develop an effective accident prevention program***

***Target***



## **Your Education Efforts**

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### **Preventing accidents requires action!**

- ✓ Use programs that have been successful in the past. Be creative in presenting information in attention-getting ways.
- ✓ Try new ideas. Target problem areas associated with power-line safety. (Customers trimming their trees, homeowner maintenance, and activities associated with cranes, lift equipment, construction sites, and dig-ins.)
- ✓ Reward creative new ideas and those who spot potential problem areas.
- ✓ Reward safe workers, especially those who consistently encourage safe practices for their crews.
- ✓ Give all employees the chance to know safety basics and be part of the accident prevention team.
- ✓ Electrical safety training should be a part of every grade school child's education at least twice.
- ✓ Consider using safety-related bill stuffers regularly. Caution customers about tree-related hazards.
- ✓ Encourage and participate in at least one (per year) utility worker safety day (or half day) with all operators who share the overhead and underground rights-of-way with you.
- ✓ Put more emphasis on training to firefighters and first responders about unsafe acts near power lines.

**Public Safety Education is an essential responsibility of the electric utility industry.**

**Worker Safety Training and Supervision is required for all utility operators.**