



2009 *Utility Electric Contact Report*



(For injury incidents reported to the Oregon PUC through 2008)

Report compiled April 2009



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

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Introduction

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.

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.

Summary

In 2008, fifteen people were injured in Oregon as the result of utility power line contacts in thirteen separate incidents. Nine of these were hospitalized, and the remaining six experienced electrical shock or minor injuries. Statistics on pages four and five of this report show that the power line contacts in 2008 are slightly lower than those of 2007. This report also shows that accidental power line contacts by utility workers were on the rise in 2008.

Twelve of the injuries¹ were the result of unsafe actions near high voltage power lines by workers and members of the public. The persons involved failed to take appropriate safety precautions while performing activities in close proximity to high voltage lines. Ten of those injured involved contacts with overhead (aerial) power lines. Five people were injured because of contacts with underground power lines.

As for injuries to the general public, only one person was injured in 2008. This injury involved a male who stopped to help another motorist whose vehicle had hit a utility structure. He unfortunately received electrical burns that required hospitalization.

Of serious concern are the high number of construction/maintenance workers who were injured in 2008 while working with lift equipment or scaffolds in close proximity to overhead power lines. The incidents are summarized as follows:

- A boom operator swung a boom into an overhead power line, resulting in the groundman receiving electrical burns and being hospitalized.
- While operating a motorized lift platform, a painter contacted an overhead power line and sustained minor injuries. The line was located at least 8' horizontally away from the building.
- A construction worker was using a motorized lift platform when he directly contacted an overhead power line. The line had 8.5' horizontal clearance from the building he was working on. He was hospitalized with serious electrical burns.
- A volunteer painter who had used scaffolding to elevate himself contacted an overhead power line. He was painting 18 to 36 inches away from the power line, which had an 8' 11" horizontal clearance to the church siding that he was painting.

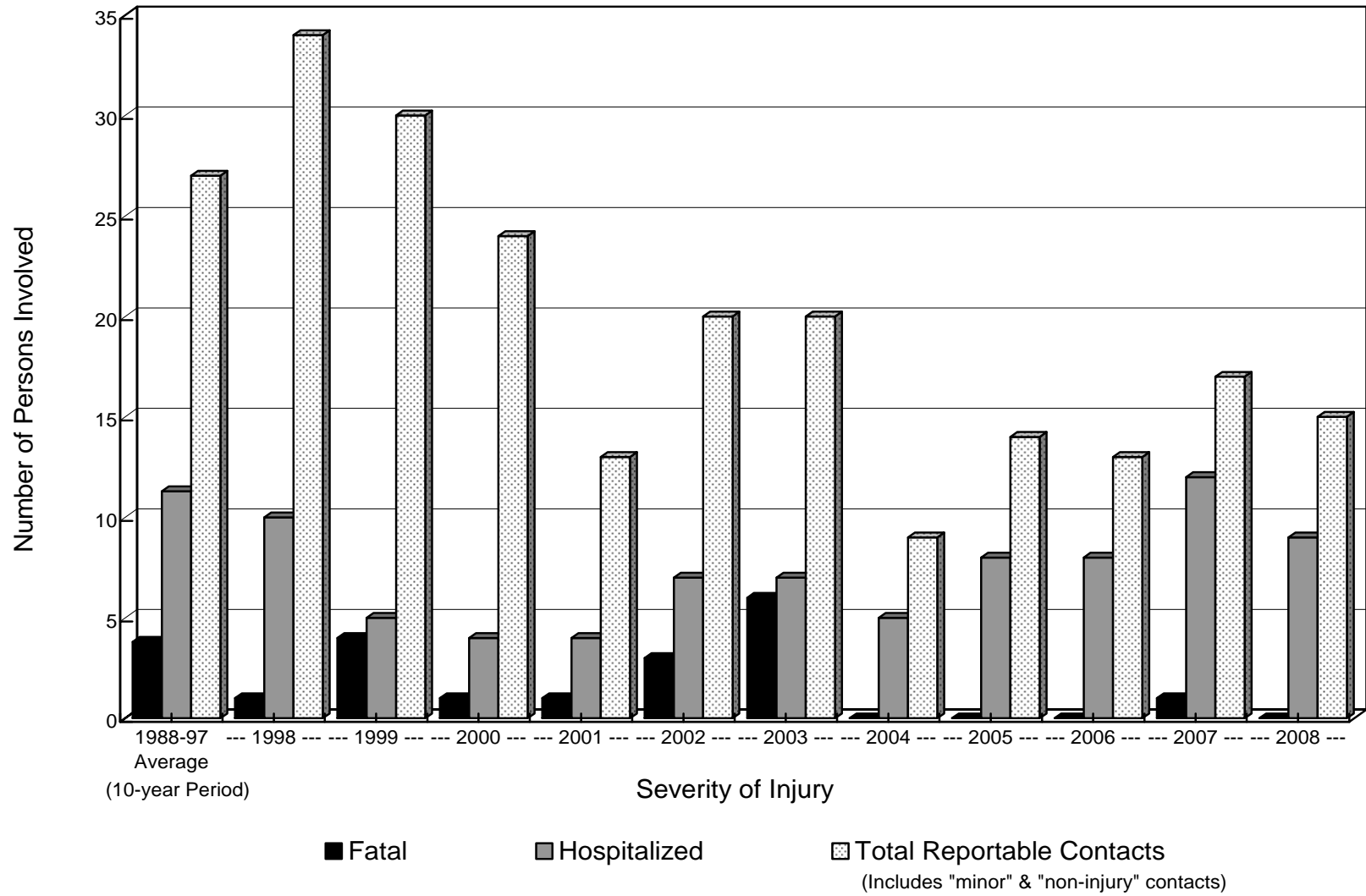
¹ Injury is defined in OAR 860-024-0050. However, only injuries related to power line contacts are included in this report.

Five workers were injured when they contacted energized underground power lines. One water utility worker sawed into a direct buried high voltage cable. In another incident a communication utility worker who was attempting to install an anchor hit an underground high voltage cable with a digger bar. These two utility workers failed to call for utility locates prior to excavation. In a separate single incident, three construction workers were drilling and installing vertical steel beams when an underground power line was hit. In this incident the electric utility failed to accurately locate and mark its underground electrical facilities. The three workers were hospitalized as a result of the incident.

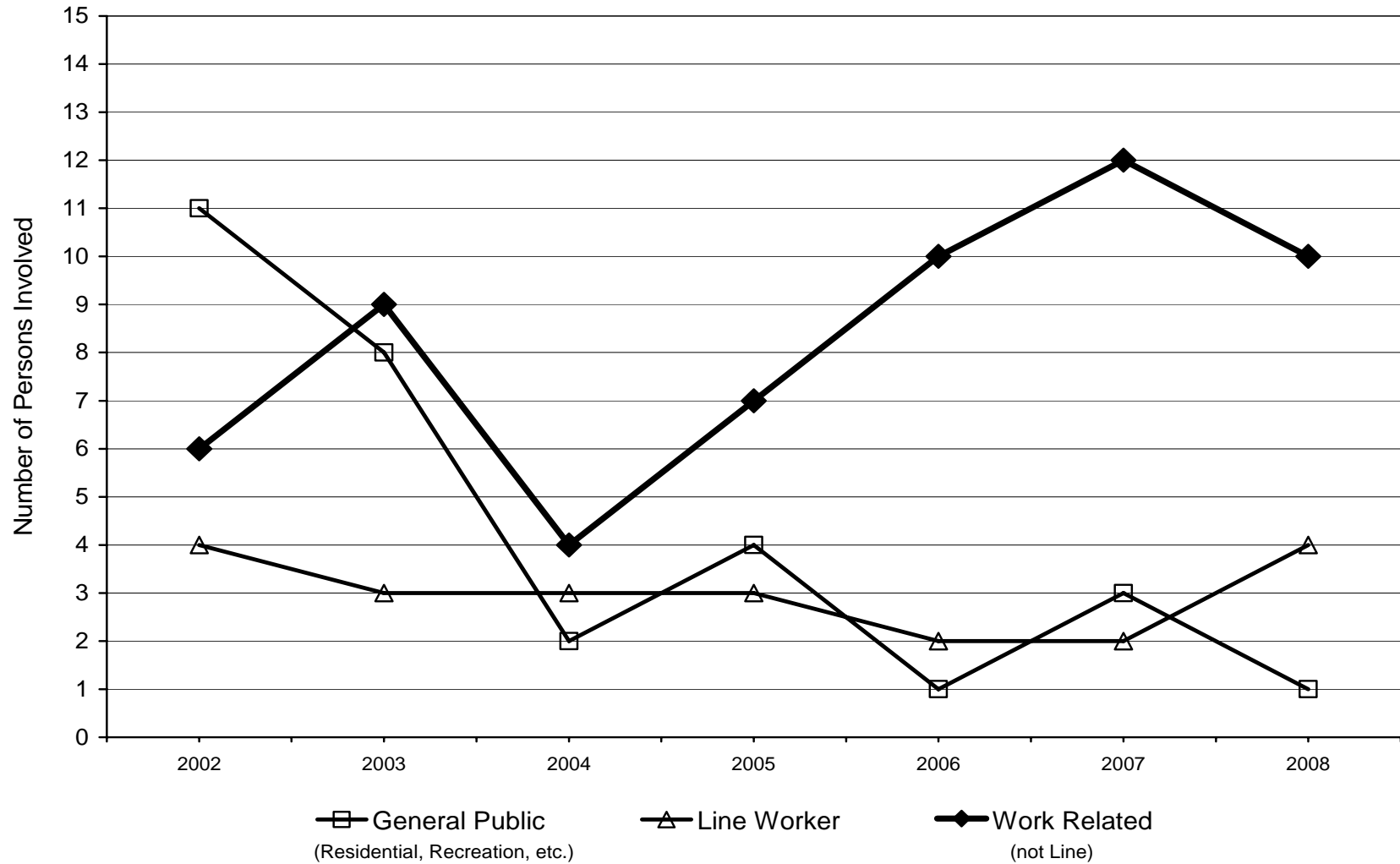
Two electric utility line workers were hospitalized as a result of contacts with energized lines in 2008. One injury involved a contract lineman who was changing out a crossarm on a utility pole. The other incident involved an apprentice lineman who was attempting to install grounding connections up on a 500 kV tower.

This report highlights at least two unsafe trends of concern. One is the growing trend of injuries related to construction/maintenance workers performing activities on or near buildings that are in close proximity to overhead power lines (see page 14). Another is the increase in injuries related to underground power line contacts (see page 15). Continued safety programs are needed to educate construction/maintenance workers, utility workers and others on the need to "Call 811" before excavating near underground power lines. Electric utilities should direct their safety programs to reversing trends in these areas.

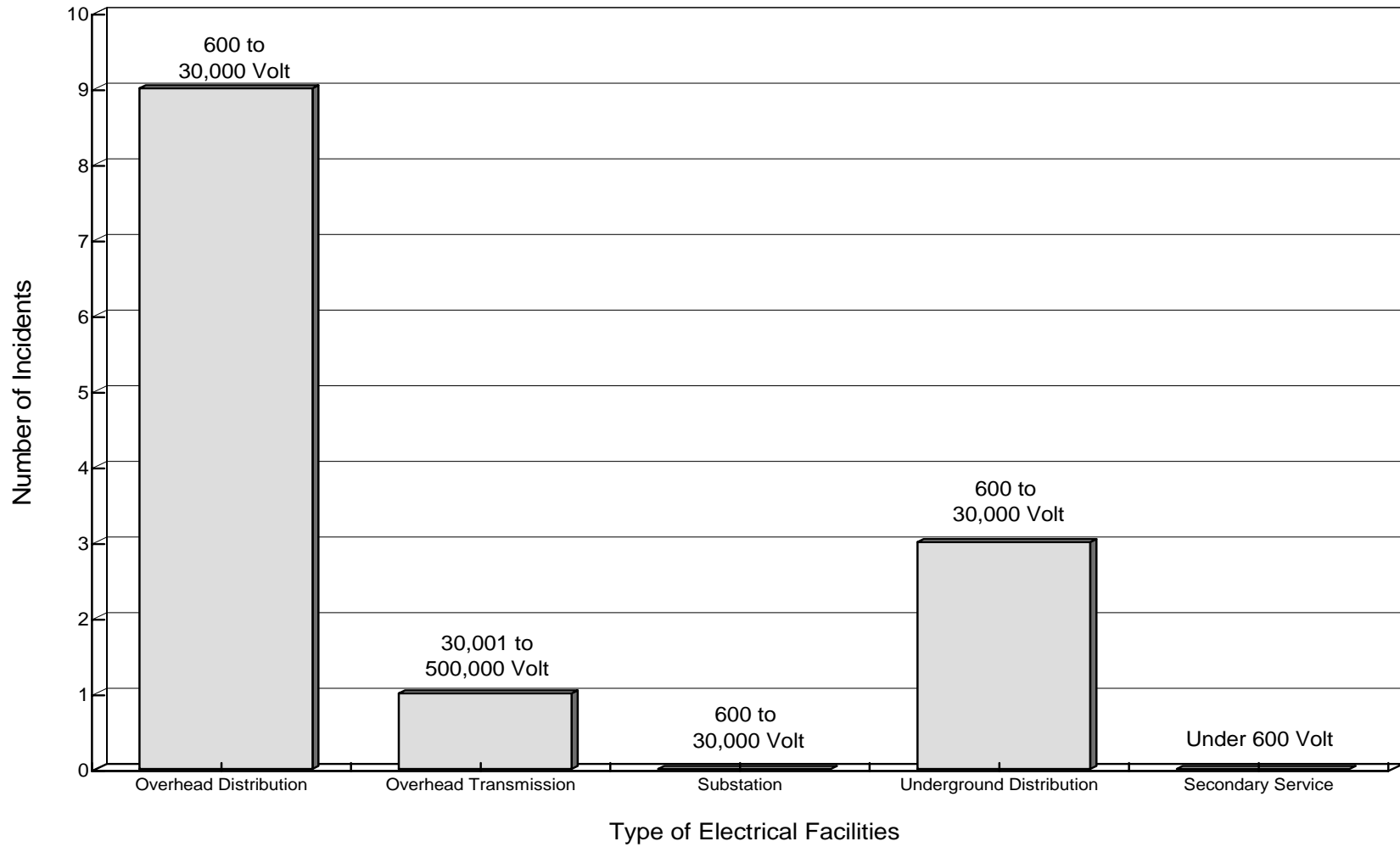
Electrical Contact Injuries by Severity



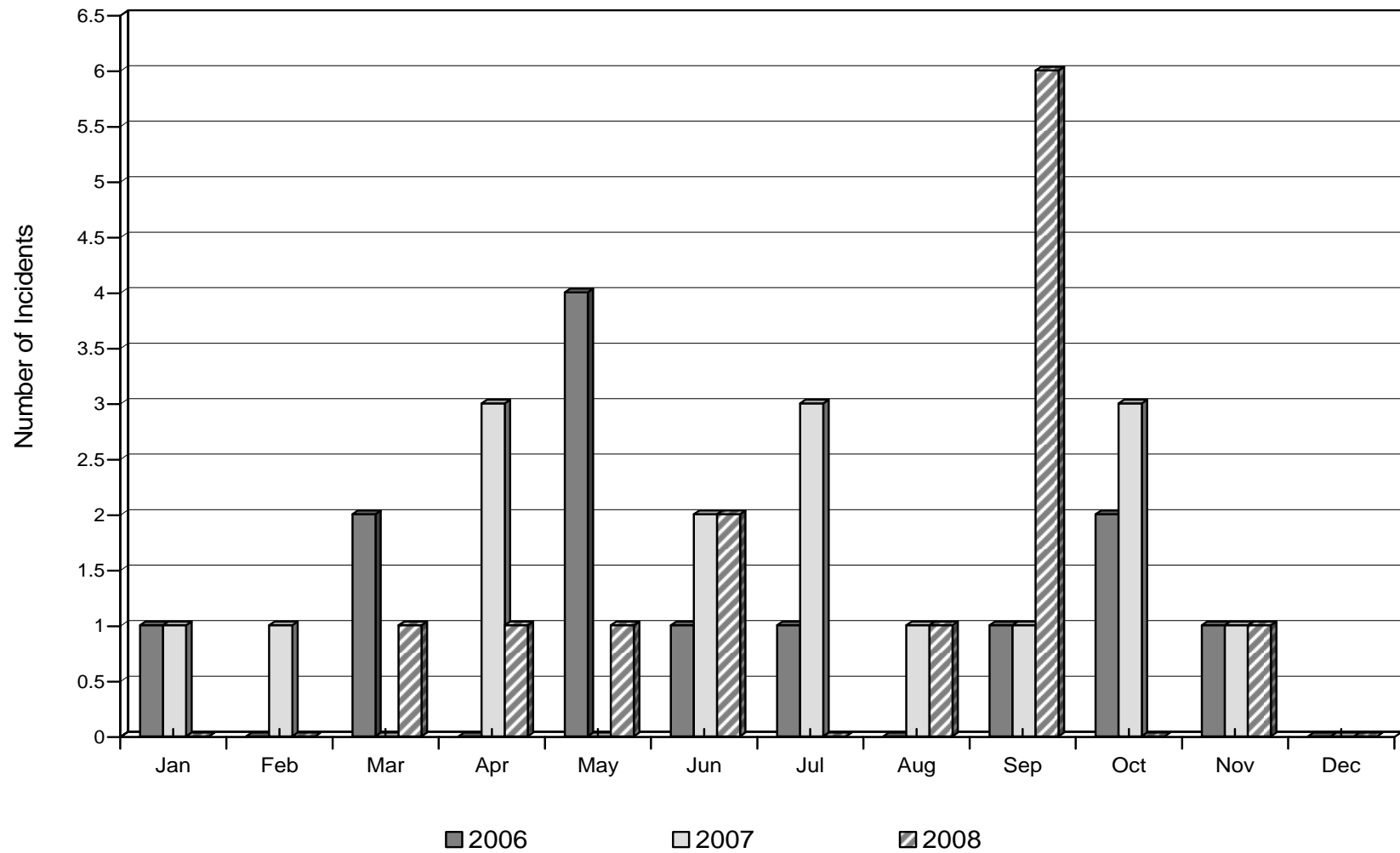
Electrical Contact Injuries by Activity Classification



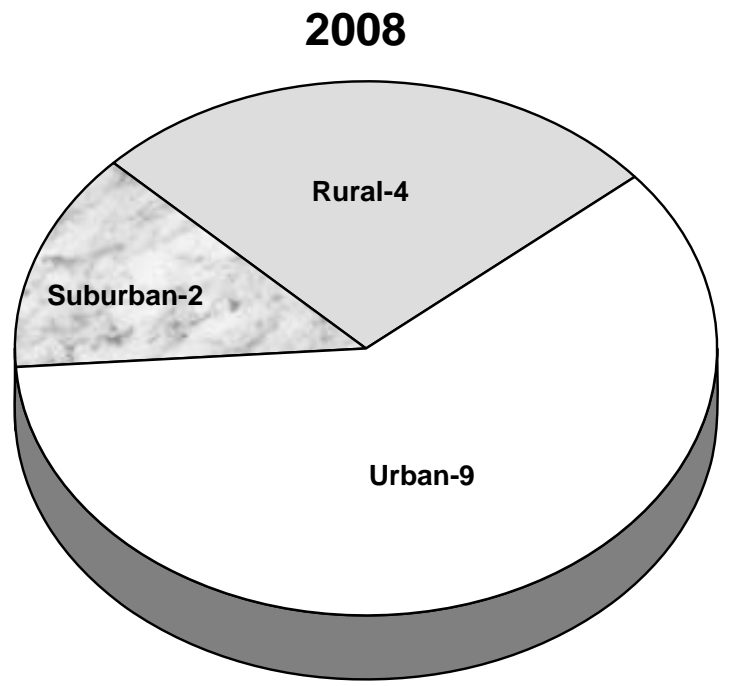
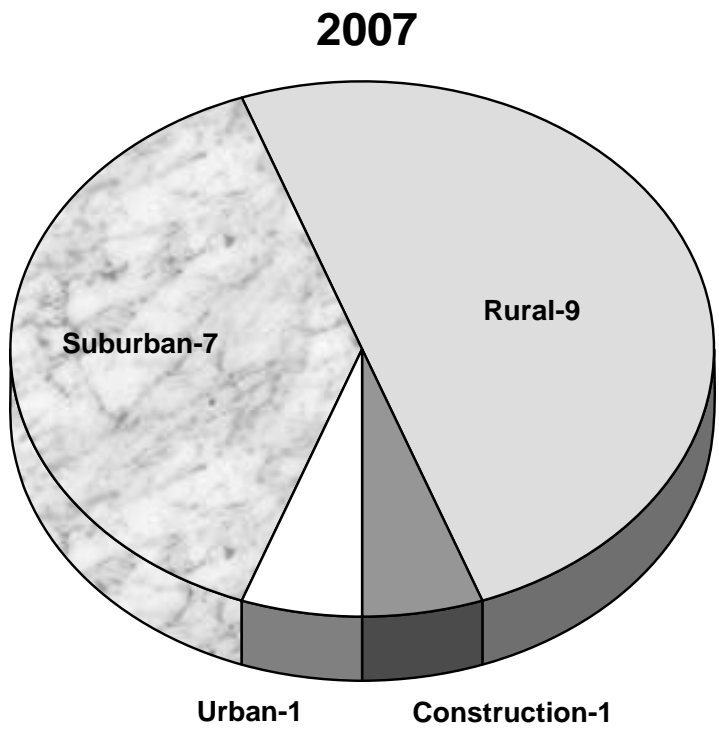
Type of Electrical System Involved 2008 Incidents



When Incidents Occurred - By Month

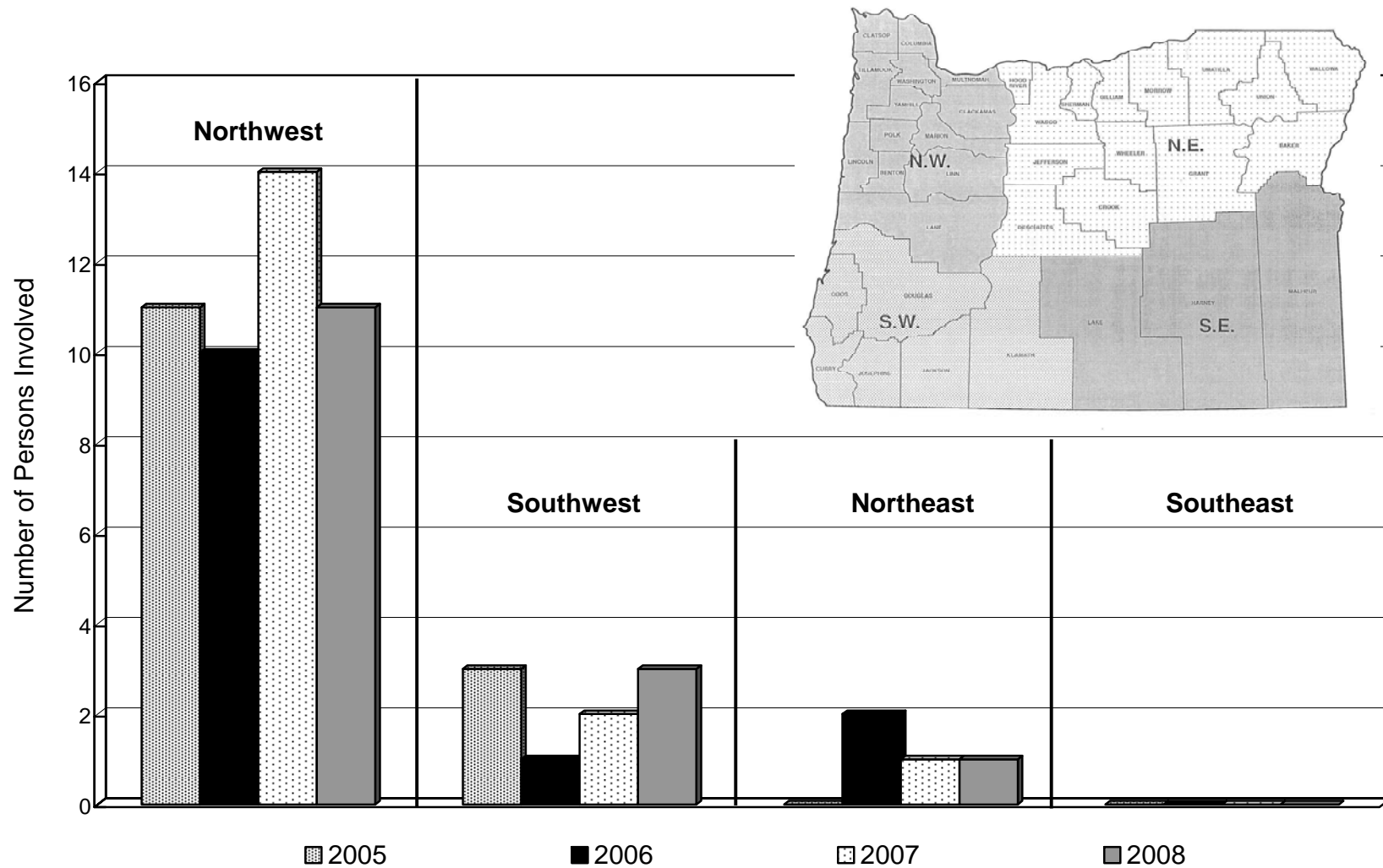


The pie chart below indicates where people are injured in regard to:
Demographic Areas or Sites: Rural, Suburban, Urban, Industrial, and Construction



By Person Injured

Where Contact Injuries Occurred - By Area

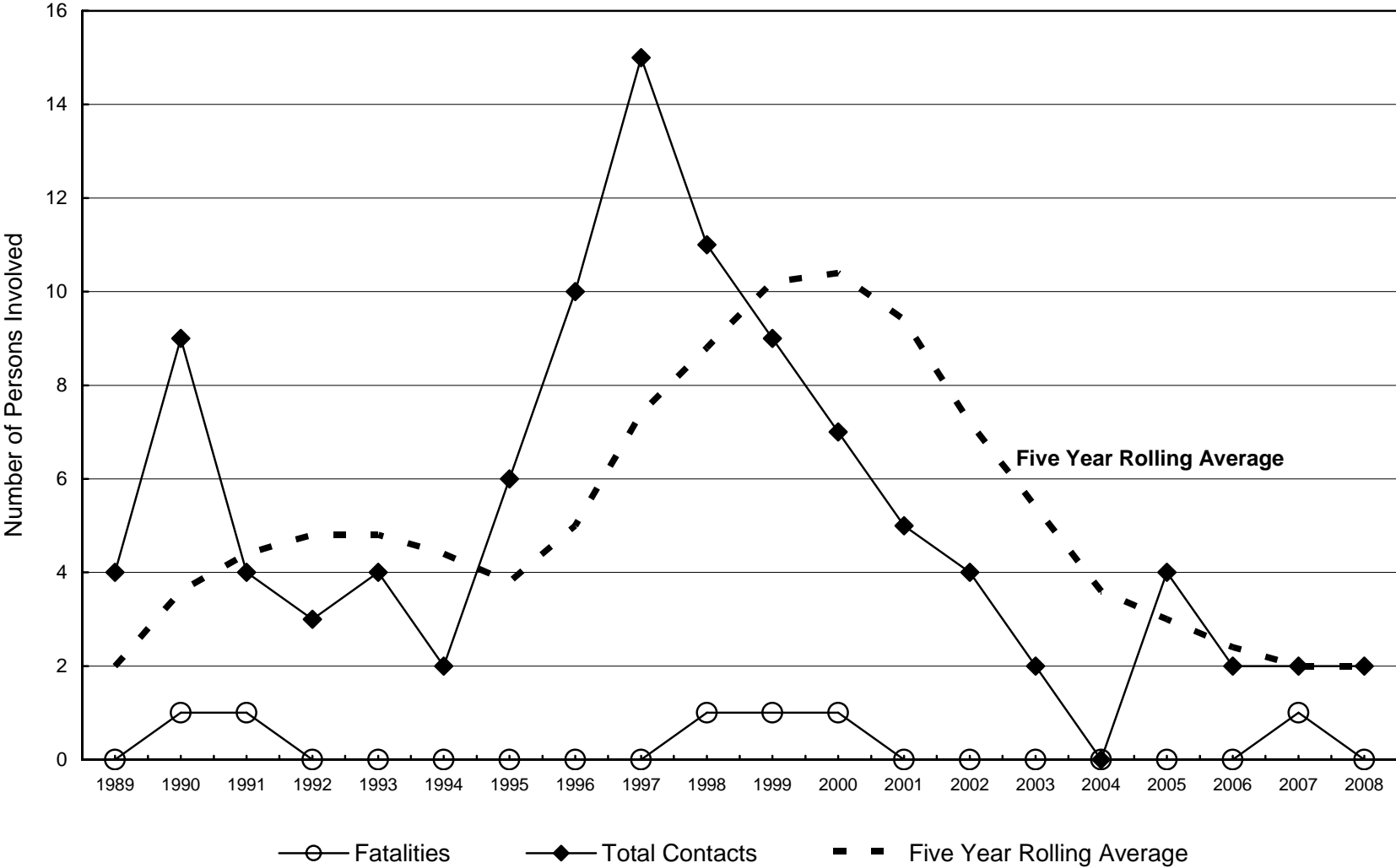


Special Areas of Concern

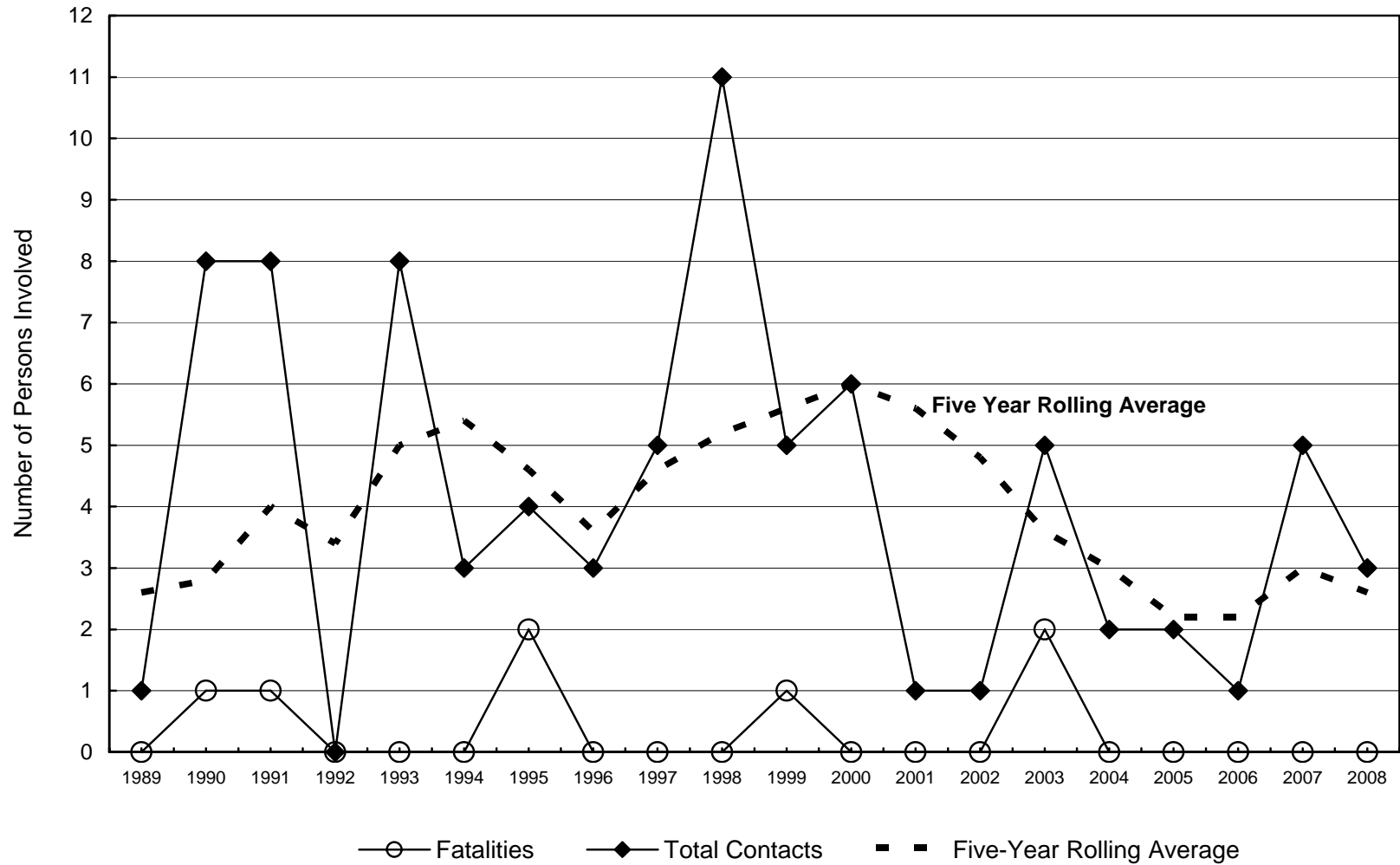
The next three charts track 20 years of incidents related to certain equipment or activities. The charts for Building and Excavation related incidents are new and reflect six years of activities:

- ◆ **Tree Related** - This category is, on average, where most people are injured. There has been an average of 5.25 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.
- ◆ **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 4.1 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.
- ◆ **Building Related** - These incidents involve buildings in close proximity to high voltage power lines. Generally, workers in these incidents did not take adequate measures to maintain the ten-foot working clearance to high voltage power lines (per ORS 757.800 and ORS 757.805).
- ◆ **Excavation Related** - These are incidents where people excavated and contacted underground electric lines. Most involve construction and maintenance workers.

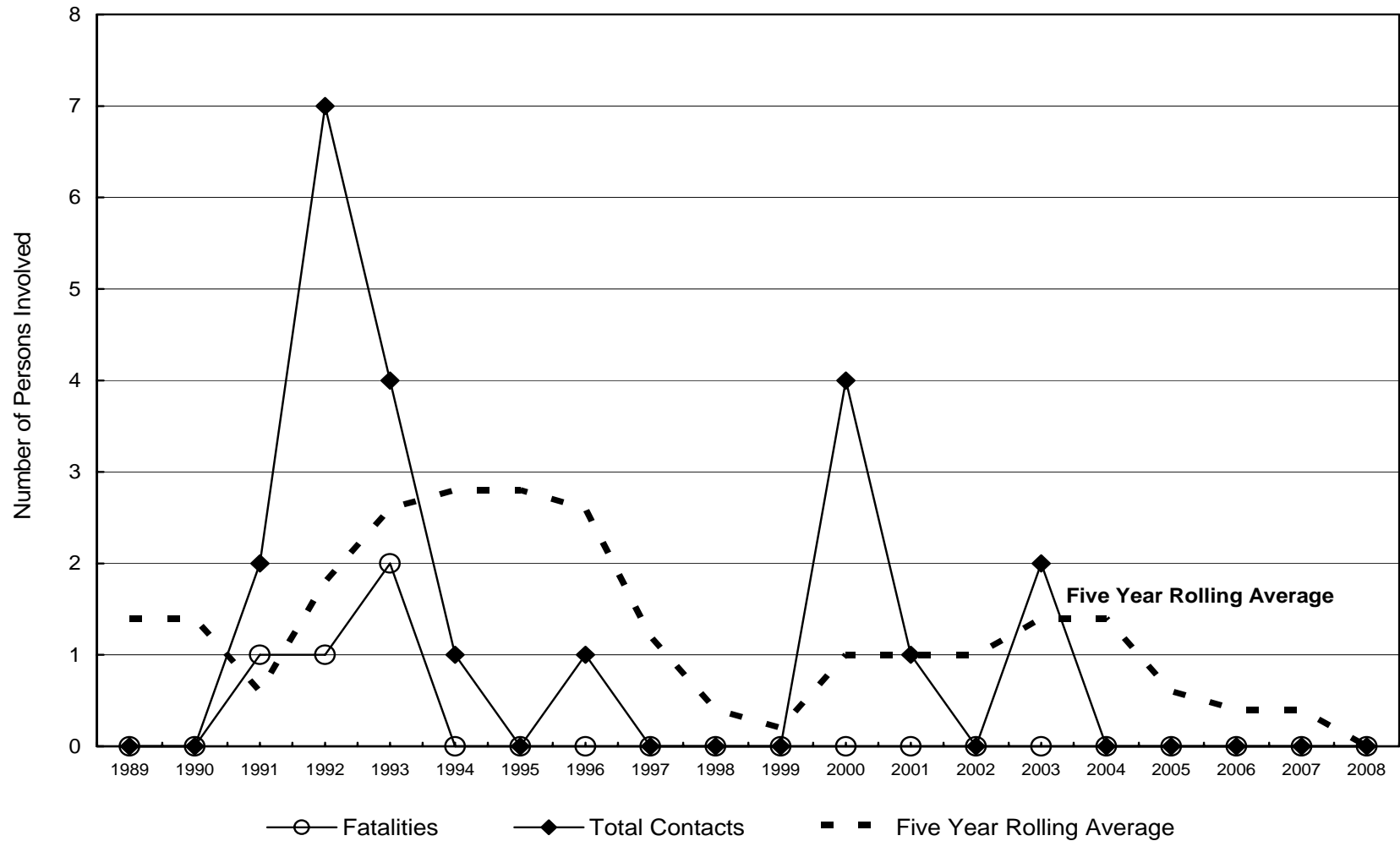
Tree Incidents Reported 20-Year History



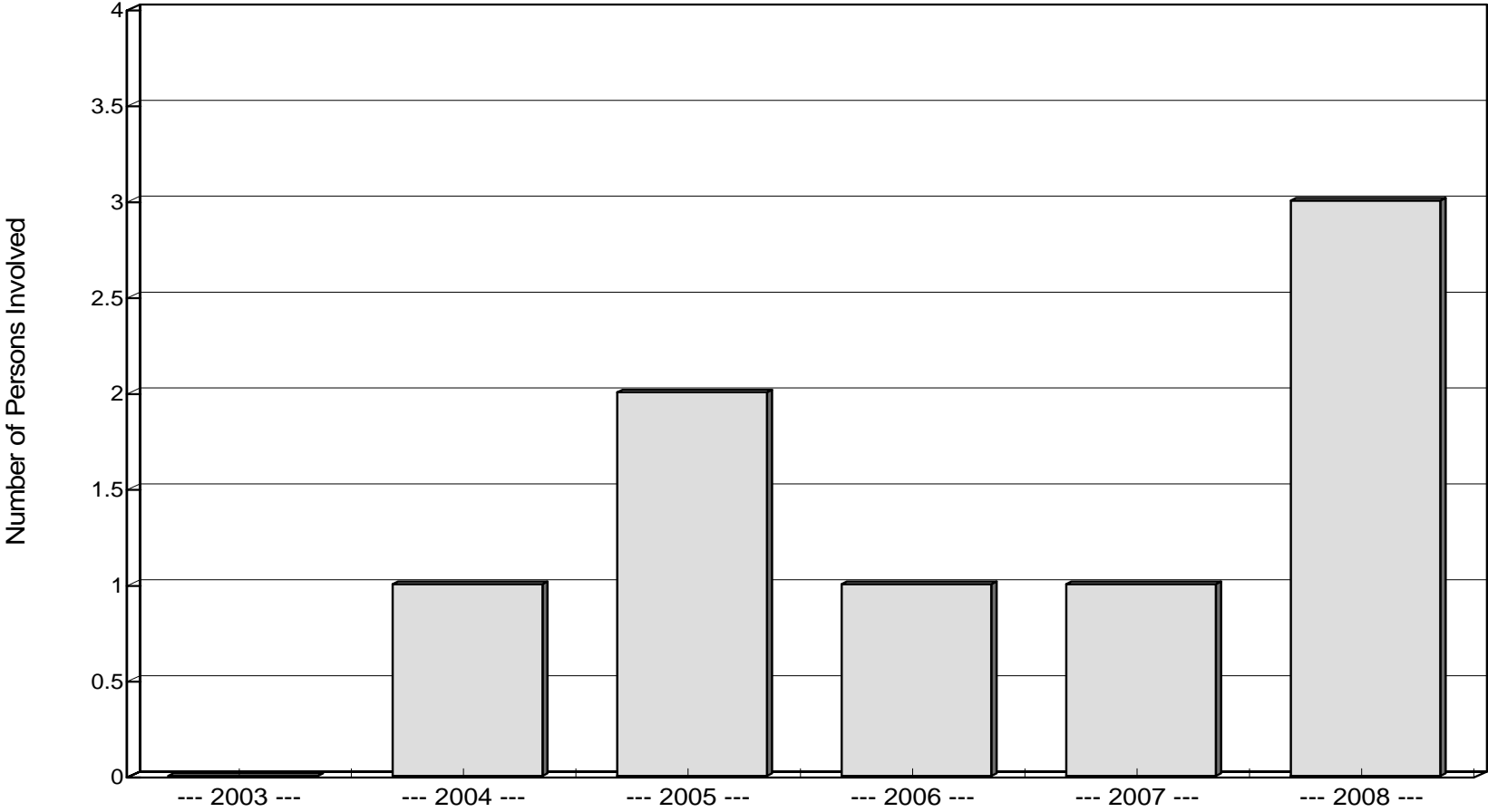
Crane or Lift Equipment Incidents Reported 20-Year History



Irrigation Pipe Incidents Reported 20-Year History



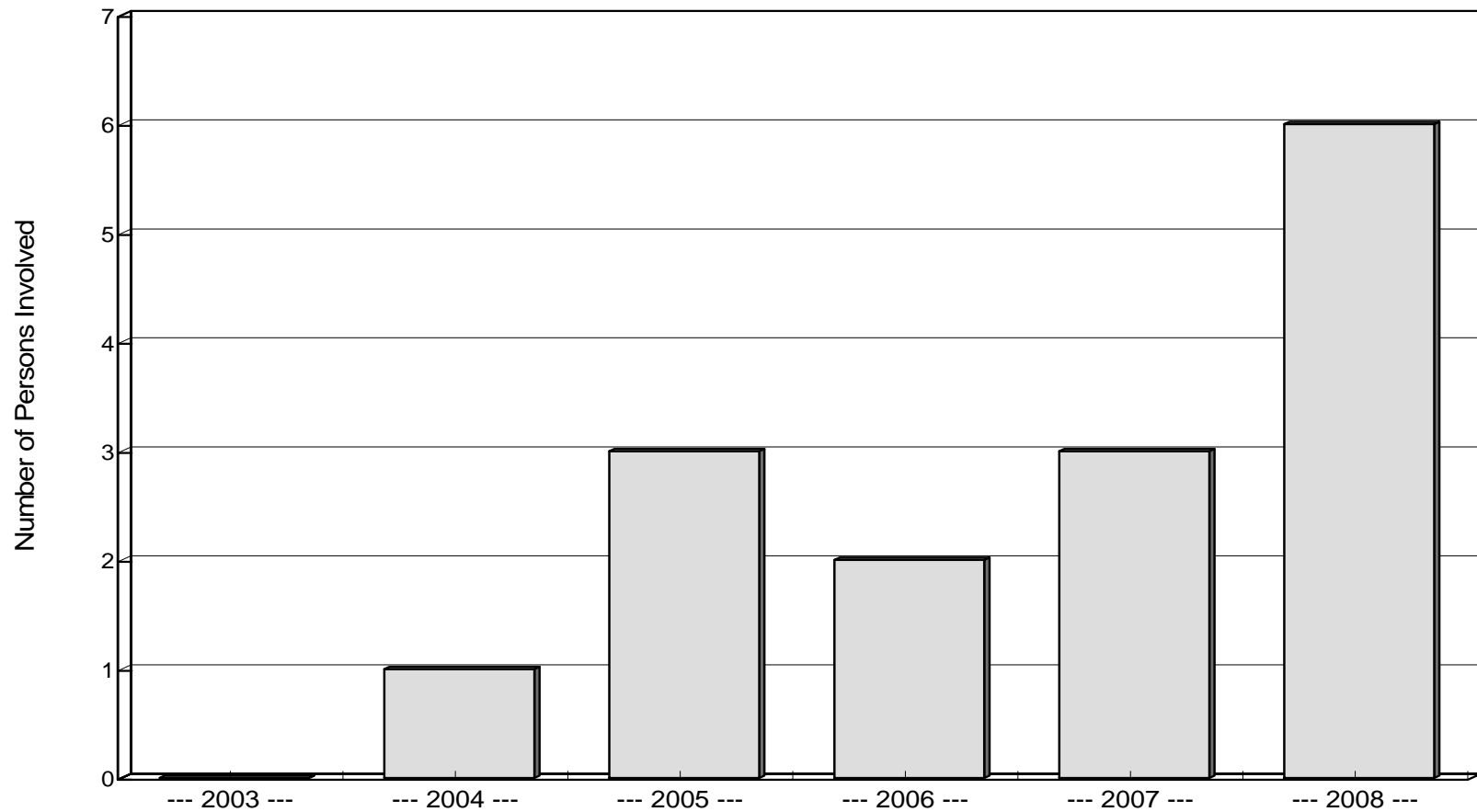
Building Related Incidents Reported Six-Year History



These accidents involve buildings in close proximity to overhead high voltage power lines.

Excavation Incidents Reported Six-Year History

(involving contacts with underground electric lines)

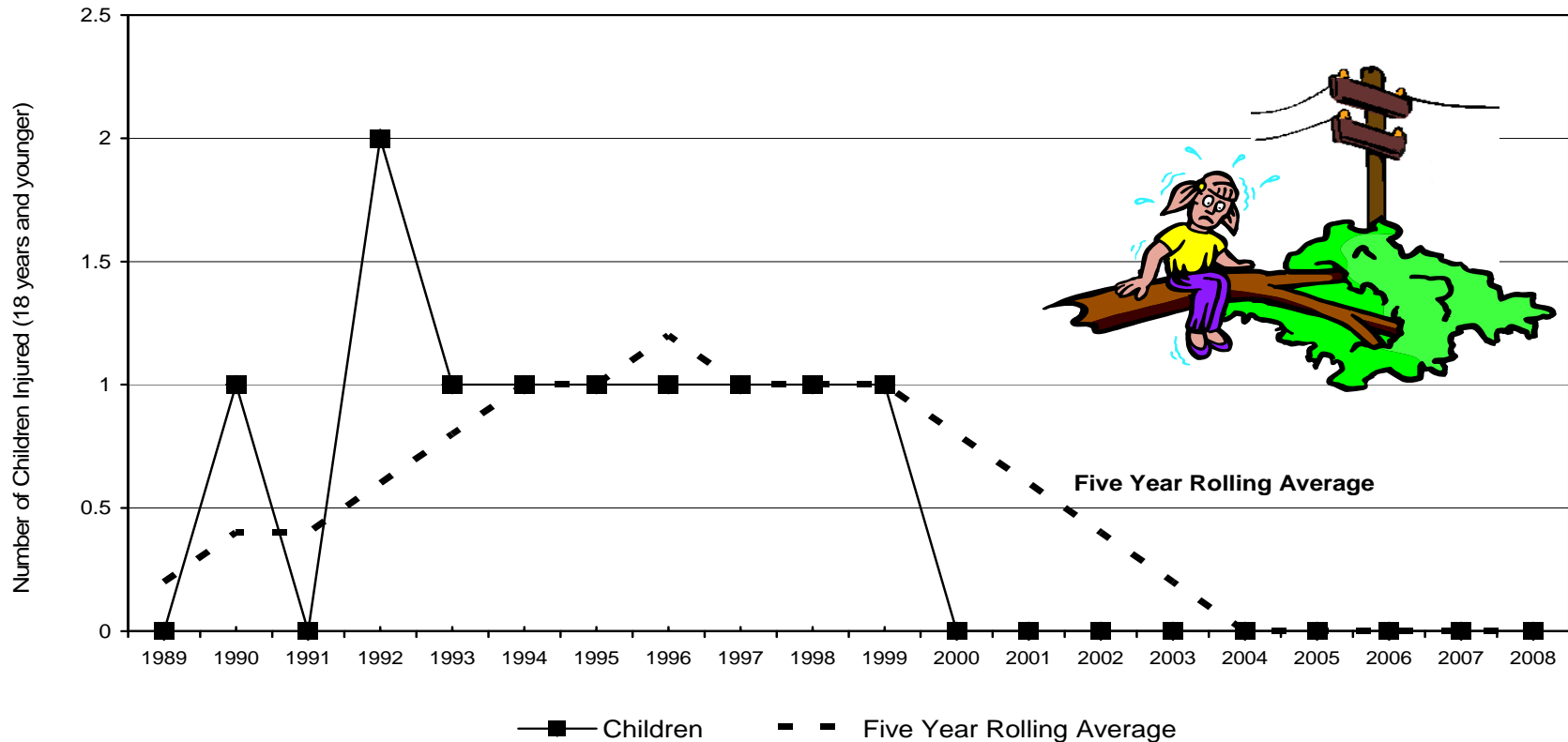


2008 Breakdown of Injury Contacts by Activity Involved (By Person Injured)

Note: Some incidents fit into multiple categories.

➤ Tree Trimming/Falling or Other Contact	2
➤ Excavation/Dig-ins	5
➤ Construction/Maintenance (all types)	13
➤ Irrigation Pipe	0
➤ Crane/Lift/Digger booms	
• Boom Truck	1
• Powered Aerial Work Platforms	2
➤ Ladder access	1
➤ Line/Utility-Related Work	
• Overhead line work (electric)	2
• Overhead line work (communications)	2
➤ Direct Contact	
• Line worker (overhead system)	2
• Wire down (car hit pole)	1
• Powered Aerial Work Platform related	2
➤ Vehicle collision (car hit pole)	1

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



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

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 each year to every customer.
 - c. Continue education for agricultural workers. OPUC 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 either overhead or 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.