

# Why are workers dying in the Brazilian electrical sector?

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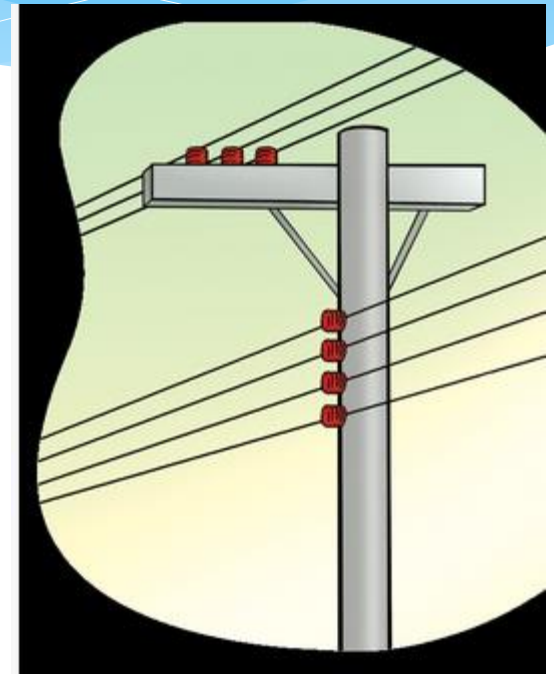
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# INTRODUCTION

- \* From 2003 to 2012 were reported 750 deaths due to workplace accidents in the Brazilian electrical sector.
- \* In 2011, the mortality rate in the sector was 31.9 per 100,000, 5.5 times higher than the rate in the formal sector.
- \* Most of these accidents occur in maintenance activities in the electrical-energy distribution

# INTRODUCTION



- \* Photo taken from the website Abradee - available-  
<http://www.abradee.com.br/index.php> - access the day 4/13/2014 8:07 a.m.

# Objective

- \* This study presents analyses of three workplace accidents that occurred in the state of São Paulo, two fatal and one with serious injuries, affecting electricians providing maintenance of energy distribution networks. The analyses aim to comprehend these events in depth, and supply an elaboration of prevention strategies.

# METHOD

- \* We utilized the Model of Analysis and Prevention of Workplace Accidents (MAPA), a conceptual and technical guide for the collection and interpretation of data, aiming to identify the greatest possible quantity of information related to accidents approached as social-technical phenomena with origins in aspects of the history of the system, in particular managerial and organizational workplace choices.

# RESULTS - Case 1

- \* The wooden cross-beam that should have replaced the damaged one arrived with drill holes of measures different from those of the piece to be replaced, requiring new drilling and prolonging the task. The electricians were positioned on opposite sides of the basket acting as two distinct teams, which had never worked together. During the intervention, the hand of one worker touched the unprotected energized structure, producing electrical shock and death.

# RESULTS - Case 2

- \* While examining the transformer elevating his body to see the upper part of the equipment, the worker drew his upper limbs close to the primary network (13.8 KV), which permitted the formation of a voltaic arc that struck him. The current entered the right wrist dorsally and exited through the left foot of the victim who lost consciousness and fell, becoming trapped by the safety belt and lanyard. Although aided by rescue workers, he succumbed to his wounds and died at the health center.

# RESULTS - Case 3

- \* while one worker used a chainsaw to cut eucalyptus situated near a transmission line of 138 KV, his colleague underpinned the same tree with a wooden log. Suddenly, the tree was knocked over by a strong wind and fell over an energized line. The accident victim suffered shock and severe burns upon attempting to contain the fall of the eucalyptus to protect himself. The tree conducted an electrical current.



# DISCUSSION

- \* The cases described herein illustrate situations in which real work transpired without or with an insufficiency of barriers for protection and prevention against electrical risks already well known and addressed in the safety norms established in the country.

# DISCUSSION

- \* In all the cases small changes in activity can lead to an accident since the functioning of the system depends on the non-interruption of the energy supply to the population, which in turn enhances work permits in proximity to energized lines.
- \* ANEEL, the national regulatory agency of the system adopts a reduction of the time that the energy supply is interrupted as an indicator of the efficiency of concessionaries.

# DISCUSSION

- \* If these goals are not achieved in this regard, the companies incur fines or other punishments.
- \* The regulatory agency has also adopted a reduction in the costs of maintaining the electrical network as an indicator of efficiency, thereby encouraging outsourcing practices associated with precarious conditions and labor relations in the sector, including those related to the management of safety and health in the workplace.

# DISCUSSION

- \* The conduct of this process in the Brazilian electrical sector takes place under the aegis of the logic of strict defense of economic interests ;
- \* The fact that the safety performance of concessionaries and their contractors have shown a significant increase in fatal accidents in the same period tends to be treated as a negative externality of no interest to the system;

# DISCUSSION

- \* This study shows evidence that the current incentives for outsourcing in the Brazilian electrical sector may be a cause of its worsening health and safety indicators, in particular via the introduction of steps that weaken the scope of prevention measures against electricity risks enshrined in the country's laws;
- \* The study also indicates the need for organizational and social changes in the system with an incentive for technological modernization, investments in improvements in reliability and in valuing of work and of prevention.