



## WHEN VIOLATIONS ARE ADAPTIVE ACTIONS TO SOLVE CRITICAL SITUATIONS AT WORK

Ildeberto Muniz de Almeida <sup>1\*</sup>

Rosemary Cavalcante Gonçalves <sup>2</sup>

### Abstract

The study addresses violations of safety rules as adaptation strategies to deal with critical situations at work. The research was conducted with electricians from the maintenance service of electricity distribution networks. The technique of critical incidents with an interview script was used to data collection. For data analysis, thematic categorization was used. The results showed that professionals, when they deviate from rules, make adjustments to restore the functioning of the system, seeking to reconcile organizational objectives while remaining within what they perceive as safety limits. The study contributes to a better understanding of rules violations, and can provide subsidies for actions in the field of safety at work.

**Keywords:** Adaptation; Rule violations; Critical incidents; Safety at work.

### 1. INTRODUCTION

Working with electricity is considered to be of high risk for the occurrence of accidents. In the context of the work of electricians in energy distribution companies, the risks of accidents are amplified due to the unpredictability of services and the speed required to restore energy supply to consumers (MELO et al., 2003). In this sense, workers play an important role in the reliability of operations, mobilizing adaptive actions to manage risks at work.

Adaptation is a consequence of working in a dynamic context, which corresponds to the ability of workers to anticipate and diagnose problems, as well as to reassess situations and seek strategies to adjust to new events (CHRISTOFFERSEN; WOODS, 1998). The need to adapt results in performance variability, implying adjustments made at each moment in the execution of the activity. Although variability is often associated with negative consequences, it is an essential condition for the functioning of systems. Adjustments make it possible for the work to achieve the objectives set, although they may lead to deviations or violations of rules. It is these deviations that make it possible to learn to deal with uncertainties (HOLLNAGEL, 2009).

<sup>1</sup> Universidade Estadual Paulista \* ialmeida@fmb.unesp.br

<sup>2</sup> University of Fortaleza



Although violations of safety rules are commonly related to the causes of accidents (HUDSON et al., 1998), a more in-depth analysis allows us to perceive that violations are complex phenomena that, paradoxically, can both increase the effectiveness of safety and expose the system to risk situations (ALMABERTI et al., 2006).

Therefore, it is important to understand how violations can be related to adaptation strategies. This study aims to analyze violations of safety rules that constitute adaptive actions used by electricians to deal with critical incidents.

## 2. METHOD

The exploratory qualitative study was carried out with electricians of the Emergency Service (SE) of a company that provides services to the electricity distribution concessionaire in the Northeast. The SE is responsible for emergency corrective maintenance in the low and medium voltage electrical network, energized or de-energized.

The research is part of a broader investigation that aimed to analyze safety management by electricians. For this study, the focus was made in order to analyze the critical incidents reported that led to the violation of rules as an adaptive action employed by professionals.

For data collection, the critical incident technique (FLANAGAN, 1973) was used because it enables the identification of critical situations experienced by the participants in relation to safety during the execution of the work, regardless of whether the results were positive or negative. An interview script was elaborated divided into two parts: (1) a question to identify a critical incident involving occupational safety; (2) questions for further study.

In the selection of participants for the interviews, the following inclusion criteria were adopted: having the function of electrician and having worked for at least one year in the ED. In all, there were 23 participants, and this number was defined by theoretical data saturation. However, due to the focus for this study, only the interviews of 5 participants were considered.

Data analysis followed thematic categorization procedures. The study adopted the ethical guidelines that regulate research involving human beings.

## 3. RESULTS AND DISCUSSION

In the interviews, 25 critical events were reported. Regarding critical incidents involving violations of the rules, six incidents were identified. In this study, the five events that involved violations were analyzed as adaptive actions to deal with safety-critical situations.



On IC1 (read critical incident 1), the electrician climbed on a broken pole, which was propped up on a truck, in order to perform the service. On the IC2, the team had to hold the electricity cable with a maneuvering stick due to the accident that knocked down a pole. In this case, the initial procedures were not carried out because there was a risk of a major accident occurring. On the IC3, the electrician found an alternative to make the repair on a very high pole, moving from the vehicle's aerial basket to the pole in order to do the work. On the IC4, the team positioned the ladder inside the customer's house, without making the moorings, to solve the problem in a branch that was on fire. On the IC5, the team had to intervene without prior authorization from the control center because there was a risk to the life of third parties.

Two incidents (CI1; CI3) were related to a critical power outage event, in which there is a sense of urgency for the electrical system to be recovered. In these situations, it is common for electricians to feel pressured and look for alternatives to repair the electrical network. Three events (CI2; CI4; CI5) related to occurrences that required rapid action to avoid further complications.

The strategies to deal with the incidents involved violations of safety procedures, such as: climbing a pole with a damaged structure (IC1); not following the initial procedures (such as isolating the area and positioning the vehicle correctly) (IC2); get out of the vehicle's air basket (IC3); not positioning correctly and not tying the ladder (CI4); and perform service without authorization from the control center. The adaptive behaviors both sought to reestablish the system and aimed to limit the severity of the consequences of the incident, especially with implications for the system or third parties.

It is observed that all the strategies adopted involved some type of risk for the worker, which could have culminated in an accident. It is considered that the expertise of the professionals has contributed to the successful action. It is possible to suppose that, faced with conflicting choices between resolving the occurrence and ensuring their own safety, electricians seek to reconcile the achievement of organizational objectives and, at the same time, remain within what they perceive as a safety zone.

It is a cognitive commitment, in which, in the face of the multiple interests in dispute, the decision adopted is never the optimal one (AMALBERTI, 2016). The study shows that if the situation leads to a conflict between security and production (system restoration), the choice often implies taking the risk. This suggests that perceived responsibilities to the system may be predominating in a way that encourages an ethic of sacrifice.



#### 4. CONCLUSIONS

The results reveal that the behaviors that violate security rules need to be understood in the context in which they occur, which is largely defined by the deficiencies of the system. Deviations are a way for professionals to compensate for disturbances in the system, and can be seen as resilient actions that reflect the adaptive capacity of workers to deal with unpredictability.

In addition, the investigation of critical incidents allowed the identification of activities that need to be explored in depth in order to reveal how, historically, in that system operators deal with variabilities and what are the strategies and conditions of success or failure of these practices.

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